

## BALANCING THE DEMANDS OF KNOWLEDGE AND TECHNOLOGY IN AN OPEN LEARNING DELIVERY COMPUTER ASSISTED LEARNING COURSE IN AUSTRALIA

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The eminent linguist Henry Widdowson has expressed the view that in order to develop teachers need discipline and authority. "Freedom of action is meaningless without limits: these are, negatively, constraints when they inhibit action, but they are, positively, necessary enabling conditions. The crucial thing is not to deny the disciplinary authority of theory, but to know how to use it as a condition for enquiry, to make it relevant as a set of bearings to find your own way" (1994: p. 20). Nowhere is this "condition for enquiry" needed more than on the World Wide Web (WWW) if one is to make one's own way meaningfully and constructively.

What sort of authority might one attempt to bring to the mass of unstructured information available on the WWW? In the model that this case study reports on, we began with theories of learning that were based on work by Levy (1997) and Jones & Mercer (1993). This resulted in our student teachers considering all material within the frameworks of relevant theories of learning; behaviourism as well as constructivism and socio-cultural theory derived from the work of Vygotsky (1978).

Levy has proposed that computer use in language learning can be categorised into two broad divisions. Materials (software or online wares) which are intended to instruct promote the use of computers as tutors. Those materials which allow users to achieve other tasks (word processing, concordancing and so forth) promote the use of computers as tools. A good deal of computer assisted language learning (CALL) software, whether consciously or unconsciously, can be characterised as being of the tutor (in Levy's terms) type. Much of this software exhibits certain behaviourist learning principles. In this view of learning one set of observable conditions (stimuli) can be related to another set of observable conditions (responses) and emphasis is on what the learner does and the response(s) that s/he is led to give. For instance, the key principle of the Skinnerian law of operant conditioning is that the correct or desired behaviour is reinforced. Strict behaviourist learning principles dictate that no feedback should be given when an incorrect response is made.

In practice, however, many of the software programmes which exhibit elements of behaviourism depart from this stricture in that they give information on both correct and incorrect responses. *Storyboard*, *Gapkit* and *Clozemaster* are programmes of this type. Certain aspects of these programmes can be viewed as behaviourist though of course the writers of them were almost certainly not behaviourists. Operant conditioning, though undoubtedly influential, has been and is much criticised. With respect to language learning these criticisms are particularly germane. Reinforcement of fixed, specific behaviours does not relate well to language use where we are faced with novel situations and need to produce novel responses to them.

The influence of a Piagetian constructivist approach to learning places importance on the learner as an active participant in the learning process, structuring his/her experience and knowledge. Emphasis is on underlying understanding rather than on behaviour or response to a situation. In this view of learning new experiences are related to existing knowledge, which in turn is derived from previous experiences. Unlike operant conditioning where teaching is central in a constructivist approach the emphasis is on learning, teaching is the means whereby the conditions for learning are created.

Both behaviourism and constructivism manifest firmly individualistic approaches to learning. Jones and Mercer (1993) characterise these approaches as ways of describing how people learn in terms of individual thoughts and actions (behaviourism) and how an individual adapts to the complexities in which s/he operates (constructivism). The CALL software referred to earlier, as far as it engages learners individually, has a great deal in common with these approaches to learning.

The weakness of individual models of learning is that they take no account of the social character of most learning. Teaching and learning is perhaps a better way of describing the social nature of classroom processes and of much learning. A great deal of learning, information technology (IT) is no exception, involves the sharing of knowledge. Learning word processing, for instance, results in the possession of knowledge and skills which allow other kinds of information to be shared through print-out, file transfer or electronic mail. Used in this way computers and their programmes are, in Levy's terms, tools. In this view of learning people share knowledge and understanding to create a new socio-cultural resource.

A theoretical framework that relates to such a social, communicative, culturally oriented view of learning can be found in the work of the Russian psychologist L. S. Vygotsky. Vygotsky gives prominence to the role of language in cognitive development, problem solving and learning and he emphasises the essentially social nature of cognitive change. The significance of these ideas for the role of the computer in the learning process and the teacher's role in relation to computers in the classroom is the potential of computers for reorganising classroom instruction and making possible the extension of education beyond the classroom.

The recent growth of the WWW as a communication medium has reinforced this potential for education beyond the classroom and made the need for "a condition for enquiry" more urgent. As Glenn Shive pointed out at the recent Hong Kong Conference *on New Professionalism in Teaching*, "its underlying power derives from its convergence of digital networks that incorporate the video powers of television, the data worlds of the computer and the voice transmission of the telephone" (1999: p. 1). Not only this digital convergence but also the fact that computer technology and computer software are becoming cheaper can be positive factors in an economic climate where cost consciousness underscores every initiative. Similarly, in an article in *The Australian* ("Convergent technology", 1998) it was pointed out that voice, data, image and video convergence can already be delivered and that organisations that have the foresight to exploit the available technologies will move ahead. Two reports on the Microsoft NetMeeting Home Page (1998) illustrate what is already being achieved with convergent technologies. The American toy retailer Toys "R" Us and software applications company, Baan Midmarket Solutions both use MSNetMeeting conferencing software to provide ongoing training for their resellers. Both companies report savings on training and associated travel costs as well as increased effectiveness and flexibility with respect to delivery. Further, a thesis published online (Rettinger: 1995) provides substantial background to the current and future potential of remote seminar delivery using convergent technologies in the form of desktop videoconferencing.

In the first semester of the current academic year at Universiti Brunei Darussalam I taught a course for pre service teachers, somewhat erroneously entitled *Computer Assisted Language Learning*, which devoted much time to assessment and evaluation of English language websites as resources for teachers and students. This assessment and evaluation was done in the context of the theories of learning which have already been discussed. A colleague at Curtin University of Technology in Western Australia was teaching a similar course and it became apparent to us in email exchanges that he had the greater Information Technology (IT) expertise while I had the greater educational and learning theory expertise. So we pooled our resources, our expertise. He took primary responsibility for the work on the websites, the practical application, while I took primary responsibility for the educational and learning theories that were used to underpin the assessment and evaluation activities and provide the theoretical background. Materials were exchanged using file transfer protocol (CuteFTP) software and lectures were delivered on-line using MSNetMeeting. We used a pedagogic paradigm of remote expert, resident tutorial group, resident backup facilitator.

There are a number of desktop video-conferencing products available. We considered using CU-SeeMe and Netscape Conference among others, before selecting Microsoft NetMeeting. This application, which comes packaged with Windows 98 or is available as a free download from [www.microsoft.com/netmeeting/](http://www.microsoft.com/netmeeting/), has a rich set of conferencing features including text-chat, full duplex audio, video, and a collaborative 'whiteboard' area where figures may be drawn and images pasted. NetMeeting also allows the others in the meeting to view, or even use, an application on your computer with its 'share' feature. Initially we planned to take full advantage of this feature by having the remote expert instruct the tutorial group in the use of one or more CALL applications. However a trial run established that we did not have enough bandwidth to utilise this feature successfully. The term bandwidth refers to the rate at which data can be transmitted over a channel, and the relative lack of bandwidth we could achieve between Brunei and Perth meant all attempts to use the 'share' feature were frustratingly slow.

Lack of bandwidth also resulted in us abandoning our original plan to make extensive use of video – instead of all participants sending and receiving video of themselves participating in the meeting, the use of video was

restricted to presentations made by the remote expert. While we initially considered this to be a problem, in the event it produced some positive outcomes. For example, as all the group discussions were carried out using synchronous text-based chat, augmented by the 'whiteboard', it was possible to keep a log, a file copy of the entire discussion. This log proved a valuable resource when planning follow-up sessions, and there is no doubt that it allowed us to meet the needs of the students more effectively. Another positive outcome of the text environment was that it appeared to invite a more equitable contribution from all participants – students who might be reluctant to speak up in the ebb and flow of verbal virtual debate were afforded the opportunity to make a considered contribution in the text-based debate.

Our trial run also reinforced to us the importance of establishing conventions or 'groundrules' to impose some structure and order on the meetings. As anyone who has participated in synchronous text-based 'chat' forums, teleconferences or even videoconferences will know, it is quite common for a number of participants to attempt to contribute at one time, resulting in confusion and frustration. In our situation, where the discussion was text-based, and individual contributions took some time to generate (depending on the participant's typing speed) there was always the possibility that the discussion would move on to a new topic leaving one or more participants with something still to say about the previous topic. To avoid this we negotiated a set of 'groundrules', an etiquette for the meetings, as part of an introductory session. It also became necessary for us to put in place a set of trouble-shooting procedures – on several occasions various participants in the tutorial group would lose their connection to the meeting and have to rejoin. Even worse, on one occasion the remote expert, who was hosting the meeting, had his computer crash, throwing the whole meeting into temporary disarray. However our previously established procedures saw the meeting reconstituted with the minimum of disruption.

While the technical difficulties mentioned above (lack of bandwidth, unreliable connections, etc..) did to a certain extent place limits on what we could achieve within our pedagogic paradigm, we should bear in mind that we are dealing with "transitional technologies" (Higgins, 1997: p. 1). The technology will surely improve, but as Higgins states:

"in the interim...we can adopt and adapt a variety of tools and environments to serve as our virtual classrooms and for cooperative learning and communication. We can use these existing technologies in useful, educational applications to serve our knowledge-building needs now." (Higgins, 1997: p. 1)

Technical difficulties aside, the pooling of resources in this way improved the quality of the respective courses considerably. Nor did it lead to substantial cost increases. Internet connections are considerably cheaper than telephone, video or satellite connections so the potential exists to provide a programme of integrity within a modest economic framework.

Providing up to date, contextually relevant materials for learners is a great deal easier using the WWW as a resource. Under the distance education model of print, audio and visual based materials adaptation to new and special groups of students was often a slow and costly business. Many distance courses were written in such a way so as to appeal to as wide a range of students as possible and thus they tended to have little in particular to offer local contexts. Addressing local issues and problems was frequently confined to interpersonal communication by telephone or facsimile. Email and the WWW have changed that by not only speeding up the interactivity of such exchanges but also by offering the potential to make valuable content available to a wider audience. In Web-based instruction (WBI) "the instructional content can be easily expanded, edited and updated. The learning activities can be readily documented and made transparent" (Shive, 1999: p. 2). The pace of change and the proliferation of published information make it imperative that education and training systems are able to adapt and update readily. WBI offers these possibilities.

In the paradigm that my Curtin University colleague and I used we were able to provide each discrete group of learners with material from the World Wide Web which had relevance to local contexts. Certain particular needs and concerns of the English language teachers training in Brunei were obviously different from those of the Australian teachers and vice versa. Under the model of print, audio and visual based materials it would have been a case of transplanting material from one context to the other and hoping for a reasonable "fit". WBI offers the potential to avoid that kind of pedagogic compromise and to do so speedily. A flowchart mapping pedagogic development with the paradigm used is presented at Appendix One.

Then there are problems associated with erratic Internet Service Provider (ISP) connections, aberrations in the performance of the software being used and, in Brunei at least, power failures. These sorts of problems are indicative of technology in the early stages of development and are similar in many ways to the problems of

early telephone line connections. Peterson: (1997) has written extensively about these and other potential difficulties that tend to undermine the successful operation of WBI.

The main concerns of criticisms directed at the use of computer networks and WBI in education are humanistic. Many are concerned about the dehumanising nature of ICT and the way that it may undermine the social construction of learning. Some writers have warned that the new technology harbours great potential for monitoring and control (Janangelo: 1991) and that use of this technology may lead to greater regimentation of learning experiences. Other fears include the loss of pedagogic leadership, the aloneness factor, lack of accountability and reinforcement of existing inequalities.

The recent history of language learning reveals a rather uneasy relationship with technology. The language laboratory, Computer Assisted Language Learning (CALL) and interactive video discs are three technologies which have not proven to be the panaceas their advocates claimed. So why should we take notice of the growth of Information and Communications Technology (ICT)? Isn't this another technological innovation which might prompt the sceptics among us to claim "we've seen it all before?" We might well keep our scepticism even if futurists and IT industry proponents predict a wonderful future for education because technology futurists have often been wrong in the past. They also tend to know little about education and the world of the teacher. It would, however, "be dangerous to discount the ICT revolution and its potential to change education systems and to enhance access to and the quality of the teaching/learning process" (Shive, 1999: p. 2).

The speed of micro-processing has doubled every 18 months during this decade, a growth which is predicted to continue for at least another decade as microchip capacity continues to grow. So as teacher educators we need to be involved in this growth, this revolution. Computers, even empowered by the expanding resources of the WWW, cannot make any paradigm shifts nor do they come with any inherent pedagogy. Ivor Goodson (1999: pp. 18-19) argued in the keynote address at the Conference on *New Professionalism in Teaching* for teacher professionalism that "will develop from clearly agreed moral and ethical principles" for "Teaching is above all a moral and ethical vocation". If we wish to develop such principles and embed them in pedagogy and appropriate learning paradigms for ICT then we need to be exploring the potential of the technology and helping to shape its applications rather than watching skeptically from the sidelines.

## References

Convergent technology (1998, March 11). *The Australian Online*. <http://www.theaustralian.com.au>.

Goodson, I. (1999). Towards a Principled Professionalism for Teaching. Keynote address at the Conference on New Professionalism in Teaching. Chinese University of Hong Kong, January 1999.

Higgins, R. (1997). Milking the MOO Cow: combining interim technologies for learning in cyberspace. [http://leahi.kcc.hawaii.edu/org/tcc\\_conf97/pres/higgins.html](http://leahi.kcc.hawaii.edu/org/tcc_conf97/pres/higgins.html)

Janangelo, J. (1991). Technopower and technoppression: some abuses of power and control in computer-assisted writing environments. *Computers and Composition* 9, (1), 47-63.

Jones, A. & Mercer, N. (1993). Theories of learning and information technology. In Schrimshaw, P. (Ed.). *Language Classrooms and Computers*. London: Routledge.

Microsoft NetMeeting Home Page. (1998). <http://www.microsoft.com/NetMeeting/>

Levy, M. (1997). Computer-assisted language learning : context and conceptualization. Oxford : Clarendon Press.

Peterson, M. (1997). Language Teaching and Networking. *System* 25, (1), 29-37.

Rettinger, L. A. (1995). Desktop Videoconferencing: Technology and Use for Remote Seminar Delivery. [http://www2.ncsu.edu/eos/service/ece/project/succeed\\_info/larettin/th.../ch5.htm](http://www2.ncsu.edu/eos/service/ece/project/succeed_info/larettin/th.../ch5.htm)

Shive, G. (1999). Information Technology, School Change and the Teacher's Role. Paper presented at the Conference on New Professionalism in Teaching, Chinese University of Hong Kong, January 1999.

Widdowson, H. (1994). Some Observations on Teacher Development. In Richards, K. & Roe, P. (Eds.), *Distance learning in ELT*. London:MacMillan.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.

**Appendix One**  
*Example Session Procedure*

