

CDTL Brief



Centre for Development of Teaching and Learning

October 1998 Vol 1 No 2

We are pleased to present the following *Brief* on the use of IT in education, featuring short articles from six teachers who have recently presented at one of our seminars on IT-related issues.

DR DAPHNE PAN, DIRECTOR, CDTL

Without asking hard questions about learning, technology remains an unguided missile. —Stephen Ehrmann

How can users best benefit from the use of technology? IT is only one tool. General Motors learnt this lesson in the '80s when it invested heavily in technology only to find marginal gains in quality and productivity. Critical success factors include strategic planning, astute application and employee participation. In education, teachers/learners must retain control over IT and its use. We need to ask hard questions about our curriculum and assessment procedures and we need to ensure that whatever technology-supported pedagogies we design actually help the end-user. What is the level of user-readiness? Will users be accessing in class, out of class but on campus, at home? Such seemingly peripheral questions must guide instructional design and delivery.

What pedagogical approaches best exploit IT's potential? What is critical is not the technology per se

but how it is used, not so much what happens while students are using the technology, but how the process promotes larger improvements in the learner's overall education. Some areas where IT can be effectively used include project-based learning in an information/tool-rich environment; collaborative learning with synchronous and asynchronous communication; learning marked by incremental improvements in a piece of work; laboratory/practical sessions using IT to replicate dynamic processes; learning at paces and times of students' choosing; improved interaction and feedback mechanisms; doing foundation/preparation work so that contact hours can be freed for the real advantage of university education: teaching/learning by interaction, dialogue and mutual challenges.

Can IT deliver? Effective use of IT involves other issues such as infrastructure (e.g., accessibility, classroom design, scalability, connectivity) and adequate technical support for staff to initiate and sustain IT-enhanced teaching.

A/P W. A. M. ALWIS, FACULTY OF ENGINEERING

The Global Campus project envisages a network that links teaching staff and students. Two major models for mode of participation appear to have gained acceptance among teachers who lead the pioneering effort. One is the producer-consumer model where teachers provide materials to be consumed by students. The other is the forum model where a platform for discussion among students and teachers is operated. The appropriateness of these models to a system that has to primarily succeed as a network deserves closer examination.

Networks are supposed to thrive by natural means. They succeed by attracting additional users who either see potential rewards or are forced by the desire to survive. Additional users increase the value of the network and it is in the interest of those who are already connected to pull in newcomers ("Get email and we can talk more often.").

Networks depend on the reality of rewards, not legitimacy or justifiability. As long as memorising essays helps in getting good grades and the network helps students find suitable essays, students will flock to the network, in turn attracting more essay providers. The system may have originated for educational purposes but those who operate from the sidelines would not care as long as they can thrive. Networks reward decentralised creation. Users seek opportunities and unfinished products are continually tried out through the network.

The producer-consumer model will not fit well into the natural self-regulating behaviour of a network. It will consume large amounts of resources if it is to exist meaningfully on the network and externally engineered rewards are unlikely achieve the expected outcomes. On the other hand, the forum model has all the basic characteristics of network-compatible phenomena; it is likely to survive and thrive.

DR CHEE YAM SAN, SCHOOL OF COMPUTING

We can leverage the use of IT for educational purposes through three main avenues: web-based content, courseware and IT usage. Web-based content typically includes information such as course outlines and schedules, tutorial questions, lecture notes, etc, which students can browse online or download and print. Given the general transition of society to a digital culture, access to this kind of content is increasingly regarded as the norm. Hence, the provision of web-based content is strongly encouraged.

Courseware is another type of content. It encompasses all forms of interactive software which students use to achieve specific learning objectives, with or without elements of assessment built in. Much of this software is delivered in the form of multimedia programs which help make the learning experience more enjoyable and effective. Courseware can be delivered via the Web as an online interactive learning experience. It can be downloaded from the Internet and run on a student's local machine, or it can come in the form of CD-ROM learning packages. The development of subject-specific courseware is something that is encouraged, but the time and effort entailed is significant.

We often overlook IT usage as an additional avenue for leveraging IT in education. Promoting the use of IT could be as simple as requiring students to submit assignments prepared with a word processor. Alternatively, it might involve less customary tasks such as using mathematics software (e.g., MathLab, Mathematica) for tutorial assignments, working on programming assignments using software compilers installed on notebook PCs, or discussing issues using electronic conferencing. Embracing the latter options will require a change of mind-set and of teaching practice. However, our willingness to make this change would contribute significantly to the widespread use of IT in everyday education practice.

A/P K. C. LUN, DIRECTOR, MEDICAL INFORMATICS PROGRAMME, FACULTY OF MEDICINE

The use of IT for teaching and student learning has come a long way in the last two decades. In 1976, when I first joined the Department of Social Medicine and Public Health (now known as COFM), I knew IT could help make learning biostatistics "painless" for our students. Some of the early IT tools that I had worked with included the key-punch machine and card sorter to help students process health data (1976), and the TRS-80 microcomputer to run statistical analyses and computer-based MCQ tests (1978).

Over the next few years, I worked on main-frame-based activities, facilitating a leased-line link between the SMPH department at Outram Park and the Computer Centre at Kent Ridge and teaching students how to use the SAS statistical package for health data processing and analyses.

DR ISMAIL S. TALIB, FACULTY OF ARTS AND SOCIAL SCIENCES

One of the teaching resources that arose naturally with the emergence of the World Wide Web was the creation of course Web sites. There are several advantages in setting up such a site, and a few of these will be mentioned here.

A major reason for setting up a course Web site is to place one's lecture notes in a readily accessible form. If these notes are put on the Internet, they will be accessible anywhere. Hypertext links can be made between one part of one's course notes to other relevant parts. Quite apart from the course table of contents or schedule, one can establish relevant linkages between one set of lecture notes and another set, so that students will have a more integrated picture of the course. Even more beneficial is the ability to link to relevant sites or pages outside the site itself.

A/P JOHN POTTER, HEAD, ACOUSTIC RESEARCH LABORATORY, FACULTY OF ENGINEERING

Lotus **ScreenCam** is a software package that records your computer **screen** like a video **cam**-era, but no cameras, lights, expensive equipment or television skills are required. Not exactly blockbuster video, but it records audio too. Now that's more interesting, and I'm applying it to the problem of tutorials. A common problem is that tutorials consume precious contact time between lecturer and students yet are often used for monologues. Tutors deliver solutions to problems, and students silently copy them down. Problem sheets and scribbled notes are filed side-by-side for reference the night before the exam. Large classes have many tutors, each with several tutorial sets. The result is an ensemble of (not always consistent) solution variations delivered several times by each tutor, who can become

In 1985, when SMPH was relocated to Kent Ridge and became known as COFM, we set up NUH's first microcomputer-based teaching laboratory comprising some 20 PC-AT machines for biostatistics tutorials. I also began developing electronic lectures in biostatistics using IBM's PC Storyboard software.

In 1990, with the help of the Computer Centre, we upgraded the COFM teaching laboratory at NUH to a state-of-the-art computer classroom comprising 50 networked PCs and printers, three 33" digital/analog display monitors and other AV facilities.

More recently, under the Medical Informatics Programme, I built an Experimental Distance Learning Server to evaluate various IT tools for online delivery of Continuing Medical Education (CME), including giving remote lectures over the Internet.

These external hyperlinks can be compared to a book or document appearing within the course lecture notes wherever one needs more information. Practically speaking, they can be compared to access to a shelf of books or a whole library that students can consult without walking or even standing up. Thus global resources can be placed at the students' fingertips.

When compared to a book or printed material, the lecturer will find that lecture notes on the Web can be readily revised, and the revisions are available on an immediate basis. Referring to a book will mean that one has to wait for its next edition before one can read its updated version. Such a situation is certainly not ideal for courses in rapidly developing fields. Setting up a Web site will also help students familiarise themselves with the Web and information technology in general—important prerequisites of education today.

tired of the material and wearying to the students.

ScreenCam allows the lecturer to go over the solution just once, with audio commentary and the emphasis of moving the mouse pointer around the screen, scrolling and highlighting text. Lecture notes and other programs can be opened and referred to. It is all recorded in a compact file which can be downloaded from the web and replayed by the student. A ScreenCam file allows better presentation of a wider variety of materials than available in a tutorial classroom. Students play only those solutions they need, as many times as they wish, whenever it is convenient for them. In addition, at the end of it all, the tutorial hour is freed for some genuine dialogue. That's where the tough part starts!

Some simple ScreenCam examples are at http://courses.nus.edu.sg/course/elejp/EE3002_website/html_docs/ScreenCam.html.



The Centre for Development of Teaching and Learning (CDTL) provides a wide range of services and facilities to support the teaching, learning and research programmes of the National University of Singapore.

These include: teaching and learning support, research on educational development issues, instructional design and development, instructional media, video conferencing and computer imaging.

contributors

W. A. M. Alwis, Chee Yam San, K. C. Lun, Daphne Pan, John Potter and Ismail S. Talib

Thanks also to all those who participated our IT-related seminars and workshops.

advisor

Daphne Pan

editor

Melanie M. Liu

graphics

Ma Lin Lin

© 1998 *CDTLBrief* is published by the Centre for Development of Teaching and Learning. Reproduction in whole or in part of any material in this publication without the written permission of CDTL is expressly prohibited. The views expressed or implied in *CDTLBrief* do not necessarily reflect the views of CDTL. An online copy is available at our web site.

Comments and suggestions should be addressed to:

The Editor, *CDTLBrief*
Centre for Development of Teaching and Learning
Central Library Annexe, Level 6
Singapore 119260

Tel: (65) 874-3052
Fax: (65) 777-0342
Email: cdtsec@nus.edu.sg

www.cdtl.nus.sg