EIP Vignette
Developing 00101 Introduction to Multimedia Systems

A C Lynn Zelmer, January 1999
Faculty of Informatics and Communication, Central Queensland University

Background

Staff in the Faculty of Informatics and Communication (Infocom) at Central Queensland University (CQU) has long been at the forefront of innovative delivery of computer-facilitated learning materials for on-campus and distance students. While some of the recent initiatives have been in collaboration with CQU's Division of Distance and Continuing Education (DDCE), most have been driven by individuals funded through partial workload allocation for unit development or Faculty Special Initiatives monies.

The author has been the recipient of CAUT funding for the development of interactive multimedia learning materials for diabetes education and was responsible for using information technology to teach information technology in the Bachelor of Information Technology unit 85138 Human Issues in Computing. This unit is currently delivered on all CQU campuses and at a distance with a 16 page printed introduction to using the web and e-mail, a diskette containing the majority of the unit resources, a videotape with a unit introduction and topical lectures, and a business communications textbook. The student's first tasks are to print the unit profile (description of unit requirements) and assignment materials from the diskette and to enrol on the class e-mail discussion list. Assignments include writing reports on IT-related tasks, organising group discussions and helping a novice user to learn a software package. On-campus students have face-to-face tutorial support but most unit support is via e-mail.

In 1998 the author developed the lead unit for CQU's new undergraduate multimedia degree. The unit, 00101 Introduction to Multimedia Systems, was designed as a 'fun' introduction to the broad spectrum of multimedia design and implementation. The unit was delivered in a classroom mode for the first two years of implementation but is now also being offered at a distance with a CD-ROM based resource package which includes a stock image library for assignment and project use. Student support is provided through a class web site, e-mail, fax and telephone.

As is common with many CQU teaching and learning innovations, the development of these units has primarily been an individual effort. While Infocom does provide monies for external unit development through its strategic initiatives fund, there is no consistent process to assess units and to ensure that staff learn from successful developments or avoid mistakes.

Desired Outcomes

The core first year multimedia unit, 00101 Introduction to Multimedia Systems, introduces students to the broad spectrum of multimedia technologies so that they become enthused about the discipline and aware of its potential. The presentation mode for the face-to-face class is relatively informal and depends heavily upon demonstrations of a wide variety of commercial and educational multimedia products. These range from multimedia encyclopedias to product promotions, games to children's stories, and include desktop, kiosk and on-line products. As students become more aware of multimedia design they actively participate in evaluating the presentations, turning what could have been passive 'show and tell' sessions into lively discussions.

In addition to the large class product demonstrations, tool demonstrations (image manipulation, sound and video editing, etc.) are provided for smaller groups of students. While the size of the class generally precludes a 'hands-on' approach, class participation is encouraged and, as far as possible, examples are taken from the students themselves. For example, a demonstration of PhotoShop's ability to manipulate images used photographs of the class taken in a previous session demonstrating the use of a digital camera.

While distance students have somewhat different needs, an attempt has been made to retain the excitement and variety of the classroom presentations in the distance delivery materials. Accordingly distance students will all receive a CD-ROM containing the unit profile (details of the unit and its assessment), lecturer-written notes in Adobe pdf format to Australianise content and highlight products and topics of interest, short video demonstrations (products and tools) for on-screen viewing, a stock library of over 1000 images and 100 sounds for use in the assignments, plus other resources. A list of 'recommended' texts guides interested students to an in-depth coverage of topics covered more generally in the 'required' textbook.

The three assignments lead the students gently into the discipline while providing scope for individual initiative. The first results in a PowerPoint presentation which uses lecturer-supplied visuals. A tutorial on PowerPoint is provided. The second rewards participating students for working in a group to learn html techniques necessary for presenting a short report on a multimedia technology. The third requires developing a multimedia presentation which demonstrates a multimedia-related skill learned during the term. The presentation does not have to be computer-based but in-person performances are not allowed (ie dance or theatre activities must be videotaped for assessment). Submissions have included paper and computer-based animations, video presentations and interactive desktop and web presentations.

Using Technology to Learn About Technology

The multimedia degree is an applied, rather than theoretical, program. In addition, the intention has been to deliver the program to students studying at a distance as well as on a campus. As is common with most other Infocom units, the multimedia units have been delivered to a campus class prior to the development of the unit for distance delivery. This ensures that both the content and assessment for a unit is appropriate and provides some opportunity for coordinating the delivery of the unit with other units within the degree and the Faculty. Unfortunately, it also often ignores the unique needs of the non-campus students.

The multimedia degree will only be offered on a CQU campus when adequate facilities are available for student and staff support. There are at least two views within Infocom about what constitutes adequate facilities. One group insists that students should only use the most current industry standard tools. This would mean introducing tools such as Adobe PhotoShop and Macromedia Director in the first year, followed by more advanced use of the tools in subsequent years so that the graduating student was eligible to receive an industry certificate as an expert user of the chosen tools. Adequate facilities in this case means developer level multimedia computers and advanced, hence expensive, software tools for every student. Experience suggests that students would need such facilities at the university and their residence with continuing and escalating costs for regularly upgrading the software.

The alternate view suggests that we should be providing more generic skills. While students would still be introduced to expensive industry standard tools, they would not be required to achieve expert status with these tools. In particular, they would be able to submit assignments using any software tool which was appropriate, available and otherwise met their needs. Adequate facilities in this case should mean a lower level of computer facility with an emphasis on the use of shareware and demonstration software. Many textbooks, for example, come with save-disabled or outdated versions of software for demonstration purposes.

Infocom decided on the latter strategy late in 1998, thus the only absolute software requirements for 00101 being a word processor, PowerPoint or 'an equivalent presentation' package, an image manipulation package capable of manipulating the supplied JPEG stock image files, a file editor and a web browser. On-campus students will have access to a digital camera and a flatbed scanner and distance students will receive a mail-in 'coupon' entitling them to a limited number of image scans through the Faculty.

The need for on-going student support is even more important. Infocom has been using class web sites and e-mail as a primary support mechanism for on-campus and distance students for several years. The latter includes both a class discussion list for staff and peer communication as well as direct e-mail contact with the lecturer. A unit such as 00101 would generate 10-20

messages per day on the class discussion list plus another 5-10 messages direct to the lecturer per 100 students. Queries would range from requests for assistance on specific aspects of an assignment to more general discussion of theoretical issues, and requests to resolve a technical issue to the dates for an up-coming training event sponsored by a multimedia publisher.

From a staff perspective the effective use of technology is both time consuming and an unreachable goal, not the least because it involves constant upgrading of both hardware and software, resulting in a constant need for retraining and reskilling. In the two offerings of 00101 to date, for example, there have been several major upgrades of tools such as Macromedia Director as well as the release of new tools such as Macromedia Flash and Shockwave. The same period saw major advances in computer technology, including the release of Apple's G3 computers, and significant changes in the capacity and use of delivery mechanisms such as the Internet.

Existing Materials

One of the main components of the 00101 package is a stock image and sound library. Comprising of over 1000 low resolution images and 100 short sounds, this stock library enables students to experiment with multimedia and complete their assignments without copyright difficulties. When first planning the unit it was argued that students should be able to use 'clip art' and other image files freely available from the web or through low cost CD-ROMs. Investigation revealed, however, that many of these materials were of doubtful provenance and had restrictive copyright provisions. It proved easier, and far less expensive, to utilise photographic images from the author's collection than it was to obtain clearance to duplicate and use an existing commercial collection. Sound and music collections are even more restrictive. The collection on the student CD was digitised from sounds collected by a student and the author.

Print materials are a different matter; there are literally thousands of consumer and academic books on various aspects of multimedia. After examining about a dozen texts one was chosen which both provided a general introduction to multimedia and had a multiplatform (Macintosh and Windows) CD-ROM with appropriate software. As well, seven other titles were 'recommended' for students who wished to explore topics such as interactive design, drawing, animation or web site design in more depth.

CAL, the Copyright Agency Limited, has procedures for academic institutions to duplicate relevant topical magazine and journal articles in print form. Regrettably, these procedures do not extend to materials to be distributed on disk, CD-ROM or via the web. To overcome this the author wrote a series of precis, reviews and short articles to accomplish the same purpose or, in some cases, to bring the same material to the attention of the students. The result is a collection of 30 plus short articles which contextualise multimedia for the Australian student.

The Development Platform

The Faculty's normal unit development procedure is for an individual academic, with or without the assistance of an instructional designer, to prepare a unit profile, assessment details and a study guide. These materials are then moderated by an individual with a solid understanding of the topic area and released to the Distance Education unit for production and duplication. Academics are increasingly developing unit materials which are not print-based, thus avoiding some of the Distance Education unit's timelines and procedures.

00101 was developed from a face-to-face class which was conducted by the author, a part time tutor, and a computing student fulfilling a 'project' assignment. The moderator was a nominal appointment and did not directly participate in the development of the unit materials. Staff from the Educational Media unit (video production and editing), one of the Distance Education unit's instructional designers, several of students in the multimedia class and a number of the author's colleagues assisted with specific aspects of the unit development.

The author has a multimedia development facility which has been funded through projects, consultancies and Faculty equipment allocations. It includes a laptop computer for documentation and presentation of multimedia products plus a mid-level desktop development machine. The laptop is also used in the classroom for most of the author's multimedia demonstrations. The desktop machine has a video capture card and is supported by a flatbed scanner, slide/negative scanner, CD-ROM burner (writer) and aging laser printer. A Windows-based multimedia laptop computer was borrowed for final testing of the class CD-ROM since the author's computers are Macintosh-based.

Software included both professional and shareware type tools which allowed for the preparation and manipulation of images, creating panorama and virtual reality images, drawing realistic human mannequins, creating interactive multimedia presentations for desktop and web delivery, and utilities to manage images, files, and projects. Replacement of the hardware and software available would cost approximately $40,000 plus roughly $10,000 per year for maintenance and upgrades.

Problems Encountered

A number of problems were encountered, and mostly resolved, in developing the materials for this unit. First, and perhaps most critical, was the Faculty's time allocation and funding formula. Infocom's workload allocations may be adequate for the development of a print-based unit built around a textbook but it is inadequate for the units using new media. While this might be resolved with the hiring of support staff, the Faculty simply does not have the funds to do so. A review of the workload formulas is underway.

Some attempt was made to overcome workload issues through the use of students and colleagues. One student was hired to record and digitise the sound library and another worked for a term as a production assistant. Unfortunately the workload in this student's other classes prevented him working during a second term (and prevented him from completing his 'project'). Those colleagues involved in the unit development did so as an extra load or, as in the case of the part time tutor, out of personal interest and on their own time.

The development of materials for this unit, including requisite skills development (learning new versions of software applications, etc.), expanded to four to ten hours per day of mousing cum keyboarding for six to seven days per week for a period in excess of six weeks towards the end of the development period. This resulted in the author requiring medical assistance for OSS (Occupational Overuse Syndrome) and a rescheduling of timelines. In addition, a staffing change for 1999 necessitated revising several hundred of the files to change references to the author from Lecturer-in-Charge to Unit Developer. The unit materials were completed by the new deadline but without adequate debugging and error checking.

The sample student assignments, for example, had been archived using software which enforced an eight character filename with a three character extension. Since the filenames were not corrected prior to making the CD-ROM students will have to copy the files to their own hard drive and correct the filenames before viewing some assignments. All other links worked on the CD-ROM but the html and pdf files were only verified on a Macintosh, even though we expect that most of the distance students will be using a Windows-based computer.

Intellectual property issues involved in distributing materials on CD-ROM had been identified in the development of materials for earlier units. These were resolved for this unit, as noted above, by the writing of resource materials specifically for the unit. These materials were saved using the Adobe pdf format to ensure consistency of fonts and formats across computer platforms. Adobe pdf files require a 'plug-in' or 'reader' program for viewing. This software is available on the CD-ROM included with the text specified for the unit and are by download from the web.

The specified 'required' text was selected from a number of sample texts supplied by publishers in 1998. At that time the publishers all indicated that their texts would be available for 1999 purchase. Mid-January 1999 the publisher's Australian agent advised the author that the selected text was now out of print and they were substituting an earlier text by the same

author. Since the Adobe software is not included with this text alternate distribution arrangements are required.

Broader Implementation?

The Faculty's policy of allowing individual development does not automatically ensure that other staff in the Faculty are even aware of the unit's innovative features and, unless there is a significant student protest, problems with the delivery of the unit are not identified and shared.

More critically, there is little awareness of the amount of time and resources actually required to develop and deliver units utilising new media. The Faculty's official records, for example, would suggest that the development of 00101's learning resources 'cost' approximately $5,000 plus a workload allocation of three to four hours per week. Instead, the resources cost over $10,000 in direct expenses, over 1500 hours of academic staff time and over 250 hours of unpaid student time, and a multimedia development infrastructure (the author's facility, Educational Media Services, etc.) worth several hundred thousand dollars.

Selected Relevant Publications

Zelmer, ACL (1997). "'Just-in-Time' Multimedia Systems: A case study of on-line delivery of a first year teaching unit", in Kevill, Rod et al, *What Works and Why: Proceedings of the 14th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education*, Perth, 652-658.

Zelmer, ACL (1997). "Multimedia, Internet, the Nintendo Generation, and Health Professions", in McGee, Sarah et al, *APAMI-HIC 97 Handbook and Proceedings*, Paper 122 on CD-ROM 936-945, Abstract 120. ISBN 0 646 30576X.

Zelmer, ACL (1996). 'The more things change... memoirs of a computer-based educator', invited keynote presentation in Christie, Allan, et al, (Eds). *Making New Connections, ASCILITE'96, Proceedings of the 13th Annual Conference of the Australian Society for Computers in Learning in Tertiary Education*, Adelaide: The University of South Australia, 49-64, ISBN 0 86396 409 5.

Zelmer, ACL, Lye, NC and Pace, S (1996). 'Academics Developing Media Materials: Learning from several cases' in Yong, Lim Kee, et al (Eds). *Human Factors of IT: Enhancing productivity and the quality of life, Proceedings of the First Asia Pacific Conference on Computer Human Interaction*, Singapore: Information Technology Institute, 356-366, ISBN 9971 88 495 X.

Lincoln, Adam (1995). 'Technonerd terminator', *Information Age: Perspectives on the new knowledge society* (Australian Computer Society monthly publication), Strategic Publishing Group, Sydney, April, 26-33. [Interview-based description of the teaching of 85138 Human Issues in Computing].

Zelmer, ACL (1995). 'Re-Examining the Myth: Developing Truly Affordable Multimedia', in Pearce, JM, and Ellis, A (Eds) (1995). *Learning with Technology: The Twelfth Annual Conference of the Australian Society for Computers in Learning in Tertiary Education*, The Science Multimedia Teaching Unit, University of Melbourne, 571-578.

Lye, NC, and Zelmer, ACL (1995). 'Development of Interactive Multimedia: Some Experiences' [Abstract] , in Pearce, JM, and Ellis, A (Eds) (1995). *Learning with Technology: The Twelfth Annual Conference of the Australian Society for Computers in Learning in Tertiary Education*, The Science Multimedia Teaching Unit, University of Melbourne, 609.

Zelmer, ACL, Zelmer AE, and Lye, NC (1995). 'Interactive Multimedia for Diabetes Education: A Progress Report', *HIANSW'95 Conference Program and Proceedings*, University of Wollongong, Department of Information and Communication Technology, 49-53.

Zelmer, A. C. L., Pace, S, (1994). 'Unrealised Expectations—Developing (Truly) Affordable Multimedia', in McBeath, Clare, and Atkinson, Roger (eds). *Proceedings of the 2nd International Interactive Multimedia Symposium*, Perth, Promaco Conventions Pty Ltd, 597-603.

Young, B & Zelmer, ACL (1992). "CAL_Maker: The Development of a Simple Courseware Authoring Tool as a Student Project". *ITTE'92 Conference Proceedings*. Brisbane: University of Queensland, Information Technology for Training and Education, 678-685.

Zelmer, ACL (1992). 'CAL/CML from the ground up: In-house CAL/CML development and change in a Tertiary Nursing Program', in Chia, Bill, Pennell, Russell, and Sims, Rod (editors) (1992). *A Future Promised: Proceedings of the 1992 Conference of ASCILITE*, Sydney, 116-127.