

Using the Cable Television Network for Cross Campus delivery of First Year Chemistry

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Faced with the necessity of delivering a beginners chemistry programme on two campuses this year and lacking sufficient bandwidth in the university's internal network, I enlisted the assistance of the Optus Education channel to deliver lectures, in real time, from the Rusden to the Burwood campus. Although the initial intent was to have full two way interactivity, the limitations imposed by the use of an external carrier meant that this was not possible in the first instance.

Demonstrations of chemical phenomena form a very important part of the lecture content which also involves exposition by the lecturer and the use of PowerPoint to display computer generated images. The computer display was closely linked to the chemical phenomena being demonstrated on the lecture bench. The consequent need for high quality visual images and the numbers of students involved on each campus made the use of the existing video conference facilities impracticable. Lectures were recorded on videotape and made available in the libraries on both campuses. Some students who had access to the Optus Education channel at home found it more convenient to watch the lectures there or to record them for subsequent viewing.

A comprehensive printed summary of the lectures was provided and the lecturer himself conducted all of the tutorials on both campuses in order to ensure that all students had the opportunity to interact with him personally. Although this involved considerable effort, it was based upon the premise that students would be more likely to accept the technology if they saw the lecturer as someone who knew them and had a real concern for their welfare. Subsequent evaluation of the unit based upon verbal and written feedback from students on both campuses appears to validate this belief. Laboratory classes were also conducted on both campuses so that it was not necessary for any student to commute between campuses though some elected to do so.

Towards the end of the semester students were interviewed by an independent evaluator and also completed a written questionnaire which aimed to determine their educational background, where and when they attended or viewed the lectures, their perceptions of the advantages and disadvantages of the method of presentation and their suggestions as to how the programme might be improved. In general, those students who only attended the live lectures on the Rusden campus and had no experience of the video link believed that the latter represented an unsatisfactory alternative with very few advantages. They tended to see video delivery as a downgrading of teaching and a cost cutting exercise rather than a means of increasing flexibility. The Burwood students, on the other hand, were almost universally enthusiastic about the approach, with 42 % actually expressing a preference for the video presentation over the live lecture and a further 30 % indicating that the two forms of delivery are equally acceptable. All of the Burwood students were able to cite a variety of advantages for the video link, particularly in regard to the flexibility of access that it permitted and the fact that it eliminated the necessity to travel between campuses, a distance of some 8 km. Interestingly, however, Burwood students expressed a greater willingness than their Rusden counterparts to travel between campuses should it be necessary. Students on both campuses commented on the fact that having each lecture available on videotape permitted them to replay all or part of it to clarify points that they had not grasped on the first viewing or to catch up on lectures missed because of timetable clashes or for other reasons.

The lessons learned from this trial are at present being applied to the delivery of a second semester chemistry unit to a much larger group of students which includes many of those involved in the Foundations unit together with their peers who took the standard first semester unit which assumed a knowledge of secondary school chemistry and was conducted entirely on the Rusden campus. Technical difficulties encountered as a result of using improvised hardware are gradually being overcome and it is anticipated that the video link will be extended in 1998 to include the delivery of first and second year units in biochemistry, chemistry, computing, earth science, physiology and mathematics.

Multimedia in the Teaching of First Year Biology: The Use of Graphics and Animations

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First year biology introduced computers to the learning environment to help students understand topics which are difficult to conceptualise and are often difficult to demonstrate in the laboratory, to encourage students to take responsibility for their own learning and to enhance group learning skills. We deliver computer-based assessment (formative and summative), computer-based teaching modules and web-based materials.

Biology is a very visual subject, thus high quality images and animations are essential, enabling biological processes to be illustrated in an animated and interactive manner. Pictures have a direct route to long term memory with each image being stored as a coherent “chunk” or concept (Paivio et al, 1968), and without useful meaning the pictures are not easily committed to memory (Freedman and Haber, 1974). Guidelines summarised by Levie and Lentz (1982) in an extensive review of the effects of illustrated text against text alone suggest:

- the presence of pictures relevant to the text will assist learning;
- pictures not covered by the information in the text will not enhance the learning of the text;
- the presence of pictures in the text will not aid the learning of the text which is not illustrated;
- pictures can help learners to understand what they read and also to remember it;
- pictures can sometimes be used as substitutes for words or as producers of nonverbal information;
- learners may fail to make full use of complex illustrations; and
- pictures may assist learners with poor verbal skills more than those with good verbal skills.

The use of graphics and animations in our computer-based teaching modules and web-based materials is designed to stimulate understanding and help in remembering the detail. Graphics are chosen for their meaningful input in portraying or understanding biological content.

Graphics have been generated from original art work, both computer and paper based, and sources such as clipart, textbooks, magazines, video camera microscopy etc. These images have been generated using Adobe Photoshop, Aldus SuperPaint and Avid VideoShop. Some images have been manipulated to create animations using Elastic Reality (ASDG), ADDmotion (Motion Works), Director (Macromedia) and Authorware (Macromedia), and incorporated into our computer-based materials.