



Videoconferencing for a Sustainable Future: A Technological Option for Science

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The issue of sustainability is one of considerable concern to all sections of society in our rapidly globalizing world. The question of how does one ensure the long-term survival of industries and institutions is one that much preoccupies managers and employees in today's world. This question is of no less interest to educators than to any other industry. There is little doubt that many small departments in Australian institutions are struggling to survive in the current environment. However, technology can provide viable solutions.

The 1997 CUTSD grant awarded to a team of academics from Central Queensland University and Deakin University, entitled "The Role Of Videoconferencing in Enhancing Teaching/Learning Via a Virtual Faculty" investigated the feasibility of developing virtual faculties for the teaching of upper undergraduate, honours and postgraduate chemistry specialisations at regional and remote universities. The project was also concerned with the issue of retaining students within their local institutions and thus within their local communities upon graduation. Staff and students from Central Queensland University, Northern Territory University, Deakin University and the University of Tasmania participated in the development and realisation of the "Virtual Faculty". Particular universities collaborated in offering content areas from their chemistry courses that were not available in other participating universities. This provided a unique opportunity for students to broaden their general understanding of the discipline as well as acquire specific, very specialised knowledge.

The project demonstrated that videoconferencing can provide a viable environment for developing a virtual faculty, inspite of its current comparative technological fragility. While technical problems are a real issue, students tend to value both the broad and general learning opportunities presented to them, and thus are generally fairly forgiving of technological breakdowns. Students were pleased with the opportunity to participate in a wider range of subject offerings while remaining at their local institution. Staff also valued the opportunity to teach to a wider audience and to gain valuable skills in using videoconferencing effectively as a teaching/learning tool.

With a wide range of delivery options now becoming available through developing technologies, there is greater opportunity to choose the delivery option on the basis of the learning need of the students and appropriateness of the content. For this particular project, videoconferencing was chosen as the medium of delivery because it was felt that it was most suited to the needs of the students and the subject matter being taught. As many of the concepts to be taught in the subjects offered were considered difficult for students to understand it was felt that students needed the opportunity for real time interaction with both lecturers and peers and immediate feedback in order to come to grips with the subject matter. It was felt that neither web nor print-based distance learning materials would provide the appropriate learning opportunities for these subject areas. (Brown, 1998)

Where very small groups of students are working alone in relative isolation, virtual faculties can expand the student group thus providing real opportunities for increased peer interaction. However, this interaction doesn't just happen and needs to be carefully designed and fostered which can require a rethink for both staff and students. For staff there is a need to rethink the curriculum design. There

is a need to understand the characteristics of the new learning environment and the way in which this impacts on the delivery of the subject. People such as Bates, (1995); Laurillard, (1993); Klease, Andrews and Druskovich, (1996); and Burke, Lundin and Daunt, (1997) comment on the problems of transferring existing teaching approaches to new media, the “old wine into new bottle syndrome” and the usually unsuccessful outcomes of taking such an approach. Many teachers and lecturers report unsatisfactory results with using videoconferencing and other technologically mediated forms of teaching and learning and this can be seen as an outcome of the difficulty in adapting to the demands and characteristics of the new environment. Students too, may experience difficulties with unfamiliar forms of teaching and learning. They may be ill prepared for the teaching and learning strategies they encounter and feel intimidated by both the technological environment and the kinds of activities they are participating in.

In utilising technological tools, the need for appropriate staff development and adequate student preparation is paramount. Staff need to have the opportunity to develop a thorough understanding of this new teaching and learning environment and its particular characteristics. There is also a need to develop an understanding of new teaching and learning strategies that better fit this environment and the ways in which the environment can be utilised to improve learning outcomes for students. The use of technology tools also highlights the changing nature of education and the increasing team involvement required for effective development of teaching and learning materials (Berge, 1998). Students also require assistance in coming to grips with what for many of them is both new technology and unfamiliar teaching and learning practices. Adequate student preparation programs and activities are an essential part of successful use of technology teaching tools.

Institutional support is yet another element in effective utilisation of technological tools. It is essential for such ventures to receive support at all levels of the organisation, if they are to be successful. Ventures such as this need to mesh closely with the strategic direction and priorities of the institution. In this way appropriate support, technological requirements and funding needs are seen as a matter of course, rather than a drain on institutional resources. Without institutional support, such ventures are unlikely to be successful.

ISDN (Integrated System Digital Network) or microwave based videoconferencing (as opposed to desktop videoconferencing) is a powerful tool in the flexible learning arsenal and can be effectively used to create both flexible learning environments and virtual learning environments. Additionally, tools such as videoconferencing allow for the exploration of more student centred learning activities than those commonly encountered in more traditional environments, particularly in areas such as Science, where the lecture/tutorial model of teaching based on the transmission of knowledge is still most generally used.

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