USING THE INTERNET TO SUPPORT ENVIRONMENTAL EDUCATION IN UNIVERSITIES

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Introduction

Use of the Internet to support environmental education in universities should be considered as part of wider strategies for the creation of appropriate institutional infrastructures. Such infrastructures – which include human as well as hardware resources – are necessary to facilitate educational administration, course delivery, resource provision/retrieval and international research networks; their development should be a core feature of universities' strategic planning. An infrastructure-led approach is being pioneered at *University College Scarborough* (UCS) through a combination strategy incorporating comprehensive student induction, local intranet-based course administration and delivery systems, active collaboration between teaching and research staff, the deployment of high quality IT hardware and a flexible and responsive programme of staff and curriculum development for members of the *School of Environmental Sciences*. This paper describes current activity and plans at UCS and discusses generally some advantages and problems of using the Internet in environmental education.

UCS Context

University College Scarborough is situated on the north-east coast of England in a rural region comprising a National Park, forests and moorland and a rich variety of coastal environments. The School of Environmental Sciences offers degree courses, validated by the University of York, in: Marine Biology, Coastal Management, Geographical Sciences and Environmental Sciences. Research activities are associated with the *Centre for Environmental Research in Coastal Issues* (CERCI), which is based at the College, together with the resources collection of the *UK Marine Forum*, a national research dissemination organisation.

Tele-Learning

Tele-Learning – the process of learning at a distance via computer – is examined alongside related ideas of open learning and distance education. For a number of reasons these methods of educational delivery are in the ascendancy in science education in British universities, and their very employment is beginning to impact upon the curriculum content of undergraduate course programmes. Use of the Internet – specifically the World Wide Web (WWW) – in the environmental sciences is discussed with reference to online 'virtual universities' and to a growing body of international literature, and from this analysis various benefits and problems are identified. Issues of concern include the validation of information quality and veracity, establishment of intellectual property rights, detection of plagiarism and the verification of original authorship. Traditional forms of university course assessment may have to be abandoned in favour of activities which place greater emphasis upon generic information skills of review, evaluation and synthesis. The wider availability of up to date information and datasets may also enable a greater use of problem-based tasks embedded in real contexts. While some of the issues raised are addressable at individual university level others have legal implications which will necessitate concerted action by the international education community.

The WWW offers enormous educational potential, but simultaneously presents challenges. In order for universities to realise its benefits considerable changes will need to be effected in terms of institutional infrastructures – both human and physical – and in a re-examination of the nature and purpose of environmental education.

Institutional Infrastructures

An examination of the infrastructures universities will need to develop in order to capitalise on the potential of tele-learning has been elaborated under three headings: physical organisation, management structures and educational operations.

The discussion of *physical organisation* overviews entry-level hardware and software resources required, and examines start-up and continuing costs. Emphasis is given to the provision of user services: through convenient siting and access and the management of effective helpdesk support. An institutional intranet strategy is recommended, facilitating the exchange and dissemination of information at local/site level, as a useful adjunct to the provision of Internet access and also to support 'departmental' and course programme administration.

Creating appropriate *management structures* at institutional level is a necessary condition for development. Some principal issues and structural considerations are identified, alongside general strategies for innovation management, which argue for full support and representation in institutional senior management and a collective ownership of change.

An essential requirement of *educational operations* is a willingness for teaching staff to experiment with innovative methods of course delivery and for students to adopt flexible learning practices. Such enterprises are best informed by empirical findings, and action research projects into teaching and learning effectiveness should be an important component of the strategy. Updating/development courses – for staff as well as students – in the principles of tele-learning and the educational use of the WWW will also be necessary on a rolling programme. While the medium-term aim of such operations is to identify opportunities for educational innovation within existing course frameworks and to evaluate their outcomes, the long-term aim is to effect systemic change through the redesign of major features of course programmes.

Infrastructure Developments at UCS

Developments are described, under each of the three headings used above, of structures in place and activities currently in progress at UCS. SISTeR, an intranet resource for the School of Environmental Sciences, supports departmental administration, research activity, access to information resources and also serves as a medium for courseware delivery and assessment. Innovation projects in teaching and learning are managed by a College-level committee, which also provides a forum for the liaison of educators with resource providers and support staff. Short courses for staff and students introduce WWW use and identify both local and remote sources of continuing support. Some typical action research projects are detailed which exemplify the use of WWW resources. Finally, curriculum development plans are outlined for the redesign of environmental sciences course modules: to make more effective use of the potential of tele-learning and the WWW, to address issues – outlined earlier – concerning potential legal problems and to explore new and more appropriate forms of coursework assessment.

Conclusions

Contrasted with traditional resources for undergraduate courses in the environmental sciences, the Internet offers a multiplicity of learning pathways and access to a vast – but transient – information pool. However, within this wealth of opportunity lie dangers. Reactive and ill-informed attempts to cope with change could result in recurrent problems. On the other hand, proactive management strategies could turn these opportunities to advantage, with resultant improvements in learner autonomy and engagement with environmental issues through an appreciation of their operation within real contexts. The WWW offers cost and effectiveness benefits and is a compatible partner to the increasing use of open learning. For these benefits to be maximised the use of the WWW must be supported through infrastructure development at institutional level – not just 'grafted on' to existing course delivery systems (indeed, the use of information technology more generally in education is still suffering from a legacy of incrementalism and unmanaged change).

This paper argues a case for infrastructure development plans in universities to be driven by *educational* considerations guided by the outcomes of action research, and some of the innovative projects at UCS exemplify the beginnings of such an approach. By acting as reflective practitioners with a primary concern for the quality of teaching and learning, university educators should be best placed to make appropriate and informed decisions to harness the full potential of open and distance education and the WWW and to foster students' own development as skilled and thoughtful learners.