E-education in the UK

Ruth Wilson
Department of Computer and Information Sciences, University of Strathclyde, UK
Email: ruth.wilson@cis.strath.ac.uk

Abstract

This paper outlines the results of the EBONI Project's survey of lecturers' use of and attitudes to electronic teaching and learning material, providing a snapshot of the current situation in UK Higher Education. Differences in the extent and type of e-content usage between academic disciplines are outlined, and lecturers' intentions for the future are discussed. Based on an analysis of their hopes and concerns, recommendations are made for increasing the development, usage and effectiveness of electronic content.

1. Introduction

The Dearing Committee's review of Higher Education in the UK (1997) recommended that there should be national coordinated development and promotion of computer-based learning materials, and that institutions should "harness and maximize the benefits of Communications and Information Technology". The EBONI Project's survey, in 2001/2002, of lecturers at three UK universities and their use of, and attitudes to, electronic teaching resources (EBONI Project, 2002a), provides some indication of the extent to which these recommendations have been met. The survey acquired quantitative feedback on actual and future use of e-resources, as well as qualitative feedback about the perceived advantages of and obstacles to developing and promoting such material.

The survey was conducted in order to "identify and report on the individual requirements of academics and students in learning and teaching on the Web". The intention was to understand any differences in needs from, use of and attitudes to technology between lecturers in different academic disciplines, as well as between those teaching undergraduate, postgraduate and evening classes. The ultimate goal of the EBONI project was to produce guidelines for designing electronic learning and teaching material (EBONI Project, 2002b), and this survey was conducted in order that the guidelines would reflect requirements at a more individual level.

Participants were selected at random from the teaching staff at Glasgow's three universities: Glasgow, Strathclyde and Glasgow Caledonian. For the purposes of analysing feedback, the university departments were divided between thirteen broad subject areas: Business and Management; Computer and Information Sciences; Engineering; Education; English; Geography; Humanities; Languages; Law; Mathematics and Statistics; Medicine; Science; and Social Sciences.

Participants completed an online questionnaire, comprising a mixture of open and closed questions, asking about which courses they teach, whether any course material is delivered electronically (and, if so, which type), and whether electronic material forms part of their list of recommended reading (and, if so, which type of material it is). 800 staff were approached, and 101 participated. Their responses are summarised below.

2. E-education at present

67% of lecturers stated that they delivered course material electronically; 63% included electronic material on reading lists. Of those, undergraduate teachers (around three-quarters) were more likely than postgraduate or evening class tutors to deliver electronic course material and to recommend electronic material to students.

Course material was most commonly delivered in digital format in Computer and Information Sciences and Mathematics and Statistics, followed by Languages, English, and Business and Management. It was least likely to be delivered in digital format in Education, Medicine and Geography. Electronic material appeared on reading lists most often in the Social Sciences, Geography, Law, English, and Computer and Information Sciences. It appeared least on the Mathematics and Statistics, Medicine, and Engineering reading lists.

Of the resource types mentioned in the questionnaire, papers and lecture notes were the most likely to be delivered electronically or recommended in electronic format. A smaller percentage of lecturers used electronic books or multimedia resources.

Different disciplines tended to use different kinds of learning materials. Indeed, several resource types emerged as unique or especially important to particular disciplines. For example, software was used in Computer and Information Sciences, electronic case reports and statutes in Law, government reports in Geography, CAL packages in Science subjects, exercises and solutions in Mathematics and Statistics, electronic essay and reading lists in English, and online theorem proofs in the Humanities. Many lecturers responded to the survey's open questions with their reasons for and against using particular kinds of resources; their feedback is summarised below.

2.1. Electronic papers and books, traditionally delivered as print publications

Electronic articles and papers were used in all subject areas, more as recommended reading than as course material. They were used most heavily in Computer and Information Sciences, Geography, Languages, Mathematics and Statistics, and Medicine, and least used in English and Science. 100% of the Geography, Mathematics and Statistics, and Medicine lecturers who took part in the survey recommended this form of e-material to students.

Electronic books were not used at all by respondents in Computer and Information Sciences, Engineering, Mathematics and Statistics, or Medicine. They were used most heavily as course material in Business, but also in English, Languages, Law and Science. They featured most heavily on reading lists in the Social Sciences and the Humanities, but also in Business, Education, English, Geography, Languages, Law and Science.

Overall, electronic books were used or recommended far less than electronic papers or articles. This reflects the fact that electronic books are newer to the UK market and that, at the time of the survey, electronic journals were already established as a popular resource in universities, with questions surrounding pricing mechanisms, delivery methods and copyright much more settled. The author believes that, in the months since the survey was carried out, use of electronic books in Higher Education has already increased significantly (although use of e-journals will still be greater).

In terms of perceived barriers to the use of electronic resources where print resources have traditionally been used, lecturers in some disciplines were concerned that the quality of material may suffer, and that assurance mechanisms were not in place. It was acknowledged that large quantities of unreliable, incorrect, out-of-date material are accessible on the Web, and that finding resources of a suitable quality can be an onerous task. As one lecturer put it, "It is a lot of work for me to trawl through all the half-baked online material, finding the good bits. It is much easier to choose a decent course book, and follow it".

Another lecturer voiced concern that material expressing ill-informed views may easily be mistaken for relevant publications by students:

> "I am worried about the need to keep some control on the quality of the content. Would prefer that the 'lunatic fringe' type of literature is not mistaken for genuine peer-reviewed publications".

The transience of online material was also cited as a main inhibitor to recommending e-resources to students and incorporating their data into lectures. Many teachers prepare their lectures for transmission over several years, and Web sites change and/or disappear frequently.

In general, lecturers in Science and the Humanities complained most about the low quality and quantity of electronic educational material.

However, in some disciplines (for example, Geography, Education and the Social Sciences), it was commented that some excellent, authentic and updated material is provided on the Web, and that quality international unpublished papers and resources are freely available.

2.2 Lectures and tutorials, traditionally delivered orally in the classroom

Electronic lecture notes were used in all disciplines, but most heavily in Business, Computer and Information Sciences, and Mathematics and Statistics, foremost as course material, but also as recommended reading. Only 20% of English lecturers used electronic lecture notes as course material, and none at all recommended them to students as additional reading, perhaps reflecting the different teaching style required by this discipline. Languages and the Social Sciences also made little use of electronic lecture notes. Online tutorials were used in all subject areas, but most commonly in Computer and Information Sciences, Geography, Law, Mathematics and Statistics, and Medicine.

Several lecturers in Education and the Humanities expressed reservations about using the electronic medium to deliver lecture and tutorial material. Some felt the digital medium alone does not provide a pedagogically enhancing environment, and must be accompanied by classroom teaching, while others felt that electronic lecture notes and online tutorials can actually inhibit learning.

The belief that electronic material should always be used in addition to face-to-face teaching stems from the conviction that, "that is where the inspiration is given to students". Further, as one evening class tutor explained, traditional-style lectures and group work can provide an effective forum for identifying and solving learning and social problems

"Adults returning to Higher Education make up the majority of the students. A seminar format is the most efficient method of dealing with any of the educational and other kinds of problems these students face."

Other lecturers stated that, while they valued electronic teaching methods, they simply preferred face-to-face teaching.

Of the few who believed that electronic material actually inhibits learning, the following comment from a lecturer in the Humanities is representative:

"Offering ready made 'material' such as lectures, etc. makes plagiarism more tempting; anyway, I believe that initial confusion and pain is essential to the process of learning. Sounds pretty 'trad', but I do have a serious belief in developing mental powers to which electronic skills are inimical - take away the PC and such adepts are like fish out of water".

This view may indeed seem traditional, however it voices a genuine concern that students should learn deeply and thoroughly. Since the Dearing Report's emphasis on exploiting technology to deliver courses more effectively, there is pressure on UK universities, their schools and departments and, therefore, lecturers, to adopt new ways of imparting knowledge to students, and some clearly feel the benefits of traditional teaching methods are in danger of being overlooked. After all, as Gibb (1998) notes, lectures have the advantage that they always involve text, tone and body language while many online teaching environments rely solely on text, thus losing as much as 90% of the potential information content. Tham and Werner explain that students, too, can become overwhelmed with coursework and lack of face-to-face communication with their instructors in an e-learning environment. They believe that the concerns expressed here over adopting a new approach to teaching should not be ignored, stressing that different situations, students and subject matter can call for different requirements in terms of traditional lecture formats and electronic delivery methods.

On the other hand, the most enthusiastic proponents of electronic educational material felt that it had the potential to increase the learning opportunities offered to students. In particular, the interactive and multimedia elements provided by the electronic medium can:

a. offer a greater variety of learning experiences than those offered by text on paper: "Teaching material in electronic form greatly enhances teaching possibilities, giving the students a greater variety of exercises and making courses much more interactive, thus motivating the students".
b. enable instant feedback to students: "Experience from other parts of the course shows students benefit from interactive quizzes to self-test their knowledge and provide rapid feedback on their progress";
c. facilitate students' ability to understand concepts: "As supporting material for the courses, giving the students additional ways of visualising the material and alternative explanations to those used in the lectures."

The majority of these positive responses came from lecturers in Science subjects, but also in Law, Languages, Education and the Humanities. In terms of actual use, multimedia resources were used most heavily in Medicine, English, Engineering, Geography, and Mathematics and Statistics; they were not used at all in Computer and Information Sciences, and very little in Business, the Humanities and Law.

3. E-education in the future

Of those lecturers who did not currently deliver course material electronically or recommend electronic resources to students, similar percentages of undergraduate, postgraduate and evening class tutors would consider doing so in future (75-79%). All respondents in Business, Engineering, Geography, Languages, Law, Medicine and Science said they would use e-course material, and all respondents in Business, Computer and Information Sciences, Education, Geography, Languages, Law, Mathematics and Statistics and Social Sciences said they would consider, in future, recommending electronic material to students as further reading. Respondents in the Humanities were least likely to use e-course material or to recommend electronic reading to students in future.

However, despite their overall enthusiasm for the digital medium, respondents were keen to point out factors that are hindering the implementation of their e-learning initiatives: namely, a lack of resources and inequality of access.

3.1 Availability of resources

Some lecturers believed that the benefits of investing in the electronic medium outweighed any costs, in terms of the range of material available to students and increased efficiency in the long term:

> "The development of new electronic courseware is not a trivial undertaking and needs support and investment, however, the payback can, in my view, be significant".

Several noted that students and departments make a saving in photocopying money and resources; others pointed out that facilities such as online assessment potentially reduce the administrative burden to staff whilst maintaining accuracy.

However, the more widely-held view was that a lack of resources was an obstacle to the use of electronic teaching material, with insufficient time and overstretched IT support services inhibiting development in all disciplines.

One Geography lecturer explained that using electronic media involves a time commitment in the preparation and subsequent maintenance of material, and that this is a major constraint to creating and using such resources. Another lecturer in the Social Sciences said,

> "My frustration with e-learning is the lack of real support from the institution. There are very few teaching spaces (lecture rooms, seminar rooms etc.) which are properly equipped to use technology as a learning medium. There are plenty of rooms of computers but not in suitable configurations to facilitate teaching and learning. It is an act of supreme determination and organisation to be able to use PowerPoint in lectures far less utilise the Web directly in the classroom!"

The dangers of this trend have been noted by Gibb (1998), who warns that the flexibility offered in an online environment may be offset by costs such as these. Academics will have to accept that greater demands may be placed on them, not only in terms of implementing e-teaching, but also in terms of responding to email enquiries and being available to participate in real-time discussions. In an environment in which there is much emphasis on e-learning, they will also have to deal with the demands of a cohort of students which is no longer progressing synchronously and be able to record and retrieve the relative progress of these students.

The issues identified in EBONI's survey were also raised by participants in the BUILDER Project's assessment in 1999 of the impact of the delivery of learning and teaching materials, with at least one academic feeling under too much pressure from other commitments to spend time developing electronic material, despite being enthusiastic about its potential (Hewett, E. 1999). The study concluded that the success of any electronic delivery of material was dependent on the provision of computer facilities and financial support. Two years later, the same factors still appear to be impeding progress.

3.2 Equality of access

Several lecturers extolled the use of electronic material in enabling students to access resources from anywhere at any time, and in potentially including previously excluded students.

However, some feared that increasing the quantity of course material delivered electronically may actually inhibit access: students' technical skills vary, and less competent computer users could be disadvantaged. One lecturer commented that the IT course all the undergraduate students in his department are required to take does not always install the basics in all students.

Evening class tutors were keen to incorporate electronic course material into their classes, but said that provision of equipment would have to increase so that all students have access to a PC and printer. With regard to recommending material to evening class students as further reading, again it was felt that all students would require equal access: "I am still not sure if all participants have access to electronic material in their work places and/or homes. So [it's] easier to continue with hard copy so far".

4. Recommendations and conclusions

Therefore, in order for electronic learning and teaching resources to be used more widely and with greater success, institutional support is needed at a number of levels:
   a. Training should be provided, in order that lecturers can transfer knowledge to the electronic medium using the most effective approach, and to increase awareness of what can be achieved with learning and teaching material.
   b. Financial support is required in order that new technologies can be implemented and new projects funded.
   c. IT support services should be equipped to deal smoothly with increasing quantities of information being put online by departments and individual lecturers, and to respond to greater demand.
   d. Consideration should be given to the implications of embarking on an e-learning initiative, in terms of staff workload and changing roles.

A variety of electronic learning and teaching material was used by the universities targeted in EBONI's survey, covering a wide range of disciplines. Electronic papers, books and lecturer notes, as well as online tutorials and multimedia resources, were used as course material and recommended to students in subjects as wide-ranging as Business, Science, Languages and the Humanities. Moreover, there was a great deal of enthusiasm among survey respondents regarding the potential of teaching through electronic media, and many intended to use more e-content to educate students in the future.

However, barriers were identified across all subjects and all three institutions which were impeding progress, namely a lack of time, skills and support available to lecturers wishing to implement their e-learning ideas. The same obstacles were identified in other UK HE institutions two years previously, and do not appear to be shifting rapidly enough to meet requirements.

In order for the Dearing Committee's recommendations to be met in full, and the benefits of Communications and Information Technology to be maximized, the problems identified above will have to be overcome quickly. The technology is ready and students and lecturers are responsive, but these factors, which institutions are currently struggling to balance, must be addressed in order for electronic learning environments to be effective in the future.

References

EBONI Project (2002a) "Electronic Books ON-screen Interface Project", http://ebooks.strath.ac.uk/eboni/

EBONI Project (2002b) "Electronic Textbook Design Guidelines", http://ebooks.strath.ac.uk/eboni/guidelines/

Gibb, F. (1998) "Online teaching and learning", in, For the library of the future - improving the quality of continuing education and teaching. Proceedings of the International Conference and Workshop, Bad Honnef. Berlin: Deutsches Bibliotheksinstitut.

Hewett, E. (1999) "The impact of the electronic delivery of learning materials in UK Higher Education". BUILDER Project, http://builder.bham.ac.uk/reports/html/stakeholder.asp

National Committee of Enquiry into Higher Education (1997) "Higher Education in the Learning Society". London: HMSO, 1997.

Tham, C and Werner, J. "Designing and evaluating e-learning in Higher Education: a review and recommendations", http://cobweb.creighton.edu/MAM/papers/Tham.doc