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ON THE PRACTICALITIES OF DISTANCE LEARNING USING THE WORLD WIDE WEB

by

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Introduction

Distance learning is increasingly popular within higher education; it enables a wider sphere of our population to obtain an educational experience at degree or diploma standard. Studying by distance learning allows each student to plan his or her study time around commitments at home or work. Each student can study at a time, place or pace that suits his or her lifestyle and, since the student is not physically required to attend a university or college on specific days, the student can negotiate, as appropriate, study leave with his or her employer or colleagues to take advantage of less busy periods at work.

As supported by Parer and Henri (1993), Kember and Murphy (1994), and Rowntree (1994) distance learning's success is being augmented by practical developments in computer technology, particularly in multimedia and networking. These benefits are specifically underlined by Reinhardt (1995). Accordingly this paper addresses the extent to which the World Wide Web, the multimedia-based facet of the global computer network known as the Internet, might benefit distance learning.

Considering the Internet for Distance Learning

We can reasonably expect that the Internet will feature significantly in any meaningful distance learning strategy. The World Wide Web, or 'Web' for short, through its emphasis on the human-computer interface is helping to extend the Internet beyond an esoteric computer science role into a mainstream means of multi-way communication in real time. Thus the established advantage of classroom style interactivity is present, unlike prevailing distance learning techniques based on one-way media such as television, video, radio, audiocassette, printed material, or even multimedia compact disc.

Of course proprietary multi-way real time methods such as video-conferencing, interactive television (ITV for short), or private computer networks using, say, Lotus Notes software do indeed exist. These do not, however, detract from the use of the non-proprietary Internet which, through its global scale, offers the most widespread sources of information. Perhaps more immediately important, the student can log in through a local service provider, and thus avoid expensive telephone charges.

Furthermore, apart from there being a wider range from which each student can select items of relevance directly, the student can add to these sources thereby being judged by their peers world wide as well as the tutor. Naturally those peers,

eminent or novice, do not even have to be fellow students. Communications via the Internet can also be private; email amongst individuals being an example. Thus the tutor can direct, from a distance, the student along deep rather than mere surface learning as that student is encouraged to embark on their own global voyage of discovery on the Internet.

Present Distance Learning Activities on the Web

Not surprisingly therefore, distance learning activity is beginning to occur on the Internet. Examples of such activity can be seen on the Web itself. These include "Distance Learning Demonstration Projects" and Apple Computer's "Virtual Campus: Distance Learning". The former can be accessed, using a Web browser such as Netscape or Mosaic, by typing the following Universal Resource Locator (URL) reference:

http://fiddle.ee.vt.edu/succeed/distance.html

whereas the latter's URL is:

http://www.info.apple.com/hed/distance.html

Some distance learning courses use the Web directly. Others simply advertise that the institution offers a traditional distance learning programme. Nonetheless certain of these courses still use the Internet in other ways, such as employing email. In any event, an investigation from the above URLs and others discovered from Carnegie Mellon University's Lycos search engine (http://lycos.cs.cmu.edu/) reveal that Web-based distance learning is currently at a nebulous stage. Where the Web approach is being used, it is evident that basic distance learning principles are not being followed. As Parer and Henri (*op. cit.*), Kember and Murphy (*op. cit.*), and Rowntree (*op. cit.*) would exemplify, distance learning course design is more than merely 'putting lecture notes on the Web', an embarrassingly common approach currently seen on the Web.

Putting Principles into Distance Learning Design Using the Web

Lilley (1995, via Web) discusses the evolution of distance learning on the Web, and assesses the factors that will affect its success. The nature of his considerations can be gleaned from his abstract, as follows:

> An evolution of educational Web use is suggested which tends in the direction of increasing interaction. It is proposed that the more a student can affect a teaching resource, the more effective it will become. The eventual aim is of course to enthuse the student such that further study is self motivated. Examples are given of the steps in this evolution, and the technical issues raised are then collected together and examined. Thoughts are given on the impact and desirability of solutions that have been proposed to help form the question - where do we go from here?

We can see from the above statement that Lilley underlines the interactive advantages of the Web, and confirms this mode of distance learning is still in its infancy. He additionally reiterates that the general principles of good distance learning design, such as engaging the student, apply to Web pages too. Therefore we can refer back to Parer and Henri (*op. cit.*), Kember and Murphy (*op. cit.*), and Rowntree (*op. cit.*), and directly apply their established principles of designing distance learning courses to those on the Web. As an illustration, a succinct paper by Price (1995) assesses the criteria that nurses should use when selecting distance course material. These criteria, given in the form of questions the nurse should ask, are:

- Will I be able to use this mode of study successfully?
- How can I be sure the materials are good quality?
- Does the material address my area of practice?
- Does the programme offer me support?
- What form does assessment take?
- What do I get for my money?

Apart from being highly relevant to potential students outside the area of nursing as well, the above questions also clearly apply to Web-based courses. Though the general principles may even appear as obviously including the Web, their worth cannot be over-emphasised; remember the comments earlier about existing distance learning on the Web.

Difficulties with the Web-based Distance Learning Course

So far we have discussed the interactive and global information advantages of employing the Web, and have seen that the established principles of distance learning design are of material benefit too. However, this discussion cannot be properly concluded until attention is given to certain limitations in adopting the Web. These are namely a) the technical barriers, and b) copyright issues.

Technical Barriers

Should an author wish to produce Web pages, not only does he or she need adequate knowledge of the subject domain and be fully conversant with good distance learning course design, that author must also understand the language of the Web, namely Hyper-Text Markup Language (HTML). Although Graham (1995) excellently describes the syntax and proper usage of HTML, and the basics of HTML are generally accepted as not being particularly difficult even for users having little computer literacy, the more advanced aspects can be very tricky. This facet is important because a sound knowledge of the more advanced aspects is a

requirement when implementing the interactivity features of the Web. An example is the use of 'forms' where the student would input answers to questions. Currently the use of forms essentially requires knowledge about the UNIX operating system, and intricate computer programming languages such as 'C' or 'Tcl', although the 'Perl' language is arguably easier (Wall and Schwartz, 1993). Technological developments addressing such issues would therefore be very welcome.

Lilley (*op. cit.*) discusses the computer auto-assessing the student's assignments, as found in Computer-Based Training (CBT). The obvious advantage is that the tutor's time is optimised. Lilley nonetheless recognises that the useful preparation of auto-marking software is, like in CBT, very time consuming in itself. Such software is also likely to be particularly limited in scope regarding higher education, given its advanced subjects in which knowledge cannot be easily programmed.

The above problems could be addressed by dividing the duties between, say, the subject domain expert and the computer expert. We have to consider, though, that such an approach has a significant cost, namely real time interactivity due to the domain expert being delayed, perhaps by many months, as the computer expert amends the materials to reflect developments in the subject being distance studied. With dynamic subjects of study, keeping up may be impossible accordingly, and the Web approach becomes no better than established distance learning approaches. Lilley, not surprisingly, calls for the appropriate technological advances.

An acceptable solution to the latter auto-assessment problem may remain elusive for some time. Nevertheless we should anticipate that the former Web authoring obstacle, through its being inherently easier to solve, will be overcome by the advance of more user-friendly Web programming tools. This expectation warrants the use of the Web for distance learning even at the present time.

Copyright Issues

Discussions with South Bank University's Distance Learning Centre revealed that one of the primary limitations on using the Web amongst the distance learning community is the danger of copyright infringement. Of particular concern is that one institution could put in much time and effort to produce a distance learning course on the Web only to have others, given the public nature of the Internet, frustrate that effort by easily copying that course. This ease of access may even cause a 'legitimate' institution to violate copyright unintentionally, thus creating another avenue of concern. The legal system has yet to catch up with the recent universal use of the Internet, further complicated by the national boundaries within which legislation would tend to apply. This problem should not present a lasting difficulty however, when we consider that international intellectual property rights agreements already exist for printed material and computer software.

Copyright infringement should also be prevented by secure Web documents, where its access is restricted only to those entitled to see the item. A significant effort is currently being put into this, given that commercial development of the Internet is

being hindered by, for instance, the inability of the Web to allow the user to pass his or her credit card details securely over the network. Industry analysts expect that Web browser software such as Netscape will overcome this problem in the near future.

Concluding Remarks

As we have seen, properly designed Web pages together with other aspects of the Internet can offer a significantly useful enhancement to distance learning programmes. Copyright, including an assurance that an institution's hard efforts are not simply copied by others less scrupulous, are matters that we can anticipate will be overcome upon the development of a proper legal framework and secure Web pages. We can also expect technological and usability enhancements to improve the Web's interactivity dimension.

An intermediate approach could be a hybrid where the key material is handled by traditional means such as print. Familiarity with the Web could be obtained by, say, using it for certain updates and responses. This approach would be less of a technical challenge, and should prevent loss of intellectual property by making it impossible for others to follow the programme by reference to the Internet alone. Although less than the interactive global information arena ideal that the Internet can offer, such a strategy could suffice until the remaining issues identified above are properly resolved. In any event we should not lose sight of the full potential of the Web, or its derivatives, for distance learning in higher education.

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