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Editor's Note: Online learning occurs in many formats. Dr. Robin Mason of the Open University provides an excellent summary in this 1998 paper. Evolution of these learning paradigms continues as a result of technological innovation, experimentation, and new instructional designs. This paper is reprinted with permission from the conference proceedings, "Networked Lifelong Learning: Innovative Approaches to Education and Training Through the Internet" edited by L. Banks, C. Graebner, and D. McConnell, University of Sheffield, 1998. It was also published in ALN Magazine, a publication of Asynchronous Learning Networks at http://www.aln.org/alnweb/magazine/vol2_issue2/Masonfinal.htm

Models of Online Courses

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Abstract

I propose a rather simple framework within which to consider the very wide range of existing online courses. The mystification surrounding the term "online course" arises because it is used indiscriminately to apply to nearly any course that makes even a passing use of the Internet, as well as to those where every aspect of the course is only accessible electronically. Of course categories are invidious to many who immediately cite applications that do not fit easily into the framework. Nevertheless, I think it is useful to begin to define the online educational world if only for others to redefine for themselves.

I. HISTORICAL INTRODUCTION

Painful as it is to remember, most of the first online courses were delivered on command-line systems that required skill and patience from even the dedicated user, let alone the intrepid novice. A perusal of early literature on computer conferencing and Internet access to databases produces a litany of concerns about training materials, help desk queries, and front-end programs, as well as discussions about how best to help new users become active participants [\[1\]](#), [\[2\]](#).

Instructions for using the evocatively named Archie, Veronica and Gopher filled whole books [\[3\]](#), but notwithstanding, were actually

used by some course providers to give students access to resources, papers and databases of information.

Early MOOs (Multi user dungeon, Object Oriented), which provided real-time text-based communication spaces, were equally arcane, and very few sustained educational applications ever emerged out of this essentially game-playing environment.

Nevertheless, these three elements: asynchronous group and individual messaging, access to course materials, and real-time interactive events, form the backbone of what continues to constitute the world of online courses. During the 90s, perhaps the most extensive developments have taken place in the area of access to course materials. Communication, whether real-time or asynchronous, and whether one-to-one or many-to-many, has merely become easier.

Newer conferencing systems became available in the early nineties and these provided a Windows interface to messaging. Training in the technicalities of using such systems has been less and less problematic and occupies almost a negligible amount of the course time. The advent of the Web and its phenomenal growth has similarly reduced the training overhead for accessing course content [\[4\]](#).

Web-based conferencing systems and the support for audio and video on the Web complete the current picture of an integrated environment for delivering course content and participant interaction and support through one logon sequence. Web-in-a-box software now takes this environment and packages it for the coal-face educator who doesn't want to be bothered with html and needs simple administrative and assessment facilities for tracking student progress.

Figures 1 and 2 demonstrate this technological journey from command line frustration to user empowerment. Of course, this relative improvement in access and usability has merely allowed other problems in creating online learning environments to emerge more clearly. These will be the focus for the rest of the paper.

```

No$y.acs-info
Topics are: 'other', 'acs97'.
Topic? acs97
Joining conference 'acs-info', topic 'acs97'. 18 new message(s).
acs-info/acs97:3
=====
acs-info/acs97 #3, from acs-info, 885 chars, Tue Feb 11 13:02:38 1997
-----
>Subject:      work on Dial-up Access nodes at Edinburgh and
>              Birmingham ...
>
>Edinburgh Dial-up Access node:
>
>Dial-up users into the Open University access node at Edinburgh are
>asked to note that we have been informed by Mercury Telecommunications
>that there will be a few minutes interruption to service between 23:59
>hrs on Wednesday 12th February and 00:04 hrs on Thursday 13th February
>1997 for essential engineering work.
>
>Birmingham Dial-up Access node:
>
>Dial-up users into the Open University access node at Birmingham are
>asked to note that we have been informed by Mercury Telecommunications
>that there will be an interruption to service between 00:45 hrs and
>01:05 hrs on Sunday 16th February 1997 for essential engineering work.
>
>...
>
>Mike Hobday

```

Figure 1. Command-line Conferencing.

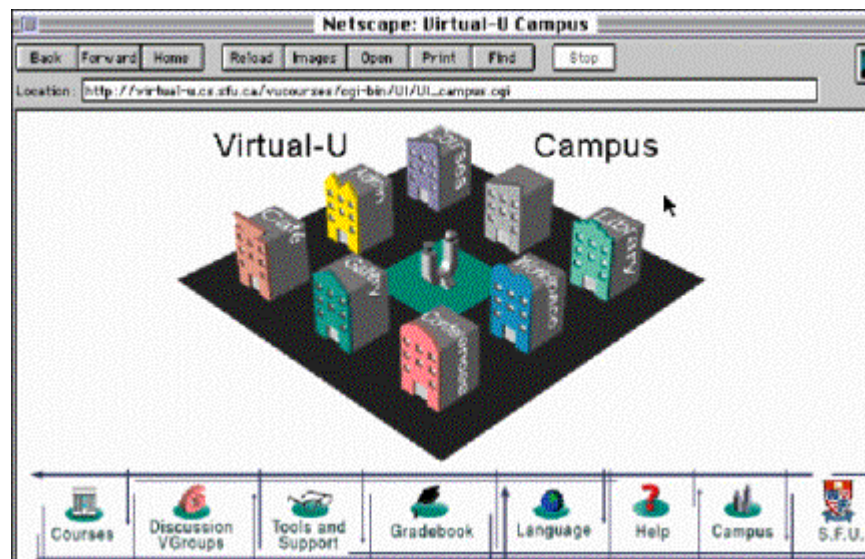


Figure 2. Virtual-U.

II. PEDAGOGICAL EVOLUTION

My use of the term pedagogical evolution is not meant to imply a notion of teaching getting better and better, or of the invention of new and different methods. Rather I mean to suggest the experience of working with the technology (itself a moving target) and with course participants to arrive at new perspectives on how learning is best encouraged and supported in the online environment. All of the elements I am about to discuss are very familiar educational approaches - they are simply being adapted and re-discovered in their online form.

Structure Discussions

Many of the early online teachers were dazzled by the new opportunity of group communication with students at a distance. Because unlimited, interactive, time-independent discussion was

technically possible, both students and tutors expected it would happen. The fact that educationally beneficial, dynamic and all-inclusive discussions are far from commonplace events in face-to-face teaching, should have prevented the growth of this unreal expectation for the online environment, which almost all early adopters experienced. While the technology tends to support a certain degree of egalitarian participation, and does allow users the freedom to input messages at their convenience, the conditions which are needed to produce good educational discussions are far more complex, more people-dependent and more educationally determined than mere technology will ever influence very significantly.

Most online educators have realized that generating good discussions online takes careful planning and structuring. Breaking large numbers of students into small groups (typically under ten), providing specific tasks (such as searching for answers to set questions in readings or Web resources) and setting timelines for discussion - all of these elements are increasingly used and adapted to the online environment to give structure and to help the learner to take an active part. Free-for-all open discussions have largely been abandoned for serious teaching purposes, although they continue to flourish in social areas.

B. Collaborative activities

As the online medium matures and many more educators adapt their subject areas to the environment, examples of collaborative activities and assignments are growing and leading to a climate of acceptance for innovative ideas in how groups of distance learners can work together online. The Web often acts as the resource around which the activities are designed, in some cases using course-specific materials and readings provided by the tutor, and in other cases using the vast materials from other Web sites worldwide. Students are often asked to construct a group Web site as the focus for their joint work. Alternatively they could be asked to work through problems, experiments or simulations presented online and to compare their solutions. Whereas early collaborative activities were largely restricted to discursive areas of the curriculum or to joint writing assignments, the Web with its multimedia capabilities has now extended the potential for collaborative work into the image-dependent subjects like science, technology and mathematics [\[5\]](#).

Peer commenting on work that normally would have been seen only by the tutor, is an area of group activity well supported by current technologies. Students submit their work to a file area or Web space so that other students on the course can read and comment on it. Just as the online environment breaks down the barriers to the lecture room walls and makes the teacher more visible, so it does for students as well when their work is open to view and critique in this way by their peers. A number of evaluations of courses involve peer

commenting report on the educational advantages [\[6\]](#).

Because it tends to require more initiative, more time and more dependence on others, group work is rather more popular with teachers than with students! When integrated with assessment and examination, however, the evidence is that most students do overcome their inhibitions and play their part in joint activities. In fact, there is a veritable explosion of interest in collaborative work at tertiary and professional updating level, as the technology improves to support it, as employers increasingly demand it, and as educators re-discover its value in the learning process.

C. Online assessment

The ease with which students can now submit assignments electronically and take self tests and even examinations online, has led many institutions to exploit the technology to globalize their courses and in some cases to relieve tutors of the more tedious aspects of marking. Web-in-a-box software customized for education offers forms for easy creation of multiple choice tests as well as assignment submission systems and record keeping facilities. A number of firms market software for developing more complex assessment processes, and these can be used to conduct surveys and collect other forms of data from users.

Current assessment procedures in higher education are long overdue for a rethink. They are particularly ill suited to the digital age in which using information is more important than remembering it, and where reusing material should be viewed as a skill to be encouraged, not as academic plagiarism to be despised. Many online courses are leading the way in devising assignments and assessment procedures which reflect the call for higher education to teach IT literacy, team working ability and knowledge management skills.

D. Interactive course materials

Early computer-based learning programs tend to be dismissed now as page turning devices which fall far short of the interactive, user-centered claims originally made for them. Although the technology exists to design and produce teaching material which offers the learner genuine choice of learning routes and methods, a range of video, audio and text materials, and opportunities to interact meaningfully with content, the resulting course materials are often prohibitively expensive to prepare. Apart from the financial resource needed, what is also essential is educational design expertise. Technology is rarely the problem - and equally rarely the solution! Sharing computer-based teaching material amongst consortia or on a commercial basis, is the holy grail - much talked of and aspired to even in funded programs, but so difficult to achieve. The Web and to

some extent CD-ROMs overcome the early interoperability problems in sharing computer-based software, and quality of teaching material is now the major stumbling block. Many computer-based teaching programs whether stand alone, on an Intranet or the Web, fall into one of two categories: all glitz and no substance, or content which reflects a rote-learning, right/wrong approach to learning.

The lifelong learning movement with its emphasis on just-in-time learning and a customer-centered approach has helped to develop the interest in online courses using a resource-based model. The underlying aim of such courses is learning how to learn; that is, facilitating knowledge management skills such as searching, selecting and synthesizing information, discovering how and where to find answers and solutions, and understanding, transforming and presenting ideas. The Web provides both the cause and the means for doing this.

E. An online pedagogy

Current approaches to teaching and learning in higher education are dominated by the following: the importance of interactivity in the learning process, the changing role of the teacher from sage to guide, the need for knowledge management skills and for team working abilities, and the move towards resource-based rather than packaged learning. All of these elements figure strongly in the literature of online educators [7]. In fact, I would contend that online courses are driving pedagogical evolution in higher education generally, because of the rush to digitize, virtualize and globalize the campus.

III. ONLINE COURSE MODELS

I am going to propose a rather simple framework within which to consider the very wide range of existing online courses. The mystification surrounding the term "online course" arises because it is used indiscriminately to apply to nearly any course that makes even a passing use of the Internet, as well as to those where every aspect of the course is only accessible electronically. Of course categories are invidious to many who immediately cite applications that do not fit easily into the framework. Furthermore, my thinking, and hence my categorizations are heavily influenced by a distance teaching background, and those from either a campus or training environment probably conceptualize the field differently. Nevertheless, I think it is useful to begin to define the online educational world if only for others to redefine for themselves.

A. Content + Support Model

This model is the earliest and most extensive category of online course. It relies on the separation between course content (which is

probably delivered in print or possibly now as a course package on the Web) and tutorial support (which in its simplest form is delivered by email or alternatively by computer conferencing). The model supports the notion of relatively unchanging content materials which can be tutored by other teachers than the content authors. Rudimentary amounts of collaborative activity amongst students, peer commenting and online assessments can be supported by computer conferencing. However, these online elements tend to be added onto the course and students of such courses frequently report conflicts with learning the materials and participating in the online activities. Considering the course as a whole, the online component represents no more than about 20% of the students' study time in this model.

Where the course content consists of structured Web pages, the division between content to be mastered and engagement with discussion is sometimes reduced. This relatively new adaptation of the content + support model and the advent of Web conferencing are beginning to blur this category with either of the next two. However, even when the course content is online as well as the tutorial support, I think it is still useful to consider the distinctive characteristics of the very many courses where there is a strong division between content and support.

B. Wrap Around Model

My next category defines those courses which consist of tailor made materials (study guide, activities and discussion) wrapped around existing materials (textbooks, CD-ROM resources or tutorials). I categorize this as the 50/50 model because the online interactions and discussions occupy about half of the students' time, while the predetermined content occupies the other half. This model tends to favor a resource-based approach to learning, giving more freedom and responsibility to the students to interpret the course for themselves. The tutor's or teacher's role is also more extensive than that in the first model, because less of the course is pre-determined and more is created each time the course is delivered, through the discussions and activities.

Real time online events sometimes feature in this model (as well as in the next). Screen sharing software is often used for problem-solving areas of the curriculum so that tutors can help students on a one-to-one, or one-to-small group basis. A one-way audio lecture accompanied by Web-based overheads is another way of adding a live dimension to the course. Students can interact through posting email questions. As technology improves, these events will include video as well as audio.

C. Integrated Model

The third model is at the opposite end of the spectrum from the first. The course consists of collaborative activities, learning resources and joint assignments. The heart of the course takes place online through discussion, accessing and processing information and carrying out tasks. The course contents are fluid and dynamic as they are largely determined by the individual and group activity. In a sense, the integrated model dissolves the distinction between content and support, and is dependent on the creation of a learning community.

Real time communication, in some cases initiated by the participants, might be video-, audio- or text-based and would support small group activities and tasks.

IV. EXAMPLES OF COURSE MODELS FROM THE UK-OU

The content+support model is used extensively at the UK Open University, where content is prepared by central academics and tutored by part-time associate lecturer staff. This model has been adapted to the online world by decreasing postal, phone and face-to-face contact in favor of interaction via computer conferencing. Large scale examples include the Technology Foundation course with over 5000 students using FirstClass for contact with their tutor, with other students and to a limited degree with course concepts in content-related conferences. In other courses, such as the second level Information Technology course, DT200, students are required to carry out two joint assignments and to send one of them in electronically. Courses in the Open Business School also use FirstClass, some with an associated Web site, alumni activity and groupings based on business interests. In all, nearly 40,000 students use computer conferencing as a support medium on courses delivered largely through print.

A Web-based version of this model has been piloted by the OU's Institute of Educational Technology, although it is relatively common elsewhere. This course consists of about 100 Web pages containing information, exercises, links to other sites and a set of tasks for the student to carry out. The students, in this case a rolling intake joining at their convenience, work through the materials and send in their assignments for the tutor to mark and comment on. This version of the model is particularly appropriate for short courses and for professional updating or training courses. It is also possible to add Web conferencing to the process for those who want more communal support.

Figure 3 is a page from this Web course showing the map of the course contents.

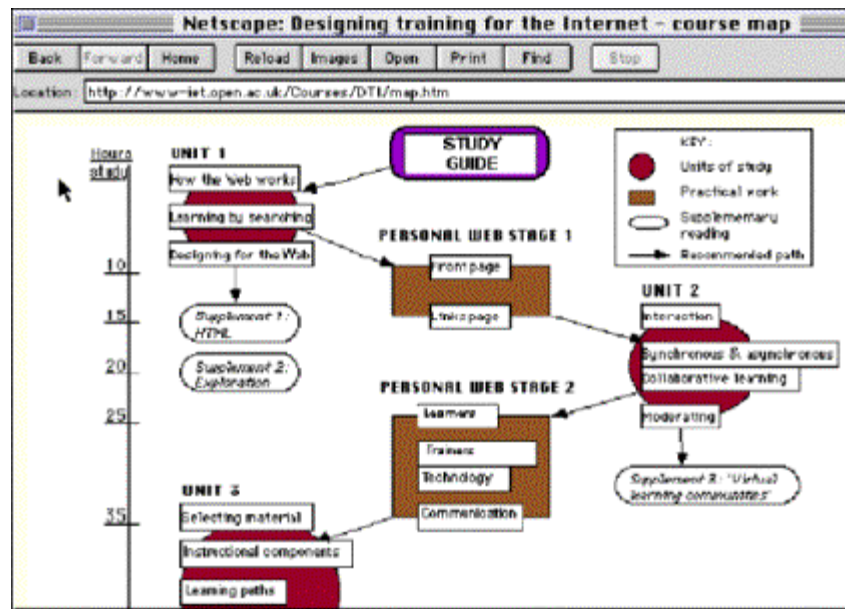


Figure 3. Map of a Web-based Course.

Less well known OU courses use the wrap-around model. The most long standing course is in artificial intelligence and Lisp programming, DM863, and consists of a textbook and extensive interaction on FirstClass with the tutor and other students. Currently, several web-based wrap-around courses are in the planning stages.

The essence of the content+support model is that it can achieve unprecedented economies of scale. Relatively high course development costs can be offset against relatively low presentation costs, and as the number of students in the course rises, the per-student cost of the course falls. This simple formula becomes more complicated with the wrap-around model. Using a textbook or other existing materials reduces the preparation costs, but increases the presentation costs, as the tutors have a greater responsibility to create the course through their interactions with students. As student numbers increase, costs (of tutors) rise incrementally. Of course tutor costs also rise with student numbers on the content+support model, but these costs are relatively small in relation to the development costs of the course materials. Wrap-around courses may require a higher ratio of tutors to students or possibly a higher rate of payment due to their greater responsibility in creating the course. Nevertheless, for small courses in niche subjects, this is a very cost effective model.

Figure 4 shows a screen from the FirstClass conferencing environment set up to accompany a textbook.

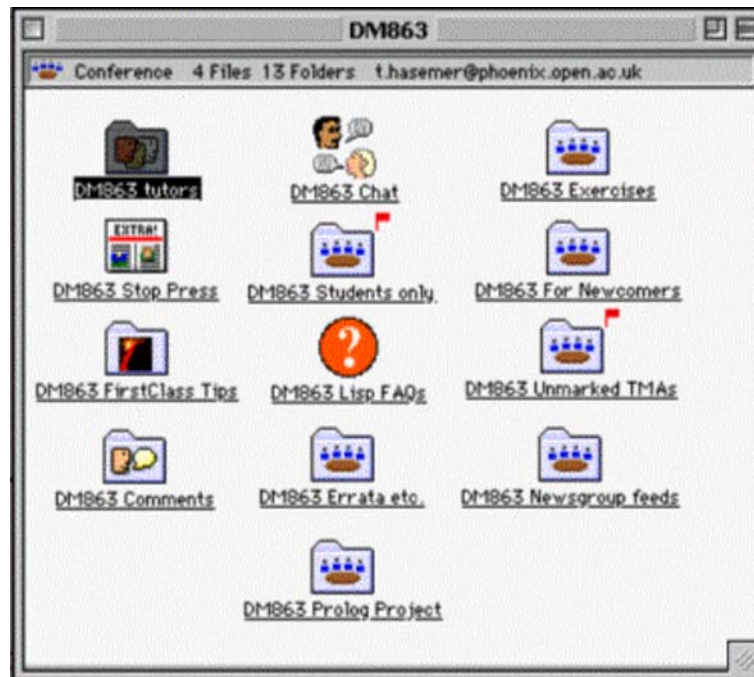


Figure 4. Online environment of a Lisp Programming Course.

As the collaborative, task oriented, discussion-based components of an online course increase, so the content of the course is increasingly determined by the group. Resources are of course provided at the outset, but the selection of materials and the interpretation of the tasks form the stuff of the course. This is what I call the integrated model.

The only OU course which approaches this model is the second year of the Masters in Open and Distance Education, designed and tutored by the Institute of Educational Technology. This course is largely based on collaborative and individual activities carried out on the Web using papers, external links and other resources supplied by the course team. Each of the assignments requires students to integrate comments from discussion conferences into their work, and the final examinable component (in the form of an extended essay) requires students to reflect on what they have learned from the various elements of the course: discussion, activities, reading and joint work. Real time events will be run using various technologies as they become available over the life of the course. The first real time session involved peer marking of one student assignment over a 24 hours period to accommodate different time zones and availabilities.

Figure 5 shows a Web page from this course.

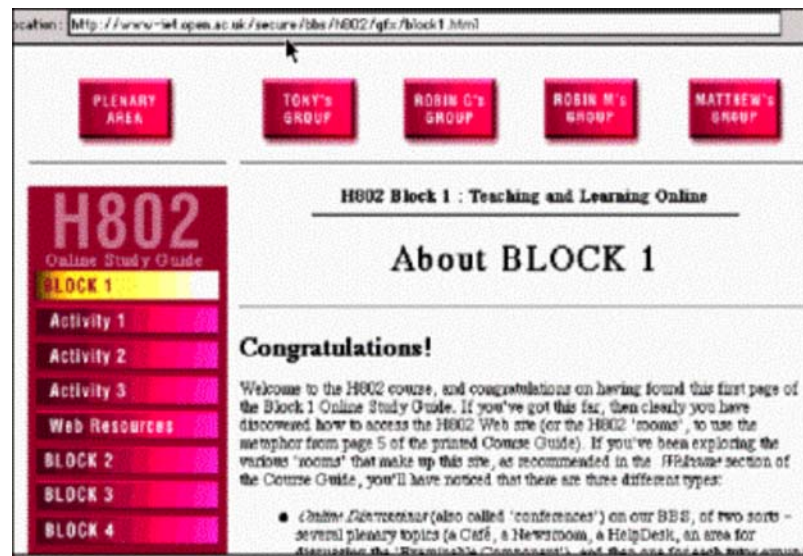


Figure 5. IET's Web-based H802.

The design of this course has arisen from extensive experience in running short online courses in technology-based education for professional updating. Various approaches to creating interactive learning environments have emerged from the experience of a dozen members of staff, and the most successful elements have been applied to the MA: structured activities such as debates with individual roles, Web searches with specific targets, peer commenting on written work, and incentives to engage in discussion.

The aim of the integrated model is to build on the inputs of the students within the carefully constructed online environment to create a self-sustaining learning community. To make this model equally achievable on a large scale, as it has been shown to be on a small scale, will be the ultimate OU test.

V. ISSUES IN TEACHING AND LEARNING ONLINE

The issues which I think are the most central to discussions of online teaching have already been mentioned, but I will draw them together here:

- collaborative working - designing activities for all the curriculum areas, coping strategies for handling non-participants, building on the advantages of online technologies and avoiding their disadvantages
- rolling intake versus cohort system - appealing to the market for just-in-time learning without losing the advantages of collaborative working, setting up administrative systems to handle a rolling intake
- tutor workload - designing online structures which maximize the input of the teacher, yet do not leave students floundering in mutual ignorance, developing tutors' online facilitation skills
- motivation of students - finding incentives for students to

participate actively, providing some synchronous events to maintain their interest and enthusiasm, supporting them in taking responsibility for their learning

- sustainable models for online education - developing successful cost-effective approaches to online learning, and for the UK-OU, scalable systems which are successful with large numbers of students

VI. NEW LEARNING ENVIRONMENTS

I said in the introduction that I would indicate the ways in which online courses are leading the development of new learning environments. These apply particularly to adults studying at a distance, and particularly at postgraduate or professional development level. Nevertheless, I suspect that we will begin to see this direction reflected in undergraduate and campus-based courses with an online component. The following two concepts best define my thinking about the nature of new learning environments:

- break down of the distinction between teacher and taught

It is well known in the teaching profession that the best way to learn something is to teach it. Just as the Web turns everyone into a publisher, so online courses give everyone the opportunity to be the teacher. Computer conferencing is the ideal medium to realize the teaching potential of the student, to the advantage of all participants. This is hardly a new discovery, merely an adaptation of the seminar to the online environment. It is not a cheap ticket to reducing the cost of the traditional teacher, however. Designing successful learning structures online does take skill and experience, and online courses do not run themselves. It is in my third, "integrated model" where this distinction is most blurred, as it provides the greatest opportunities for multiple teaching and learning roles.

- collective construction of the course

The online environment, with its resources, places to interact and people to contact, can form the backdrop against which a learning community comes together briefly to collaborate in a shared course. This ideal may only be tasted on a few courses and usually towards the end, as people realize what they are about to lose. Nevertheless, the idea of collective construction of a course can act as a guiding principle for course designers and participants, as the technology and the pedagogy are available to support it. The notion of co-constructing a course is not an excuse for teachers to entirely abdicate their traditional role. In my experience, it must always be a delicate balance between good preparation on the part of the course designers and yet willingness to work on the fly, and to adapt to the evolving group dynamic. It involves a real understanding of the purpose of a course and the ability to realize this in the form of

challenging activities and group processes. Twenty-five years ago, the OU established its reputation on its ability to apply these principles to writing out-standing learning materials in print. The challenge now is to develop similar excellence in designing online courses.

ENDNOTES

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About the Author

Dr. Robin Mason Professor at the Institute of Educational Technology, The Open University, Walton Hall, Milton Keynes MK7 6AA. Professor Mason is a specialist in the research and practice of online teaching and learning and a pioneer in developing computer conferencing for distance education. She works with many course teams across the Open University in the design, tutoring and evaluation of online courses.

Currently she is Director of the Open University's Masters Programme in Open and Distance Education. She has led course development and tutored several of them. In 2000, she conceived a Virtual Graduation for the first cohort of Masters students and developed the concept with the Open University's Knowledge Media Institute.

Her research interests are focused on cultural issues in online courses, assessment methods using the web, globalization of education through new technologies, growth of e-Universities, and educational-provider partnerships.

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