THE EXPERIENCE OF THE OPEN UNIVERSITY:
POINTERS TOWARDS A GLOBAL NETWORK FOR EDUCATION AND RESEARCH

by

Gary Alexander
Senior Lecturer in Telematics
Director, Electronic Media in Education Research Group
The Open University
Milton Keynes, England

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INTRODUCTION

As we approach a new millennium, people are becoming more aware of the global problems facing humanity. The most often talked about global problems are environmental, but many other problems, including the regular outbreaks of ethnic conflict, the spectre of mass starvation in various places, and the inequalities and instabilities in what is now a global economic system, can all be seen as collective diseases of the human spirit.

There is, of course, no guarantee that these problems will be overcome, but if progress is to be made, it will be through humanity learning new ways of being. This will require new ways of learning, consistent with a global viewpoint: Ways of learning which give people a sense of being part of a human family – a family which appreciates its diversity while recognising its unity and which appreciates its crucial role in the health of the living Earth.

Education can no longer be confined to childhood and young adulthood, but must become life-long. Curricula can no longer be confined within the boundaries of a single traditional culture but must instead be cross-cultural.

Over the past few decades some of the ingredients of such a new global learning system have been developing, and the system itself is now in an embryonic form. The spread of the Internet and the World Wide Web on it are particularly important in creating a linking infrastructure. But that infrastructure alone is not sufficient. New educational approaches are also needed – for distance learning, open learning, life-long learning, – and these have been pioneered by the new 'open universities' which have sprung up all over the world.

These new approaches should not replace traditional face-to-face teaching, with its direct human contact, but instead should be seen as complementary to it. They extend educational possibilities and create new ones where traditional means are inadequate, as where relevant groups of people are widely dispersed.

The combination of a linking infrastructure with new educational approaches leads to the idea of a 'global network for education and research', which is one of the themes of this conference. Many such networks are possible and likely.

In this paper I will look at the experience of the UK Open University, which was the first of its kind, the model for many of the others, and which remains one of the largest and most respected. I will present a selection of courses, research projects and other activities which illuminate issues relevant to the formation of a global network for education and research, in the spirit of the preceding paragraphs. The selection is personal, and should not be taken as meaning that the Open University, as an institution, was designed with these aims in mind.

A BRIEF INTRODUCTION TO THE BRITISH OPEN UNIVERSITY

The Open University system

"Today I want to outline new proposals on which we are working, a dynamic programme providing facilities for home study to university and higher technical standards, on the basis of a University of the Air..." Prime Minister Harold Wilson, in the speech in September, 1963 which first proposed the Open University.

In the early stages of its planning, the Open University was called the 'University of the Air', as it was intended to use the facilities of BBC television and radio to reach students in their homes. Thus, from the first it was a multi-media university. Students of science and technology were even sent specially designed, returnable, 'home experiment kits' which were home laboratories in which they could explore the concepts they were being taught. However, from the start, the dominant medium was print: specially produced texts ('course units') designed for the needs of students learning from home. The other media were secondary.

In 1971, the first year it opened, some 24,000 students took broadly-based 'foundation' courses in Arts, Social Sciences, Mathematics, and Science. (A Technology Faculty followed in 1972 with its own foundation course.) The pattern set then still more or less predominates today. A typical course runs from February to October and consists of about 32 weekly 'units'. A unit requires about 10 - 15 hours work from the student, which includes reading the text, perhaps watching a TV programme (or now, a video), listening to radio or audio tape, performing various activities, including assessment. Students must take a 3 hour written examination at the end of the course.

A course such as the above gave students '1 credit' and 6 credits were required for an 'ordinary' degree or 8 credits for an 'honours' degree. For flexibility, many courses were worth 1/2 credit and consisted of about 16 units instead of 32, with each unit studied over two weeks. Students typically take between 1/2 and (exceptionally) 2 credits at one time, so that a degree takes anything from 3 (rare) to 5, 6 or even 8 years of part-time study. Today, the credit system has been changed, so that what was once 1 credit now is counted as 60 credits, for compatibility with a UK-wide credit transfer system.

Open University courses are very large by conventional university standards. Our small courses have a few hundred students and our larger courses have a few thousand. This large scale is necessary to justify the costs of developing special texts, TV and radio programmes. (It also reduces flexibility: OU courses on this model cannot be easily revised and tend to last for 6 to 8 years.)

Open University courses have always been developed by small teams at its central headquarters in Milton Keynes, but clearly, a small team could not look after the needs of perhaps 3,000 - 5,000 students, spread across the entire UK, taking their course each year.

Student support

Student support has always been a key part of the Open University system. It was always much more than a correspondence college. While the courses were developed in Milton Keynes, a national network of regional offices and study centres was set up to look after the students. For each course, the OU hires part-time 'associate lecturers' who hold local evening tutorials and mark student assignments. First year courses, where students need more support, may have weekly tutorials, but later courses may only have 2 or 3 tutorials in a year, or perhaps a Saturday day

school or two. Some courses have one week residential Summer Schools. The associate lecturer's role is that of facilitator, not teacher. They help their students work through the materials, which have been developed by the central OU staff.

Perhaps the most striking innovation of the Open University is its openness. In particular, this means that there are no academic requirements for entrance. The OU is sometimes described as 'the university of the second chance', as it caters for people who have missed going to a conventional university in their late teens. The majority of OU students are in their late twenties, thirties or forties, but the oldest graduates have been in their nineties. The OU accepts special responsibility for people who otherwise could not take a degree: people with physical or sensory disabilities, house bound people, even people in prison.

For many students, the Open University is a life-changing experience. They find, perhaps for the first time in their lives, that they are intelligent people, and are respected and accepted as such by their peers.

The staff experience

The Open University was as much a radical change for its academic staff as for its students. Course development meant writing course units, preparing TV and radio programmes, home experiments, summer school activities and assignments, but not giving lectures or marking papers. Often, the only contact between academic staff and their students is at summer schools. Academic staff work as part of a team, which includes editors, graphic designers, BBC staff, administrators and educational specialists.

In a course team, people present drafts of their materials to a team meeting. This is often a painful process, as authors must put aside their egos to accept other people's comments on their work. The skill of commenting includes acknowledgement of the strength of someone's work before criticising its weaknesses. The result is unusually high quality materials, because each author has the benefit of several different perspectives. Open University materials are generally highly respected and are widely purchased for use by other higher education institutions.

The present position of the Open University

From its first intake of 24,000 students in 1971, the Open University has grown to become the largest higher educational institution in the United Kingdom. There are now more than 150,000 students registered for degrees, while another 61,000 take self-contained study packs each year. There are undergraduate and postgraduate study programmes in management, manufacturing and computing, professional development in education, health and social welfare, community education and leisure studies in addition to the original five faculties. Since 1992 the Open University has accepted students from all European Community countries, and, at its discretion, from other parts of Europe.

Summary of key points relevant to a global educational network

1   Multi-media materials

2   Mass education but with intensive student support

3   Students looked after by staff trained as facilitators

4   Openness - not limited to conventional students

MILESTONES IN THE OPEN UNIVERSITY'S USE OF INFORMATION TECHNOLOGIES

From its start, high technology has been integral to the Open University. Radio and TV were used to present materials, and student assessment included assignments marked by computer as well as by tutorial staff. Some of the lessons learned over the years provide useful pointers to the needs of a global network for education and research.

Again, my selection is very personal, and leaves out many interesting and outstanding projects.

1974 - TM221 The Digital Computer: Activity-based learning

For this early course on computers, the OU sent all students a small computer as part of a home experimental kit, to enable them to learn by practical activity: writing small programs and seeing their effect. A more conventional distance learning course would have restricted students to reading about computers and doing paper exercises. What made this so novel was that in 1974, personal computers had not yet been invented, and even microprocessors were not yet available. The kit sent to students used a read-only memory (ROM) to simulate the operation of a computer's central processor. Input was through a small keypad and a few switches. Outputs were lights and a few character display. This kit was the first of a series of small computers designed by the Open University for use by their students.

1982 - T101 Summer School Energy Game: Collaborative learning

In this summer school activity, groups of students created their own forecasts of the future of energy supply and demand using a computer model. Students learned by exploring the model and by group discussion. This too, was a technically advanced activity for its day. The computer model ran on a mainframe computer in Milton Keynes which students accessed through dial-up lines. In its first years, the student terminals were teletypes producing printed, character-based graphical output.

1988 - DT200 Introduction to Information Technology: Computer conferencing

This course gave students an introduction to social and technical issues in information technology and also practical experience in the use of computer applications such as word processing, spreadsheets, databases and computer conferencing. With 1500 students a year, this was the first large scale use of computer conferencing in distance learning at a time when email was still used mainly by specialists. Students used the mainframe based conference system CoSy. It relied on the traditional glass-teletype style command-line interface which was then the norm, but we developed a basic drop-down menu system so students didn't need to memorise all the commands. With CoSy, we enabled students to keep in much closer contact with each other than was possible in occasional face-to-face tutorials. Group activities became possible in distance learning.

1988 - DELTA Modem Course: early multi-media

This research project, sponsored by the European Commission, produced a prototype multi-media

course, long before CD-ROMs had become popular.[1][2] It was designed for a multi-cultural audience across Europe, and included a multi-lingual glossary of technical terms. It used the CoSy conference system, but with a graphical front end we designed. Figure 1 shows some screen shots of the interface we developed. At the bottom of each screen is an area we called the 'sill', for quick access to all components, which anticipated the Windows 95 task bar and start button by many years. We were concerned to develop a comprehensive support environment for students.
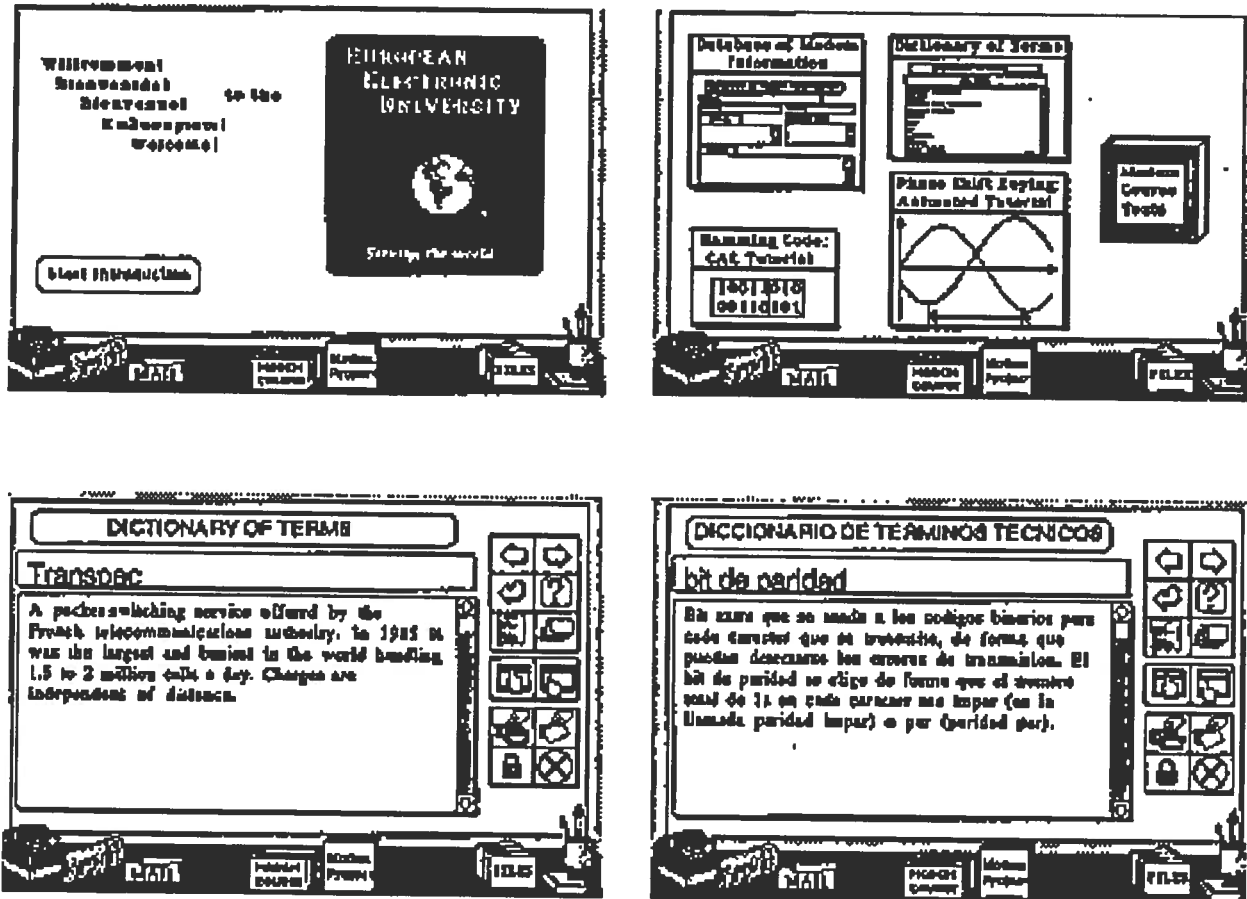

Figure 1 - Screens from the prototype DELTA Modem Course

1993 - XT001 Renewable Energy Technology: fully collaborative learning

This research project, sponsored by the UK Department of Employment, produced an experimental multi-media course taken simultaneously by students in the UK, Finland and Australia[3, 4, 5]. Students received a CD-ROM containing a variety of resources. This course was designed, from the ground up, to use collaborative learning techniques. There were three activities, one based on joint document creation, one based on exploring a virtual world, and a role playing exercise. It used a new generation of computer conference system, FirstClass to link students. This was also the introduction of FirstClass to the Open University.

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╔═══════════════ A few axes to grind (Group B ═══════════════╗
                Thursday, December 9, 1993 5:19:17 pm
                RET in Europe Item
   From:        Konstantinos Kosmidis
   Subject:     A few axes to grind (Group B )
   To:          RET in Europe
                Paul Trimby
                Sandra Painter

   Cc:          Mike Flood

   Attachments: ▢ rreett                        7K
─────────────────────────────────────────────────────────────
Paul and Sandra
        Having in mind the Introduction & Conclusion chapters I send a few k's (just
notes that I collected after reading some material beyond the cd-rom as well). As
timetables have relaxed maybe we can go through a good "distant interactive
collaborative" phase with debates, discussions,agreements & disagreements and who
knows some 'hot or juicy' inspirations could be at the end of the tunnel for the B-report.
All the best
Kostas
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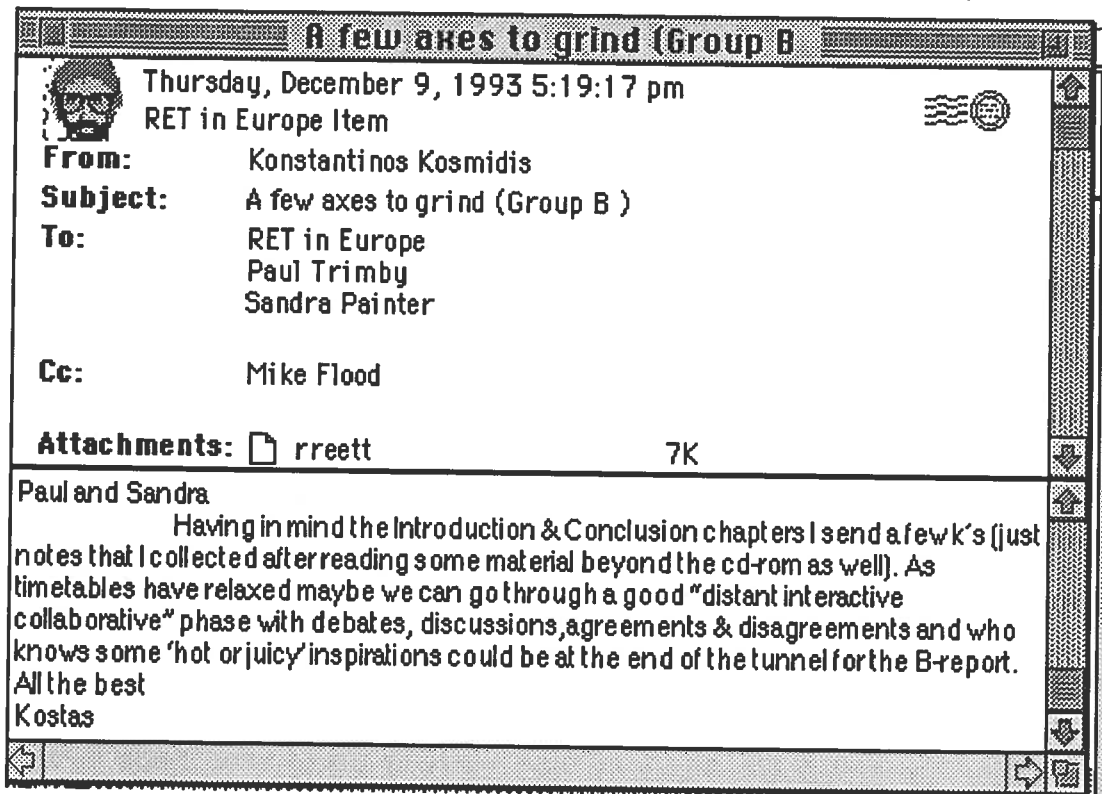
Figure 2 - The FirstClass interface as used in XT001

We made considerable efforts to create an on-line atmosphere conducive to collaboration, including such devices as 'electronic faces' (see figure 2), and 'empathy templates' to help students avoid misunderstandings.[6]

1996 - T102 Living with Technology: computer conferencing integrated into mainstream OU teaching

Following upon the successful use of the FirstClass conference system in the experimental course XT001, it was incorporated into the Technology Faculty's first year course, T101 Living with Technology, which has 3,000 - 4,000 students per year. This enabled us to provide a wide range of on-line activities for students, including a library of current documents to keep the course up-to-date, guest seminars with outside experts, formal and informal discussions on various topics and themes in the course. The T102 on-line environment is shown in Figure 3.
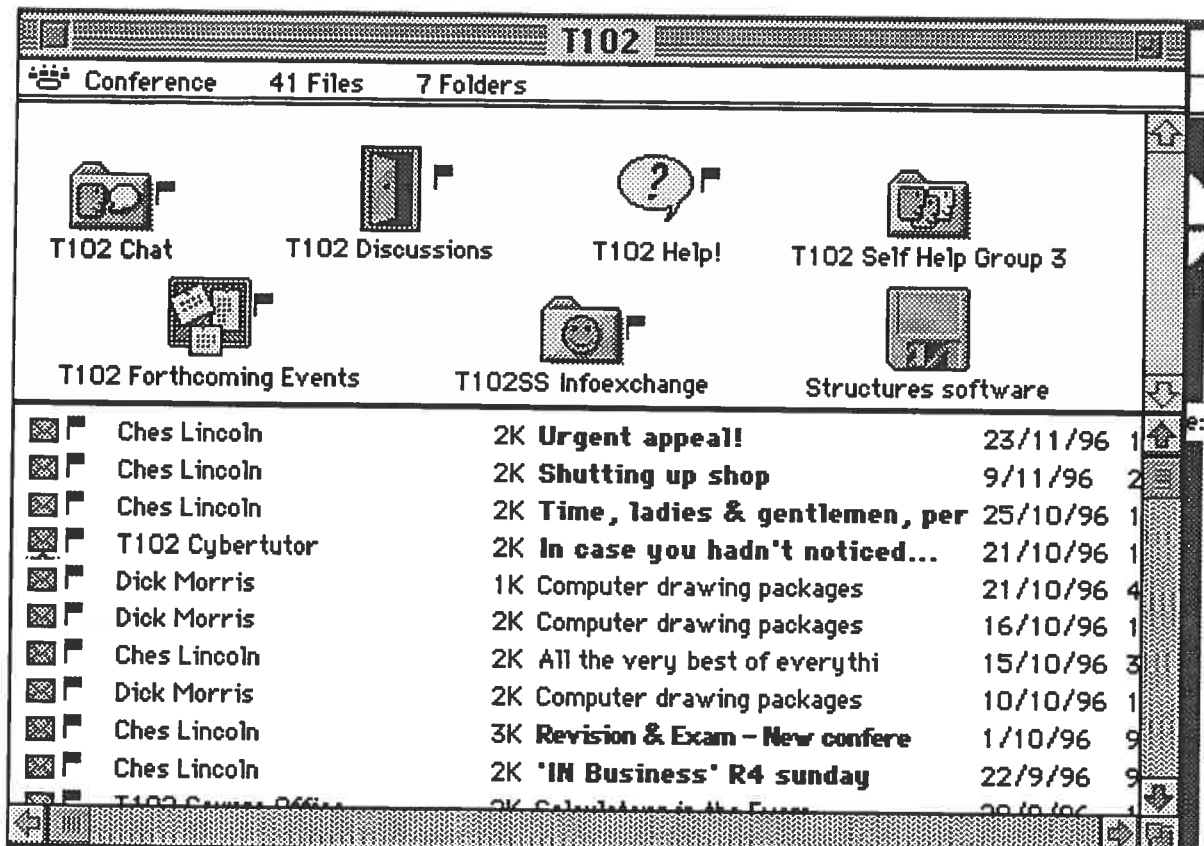

Figure 3 - The T102 on-line environment

To introduce computer conferencing on this scale required substantial effort to ensure that it went smoothly. We developed a 'Communications Guide' which gave students structured exercises in using computer communications, and especially, on 'Netiquette', or how to work as part of an on-line support group. The exercises included practice applying several 'Practical Communications Principles' which were developments from the XT001 Empathy Templates.

- PCP 1: Thank, acknowledge and support people freely

- PCP 2: Acknowledge before differing

- PCP 3: Speak from your own perspective (or at least from some specified perspective)

As this one course alone had some 300 part-time associate lecturers working with the students, we also developed extensive training for staff in how best to use the new media now at their

disposal.

The use of FirstClass conferencing in T102 led directly to its use by many other courses in the Technology Faculty and other faculties, mostly using variations of the materials developed for both students and staff training. In 1998 there will be roughly 30,000 students using this system. With its extensive possibilities for communication between students and staff, this has been one of the largest changes made to the learning methodology of the Open University since its original set of courses.

Some current Open University projects

There are numerous current projects involving the use of information technology at the Open University. Many of them use CD-ROM, computer communications and the World Wide Web. Many are described on the Open University's Web site: http://www.open.ac.uk. Those briefly described below give an indication of their range and scope.

- The Shakespeare Project:[7] This is a joint Open University/BBC project in which a team of academics in literature and theatre studies, BBC drama producers and programmers, are all working to create interactive educational tools about Shakespeare in performance to be presented on CD-ROM. This will be used in a third year course entitled *Shakespeare: Text and Performance*, which is expected to have about 1500 students per year. The CD-ROM will also be available commercially and for use by other academic institutions.

- Academic Writing On-line:[8] This on-line course in writing research papers for international journals is an experiment to explore the potential of the World Wide Web to facilitate and accelerate the teaching and learning of genre conventions through the creation of an on-line community of academic researchers. It seeks to reproduce, in an abbreviated and simulated form, the living social process through which articles are produced, reviewed, amended and eventually published in an academic journal.

- THD204 Information technology and society:[9] This course is about information technology and the social issues raised by its impact on our everyday lives. Students gain a personal understanding of the issues through their use of electronic mail, computer conferencing, the Internet and CD-ROM technology as part of the teaching process. The course makes heavy use of specially-produced CD-ROMs containing libraries of relevant documents. Students use these to do their own research on topics in the course.

- B882 Creative Management:[10] This course is presented by the Open University Business School and forms part of the MBA. It draws heavily on the World Wide Web to provide material for its students to explore.

- M206 Computing: an object-oriented approach:[11] This new introductory course on computing includes Smalltalk programming, network computing how to reason about computing systems, how to understand and design solutions to computing problems, and how to work across the Internet in groups. It explores some of the choices that have to be made in software development, including those influenced by ethical and social issues. Learning to work with people is an essential skill for computing projects, so a sizeable part of the course is about working in groups. The Group Working part of M206 is about working with peers to discuss, argue about, analyse, design, implement and test software.

Summary of key points relevant to a global educational network

1   technical innovation to support educational needs

2   activity-based learning: learning by doing

3   collaborative learning: learning through discussion and joint projects

4   computer networks to facilitate support for widely distributed groups

5   use of multi-media to provide rich resources

6   comprehensive on-line support environments

7   student and staff training in effective on-line learning

8   'practical communications principles' to support group working

THE FUTURE: AN ACTIVITY-BASED, COLLABORATIVE FRAMEWORK FOR ON-LINE COURSES

This paper has described the system of distance learning used at the British Open University from its earliest days and some of its more recent uses of information technology, all with pointers towards a global network for education and research. This section will describe recent proposals for a new framework for Open University courses, building on many of the experiences described above.

The approach is based upon active learning, based around mini-projects or other practical activities, and includes peer discussion, collaboration, and self-reflection. It draws freely upon the new technologies: computers, communications, the World Wide Web, multi-media where appropriate.

We expect this new framework to appear attractive to students because it is based upon:

● helping them to integrate what they learn into their experience and making it relevant to their lives

● providing a lively environment in which they feel supported, and in contact with sympathetic people in a similar position to themselves

Outcomes: content-in-context plus skills

The outcomes of this style of learning are content-in-context, not just ideas in the abstract. It also includes elements of skill, creating materials and skills of working collaboratively.

Learning philosophy: activity-based collaborative learning

Our starting point, coming from systems ideas and cognitive psychology, is that people actively construct their understanding from engaging with learning materials, and especially through critical discussion.[12] Furthermore, our understanding is that learning is most effective in a social situation where learners feels appreciated, supported and accepted with all their strengths and weaknesses.[13]

For distance learners, this means there is an inherent and central need for communication with others. This may take place face-to-face where possible, but generally also requires technological support. Communication is not an add-on extra, but the central part of the learning environment. Collaborative activities are not back-ups, but become central to the learning design.

Thus the basis of the learning design is to look for tasks, projects big or small, problems to solve, etc. in which the learner engages with the subject, and which include elements of collaboration and discussion. It includes a lot of careful guidance for the learner, but also a significant element of exploration.

Resources

As in more conventional distance learning, high quality learning resources must be provided. Various media are available:

- **Printed Texts:** Specially-written course units and study guides, or published text books still have major advantages in ease of use and accessibility. Where the written word is the major source of information, people generally prefer to read paper rather than on-screen versions.

- **CD-ROM:** CD-ROMs may soon replace floppy disks as the preferred medium for presenting computer-based materials. CD-ROM is most often associated with highly produced, multi-media materials, such as the BBC/OU Shakespeare project described above. While such CD-ROMs are very useful, they are also extremely expensive to produce, being nearer to a film than a book. They can generally only be justified when very large audiences are expected. However, there are also many valid, lower cost uses for CD-ROMs. They can provide interactivity of various forms, from self-assessment quizzes to models and simulations. They can include audio and video sequences, bringing the lecture back into distance learning, where it is appropriate. They can include versions of printed material, although preferably not as the only way it is presented. A CD-ROM version of a text can include more colour than can normally be afforded in print, can provide hypertext links, search facilities, annotation mechanisms. A CD-ROM can contain a large library of text material, but obtaining copyright clearance is a major hurdle.

- **The World Wide Web:** In some subjects there may be good materials on the Web. Doing research on the Web, looking for multiple viewpoints can be useful activities. A course-based Web site can provide starting points for searches, and links to very current materials. It is also a useful way to providing organisational information such as timetables and assignments. However, as a primary means of delivering teaching material, especially in large quantity, the Web is slow and cumbersome and may involve large telephone costs for students.

  Many academics have 'discovered' the Web, think it is a new basis for open and distance learning, and are reinventing programmed learning using it. However, all of the experience of the Open University goes against this. Solid student support, based around personal contact (see below), combined with good quality educational materials are the bases of good open and distance learning.

An on-line environment for collaborative learning

Perhaps the most important lesson to be learned from the various projects described in the earlier sections of this paper, is that the most important use of computer networks is to link people for discussion and collaborative work. The information resources of the World Wide Web, with all their advantages (and dangers) are useful but secondary. Good facilities for educational discussion, such as those pioneered in the projects described earlier, form the core of the on-line environment.

Crucial to this new framework is an on-line environment with associated organisational support designed to foster a sense of community. It requires the development of an ethos of mutual support. It requires tools for checking agreement and mutual understanding. And most important of all, it requires training for students and staff in skills of collaborative learning on-line.

Development work is needed to fully integrate the various elements: computer conferencing, Web and CD-ROM, as well as assessment and administration, but the work in the projects described above provides a very good starting point.

CONCLUSIONS: POINTERS TO GLOBAL NETWORKS FOR EDUCATION AND RESEARCH

In this concluding section, I would like to pull together ideas raised above, leading towards a global network for education and research which addresses the issues in the introduction: "Ways of learning which give people a sense of being part of a human family – a family which appreciates its diversity while recognising its unity and which appreciates its crucial role in the health of the living Earth."

A running theme in the previous sections was the importance of collaborative learning and comprehensive student support. This can be justified entirely on the grounds of promoting effective learning. However, from a larger perspective it is important in its effects on the learner's sense of self. It creates a sense of being part of a larger whole which cares for its parts, countering to some extent, cultural influences which present society as composed of competing individuals, whose interests are opposed.

Again, the need to counter these cultural fragmenting tendencies underlies the importance of training for students and staff in collaboration and techniques of coming to mutual understanding, as exemplified by the 'empathy templates' and 'practical communication principles'.

Another vital issue is the need for people to accept and appreciate each other in all their cultural diversity. Clearly, this requires learning which crosses cultural boundaries. Distance learning, and open learning techniques are the most appropriate ways of fitting such learning into people's lives. Such media as computer conferencing are needed as the way to enable personal contact and collaboration within a distance learning framework. The same communication systems used for students can be used for course development by multi-national teams.

Computer conferencing has an added benefit: that people experience each other in a style which is somewhere in between spoken conversation and writing. Personalities shine through clearly, but

other characteristics which might otherwise evoke prejudice, such as skin colour, religion, nationality, disability and even gender, are hidden (although sometimes indicated by names).

The activity-based learning approach used in various of the courses and research projects described above is necessary if people are to integrate what they are learning into their lives. It contrasts strongly with traditional academic approaches: reading textbooks, listening to lectures, and doing exams. This is vital if learning is to have a significant effect on major problems. With activity-based learning, the ideas learned become the students own, not just the ideas of some distant authority. And of course, it is synergistic with a collaborative, group project-based strategy.

There is one further issue, not discussed above, which is of particular importance to a global network for education and research: a good framework for intellectual property. It is common to encounter serious difficulties in obtaining and paying for copyright clearance for third party materials to be presented in electronic form (CD-ROM or World Wide Web). For example, to put part of a textbook containing photographs or diagrams from another source into electronic form, copyright clearance must be obtained for each photograph and diagram. If someone else wants to re-use those materials in another context, they must obtain copyright clearance again. The way to minimise such problems is for the global network to build a common pool of materials which are freely copyable and reusable within the confines of the network (or preferably, anywhere).

To conclude, I have outlined a set of principles which should underlie the organisation and approach of a global network for education and research, aimed at easing global problems such as those posed at the start of this paper. I have said nothing about the contents of what should be taught. However, it should be clear that the experience of creating and using such a global network should in itself contribute to the solution of those problems, regardless of the content, simply through the sense of unity and mutual understanding it would create.

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[4] "Computer Support for Resource-based Collaborative Learning at a Distance: OU XT001 and the Finnish Experience", Ganaes Dorairaju, Matti Hamalainen, Jarek Krol, Johanna Mikhi, Erik Patynen and Jouni Virtamo, Finland and Gary Alexander, UK, in *Hypermedia in Vaasa '94*, Matti Linna and Pentti Ruotsala, Eds., Vaasa Institute of Technology, 1994.

[5] "Enhancing Quality in Distance Learning through Collaborative and Resource-based Learning", Gary Alexander, *One World Many Voices, 17th World Conference for Distance Education*, ICDE, June 1995.

[6] "The Empathy Templates: A way to support collaborative learning", Zimmer, R.S., Chapter in *Open and Distance Learning Today*, Ed. Fred Lockwood, London, Routledge, pp. 139-150, 1995.

[7] see http://www.open.ac.uk/OU/Academic/Arts/shakespr.htm

[8] see http://www-iet.open.ac.uk/courses/awo/awo.html

[9] see http://www.open.ac.uk/OU/CourseDetails/thd204.html

[10] see http://oubs.open.ac.uk/b882/

[11] see http://www-cs.open.ac.uk/~m206/m206home.html

[12] see for example, *Radical Constructivism, A Way of Knowing and Learning*, Ernst von Glasersfeld, The Falmer Press, Studies in Mathematics Education Series, no. 6, 1995.

[13]see examples and discussions in *Emotional Intelligence,* by Daniel Goleman, Bloomsbury, 1996.