Distance Education for Agriculture and Rural Development:
The Third Wave

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All opinions expressed in the paper are those of the author.

Jonathan Cook, AERDD, February 1998
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I Introduction

It has been argued (Nipper, S. 1989) that there are three generations of distance education.

**First generation** - predominant use of a single technology and lack of direct student interaction with the originator of the material e.g. Correspondence education

**Second generation** - integrated use of multimedia, but with two way communication still mediated by a third person (tutor rather than the originator)

**Third generation** - two way communication media allowing direct interaction between originator of the teaching material and remote students and between remote students individually or as a group.

These three generations represent a progressive increase in learner control, opportunity for dialogue and emphasis on thinking skills rather than on comprehension of material alone. In the not too distant future, open and distance learning may become the norm rather than the exception. The technology is providing such opportunities for changing the way we learn that already, in Canadian universities and colleges, full time student are a minority (British Columbia Ministry of Skills, Training and Labour cited in Bates, A.W. 1995)

What would the ideal learning experience be like? A student would be able to use all the senses, receiving and selecting information in any form and using any media whenever and wherever they wish, text, graphics, sound, video, live drama, discussion etc. They would be able to see demonstrations of others doing whatever they are to learn and then practice it themselves with a more experienced practitioner available to help them as and when they need it. They would be able to meet and discuss with fellow learners whenever they wish. They would be able to learn in their own time and at their own pace. They would be able to monitor and evaluate their own progress. Choice is the main criteria - whenever, wherever, with whoever and whatever you wish - that would be an ideal.

The new media now becoming ever more widely available hold the promise of fulfilling many aspects of this ideal. Barriers of distance and time are being overcome. Access to ever greater amounts of information are becoming available from a computer screen. Communication and interaction with others at a distance is becoming cheaper and more widely available. However, information alone is not knowledge. The technology is becoming available - much of it is already widespread, but as David Hawkridge wrote before most people had even heard of e-mail, it is important to think how education can take advantage of this technology rather than how the technology might be used in education. (Hawkridge, 1983).

As each new development in teaching technology arises, there is a temptation to see it as a panacea for all teaching problems and to use it because it is there. People in general ignore what has been learned in previous contexts. Each new technology has its own characteristics however and needs to be used only where appropriate. This rarely happens though in the excitement of the new medium. As the poet Steve Turner puts it
‘History repeats itself
Has to
No-one listens’

The recent explosion of interest in the internet and the world wide web has led to a rash of conferences and workshops around the world and a frantic rush for colleges and universities to begin to ‘put their courses on the web’ for a range of different reasons, some idealistic and some commercial.

- Some see the web as a way to increase student numbers by attracting those who are unable or unwilling to travel to the host institution hence making the system more cost effective through reaching a larger market,
- Others see on-line education for use in flexible or open learning to provide an opportunity for part time study at the learners own pace, when and where they wish.
- Some see the web as a way to reduce costs, others as a way to improve access to learning and still others as a way to improve the quality of learning.

This paper discusses the issues involved in providing open and distance education courses for agriculture and rural development. The emphasis is on the new forms of electronic media or ‘on-line education’, but since the field is still very new, conventional ‘print based’ forms of distance education are also reviewed in order to draw out principles of effective distance education in general and how these may apply to on-line education.

The Internet and multimedia are indeed different to other forms of teaching media crossing as they do the boundaries between individual, group and mass media. The internet can be used to send messages to large numbers of people, individually or in groups and each of these people can respond to the sender or to each other. For the first time it is possible for many to communicate with many as easily as one person can address one other or a group (Rowntree, D. 1995). On-line discussion groups, e-mail, video and audio conferencing make it possible to overcome the obstacles of space and time for participants on a course such that many of the advantages of class based teaching can be incorporated into distance education. However, this does not mean that the new media are always the most appropriate medium for distance education. What is more likely as has been found in the past with other media, is that a mixture of media is the most effective solution.
2 Open and Distance Learning

A number of different terms are used within the broad area of non-traditionally delivered courses including open learning, flexible learning, distance learning and distance education.

Open learning, is a somewhat imprecise phrase used to describe any form of education in which the restrictions placed on students are minimised, and where decisions about learning are taken by the learners themselves. These decisions may include any or all of the following:

- whether or not to begin and continue study,
- what to study - content/skills, courses
- how to learn - methods and media, route through courses
- where to study (not necessarily a classroom)
- when to study - when to start, how rapidly to progress, and when to finish
- how to be assessed - formal exams, continuous assessment, interviews or even no assessment since study does not necessarily need to lead to formal qualifications

Distance teaching methods can include any of the above aspects of open learning, however, distance systems are not necessarily open.

Flexible learning, is used more or less synonymously with open learning. This also has no precise definition. The composite term flexible and distance learning (FDL) is also used, particularly by agencies of the European Commission. (Rumble, G. 1997)

Distance learning or distance education, refers to teaching and learning where the learner is physically separated from the instructor, but still with regular contact (c.f. self instruction where there is no direct contact with an instructor). While there may be occasional meetings between the instructor and learner, the actual amount of face-to-face contact is always limited or non existent.

The main features which have differentiated distance education from open/flexible learning or conventional learning so far are that:

- Teaching materials need to be self explanatory since students study these materials, generally alone, and at times and in places of their own choosing. While materials for distance education may include some conventional sources of information such as text books, within the ‘distance learning package’ there will also be a ‘study guide’ which leads the learner through the material and so to some extent replaces the classroom instructions from a teacher.

- There is an element of two-way communication in support of the student. Early forms of distance education (correspondence education) relied on postal systems and hence there was a built-in delay between the sending and receipt of a message. Today’s electronic means can greatly reduce or even completely eliminate this delay.
The distinctions between open learning and distance learning are becoming more blurred as instructors increasingly make use of web based materials for a number of reasons within their otherwise conventional courses.

Four categories of content have been identified for this type of material. (Kayany, J.M. 1997)

- Organisational material dealing with structural issues such as the syllabus, calendar, class assignments and grades
- Links to on-line resources
- Course content in the form of lecture notes or topical essays
- Student work

This paper is concerned with distance education in particular (which may include elements of open and flexible learning) and for the purposes of this paper, this is taken to mean:

| Delivery of certified courses with few or no physical meetings between the learners and instructors. |

**Fig 1: Comparison of distance and conventional education**

<table>
<thead>
<tr>
<th>Distance education</th>
<th>Conventional instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>learners may be separated by time and or space</td>
<td>learners meet together regularly</td>
</tr>
<tr>
<td>learners rarely if ever meet face to face with the instructor</td>
<td>learners meet with an instructor regularly</td>
</tr>
<tr>
<td>learning materials need to be self explanatory</td>
<td>materials are used as directed by an instructor</td>
</tr>
<tr>
<td>instructors can physically be anywhere</td>
<td>instructors need to be at the institution where the course takes place</td>
</tr>
<tr>
<td>instructors from a range of institutions can take part in the course</td>
<td>instructors tend to be from one institution or travel to it for the course</td>
</tr>
</tbody>
</table>

**Who is the audience for distance education?**

Courses at open universities cover a range of conventional and unconventional degree and diploma subjects as do those offering campus based courses. However, the demand for distance learning courses is inevitably higher in some subjects than others as the motivations for learning differ between those attending a full time campus based course and those unable or unwilling to do so.

The Hong Kong based ‘on-line education programme’ for example, only offers ‘courses that impact directly on the world of business and the professions’. They ‘present only courses that show a clear concern for special needs of working adults who seek to develop practical skills of immediate value in the workplace’.
Under this they include:

- B.Sc. Health Studies
- M.Sc./PhD Quality Management
- MBA Marketing
- MBA Total Quality Management
- MBA Real Estate Management
- Master of Applied Finance
- Bachelor of Business Administration (Management)
- MBA (Hospitality)

The CASO web site, [http://www.caso.com/iu/courses.html](http://www.caso.com/iu/courses.html) lists 2358 courses from 65 accredited course providers:

Fig 2: Proportion of on-line courses by subject offered by 65 course providers

While courses can be found on almost any subject offered in conventional classroom based education institutions, in general, across the world, the most common courses to be offered on line are those leading to professional development qualifications such as business computer studies, or the arts, especially social sciences. Applied sciences such as agriculture in particular are very uncommon. As the concepts of life long learning become increasingly widespread, this emphasis is likely to remain, however the demand for and ability to be able to deliver courses in all subjects at least partly on-line is likely to increase. Because of this the role of academic institutions in general is likely to change significantly.
The main groups of students taking up distance education are:

- those wishing to further their careers or improve their opportunities for employment
- those wishing to change profession but without the immediate financial penalties of a full time course
- those unable to afford the costs of full time education
- those studying for pleasure - such as those in retirement or with time to spare from their work and social activities
- those without access to full time education because of distance
- those unable to attend classes due to disabilities

The reasons for study have implications for the subjects studied and the needs and expectations of students from the courses. For example, some subjects cannot be entirely provided through distance education due to the need for equipment or facilities that can only be provided on a campus. Others are of limited interest to the groups of students mentioned above.

Distance learning has changed from being the last choice for people who couldn’t attend college or university to being the first choice for people who want flexibility and guaranteed quality. It has also pioneered the concept of learner-centred education. The future is one where learning boundaries will disappear, and distance learning opportunities continue to expand.

The range of courses studied by different groups differs with the reason for choosing distance education over campus based education. Lack of access due to distance, is very different to lack of time, since if the reason is lack of time for a full time campus based course, it may still be possible with an open learning approach to provide access to facilities in evenings or weekends. Hence in this case courses requiring large scale facilities can still be possible. In contrast, where the reason is distance, such courses cannot be held at all (such as those requiring laboratories).

Agriculture is a particularly difficult area for distance education at higher levels, since while theory can be taught at a distance, ultimately agriculture is a practical science and needs land and equipment. However, some have found that even practical scientific skills can be taught at a distance with the new technologies...

Williams, A. T. (1992) in a study of the use of Video Conferencing to teach Cardiac Arrest Skill wrote

"Statistical analysis of the data showed that there was no difference in performance of the two skills between those who received in-class instruction and those who received instruction through video conferencing."

Similarly, Simpson, H., Pugh, H. & Parchman, S. (1992 in a study of delivering hands on training for the US Navy found:

"...observations indicated that the learning processes occurring in the off-line laboratories were very similar to those in traditional resident laboratories."
3 On-line delivery and electronic support for open and distance learning

On-line communication technologies bring the promise of a new information age. The technology is hyped as 'having the potential to provide access to global information for all, to empower the individual, to democratise societies, and deinstitutionalize learning and work' (Kahany, J.M. 1997b).

How much of this potential is realised and how much is not, due to restrictive practices, control by commercial interests and practical issues such as lack of access to the technology in many parts of the world remains to be seen. Current initiatives in both academic and especially, non-academic areas, will help to determine this future.

The advent of the internet and the world wide web has dramatically increased the possibilities for distance education to overcome many of its conventional disadvantages - the isolation of the learners, lack of contact with others, lack of access to information resources etc. An essential difference in delivering courses through the internet entirely or partly are that the opportunities for interaction between staff and students and between students and students are greatly increased. The table below lists a number of other differences.

<table>
<thead>
<tr>
<th>Conventional Distance education</th>
<th>On-line distance education</th>
</tr>
</thead>
<tbody>
<tr>
<td>little or no contact between learners</td>
<td>learners can freely interact</td>
</tr>
<tr>
<td>group discussion not possible except through physical meetings</td>
<td>group discussion possible through video/tele/computer conferencing</td>
</tr>
<tr>
<td>lack of competition and encouragement by others on the course</td>
<td>competition and encouragement between learners</td>
</tr>
<tr>
<td>feeling of isolation</td>
<td>less feeling of isolation</td>
</tr>
<tr>
<td>no pressure from others; no critical judgement by others</td>
<td>pressure and critical judgement from others as in conventional education, - can feel worse because it is written!</td>
</tr>
<tr>
<td>high fixed costs, low variable costs - cheaper with more students</td>
<td>low fixed costs, higher variable costs if interactive. Costs higher with more students.</td>
</tr>
<tr>
<td>rarely practical to involve more than one institution in delivery of the course</td>
<td>can be a consortium of institutes; which can bring together expertise from different areas/sites</td>
</tr>
</tbody>
</table>

Fig 3: Comparison of ‘conventional’ v ‘on-line’ distance education
A brief history of distance learning technology

The printing press was the first invention to open access to education in general to more than a small elite group. Distance education (first generation) however had to wait until the development of a reliable postal service. Until the invention of radio however, distance education played a very minor role in education in general.

The first schools radio programme was broadcast by the BBC in 1926. By 1981, the BBC was broadcasting over 450 radio programmes per year for continuing education (Bates, A.W.). Radio is still used extensively in many countries as a tool for both distance and class based education. However, difficulties in reaching the audience at specific times and limited ownership of radios as well as issues related to group study, led to the rise of radio-cassette forums in a number of countries particularly in the developing world (Garforth, C. and Warr, D.).

Cassettes still have a significant part to play in distance education and have advantages over radio in freeing the student to listen as and when they can. The United Kingdom Open University (UK OU). for example, estimated in 1990 that it mailed over 750,000 hours of audio cassette teaching materials to students each year. Such examples have been followed in many institutions throughout the world. (Open University, 1997)

Schools television began to be broadcast regularly by the BBC in 1957 and adult educational television in 1963. It was hoped that students could use radio and television broadcasts to ‘attend’ lectures and that quality could even be higher than in the classroom since the lectures could be delivered by the very best teachers. A drawback though was the need for a very high level of self motivation since there could be little or no teacher-student interaction - seen as a major factor in the effectiveness of classroom-based instruction.

These three technologies - print, radio and television were the main teaching technologies available to distance education until the late 1970s. Since then, there has been a rapid increase in the number of new technologies available:
So, using technology is hardly a new phenomenon, but the pace continues to accelerate and at the end of the line is the teacher who is expected to master the use of all this technology. Nevertheless there are numerous examples particularly in the USA, of widespread use of each new technology for distance education as it becomes practical to do so (Douglas, S., 1993). The convergence of all of these technologies into a single delivery mechanism (the web) is different from anything that has happened before as is the extraordinary change this means in terms of access, interconnectivity and interaction between learners and instructors both synchronously and asynchronously. However, after 20 years of rapid developments in new technologies, it is hardly surprising that many institutions are slow to take up this technology.

It is also true as much of the internet as it is of all other teaching technology, that the technology itself is of little use without good well prepared teaching materials. While increasingly materials are being made available free on line, issues of quality and especially suitability mean that teachers will need to develop their own materials also as well as learning or being trained in how to use the technology.
At the end of the day:

"Media are primarily for the delivery and storage of information. Media do not directly determine the type or amount of learning. It is the messages themselves, which are carried by media, that are critical factors for producing achievement or changing attitudes." (Winn, W. 1984)

Technologies available today

The new media have added to the tools for distance education in three areas: delivery of material to the learner, exchange of information between learner and institution and exchange of information between learners.

While they do not remove the need for conventional tools, (especially print) increasingly all other technologies are coming together through the web - text, graphics, sound, animation's, video, computer based training and specialist computer software as well as both live and asynchronous discussions.

**Fig 5: Communication aspects of a distance learning course**

<table>
<thead>
<tr>
<th>Delivery of information (institution to learner)</th>
<th>Information exchange (institution-learner)</th>
<th>Discussion (between learners - including the facilitator)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Conventional (post, courier etc.) to deliver print, video, discs and CD-ROM</td>
<td>• Meetings</td>
<td>• Physical Group meetings</td>
</tr>
<tr>
<td>• Telex</td>
<td>• Post</td>
<td>• E-mail discussion groups</td>
</tr>
<tr>
<td>• Fax</td>
<td>• Telephone</td>
<td>• Conferencing systems</td>
</tr>
<tr>
<td>• Radio</td>
<td>• Fax</td>
<td>• IRC</td>
</tr>
<tr>
<td>• Television</td>
<td>• E-mail</td>
<td>• Audio conferencing</td>
</tr>
<tr>
<td>• Satellite</td>
<td>• Web forms</td>
<td>• Teleconferencing</td>
</tr>
<tr>
<td>• E-mail</td>
<td></td>
<td>• Video conferencing</td>
</tr>
<tr>
<td>• Web based delivery</td>
<td></td>
<td>• Netmeeting, White pine etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• MUDS, MOOs and virtual environments</td>
</tr>
</tbody>
</table>

**Delivery of information (institution to learner)**

All delivery systems, including post, have their own problems. Fax machines produce dirty messages on curly paper that fades over time. Packages are stolen, delayed or damaged in the post, and technological problems can prevent e-mail, web and satellite delivery from reaching the receiver. Radio, and television can suffer from transmission and reception problems. However, in terms of speed of deliver and ease of use to both sender and receiver, the new media offer huge advantages over some of the more conventional methods.
**E-mail** - the most commonly used part of the Internet continues to see explosive growth demonstrating the demand for this revolutionary method of communication. The extreme ease of use in being able to type a simple message and send it to one or hundreds of people directly from the computer without the need to print it out, write addresses, find stamps and go to a post office, together with the ability of the user to collect the messages from wherever and whenever they wish - all for the cost of a local telephone call, make this a dramatic improvement in many ways for most people.

However...

**Attachments** can be a major problem - whilst straight text messages work extremely well between all systems, attachments (other files added to the message such as wordprocessor documents, graphics, video and sound) may be simple enough to send from any machine but are regularly compressed through a range of different standards and often become a collection of indecipherable gibberish to the user. While there are freely available programmes to decompress or decode such files, the user often needs to first recognise what compression has been used, obtain the appropriate programme and know how to use it.

Not infrequently, there are **problems with the delivery system** - a particular server will be ‘down’ or even a whole network meaning that as with a postal strike, no mail is delivered. Even major Internet Service providers (ISPs) such as Microsoft and Compuserve suffer from such occasional hiccoughs. **Speed of delivery also varies** to some extent with the traffic on the internet and the route the message takes. In sending e-mails from the UK to Vietnam (via Australia) I found it could take up to 12 hours for a message to reach its destination. In contrast other messages can be a matter of seconds regardless of distance.

**Web based delivery** can suffer from similar problems

The level of technology available to the end user is critical. Processor speed, memory, screen resolution, how recent is the browser software used, how fast is the connection. etc.

The slowness of the web can be a major drawback. Using an intranet within a university campus network can be slow enough at times, but connecting to the outside world can be completely unusable at times due to overload from too many users. As with much technology though, there is considerable promise for the future to speed up the web.

- cable modems - for high bandwidth, low cost access
- satellite delivery - at 400Kbps compared to 56Kbps maximum for modems.
- ASDL (Asymmetric Digital Subscriber Line) which uses existing telephone lines with additional gadgetry at the local telephone exchange - at 8Mbps
- radio based internet access - available in parts of the US but unlikely in the UK due to broadcast licence issues. (Fanning, D. 1998)
Information exchange (institution-learner)

A critical aspect of any distance learning programme is exchange of communications between the providing institution and the learner. Most institutions at present use a mixture of methods - post for regular communication, telephone for urgent matters and to help make courses more 'human', and increasingly, e-mail. In addition almost all courses like to maintain some element of the personal touch by including physical meetings either with learners individually or in groups. This also helps learners to feel part of the institution and increases motivation.

Web based forms are a particularly simple mechanism for individual feedback from learners to the institution which require no extra hardware, software or knowledge beyond that necessary to use a web browser. Personal experience of using such forms in a course based at Reading has been extremely good, with users finding this much easier than e-mail to send messages to the tutor.

My own experiences are that learners like to know there is a human being somewhere that they can reach to help solve individual problems. Telephone help lines are installed by most major information providers and while many problems can be solved by e-mail, at least initially, the best method is probably a physical meeting, followed by telephone support, before switching to mainly web based support.

Discussion (between learners)

The third element of courses whether delivered at a distance or in classrooms is that of discussion between learners. It is here that the new media are a major advance on previous methods for distance learning. With a campus based course it is relatively easy to arrange group meetings, but much harder with distance courses to maintain any sort of group cohesion. Most courses overcome this by the use of some element of residential course - evenings, weekends, - or longer depending on the institution and the subject.

Discussion groups, telephone and video conferencing, IRC (Internet relay chat) and mixed technologies such as Net meeting, CUSeeMe1, MUDs and MOOS and virtual environments such as ‘the palace’ hold the promise of reducing to a great extent the problems of working together2. Some people (though not all) would still prefer to physically meet, but the necessity, apart from for social reasons, can be reduced with no loss in learning effectiveness.

“Studies of media preference are common in comparing face-to-face instruction to telephone-based instruction. In general, there are no differences in preferred media. When faced with the option of travelling to a live class, students prefer learning by telephone.” (Threlkeld, R. & Brzoska, K. 1994)

Most of these technologies are still very much in their early stages Tele/audio conferencing are now relatively well established and work smoothly enough.

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1 Desktop conferencing software incorporating, video, text, audio and a common ‘whiteboard’
2 See annex 2 for description of MUDS and MOOS & the palace - a graphical MOO
However the technology is not yet available very widely outside the more technologically advanced countries. Video conferencing is slow and erratic except through LANs (Local Area Networks) where it is growing in popularity. The high cost and low bandwidth of ISDN\(^3\) based systems mean this is a relatively inefficient method for delivery of lectures, but nevertheless it can have its place as a medium for holding live discussions, particularly short ones with participants in separate locations. Single, point to point, conferences seem to be generally well regarded, but multipoint conferences need technological improvements before they are likely to become widely used with ISDN - or more likely, another system will replace ISDN (see above). In general, the more complex the tasks and the more paper is needed, the less effective is video conferencing.

Pilot studies of conducting remote seminars using desktop video conferencing over the internet using the multicast backbone (Mbone) show that there are still major technical limitations with this approach. (Sasse et al quoted in Linde, P. 1996) The main problem is that over the internet the bandwidth available at the endpoint varies according to the network load. Or in other words, the quality of the picture and the sound falls dramatically as more people use the net. Such a conference at 6 a.m. may work well but at 2 p.m. would be unusable.

Broadband communications technologies\(^4\) such as ATM\(^5\) (used in the EU telematics Aquarius programme between Wageningen, Ghent and Trondheim universities) do show more promise to be able to deliver practical desktop video between students and lecturers as well as delivery of video on demand. (Linde, P. 1996). However, this is still at present an experimental technology.

**What’s special about on-line discussions for distance education?**

Computer based discussion groups such as USENET and especially programmes such as HyperNews are potentially one of the most useful advances in group communications for education. However, experiences so far have been disappointing with students initially sending many ‘hello’ messages and then gradually using it less and less, unless use is a requirement of the course. Hunt. A.R. (1996) gives a number of reasons for this and why programmes such as HyperNews hold out considerable hope for overcoming this problem.

There are three types of programme:

**Bulletin Boards:** where users access a programme on a remote computer and read its accumulated database of messages.

**Newsreaders:** which are programmes running on a users’ own machine used to access a remote database of messages through the Internet

**E-mail based discussion groups:** which provide a common address and distribute e-mail messages to all list subscribers.

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\(^3\) ISDN (Integrated Services Digital Network) is a digital service that supports communication by phone, fax and PC.

\(^4\) Telephone lines are low bandwidth and only allow very limited amounts of information to be transmitted. In contrast, satellite, fibre optic cable and some other systems can allow far more information such as that needed for video to be transmitted.

\(^5\) Asynchronous Transfer Mode, or ATM, is a new communications standard that is currently in the later stages of development. ATM is designed to transfer voice, video, and other data that requires short bursts of large quantities of data that can sustain some loss but must be broadcast in real time.
The problem with most of these systems, is that after reading messages, they are deleted - or hidden from view and consequently the context of the discussion is lost. The third system, e-mail discussion groups, does provide a record for the end user (as e-mail messages), but with a relatively clumsy interface (it is necessary to read back through e-mail archives to follow an argument).

Hypermail based archives (e-mail discussion groups archived on the web) and HyperNews on the other hand, preserve the full context of the discussion, allowing one to enter the dialogue at any point in its past as well as its present.

HyperNews goes further in being able to be attached to web documents allowing true discussion rather than a series of monologues and in linking responses to messages together, regardless of title line.

Advantages of conferencing systems

- Messages are asynchronous - while immediate response is possible, most takes place at the convenience of the participants
- All participants contributions can be reviewed by all participants at any time. Web based systems such as HyperNews, have the advantage that links to resources can also be posted as messages creating knowledgebases as a first reference point for students.
- Communication is ‘many to many’ not ‘one to many ‘or ‘many to one’. This is particularly helpful when it comes to answering questions, since if one student asks a question, it is usually the case that others would also like to know the answer. This system, as with a live classroom discussion removes the need to keep replying to the same question. An advantage over classroom discussions is that the answers are the already written down and can be used as the basis for a FAQ (frequently asked question) file.
- The medium is not dependent on learning materials - while on-line discussions can be based on such materials, they can just as well be based on discussions of shared life or work experience. They can thus easily adapt to what learners actually want or need to know and can take off in any direction with less direction from the course designer
- After the hardware is purchased, the costs are relatively inexpensive - significantly cheaper than travel to a given site or audio or video conferencing.

All these points have their negative as well as their positive sides.

- Asynchronous conversations can be frustrating for those wanting an immediate answer - this can be overcome by building in chat (IRC) type programmes as needed e.g. ICQ.
- Since the messages are left for all to see at any time, this can be off putting to some participants

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6\(^\text{http://www.hypernews.org/HyperNews/get/hypernews.html}\)
7\(^\text{IRC - Internet Relay Chat - a live ‘chat’ programme on the web which allows free synchronous exchange of text messages between users as opposed to e-mail which is asynchronous}\)
8\(^\text{ICQ [http://www.icq.com/]}\) is an example of an IRC programme that informs you who’s on-line at any time and enables you to contact them at will.
• Since the medium is less dependent on learning materials, it can lead to unstructured discussions which can be time wasting as often as they can be useful

• While costs are lower than travel, audio or video conferencing, they are still very much higher than post - even mail shots to all participants. However, this is not directly comparable since the speed and ability to reach all participants at once is not present in other systems.

A practical problem is that e-mail sent from within the web will be given the identity of the person whose name is set up within the web browser unless CGI\(^9\) script based forms are used instead. This means that where students use a number of different machines (such as at a resource centre), it is difficult to tell who is sending a message unless they specifically add their name each time within the messages. Some institutions for this reason do not accept the browser to be set up for e-mail on multi user machines.

**Virtual Classrooms**

A number of programmes in recent years, have integrated elements of e-mail, conferencing systems and courseware into a virtual classroom environment. The systems have been widely taken up with universities and colleges offering on-line courses and seem reasonably successful. A possible disadvantage is the need to purchase and install the software (and learn how to use it), rather than being able to offer the courses to anyone with internet access.

**FirstClass**\(^{10}\), is one such integrated e-mail, discussion group and courseware programme which reasonably successfully combines the main elements of on -line courses into a single package.

**TopClass**\(^{11}\) takes this a stage further incorporating a complete on-line classroom environment with interlinked text, chat rooms, group discussions and courseware

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\(^9\) The Common Gateway Interface, or CGI, is an interface for running external programs, or gateways, under an information server. Gateways are programmes which handle information requests and return the appropriate document or generate a document on the fly. A CGI program, can operate within a Web document and handle things like finding out the current date, keeping statistics, counting how many people access the page, process forms, run animations or make Web pages interactive.

\(^{10}\) FirstClass - [www.softarc.com](http://www.softarc.com)

\(^{11}\) TopClass - [www.wbtsystems.com](http://www.wbtsystems.com)
4 Pedagogical issues

Effectiveness of on-line learning

Research seems to show that all teaching technologies are essentially neutral when comparisons are made between those taught with a new medium and those taught without it. This is a difficult issue to evaluate since there tends to be extra enthusiasm in teaching with a new technology. However the following quotations seem fairly conclusive...

"Historically, the introduction of each new medium of instruction is accompanied by research designed to determine if it is as effective as traditional instruction...Each new wave of comparison studies brings similar results--no significant difference..." (Dillon, C. L. & Harwell, D. 1991)

"Comparing the achievement of learners (as measured by grades, test scores, retention, job performance) who are taught at a distance and those taught in face-to-face classes is a line of research going back more than 50 years. The usual finding in these comparison studies is that there are no significant differences between learning in the two different environments, regardless of the nature of the content, the educational level of the students, or the media involved......reasonable to conclude:
(1) there is sufficient evidence to support the idea that classroom instruction is the optimum delivery method;
(2) instruction at a distance can be as effective in bringing about learning as classroom instruction;
(3) the absence of face-to-face contact is not in itself detrimental to the learning process; and
(4) what makes any course good or poor is a consequence of how well it is designed, delivered, and conducted, not whether the students are face-to-face or at a distance." (Moore, M. & Kearsky, G. 1996)

While it does appear that students prefer to be able to discuss issues with a tutor and/or with other students, where this can be done effectively with on-line technologies, it may well offset any remaining disadvantages students have in being isolated from the classroom (apart from the social role of the class).

Interaction is a key word in discussions of educational effectiveness today, This is often taken to mean interaction with the subject matter as much as with other learners and tutors. While the new technologies of computer conferencing, e-mail, audio, tele and video conferencing can to a large extent reduce or remove the problems of lack of interaction with other students in distance learning courses, the issue of interaction with subject matter remains and is dependent on well structured clear materials design - regardless of the medium. This takes time and is a major issue in development of on-line courses.

The effectiveness of learning with the new media, depends not only on actual access and speed of the media, but on familiarity with computers and technology (by both the tutors and the students and on their level of comfort with on-line learning and interaction. My personal experiences with this are that, provided students are given
introductory training on the use of the technology, any initial inhibitions can fairly quickly be overcome by most students. Some, however, will continue to have difficulties such that over-reliance on on-line teaching may result in excluding some students - the opposite of the promise of the technology!

Pooling resources

A particular advantage of the new technologies for distance or even classroom education is that because of the removal of space and time constraints, it is possible to pool resources from a number of institutions and to increase the quality of instruction by making use of experts in their respective fields from around the world. Video conferencing systems can be used to deliver lectures at a distance, though in many cases, as suggested above, these would be better delivered as video tape with video conferencing kept for the discussion sessions.

The Commonwealth of Learning have outlined what they see as some of the requirements for successful inter-institutional partnerships. In discussing the practical issues related to development of such partnerships, they emphasise the need for demonstration projects that would both provide useful courses that could be expanded into larger programmes and show the efficacy of a collaborative approach to remote delivery. In particular they recommend that:

1. Such courses should be parts of existing programmes or programmes under development rather than new programmes and thus be usable in all participating institutions or at least transferable as widely as possible.

2. The issue of credit transfer should be dealt with as part of the initial agreement to collaborate on development and delivery of particular courses along with all other details of the agreement. (Mugridge I. 1996)

Assessment, quality and accreditation

With all distance learning (for certified courses), there is a problem with knowing whether the student sending in the assignments is the one registered for the course. Conventionally this has been overcome through checks on the students, requiring an element of residential study and formal exams and interviews at the providing institution.

Similarly, quality issues in provision of the course need to be provided through the same mechanisms as for conventional courses - external examiners and external auditors need to be appointed from recognised institutions familiar with the process of distance learning as was done with the Open Learning Institute of Hong Kong Robertshaw, M. (1997)

For assessment of student assignments, apart from the issue above, a significant problem in the past with distance education has been the speed of return of marked assignments. When assignments are delivered and returned electronically, this problem is completely removed - (as is any excuse for the tutor in not returning the assignment). It is also increasingly possible to automate the process with multiple choice questionnaires which return a score directly to the student without any input from the tutor (beyond setting up the tests). Essay type answers are as yet, less amenable to this type of assessment
A separate issue in quality concerns not the course materials provided, but the content of the world wide web ‘proper’. While students work within the course materials, the content is controlled. However, it can be useful to link to other resources available on the web and from there students search the web in general for materials relevant to their courses. An overwhelming amount of information is now available on the web, but there is little or no quality control over the information since there are no restrictions outside the bounds of a country’s laws, as to who can post what on the internet.

5 Administrative issues

Costs

It is difficult to give any general conclusions concerning costs of on-line learning as opposed to conventional learning, since the costs vary dramatically with the technology used, number of students and staff involved and complexity of the courses provided. The physical location of both students and staff can have a large influence on cost due to both the costs of the technology and the costs of living for those involved. As the costs of hardware, software and connections continue to fall, the proportion of the course costs which are due to staff time will continue to rise.

When telelearning allows for direct communication between the student and the instructor/tutor, specific measures have to be taken in order to limit the amount of communication to manageable proportions, otherwise the costs will become uncontrollable. (Moonen, J. 1997)

It is often the case that distance education is cheaper than conventional education. While this can be true, since the institutional costs are largely removed, it depends to some extent on the number of students who will take part in a particular course. Designing and producing materials that can be used for distance learning takes more time than those which can be used in a class room setting (though much material used in a classroom would benefit from the disciplined approach needed to produce stand alone distance education materials). However, very much larger numbers of students can be accommodated in distance learning courses than is possible with campus based courses and this can lower the costs per student dramatically.

For example: the Radio and Television University, China, had 850,000 students in 1993; the Universitas Terbuka, Indonesia, had 380,000; the Sukhothai Thammathirat Open University, Thailand, had 300,000; the UK Open University had 150,000 in 1995; and the Open Education Faculty, Anadolo University. Turkey, had 823,000 in 1995. It is not uncommon for individual courses to have many thousands of students enrolled on them. (Open University 1997)

Counteracting this is the amount of staff time needed for on-line support, discussion and marking assignments.
Logistics

Some of the logistical issues involved in running an on-line distance education course have already been covered above but are included in this list of issues for convenience.

- **Course materials development**, How much can existing materials be used? How much material from one site can be used at others? How relevant is it to others? How much do courses need to be tailored to individual areas to be usable? Is global provision of information useful and if so to what extent?

- **How much time is required to set up web pages and other course materials?** The time required to learn programmes, plan and design materials, and convert existing materials is often underestimated. Whilst writing html pages is becoming far easier with software packages dedicated to this, the conceptualisation of course content in terms of interlinked modules cannot yet be automated and is very time consuming (Kahany, J.M. 1997b)

- **How much time is required to maintain web pages?** Estimates range from 1 1/2 hours per lecture to 5-10 hours per week (Kahany, J.M. 1997b) A problem with the continually advancing technology of the internet is that there is always a more dynamic, exciting way to present pages and a great deal of time can be spent ‘spicing up pages’ with animation’s, image maps etc., though with questionable gains to the learner (especially if they have older technology to access the pages)

- **What mixture of media will be used?** Which media are most appropriate for the particular audience concerned? How much material should be delivered on-line and how much is better delivered as print materials, video, audio-cassettes, CD-ROMs and diskette?

- **How will practical sessions be dealt with?** How much residential learning is needed if any?

- **What are the staffing requirements** both for course development and for course administration

- **What will be the Institutional base(s) and what partners will be involved**

- **What equipment, software and other resources** are needed both at the institution and for the user

- **What training is needed for staff** in use of the interface and software to ensure those administering the course are comfortable with the technology? In this case the simpler and easier it is to use, the better. One good example is that of the ‘Admin forms’ used by the LRF web site in Sweden (www.lrf.se) where changes to the web site are made by staff using on-line web forms (password protected) which then automatically update pages through CGI scripts without the need for the staff to know any html or use a separate web editor.

- **What training is needed for students** - to ensure the end users are familiar with the technology and how to use the materials? Personal experience to date in this area suggests that most students benefit from an initial ‘live’ session to introduce the interface before moving to on-line only work.
• **What support will be provided to students** both on-line and through telephone and other means. While it is possible now to link to a remote computer to deal with many software problems or to demonstrate a procedure, this does not help when the problem is with the connection itself. Ideally, local support needs to be provided, but where this is not practical, telephone or at the least, e-mail support should be available and provided promptly.

• **Submitting and marking assignments** - how much can this be automated?

• **Propriety and copyright issues** - both for materials provided to the students through the web and confidentiality and ownership of materials submitted electronically by students

**Joint operation of courses**

Where courses are jointly administered by more than one institution, a number of questions need to be addressed at the planning stage:

• Will courses originating at one institution be included in other institutions' class schedules?

• Do staff of an individual institution get a single class list that includes students registered from all participating institutions?

• When the students register, whom do they pay? If there is a difference in tuition, how is this handled? If the student is registered full-time and at the top limit, how is this handled?

• Which institution pays any financial aid?

• Which institution awards credit to the student? Is it to be transferable?

• Do all institutions have the same semester start and end dates? The same time periods for classes?

• Will institutions be charged for rooms and equipment at other institutions? If so, will the charges be consistent?

• Will support services be the same at each location (i.e., site co-ordinator, technical support, fax, photocopy machine, and telephone)?

• Who is responsible for hiring and training site co-ordinators and technical support staff?

• Who pays for the cost of distributing materials?

• How will equipment repair and maintenance costs be handled?

• Who ensures that appropriate computer software and hardware is available at each site; who pays for licenses?

• How do students get access to electronic information?

(adapted from University of Maryland: **Models of Distance education**, On-line paper)

**Study centres**

Study centres are widely used to provide access to technology for education. The Indira Gandhi National Open University in India for example has a huge network of comprehensive study centres that provides students with both a local and an institutional sense of identity. South Africa is setting up ten new
‘telecottages’\textsuperscript{12} each year for educational use, and the EU, through the development of the EuroStudyCentre network, aims to ensure access to global communications technology for all students from European distance teaching institutions.

A question mark over such developments, particularly in poorer countries is that, if a study centre with the latest technology, video conferencing and satellite links is to be provided, how sustainable is this technology - particularly if it is project based. In developing countries, high technology is regularly abandoned once the funding agency pulls out at the end of the project period. Even in technologically advanced countries, cost effectiveness is a major issue and with the pace of development of technology today, whatever equipment is purchased, tends to be out of date immediately (if not before). Until a technology is established, it may not be justifiable to invest large amounts of time and money in it. For example, digital video \textit{can} be delivered over the internet. But it is still of relatively poor quality and is slow to download. Except for live discussion or delivery, video tape seems the more practical option at present. Similarly, large documents \textit{can} be placed on the web, but are slow to download and cost the end user more to print than if they are mass produced and delivered by conventional post. While archives of materials on the web may be useful where information is not otherwise available, this is probably not the best method for general use in a planned distance learning course.

At present most courses conducted ‘on-line’, actually still provide a considerable proportion of the course content as printed text, audio and video cassettes.

Hybrid CD-ROMs which contain the bulk of the instructional materials for a course together with links into a live web site can be a useful way to bypass the problems of download times. The storage capacity of a CD ROM is already sufficient to store all the text and graphics needed in most courses and can also include audio and video clips. Storage capacities are likely to increase significantly in the next few years allowing full frame video to be more practically added.

\textbf{Elements of an ‘on-line learning’ course}

1. Technical instructions on equipment needed and the interface for the course
2. Course organisational material such as the syllabus, course map, calendar, class assignments, grades
3. Course content in the form of notes, presentations learning tasks and other files which can be viewed directly or downloaded
4. Weekly or daily update/announcements
5. Links to other relevant web sites and on-line resources
6. A mechanism for private communication between tutor and student (e.g. e-mail)
7. A mechanism for private communication between tutors (e.g. Listserver)
8. Social interaction - a chat mechanism (e.g. Internet Relay Chat - IRC)
9. A mechanism for discussion between the course members (e.g. bulletin boards, conferencing systems, Netmeeting, CUSeeMe)
10. A way to evaluate the course (e.g. on-line forms)
11. A mechanism to incorporate results of discussions and student work

\textsuperscript{12} Resource centres for use by individuals and small business providing communications and computer equipment and training for personal use
6 Special considerations for developing countries

The internet is rapidly coming to dominate new communications services in the western world, since computers are widespread and the costs of telephone is low and falling. This, however, is much less the case in developing countries, where not only is access to the internet much more expensive, but also less reliable telephone and postal services making distance education in general a more difficult procedure. Nevertheless, distance education course have been conducted throughout the developing world for the latter half of this century, largely by use of printed materials delivered by post - the ‘first wave of distance education’.

While the Internet holds great potential to provide for developing countries' information needs, the infrastructure is not yet in place, particularly in Africa. Today, increasing numbers of countries do have a direct link into the world wide web (Permanent fibre optic connection rather than dial up modem link), and it is to likely that this will be rapidly extended through one means or another to all countries. The majority of people in developing countries, however do not have a telephone, let alone a computer and the biggest problem is that of ‘the last mile’ (or first mile) linking between the towns and the villages.

As pointed out by Holderness, M. (1996), two countries, Finland and the United States have more than one Internet host computer per 100 population. In comparison, in 1992, 49 countries had fewer than one telephone per 100 people, and 35 of these were in Africa. India, for instance, has just 8 million telephone lines for 900 million people.

Language & Culture

Language is another major issue with the internet. The majority of web pages are in English. While this may be the single language understood by more people than any other, it still only represents a minority of the world’s population. Non-Latin scripts are more complex to produce on a computer (though perfectly possible, since the second most common language on the internet is Japanese) and add to the costs. This raises issues of cultural dominance, though this need not necessarily occur - after all, the Internet is not a mass medium. In fact it could be said that it is the first medium to be simultaneously usable as a mass, group and individual medium. In the same way that special interest newspapers and radio programmes are produced, it is perfectly practical for groups of people to use whatever language they wish and form their own communities on the internet, unrestricted by time and space. The internet, can as easily be used to provide for greater freedom for minorities to group together as it can be dominated by larger groups.

Student funding

In most developing countries, funding for further training at post-graduate level comes from foreign funding agencies. There may well be cost advantages to the donor institution in provision of post-graduate training on-line. There may also be advantages in retaining staff in their own posts without extended absences. However, these may be offset to some extent by the loss in experiences to the student and may also be less attractive to the student in some cases. Also, since students are not away from their work; they are likely to be expected to do their normal work. This could be partly accommodated within a distance course through
visits to the institute (an initial visit to the parent institute; a second visit, meeting the students at another location with tutors etc.)

**Information technology skills of the learners**

In all on-line courses, regardless of where they are held, an induction period where the student learns the IT skills required is generally needed. Students, in developing countries, however, tend to have less exposure to computers and may need a considerable amount of training before a course is run. My own experiences in this area is that a significant amount of initial training is needed before students unfamiliar with computers are comfortable with the medium. For the second year, I included an initial introduction course to computers in the term before the web course was run which significantly improved their confidence in using the technology. However, it is also striking that this year, a much higher proportion of students arrived at Reading, already familiar with e-mail than did last year.

In most cases, the necessary skills training could generally be provided in the learners home country through, for example, the British Council or local universities, colleges and learners own institutions.

**Language skills**

As the medium of teaching and learning for degree level international courses is usually one of the main international languages (English, French, Spanish) the learners need to have a reasonable standard of the language of instruction. For conventional training abroad, the institute that offers the award and the award administering agency, such as the British Council, have their own testing procedures for this. Similar requirements would be needed to follow distance education courses where the learner remains in his or her own country. An issue in distance education courses is that learners’ listening comprehension and conversational skills are not so important, as the work is mainly written. A *disadvantage* of this is that learners lack the opportunity to improve their language skills. One possibility to overcome this problem is to include regular group meetings in country or face to face discussions with an in-country tutor.

7 **Agriculture and rural development (education and training)**

Farmers, by the nature of their work tend to have less access to education and training than the general population. They are often isolated geographically and socially, work long hours, often alone and would find it impractical to attend long term traditional courses. The work they do is constantly changing and they need to learn new knowledge and skills. For these reasons it may seem that distance education is the ideal solution.

However, farming is also a very practical occupation and distance learning does not lend itself so well to courses which require a great deal of practical work. The crops, animals, machinery and facilities also vary significantly from farm to farm even in the same area which can make it difficult to provide a ‘one course fits all solution’. Finally, since farmers are isolated and in many cases not used to studying alone, it can be difficult to maintain motivation without contact with tutors and other learners.
For these reasons, the majority of courses in distance education offered by universities have been at the postgraduate diploma and masters degree level where the need for practical work is far less and theoretical abstractions and generalisations are often more important than individual examples.

There are however a number of successful examples of agricultural education and training for a wider group of students - often at all levels from primary education to degree and postgraduate studies. Examples are INADES-formation in Africa (courses for farmers and extension staff), Lesotho Distance Teaching Centre (LDTC) (courses for students up to certificate level), Central African Correspondence College, Zimbabwe (secondary and tertiary levels), the University of Guelph, Canada (certificates and diplomas) and Lincoln College in New Zealand (diplomas).

Most institutions deal with the requirement for practical aspects of the courses by including an element of residential training - from weekends to longer sessions (one year of the three for Lincoln College). The variation in farming practices is usually coped with by providing exercises which require the student to apply the theory to their own situation and are left sufficiently flexible to allow for the different situations.

In the western world, access to the media are not significant issues - practically all farmers are literate and have at least secondary education. They have television, radio, telephone, and increasingly also fax and internet also. TV and radio are also practically universal across Eastern Europe though the telephone system in some areas can be erratic and the coverage of rural areas is less complete.

In many areas of developing countries however, the picture is very different. Literacy levels are often very low and present a major drawback to education of any kind but even more so for distance education. Electricity is not widespread and while radio is common, television, and the telephone are not. Agriculture is often more a matter of subsistence production rather than the large scale commercial agriculture of the West, hence the motivations of the ‘audience’ are often very different. Radio and cassette forums as well as video have been used to try to overcome the limitations of illiteracy, but with limited success.

In such situations, the internet with its requirements for at least basic computer literacy as well as general literacy is equally unlikely to have much impact directly.

It may however be more useful in providing a fast, relatively cheap and efficient means of providing information through the extension systems.

8 Regional summaries

Distance education and training in Western Europe

There are six institutions in Europe set up specifically as open universities only where most if not all teaching is through distance methods. The Open University of the United Kingdom at Milton Keynes; Universidad Nacional de Educacion a
Distancia in Madrid, Spain; the FernUniversität, Gesamthochschule in Hagen, Germany; the Open universiteit at Heerlen, the Netherlands; the Universidade Alberta in Lisbon, Portugal; and the Universitat Oberta de Catalunya in Barcelona, Spain. (Open University 1997)

Increasing numbers of other universities and higher education institutions throughout Europe also provide the option of taking short courses or postgraduate studies through distance learning. Few yet offer compete undergraduate degrees outside the open universities.

Private institutions offering distance education are also common across western Europe. The main providers in 1997 are Spain, the Netherlands, France, Germany and the United Kingdom, with smaller groupings of institutions in most European countries. (Open University 1997)

Increasing numbers of universities across Europe, even those who had not previously contemplated offering distance learning courses, are experimenting with use of the web as a teaching tool. Some are using the web within campus based courses to provide a more open learning environment. Others as an entry into the field of distance learning. Searching the web for web based courses in Western Europe still show a predominance for business courses over others, The MBA is probably the single course most widely offered through distance study.

While all countries of Western Europe have well established Agriculture and rural development courses, few offer these by distance learning for the reasons given above, Wye college in the UK is one exception with a range of programmes. No programmes are yet provided through on-line learning though there is considerable interest in the potential.

Distance education in Eastern Europe

Countries of Eastern Europe often have the necessary institutional infrastructures in place in terms of universities, colleges, and local training centres. In many cases, they also have sufficient hardware, software and communications technology to be able to participate in joint operation of distance learning programmes between several countries. While technology available to individual users tends to be more limited, it is widespread enough in countries such as the Czech Republic, Slovakia, Hungary, and Turkey for on-line courses to be practical, particularly where there is an institution available for use as a study centre. The problems are more likely to arise in attitudes rather than practice since on-line learning puts the focus more on the learner than the teacher and much of the motivation and direction needs to come from the learner for the system to be successful.

Overall in the countries of Eastern Europe, the Czech Republic, Slovakia and Turkey have the most strongly established programmes of distance education. Romania also has a sound base and ambitious plans. Apart from Turkey, the most dynamic programmes are those run through the private sector, generally with business courses as one of the main offerings. As yet, no courses appear to be offered in any country making use of the internet. Hungary and Poland have made very little progress in this area so far - despite the amount of EU investment in Hungary in particular.
In Hungary, the PANNONIA’ Joint European Project (part of the TEMPUS Programme) has established a network of universities to collaborate in distance learning developments co-ordinated by the Hungarian National Council for Distance Education (NCDE). The programme is being operated in co-operation with Italian, British, German, Dutch, French, Portuguese and Finnish distance education institutions. It is unclear, however, whether any actual courses have been established to date.

The IDEAL - Integration of Distance Education at Advanced Level - TEMPUS JEP has been approved for the period of 1995-1998. The main objective of the project is to adapt and develop new distance education materials with the co-operation of the experts of institution involved in the project and utilising experiences and existing teaching materials of the EU partners. The programme is centred at Godollo University of Agricultural Sciences with the collaboration of nine Western European and 16 Hungarian partner institutions. (Source ICDL database)

In 1991-1992, the University of Veszprem, Hungary ran an experimental distance education series in English for Management in conjunction with the Language and Communication Centre, King's College, London, United Kingdom. The University is one of five European universities to have taken part in the live, interactive, satellite (Olympus)-delivered programme. Students received sound and vision from London and were then able to ask questions via the telephone. This appears however not to have led to any further developments in open or distance education.

The only really active organisation running distance learning courses in Hungary seems to be in the commercial sector. SZAMALK Ltd, launched the Gabor Denes College for Information Technology in 1992 where graduating students receive an engineering degree in information technology. They now have three international management training centres with 6,000 students a year following courses. Several hundred of these follow distance education courses which are run in association with British and American business colleges.

**Romania**, again has its most successful programmes in the commercial sector. The Centre for Open Distance Education for the Civil Society (CODECS) SA, is a joint stock company formed on 15th November 1993, as a follow up of the CODECS Project, aimed at the introduction in Romania of open distance learning. The company has ambitious plans for the expansion of distance learning throughout the country using web based materials, CD ROMS and video conferencing. This project was developed in co-operation with the Open University, United Kingdom and Bucharest University, being funded by the UK Government's Know How Fund scheme.

A potentially useful source for further information in Romania is the UNESCO European Centre for Higher Education, (CEPES) based Bucharest. [http://www.cepes.ro]

**Russia**

Distance learning has only recently been established in Russia as a serious alternative to conventional education. The University of Russia’s Academy of Education was founded in 1995 and is the main institution in Russia offering distance education. They provide a range of degree, diploma and pre-university studies in 11...
departments and 20 disciplines. Courses are at present mainly print based with tutorial support. The International distance learning centre (LINK) began to offer degree and diploma courses in business management in partnership with the Open University (UK) just last year.

**Slovak Republic**

No courses are yet web based but there are a number of well established distance learning courses using print materials, video and audio cassettes and telephone support at a number of institutions.

The main institutions involved are the City University Bratislava which runs business courses in association the UK Open University and the University of Zilina which runs a number of courses in engineering.

**Poland**

Only one institution at present appears to have a programme of distance education at present in Poland. The National Centre for Distance Education in Warsaw was established in December 1992 with the aim of organising and popularising distance education in Poland. Only two courses are offered at present on computers in business and schools in Europe. The courses are delivered using a variety of media and methods including printed correspondence texts prepared by/or the institution, video cassettes, computer based training programmes.

**Turkey**

Turkey has the largest established programme of distance education in the region with close to three hundred thousand students registered at any one time with the Open faculty of Anadolu University. The university uses a wide range of teaching methods from print to TV and video, though not as yet internet based courses. Courses are run at a range of levels and for both full time students and professional working people to enable them to study outside working hours. Courses are also run for Turkish nationals resident in other countries sending video tapes of the TV programmes.

**Distance education in North America**

The Universities of North America have taken to heart distance education as a way of reaching the masses far more than any other country.

In February 1925, the State University of Iowa offered its first five radio courses for credit. Educational television was developed as early as 1934 and by 1939 the University of Iowa’s station had broadcast almost 400 educational programmes. (Open University 1997)

The experimentation with new media continued with television, teleconferencing, audio cassettes, satellite and cable delivery. At present Canada and the US are well ahead of the rest of the world the world in the number of courses being provided on-line. Whereas two years ago, few universities offered more than token courses on line, now it would be difficult to find a single university that has not taken the technology on board either on campus or for distance programmes. A particular advantage North America has in this area is the common language and common
Distance learning for Agriculture: The third wave

In addition the very low costs of telecommunications bring on-line education within the reach of almost everyone, either at home or through local training centres.

**Examples**

**Pennsylvania State University** has offered independent study courses for over 100 years. Associate degrees, Certificates, and a variety of undergraduate courses are offered through distance learning, with selected courses supporting e-mail lesson options. This year they will be introducing the initial courses of their virtual university, the ‘world campus’

The Distance Education On line Symposium (DEOS) is an electronic on-line discussion forum based at Pen State.

**The University of Waterloo** Environmental Economics Degree (on-line)

Assessment is by assignments which are Web-based and range from assignments such as e-mailing the instructor, creation of a home-page, participation in discussions on-line (related to lectures and reading material), writing response papers (one page, on-line) to a final project, on-line (in groups with other participants in the course).

The **University of Minnesota** offers hundreds of credit courses at any time and any place. Any interested person may enrol. You set the study pace yourself, submit assignments and exams, and receive evaluations from your instructor by conventional or electronic mail (a growing number of the courses are provided by e-mail or the Internet).\(^{13}\)

**Mind Extension University** (MEU) is a US based non-profit cable TV company, offering cable broadcast and videotaped courses as well as complete Associate, Bachelor, and Masters degree programs with no campus visits from several US colleges. Some programmes support electronic mail or Internet interaction and international enrolments.

George Washington University, in Washington, D.C., offers a combined internet-assisted and video-based campus-free Master’s in Education and Human Development with a Concentration in Educational Technology and Leadership through the Mind Extension University.

**Distance education in Latin America & the Caribbean**

In the 1950s and 60s literacy campaigns using radio and television to reach distant populations were the first serious attempts to try to bring education to the masses through distance methods. However, university distance education programmes did not really begin until the 1970s in most countries. Despite initial popularity, it became regarded as second class education, possibly due to lack of attention to detail in adapting the structure of the UK OU format. (Open University 1997). Efforts are now being made to provide more up-to-date materials of higher quality and greater relevance since it is clear that conventional classroom based education cannot meet the needs of the rapidly expanding population.

\(^{13}\) extract from their web pages at [http://www.crk.umn.edu/](http://www.crk.umn.edu/)
Most distance education programmes rely heavily on printed text with as yet very few examples of use of the new media.

One exception is the Technological Institute of Monterrey (ITESM), in Mexico, which has more than 20 campuses linked by satellites in Mexico and several campuses located in other countries. This successful experience is being rapidly emulated in other instances. (Open University 1997)

The World Bank is backing the expansion of satellite delivery in Costa Rica, Mexico and Venezuela together with the integration of e-mail and the world wide web into the distance education programmes.

A particular advantage in Latin America as compared to other developing regions is the use of Spanish, Portuguese or English in all countries. This makes transfer and adaptation of materials relatively easy as compared to Asia or even individual countries within Africa. While those who have access to computers and the internet generally have a reasonable command of English, French or Spanish (or Japanese), this is not the case for all those who make up the audience for distance education. Preparation of materials for distance learning in a country such as India with its huge diversity of language and culture is a much more complex task than in Latin America and the Caribbean.

Distance education in Africa

South Africa is by far the most advanced technologically in Africa with its distance education courses. It has several specialist distance education institutions and many traditionally residential educational institutions, both universities and colleges, are now also beginning to include the option to study courses through distance education. The majority of the institutes now have e-mail addresses and some (such as UNISA) are beginning to experiment with web based delivery of courses. They hope to carry out an initial evaluation of a course towards the end of this year. (Bornman, 1998)

Most course material provided is as print with audio cassettes and radio also used to some extent. Teleconferencing and video conferencing are beginning to be used for discussion sessions. Contact sessions are also held in some towns though the extent to which this is done varies with the institution providing the course.

Distance education is offered by a number of organisations in other countries of Africa, though not to the same degree as in South Africa. The World Bank is involved in setting up the African Virtual University - a project to deliver lectures to students in Africa via satellite television. Lecturers are then available to take telephone calls from students at selected times. The TELIS A (Technology Enhanced Learning Initiative for Southern Africa) is a joint initiative between COLISA and various other African institutions, governmental departments and the World Bank. Elements of the initiative include the provision of information servers, educator training programmes, school and institutional connectivity and community capacity development.
Distance education in the Middle East

There are few examples of distance learning programmes in any subject in the Middle East. An exception is Payame Noor University in Iran which over the past ten years has developed a range of degree studies operated through distance learning (correspondence) methods. In practice these are almost entirely print based with some audio cassette and radio support. The University is developing a new programme in Agriculture, at present.

Israel's Open university, established in 1974, offers over 380 courses in the arts, sciences, and religion. 6000 students in Russia and the CIS study for the Judaic courses with tutors in their own countries and a course supervisor in Israel.

The only other example found of an institution offering distance learning courses in the middle east is Al Quds Open University in Palestine which began in 1991. They run degree level programmes in sciences (including agriculture), business and general education. They also operate a continuing education scheme for those who wish to study without taking a full degree programme.

Distance education in Asia

Some countries of Asia (e.g. India, Pakistan and Thailand) have run distance education programmes for a number of decades. However, by the mid 1980s, it was becoming clear that the demand for education, especially in post secondary school level could not be met by conventional means and a rapid expansion of distance education systems would be needed.

Since the mid '80s, there has been a considerable growth in both the number of dedicated distance teaching institutions in the region and the number of campus based institutions offering courses by distance learning. Millions now attend classes through open schools and open universities throughout the region in India, Pakistan, Bangladesh, Sri Lanka, Thailand, Malaysia and Indonesia.

In the more advanced countries such as Malaysia and Singapore, the internet and digital technology are becoming very widespread to the extent that Singapore is likely to become the first state in the world to provide internet access to all its citizens through fibre optic cable. On-line learning is not just an idea there, and not a second best option either. Because of the flexibility of open learning systems using the internet with very rapid connections, to many people it is becoming the preferred method of learning.

Most of the region's distance education providers still use print as the main way to delivery courses, others supplement print with the whole range of other distance learning media which have been developed over this century, from cassette tape to broadcast television to telephone tutoring.

Distance education in the South Pacific

The South Pacific has long known the need for distance education since they cannot easily reach their citizens scattered over thousands of small islands with conventional education programmes. Australia and New Zealand, similarly with
their low populations and large geographical area have long had radio, television and correspondence based education. Some, like Deakin University in Victoria and Massey University in Palmerston, New Zealand, have more off-campus students than on-campus learners and this trend is likely to continue with the growth of online learning.

9 Conclusions

The new media offer extraordinary new tools which have the potential to transform open and distance education from second choice, to the first choice for long term study. The technology to make this possible is here now - or at least just round the corner. However, the problems and difficulties in implementing it are likely to be as they always have been, human problems, rather than technological ones. Courses can only be successful when they meet the needs of the consumers. Technology without the content will be just a new toy. Regardless of the technology, good design of instructional materials with a relevant and appropriate curriculum are still the key to an effective distance learning programme.

Further conclusions?

This space has deliberately been left blank to make this paper interactive. Please enter your own comments and conclusions here and mail them to the author: J.F.Cook@reading.ac.uk
References

Adam, L. (1996) Africa on-line? in Ceres, the FAO review No 158
Blom, J.J.C. (1997) Use-oriented courseware development for Agricultural Education: An ecological approach Twente University, Netherlands
Moonen, J. (1997) The Efficiency of Telelearning Faculty of Educational Science and Technology, University of Twente, Enschede, The Netherlands


The American Center for the Study of Distance Education (ACSDE)

Threlkeld, R. & Brzoska, K. (1994) Research in Distance Education. Distance Education: Strategies and Tools. Educational Technology Publications.


Annex 1

What is a MOO?

MOO stands for "Multi-user domain, Object-Oriented." Early multi-user domains, or "MUDs," began as net-based dungeons-and-dragons type games, but MOOs have evolved from these origins to become social environments in a text-based virtual reality where people gather to chat with friends, meet new people, and help build the MOO. Users communicate with others in real time (as opposed to the delayed communication of e-mail). Users can create rooms, objects, and programs that recreate in text anything the user might imagine. For example, "Gregor" at schMOOze University created a monkey that hands out dry towels to swimmers. This program causes lines of text describing the monkey's actions to appear at regular intervals on the screens of all the users in the same "room."

What is an educational MOO?

An educational MOO has an academic theme and uses a variety of MOO communication tools such as internal e-mail, newspapers, documents, blackboards, and classrooms to accommodate a variety of teaching styles. Teachers can use these tools in harmony with the goals for the class while exploiting the nature of MOO as a student-centred learning environment.

Most MOOs are not designed with specific academic purposes in mind, and some are simply not appropriate for young people.

(Extract from Turbee, L. (1997))

The palace

The Palace is a graphical version of a MOO where AVATARS - two dimensional graphic objects move in a virtual environment. The system is becoming widely used as an online networking and educational tool. The Association of Internet Professionals (AIP) has created an online meeting and gathering place for its members to discuss industry trends, collaborate on projects, and exchange technical information with each other using the palace.

The AIP Palace consists of graphically realistic online meeting rooms and lounges where participants are each represented by individual graphical images of their choice. Members communicate through text appearing next to their icon and all participants in a single room see the same graphical images that they can "point" or refer to which eases communication. Through The Palace’s auditorium module, PalacePresents, the AIP members can conduct specialized seminar sessions and receive training on different technical or business issues. The AIP Palace can be accessed through the website of the international association at http://www.association.org.

(text from the palace web site (http://www.thepalace.com/))
Annex II

Distance education institutions world-wide

This list covers institutes offering distance education courses in agriculture as well as a number of special purpose (distance education only) institutes

Western Europe

**Finland**

*FADE (Finnish Association for Distance Education)*

E-mail: collan@oyt.oulu.fi

**France**

*Federation Interuniversitaire de l’enseignement a Distance (FIED)*

e-mail: fied_ctes@telesup.univ-mrs.fr

[http://telesup.univ-mrs.fr/telesup](http://telesup.univ-mrs.fr/telesup)

**Germany**

*DIFF (Deutsches Institut fur Fernstudienforschung - German institute for distance education)*

e-mail: diff@mailserv.uni-tuebingen.de

*FernUniversität (German Open University)*

e-mail: rektorat@fernuni-hagen.de

[http://www.feruni-hagen.de/allginfo.html](http://www.feruni-hagen.de/allginfo.html)

**Ireland**

*National Distance Education Centre*

**Italy**

*Consorzio per l'Università a Distanza*

**Netherlands**

*European Association of Distance Teaching Universities*

e-mail: eadtu@ouh.nl
Open universiteit
World Food Production (Degree, Continuing education)
Modern Biotechnology in Food Production (Degree)

E-mail nwm@ouh.nl

Wageningen Agricultural University
[http://www.wau.nl]

Norway
NADE (Norwegian Association for Distance Learning)

SOFF (Norwegian Executive Board for Distance Education at University and College Level)
E-mail jan.atle.toska@unikom.uit.no
[http://www.soff.uit.no/]

Portugal
Universidade Aberta (Distance learning university)

Spain
Universidad Nacional de Educacion a Distancia
E-mail relint@bm.uned.es
[http://www.uned.es]

Sweden
SADE (Swedish Association for Distance learning)
E-mail jel@ipe.liu.se

SCDE (Swedish Consortium for Distance Education)
E-mail univex@adm.umu.se
[http://www.distans.kth.se]

Uppsala University
E-mail inger.rathsman@uadm.uu.se
[http://www.uu.se]
UK

Aberdeen

e-mail: abcoll-enquiry@abdn.ac.uk
http://www.abcol.ac.uk

Horticultural Correspondence College

Mixed Farming (Certificate, Training)

IBC Legal Studies and Services Limited

Agriculture Law (Diploma, Postgraduate, Continuing education)
e-mail: eve.kinane@ibcuk.co.uk
http://www.ibc-uk.com

International Extension College

Courses for developing countries
e-mail: iec@dial.pipex.com

Myerscough College

Rural business management courses
e-mail: acreg@myerscough.ac.uk

Open University

e-mail: general-enquiries@open.ac.uk
http://www.open.ac.uk

Reading (AERDD)
aerdd@reading.ac.uk
http://www.reading.ac.uk/AERDD

University of London - Wye College

Agricultural Extension Systems (Diploma, Postgraduate)
Gender Issues in Agrarian and Environmental Change (Diploma, Postgraduate)
e-mail: ep@wye.ac.uk
http://www.wye.ac.uk
Eastern Europe

Czech Republic
Akademie Jana Amose Komenskeho
e-mail: akademie@login.cz

Technical University of Liberec
e-mail: eva.dvorakova@vslib.cz

Hungary
Euro-Contact
e-mail: ecbs@mtesz.hu

Hungarian National Council for Distance Education
e-mail: info@ntt.hu
http://www.ntt.hu

Romania
Centre for Open Distance Education for the Civil Society
e-mail: office@codecs.eunet.ro

UNESCO-European Centre for Higher Education
e-mail: cepes@cepes.ro

Russia
International Distance Learning Centre 'LINK'
e-mail: postlink@link.msk.su

The University of Russia, Academy of Education
e-mail: rou@glas.apc.org

Slovak Republic
City University of Bratislava
e-mail: morovick@cub.sanet.sk

University of Zilina
http://www.utc.sk
**USA**

*Arizona State University*

e-mail: icsiw@asuum.inre.asu.edu

http://www-distlearn.pp.asu.edu

*Central Michigan University*

http://www.cmich.edu

*Iowa State University of Science and Technology*

Professional agriculture courses

e-mail: proaginfo@iastate.edu

*Oklahoma State University*

MA in Agricultural Education

e-mail  ics-stu@okway.okstate.edu

http://www.okstate.edu/education/inc.html

*Pennsylvania State University*

e-mail: psude@cde.psu.edu

http://www.cde.psu.edu/de

*Purdue University*

http://www.purdue.edu

*University of Idaho*

http://www.uidaho.edu

*University of Kentucky*

http://www.uky.edu

*Washington State University*

e-mail: edp@wsu.edu

http://www.eus.wsu.edu/edp

**Canada**

*Alberta Distance Learning Centre*

Agriculture: Land and Life (Secondary)
Athabasca University
e-mail: auinfo@admin.athabascau.ca
http://www.athabascau.ca

British Columbia Ministries, Distance Learning and Continuing Education Branch
Agriculture (Secondary)

Commonwealth of Learning
e-mail: info@col.org
http://www.col.org

Open Learning Agency
Introduction to Food Production Systems (Degree)
e-mail: studentserv.ola.bc.ca
http://www.ola.bc.ca

Olds College, Canada
New Farmer, Certificate (Certificate, Training)
Ontario Diploma in Agriculture (Diploma, Continuing education)
e-mail: mvine@admin.oldscollege.ab.ca

Saskatchewan Government Correspondence School
Agriculture (Secondary)
http://www.sasked.gov.sk.ca/sgcs

South Island Regional Correspondence School
Agriculture (Secondary)

Tele-universite
Gestion des Ressources Renouvelables: Secteurs Agricoles and Forestier
Management of Renewable Resources: Agriculture and Forestry Sectors (Certificate, Further education)
e-mail: info@teluq.uquebec.ca
http://www.teluq.uquebec.ca/
University of British Columbia
Introduction to Food Production Systems (Degree) Agriculture, Bachelor of Science (Degree)
e-mail: det@cstudies.ubc.ca
http://www.cstudies.ubc.ca

University of Guelph
Food Production in the Environment (Degree)
New Farmer (Certificate, Training)
Ontario Diploma in Agriculture (Diploma, Continuing education)
MBA in Agriculture (Joint degree with Athabasca University)
e-mail: info@open.uoguelph.ca
http://www.open.uoguelph.ca

University of Saskatchewan
e-mail: grace.milashenko@usask.ca
http://www.extension.usask.ca

University of Waterloo
Environmental Economics (Degree) (on-line)
e-mail distance@corrl.uwaterloo.ca
http://www.adm.uwaterloo.ca/infoded/de&ce.html

Latin America and the Caribbean

Argentina
Universidad de Belgrano
e-mail: arteche@ubrecht.edu.ar

Bolivia
Radio San Gabriel
e-mail: rsg@fundayni.rds.org.bo

Colombia
Unidad Universitaria del Sur de Bogota
e-mail: unisur12@gaitana.interred.net.co
Costa Rica
*Centros APEC de Educacion a Distancia*
e-mail: cenapec@codetel.net.do

Equador
*Escuela Politecnica del Ejercito*
e-mail: dirmed@sun5.espe.edu.ec

Mexico
*Universidad de Monterrey*
http://www.udem.edu.mx

*Universidad Nacional Autonoma de Mexico*
http://www.unam.mx

*Universidad Virtual del Sistema Tecnologico de Monterrey*
http://www.ruv.itesm.mx/

Trinidad
*University of the West Indies*
Gender Issues in Agrarian and Environmental Change (Postgraduate, Continuing education)
Project Planning, Monitoring and Evaluation (Postgraduate, Diploma, Continuing education)
Research Methods and Data Analysis (Postgraduate, Diploma, Continuing education)
Agricultural and Rural Development (Postgraduate, Diploma, Continuing education)
e-mail: tuf@wow.net

Africa

Mauritius
*Mauritius College of the air*
http://pages.intnet.mu/nrcmca
e-mail dej@bow.intnet.mu (distance education division)

Botswana
*University of Botswana*
Learning and Teaching in Adult Education (Certificate, Continuing education)
Kenya

University of Nairobi

Agricultural Geography (Degree, Continuing education)
Agricultural Economics (Degree, Continuing education)
African Economic Problems (Degree, Continuing education)
Macroeconomics (Degree, Continuing education)
History of the USSR (Degree, Continuing education)
African Economic History (Degree, Continuing education)

Inades - Formation,

General Agriculture and Animal Husbandry (Continuing education, Certificate, Training)
Perspectives in Development (Continuing education, Certificate)
Farmer Production Series (Continuing education, Certificate, Training)

Kenya Institute of Education, Kenya

Crop Husbandry (Certificate, Continuing education)
Primary Teacher Certificate (Certificate, Continuing education)

Ministry of Culture & Social Services, Dept of Adult Education

The Role of Adult Education in National Development (Training, Continuing education, Certificate)

Lesotho

Institute of Extra-Mural Studies, National University of Lesotho

Planning and Implementation of Community Development Projects (Degree, Continuing education)

Malawi

Aggrey Memorial School

Agriculture (Training, Diploma)
Agriculture Extension (Continuing education, Diploma)
Agricultural Economics Marketing and Farm Management (Continuing education, Diploma)

Nigeria

Federal Radio Corporation of Nigeria

Agricultural Science for Junior Secondary (Secondary)

Progressive Management Correspondence College, Nigeria

Administrative Management for Development (Continuing education, Certificate)

Swaziland

Emlalatini Development Centre, Swaziland, SADCC

Agricultural Education, Primary School Teacher's Certificate (Certificate, Continuing education)
Phase I, Phase II, Phase III (Certificate, Continuing education)
Ministry of Agriculture and Cooperatives
General Agriculture (Training)
Cooperative Development (Training)
Food and Nutrition (Training)
Home Economics and Craft (Training)

South Africa
Africa Growth Network
e-mail agncare@is.co.za

Astrological Institute of Research and Studies (South Africa)
e-mail airs@icon.co.za

Azaliah College for Further and Higher Education (South Africa)
http://www.azaliah.co.za
e-mail: educate@azaliah.co.za

Business management training college of Southern Africa
e-mail bmtc@global.co.za
http://www.global.co.za/business/bmtc

Eltic Education Trust (South Africa)
e-mail: eltic@pop.onwe.co.za

Institute of marketing management (South Africa)
e-mail imm@is.co.za
http://www/imm.is.co.za

Potchefstroom University (South Africa)
e-mail: tlsab@puknet.puk.ac.za

Promat Unit for Resource-based Learning (South Africa)
e-mail: tonymays@global.co.za

Rand Afrikaans University
http://www.rau.ac.za
e-mail regacad@bestuur.rau.ac.za

Regional access programme (RAP)
http://www/und.ac.za/esati.rap
SACHED (South Africa Committee for Higher Education)
e-mail sachedhc@bridges.co.za

The South African Institute for complementary Health Sciences
http://www.nutrition.co.za

University of Cape Town (Primary Education Project)
e-mail wf@education.uct.ac.za

University of Port Elizabeth
e-mail bsamee@upe.ac.za
http://www.upe.ac.za

University of Pretoria (Live interactive television!)
e-mail malan@libarts.up.ac.za

University of South Africa
  Development Administration (Degree, Diploma)
  Geography (Degree)
e-mail undergrad-student@alpha.unisa.ac.za
http://www.unisa.ac.za

University of Witwatersrand
e-mail bradley@aurum.chem.wits.ac.za
http://sunsite.wits.ac.za/wits/science/radmaste/radmaste.html

Tanzania
International Baptist Theological Seminary
e-mail: bheadrick@maf.org

Southern Africa Extension Unit, Tanzania, SADCC
Agriculture (Primary, Community education)
Zimbabwe

Central African Correspondence College,
Agriculture, Certificate (Certificate, Training)
Animal Husbandry, (Certificate, Training)
Crop Husbandry, (Certificate, Training)
Farm Management and Planning (Certificate, Training)
Marketing (Certificate, Training)

Rapid Results College
e-mail: david@id.co.zw

The Middle East

Palestine

Al-Quds Open University
e-mail: qudsou@palnet.com

Israel

Open University of Israel
e-mail: infodesk@oumail/openu.ac.il
http://www.openu.ac.il

Iran

Payame Noor University

South Asia

India

Biria Institute of Technology and Science
e-mail: krvs@bits.soft.net

Christian Medical College
e-mail: abraham@cmc.ernet.in

Indian Institute of Finance
e-mail: iif.instofin@gems.vsnl.net.in

Indira Gandhi National Open University
Agricultural Development in India (Degree)

Kakatiya University
Co-operation in India (Degree)
Osmania University, India
  Rural Development (Postgraduate)
  Planning and Rural Industries (Degree)
  Rural Banking (Degree)
  Rural Industrialisation (Degree)

University of Hyderabad
  e-mail: pmkcde@uohyd.ernet.in
  http://www.uohyd.ernet.in

Tamil Nadu Agricultural University
  Agriculture and Allied Subjects Correspondence Programme
    (Community education)
  Farm School on Air (Community education)

University of Mysore, India
  Study of Rural Society - Problems, Development, Reconstruction
    (Postgraduate)

Yashwantrao Chavan Maharashtra Open University
  Agriculture (Training, Continuing education)
  Pomology, Diploma (Diploma, Continuing education)
  e-mail: vco@ycnou.ernet.in

Pakistan
Allama Iqbal Open University
  Farm Income Generating Skills (Certificate, Training, Further education)
  Basic Functional Education (Community education, Training, Further education)
  e-mail: aiou01@paknet1.ptc.pk

Sri Lanka
National Institute of Education
  e-mail: libinfo@slt.lk
East and South East Asia

Indonesia
Open Junior Secondary School
e-mail: tekkom@rad.net.id

Universitas Terbuka
e-mail: bs@ka.ut.ac.id http://www.ut.ac.id

Japan
Keio University
e-mail: syomu@tsushin.keio.ac.jp
http://www.keio.ac.jp

Korea
Air and Correspondence High Schools
e-mail: chlee@ns.kedi.re.kr

Korea National Open University
e-mail: ide@av9500.knou.ac.kr
http://www.knou.ac.kr

Malaysia
Universiti Sains Malaysia
Agricultural Geography (Degree)
e-mail: dir_cde@usm.my
http://www.usm.my
Thailand

*Sukhothai Thammathirat Open University*

e-mail: edassnip@samsorn.stou.ac.th

http://www.stou.ac.th

Papua New Guinea

*University of Papua New Guinea - Goroka Teachers’ College*

Agriculture Production Project (Diploma, Continuing education)

Philippines

*Home Study International Far East*

e-mail: postoffice@iconn.com.phi

*University of the Philippines Open University*

Agriculture (Diploma, Postgraduate, Continuing education)

e-mail: upouoc@laguna.net

Singapore

*Singapore Institute of Management*

http://www.sim.ac.sg/

China

*Caritas Adult and Higher Education Service (China)*

http://www.hk.super.net/~car_mnep/

*Hong Kong Polytechnic University*

e-mail: polyu@hkpu01.edu.hk

http://www.polyu.edu.hk

*Open University of Hong Kong*

e-mail: ouhk.edu.hk

http://www.ouhk.edu.hk

*School of Continuing Studies, Chinese University of Hong Kong*

e-mail: scs@cuhk.hk

http://www.cuhk.hk/scs/index.html
Tongji University
e-mail: lplhs@tju.ihep.ac.cn
http://www.tongji.edu.cn

University of Hong Kong, SPACE (School for Professional and Continuing Education)
http://www.hkusuc.hku.hk/space/

South Pacific and Australasia

Australia

CB Alexander Agricultural College
Landcare (Certificate, Training)
e-mail: tocal@agric.nsw.gov.au
http://www.opennet.net.au/tocal

Central Queensland University
http://www/cqu.edu/au

Charles Stuart University
Extension (Degree)
Masters Research (Agriculture) Part-Time or full time
Master Research (Agriculture Extension) (Postgraduate)
Doctoral Research (Agriculture) Part-Time or Full-Time
Doctoral Research (Agriculture Extension)
Agriculture, Bachelor of Applied Science (Degree)
Doctor of Philosophy Science/Agriculture
Graduate Diploma of Applied Science(Agriculture)
Master of Applied Science (Agriculture)
e-mail admissions@csu.edu.au
http://www.csu.edu.au

Curtin University of Technology
Bachelor of Agriculture (Degree)
e-mail: tassignd@cc.curtin.edu.au
CY O'Connor College of TAFE
e-mail: cyo-no@devetwa.edu.au
http://www.devetwa.edu.au/cy/cyhome.htm

Deakin University
Agriculture and Third World Development (Postgraduate)
e-mail: admissions@deakin.edu.au
http://www.deakin.edu.au

Macquarie University
e-mail: coe@mq.edu.au

Open Learning Australia
e-mail: cls@ola.edu.au
http://www.ola.edu.au

Orange Agricultural College, University of Sydney
Agribusiness Marketing (Diploma, Training)
e-mail: studies@oac.usyd.edu.au
http://www.oac.usyd.edu.au/

University of Queensland, Gatton College
http://www.uq.oz.au

University of Western Sydney, Hawkesbury
e-mail: p.mckinlay@usw.edu.au
http://www.hawkesbury.uws.edu.au

Victorian College of Agriculture and Horticulture
e-mail: jfenwick@vcah.edu.au
http://www.agfor.unimelb.edu.au/
Fiji
University of South Pacific
Applied Statistics for Agriculture and Biology (Degree)
Foundation Agriculture (Pre-degree)
Agriculture, Food, and Nutrition in the Developing World (Diploma, Continuing education, Degree)
e-mail: satellite@usp.ac.fj

New Zealand
The Open Polytechnic of New Zealand
http://www.topnz.ac.nz

Victoria University of Wellington
http://www.vuw.ac.nz/scim

Wellington Polytechnic
http://www.wnp.ac.nz/onlinec/virtcamp/

Massey University
http://www.massey.ac.nz/~wweduc

Solomon Islands
Solomon Islands College of Higher Education
e-mail: decsiche@welkam.solomon.com.sb