



Open Research Online

The Open University's repository of research publications and other research outputs

Supported open learning for rural development: some experiences from the Open University, UK

Conference or Workshop Item

How to cite:

Ison, Ray (1998). Supported open learning for rural development: some experiences from the Open University, UK. In: Proc. Seminar on The role of distance education and open learning for rural development in the Greater Mekong sub-region and South East Asia, 1998, Sukhothai Thammathirat Open University & UNESCO, Thailand.

For guidance on citations see [FAQs](#).

© 1998 The Author

Version: Accepted Manuscript

Copyright and Moral Rights for the articles on this site are retained by the individual authors and/or other copyright owners. For more information on Open Research Online's data [policy](#) on reuse of materials please consult the policies page.

oro.open.ac.uk

SUPPORTED OPEN LEARNING FOR RURAL DEVELOPMENT: SOME EXPERIENCES FROM THE OPEN UNIVERSITY, UK

*Ray Ison*¹

Professor of Systems
Systems Discipline
Centre for Complexity and Change
Technology Faculty
The Open University U.K.

Summary

Four key elements which have underpinned the OU(UK)s success in delivering an integrated system of supported open learning are outlined. These are: high quality, multi-media teaching materials; locally-based tutorial support; first class research and scholarship and highly professional logistics.

The argument is put that when designing any contemporary education programme there are advantages in considering the programme as if it were a learning system. To be responsible, designers also need to consider this within a context of global sustainable development which encompasses environmental decision making. Seminar delegates are invited to consider the question: How can distance education and open learning contribute to the emergence of viable and sustainable rural livelihood systems?

It is further argued that a valid response to this question involves surfacing the value positions of the major stakeholders as means to establish what is culturally feasible and so as to define what relationships stakeholders wish to conserve in any organisation that is constituted for the Greater Mekong Sub-Region. Evidence from other contexts suggests that any effective rural development strategy needs to be owned by more than one ministry. This presents particular challenges for a multi-national “university” concerned with rural development. International partnerships have a potential role and the OU(UK)’s collaboration models are summarized.

Introduction

The Open University [OU] has been described as the greatest innovation in UK higher education in the twentieth century. It has pioneered two significant new developments - open entry and supported open learning - and it has created a unique learning experience that combines high quality with low unit cost. Moreover, it has demonstrated that open learning is popular with adults. The OU is the UK's largest university. Over 230,000 adults will study OU courses and packs this year, and since 1971 it has taught over two and a half million people.

¹ This paper draws heavily on Appendix 2 of the OU(UK) paper “The Learning Age: a Renaissance for a New Britain: *an Open University Response*” (Open University 1998a); the final form of the paper and the ideas expressed are those of the author and do not necessarily represent official views of the OU (UK).

The OU has also been successful in recruiting students elsewhere in Europe and is operating with partner institutions in a range of countries. The OU has also just established the Open University of the US Inc. In addition, policy makers in other countries have adopted and adapted the OU model to open up higher education to many more learners in new and flexible ways. More than 50 public open universities now exist around the world. The ten biggest have two million students between them.

Four key elements underpin the OU's success in delivering an integrated system of supported open learning:

- high quality, multi-media teaching materials;
- locally-based tutorial support;
- first class research and scholarship;
- highly professional logistics.

These elements are examined in turn. I then consider the design of learning systems for rural development. However for “learning systems” to be sustainable they require institutional arrangements within the Higher Education (HE) sector as a whole. Political, organizational and structural arrangements need to be considered so as to locate open learning as a key component of a multi-national rural development strategy in any region such as in the greater Mekong sub-region of South East Asia.

Course Materials

When the OU was established, there was considerable scepticism about its ability to provide a learning experience for its students equal in quality to that enjoyed by full-time students in conventional institutions. Correspondence tuition, as it was then perceived, had a poor reputation.

Therefore, from the beginning, the OU has taken as one of its top priorities the development of instructional materials of the very highest quality. Respected academics from other universities work alongside experienced OU colleagues in planning and preparing courses, sharing drafts of materials, and revising and reshaping them in the light of team discussion. Qualified educational technologists, BBC producers, and OU editors and designers contribute pedagogic and technical expertise through all stages of course development. External assessors from other universities ensure that the academic standards are consistent with the rest of the sector. Sometimes, small groups of students test the materials before they are finalised.

In recent years, the course teams have been constituted slightly differently, to include those versed in the new knowledge media and in the application of video, computer and communication technologies to teaching and learning. But the principles of co-operative working, and of mutual assurance of quality and standards, remain the same.

This multi-skilled approach has led to the production of courses that use a wide range of media, with elements combined in various different ways to achieve different learning objectives. At the heart of most courses is a series of specially-produced text books or 'course units' (which are also widely used in the rest of the HE sector). They are closely integrated with a varying mix of

set books, recommended reading, radio and television programmes, audio and video tapes, home experiment kits, computer-based learning programs and multimedia resources.

Student Support

The OU also attaches great importance to the local and personal support it provides to its students. It has developed a national system of tutorial support, assessment and counselling that allows for interaction between students and tutors in a variety of ways. Tutors (now called Associate Lecturers) mark the assignments submitted by students and provide detailed written feedback on each essay. They meet students in tutorials and day schools and they keep in contact through telephone or computer network, either individually or collectively through audio/computer conferencing. Residential schools held at various places around the UK over a weekend or a week are also an integral part of many OU courses.

In addition, OU students have access to regionally-organised advice, guidance and counselling services that are available to help them plan their learning and relate it to their personal and career goals; to help them develop their study skills and transferable competences; and to attend to any study difficulties they may encounter. Regional teams also arrange for additional services to be provided for students with special needs, including those with disabilities.

Tutors and counsellors make a contribution to the students' learning experience as great as that of the learning materials. Consequently much care is taken with the selection and appointment of suitable staff, and with their training and development. All newly-appointed staff receive thorough briefing and training about the nature of teaching with the OU and about the particular course to which they are appointed. In addition, they are advised and supported by a mentor and their progress is regularly reviewed before, during, and at the end of their probationary two-year period. Staff are encouraged to undertake further training and development during their period of appointment with the OU.

As in course development and production, the OU draws heavily on the rest of the HE system to help present its courses and support its students. Staff from other institutions serve as tutors and examiners, and universities and colleges provide premises for study centres, residential schools and examinations. In return, the OU provides for its tutors one of the largest and most comprehensive staff development programmes in the UK and makes publicly available a wealth of teaching and learning materials that is used extensively in other universities.

This provision of support to the HE sector as a whole is generally not factored into political and resource considerations; the possibility exists in the UK and in other countries or regions where there are robust arrangements for the provision of open learning to institutionalize this provision as a key strategic element of the overall HE sector. For this to occur politicians and policy makers (whose experience is often restricted to traditional HE institutions) must be provided with experiences in which they learn about the mechanisms and potential for open learning

Research and Scholarship

Research and scholarship is vitally important in fulfilling the academic and educational objectives of the OU. Course materials must be authoritative and up to date and written by authors who are fully conversant with the latest developments in the field. Because they are in the public domain in a way that other HE teaching is not, they must be able to withstand rigorous external scrutiny. In addition, teaching strategies and educational technologies must be of proven effectiveness and appropriate for large scale, open learning. The environment and reputation of the OU must be such that it can attract staff and consultants of the very highest calibre.

In the 1996 UK Research Assessment Exercise, the quality of research in all twenty-six of the OU's subject submissions was rated to be, at least, at levels of national excellence. Indeed most subject areas carried higher ratings. Within the twenty-six submissions, nineteen units of assessment were recognized for quality research at international level, and six units of assessment were awarded grade 5 ratings, demonstrating top of the scale research of international excellence.

Logistics

The University's administrative and operational processes provide the underpinning essential to ensure the quality and effectiveness of its materials and student support. Wherever students live, the courses they take have the same high quality content and are taught to the same high standards. There is a sensitive balance between what is done in the University's central headquarters at Milton Keynes and what is done regionally and locally.

Roughly three-quarters of the University's 850 academic staff and most of its 900 administrative staff and 1500 clerical staff work at Milton Keynes. They plan, prepare, produce and distribute the course materials using mass production and delivery systems. Some services (such as editing and design) are provided in-house; others (notably printing and publishing) are contracted out. The OU has a long-standing partnership with the BBC for the production and transmission of broadcast programmes.

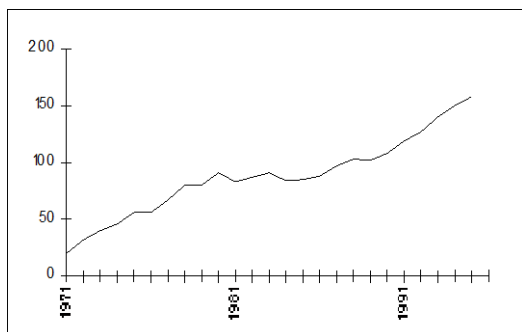
The rest of the University's staff are located in 13 Regional Centres, three of which cover nation-regions (i.e. Scotland, Wales and Northern Ireland). Regional Centres deal with all matters which concern the way in which courses are presented to students. Academic staff in Regional Centres select, brief, train and monitor tutorial and counselling staff, arrange tutorial timetables, deal with student enquiries and admissions, handle complaints and appeals, and attend to personal difficulties and special circumstances. Administrative staff allocate students to tutors, secure suitable study centre sites and examination centres, and organise residential schools and graduation ceremonies within their regions. The whole operation is supported by data handling systems of enormous size and complexity.

Output

What, then is the impact of the OU? The answer is that it has provided opportunities to individuals on a large scale. More than two million people have studied with the OU since its

foundation and another 230,000 will do so this year; 160,000 of these will be students following courses and the rest will be learning from self-study packs.

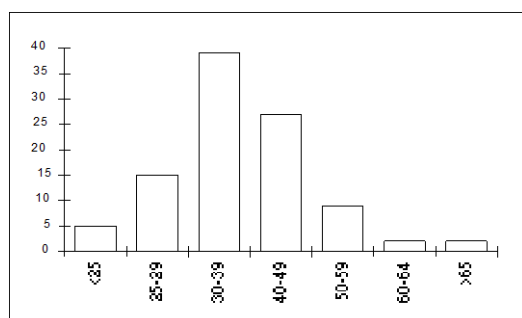
Fig 1: Numbers of OU Students 1971-98 (000s)



Over one third of all part-time UK undergraduate students choose to study with the OU.

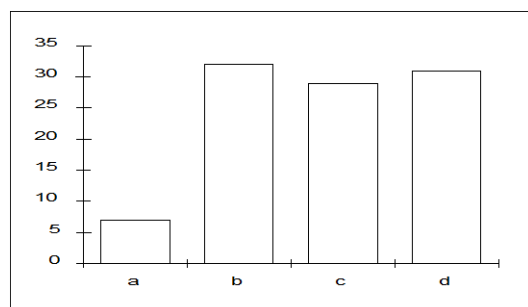
But the OU has not only increased access to HE, it has also extended opportunities to those who might not otherwise have engaged in HE. Two thirds of OU students are aged between 30 and 49 and about half are women.

Fig 2: Age Distribution of OU Students (%)



More significantly, over one-third of the OU's undergraduate students did not possess the normal entry requirements for conventional universities when they joined the OU.

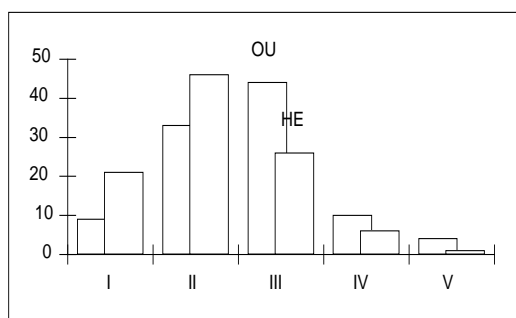
Fig 3: Highest previous educational qualifications of OU undergraduate students



a Below GCSE; b GCSE or equivalent; c 2 'A' levels or equivalent; d HE level (GCSE – public examination taken in year 10 at secondary school; A levels taken in year 12)

And almost half of OU graduates had fathers with manual occupations - almost the double the figure found amongst students elsewhere.

Fig 4 Social class of OU students and other HE students by fathers' occupation



I: Professional; II Intermediate; III Skilled; IV Partly skilled; V unskilled

More than 5,000 OU students have physical or mental disabilities, making the OU the UK's leading provider of higher education for disabled students.

Furthermore, the OU has shown that open entry works and that conventional higher education exaggerates the importance of prerequisites at all levels. The OU applies no conditions for entry to its undergraduate level courses. New undergraduate students have the opportunity to try out a course, to take part in tutorials, submit an assignment, use the counselling service, and then to withdraw with a full or partial fee refund (depending on the point of withdrawal) if, for whatever reason, they decide not to proceed to the end of the course. About one-quarter of students take advantage of this facility. Of the remainder, about three-quarters successfully complete their continuous assessment, pass their first year exams and gain a course credit. This is the average pass rate for all OU undergraduate courses.

Although there is no requirement to study for a qualification, about one-third of all undergraduate students have proceeded to graduation and many others have continued their learning in other institutions. The OU has thus proved, with tens of thousands of examples, that motivated adults can succeed in university study despite shortcomings in their earlier schooling.

It has also demonstrated the extremely positive relationship between open learning and employment. Three quarters of OU students are in full-time employment while they study. Half the remainder are women who are occupied full-time at home when they join the OU; 60 per cent of them enter or return to paid employment during or following their studies. Over 80 per cent of graduates report that studying with the University had a 'great' or 'enormous' benefit for their lives and over 80 per cent report a beneficial effect on their careers. One third change their occupational category while they are students. One third use their OU qualification as a springboard for further training.

Finally, the OU has shown that open and distance learning can combine high quality with low unit costs. The OU is near the top of the quality league for teaching, having been rated by the HEFCE as excellent in more than half of the subjects so far assessed. At the same time, the cost of teaching each full-time equivalent student at the OU is a half to two thirds (depending on subject) that for full-time students in the rest of the HE system. Partly this is because OU students are not entitled to mandatory awards. Partly it is because large scale open learning is inherently more cost-effective than residential, campus-based teaching.

Learning from Success

What lessons can be learned from the OU experience that are relevant to the rest of the sector? Three major conclusions suggest themselves.

First, effective open learning is not cheap. Though the direct costs of teaching are relatively low, the development of high quality learning systems and resources incurs high initial costs and continuing high levels of fixed costs. Open learning courses can only become cost-efficient, therefore, when they are studied by large numbers of students.

Second, the effectiveness of open learning courses (as measured by the numbers of students who successfully complete their learning objectives) critically depends on the quality of the course materials and of the learning support that students receive. This in turn depends in large measure on the quality of the staff. It is this factor more than any other that has enabled the OU to achieve higher completion and success rates than other distance teaching institutions and establish a world-wide reputation for the quality of its scholarship.

Third, open learning, linked to modular programmes and schemes of credit accumulation and transfer, has proved popular with mature students. It enables them to study at times and in places which cause minimum disruption to their life and work, to construct learning programmes that best fit their individual needs, and to study at a rate that best suits their changing circumstances. Not all study need be undertaken in one institution.

Open learning, then, has significant potential for helping the transition to mass higher education and to lifetime learning in the UK and further afield. It has the potential to increase access, widen choice, enhance quality and reduce unit costs. But to be truly cost-effective, it needs to achieve critical mass and to generate economies of scale. Many institutions do not have student numbers large enough to achieve such economies. Even an organisation the size of the OU may not achieve critical mass in some subjects at some levels.

There is considerable scope, therefore, for collaboration and partnership - in creating, sharing and using open learning materials, in developing a delivery network of study centres, laboratories, and computer networks, and in securing the development of appropriate support services, including staff development programmes.

Moreover, a system of higher education built on flexibility and partnership needs to be underpinned by a method of institutional funding that encourages innovation and collaboration

and by a system of student awards that treats all students equitably, irrespective of mode of study.

We believe that there is a major role for the OU in helping to create a system of higher education that combines flexibility, quality and cost-effectiveness in the service of lifelong learning.

Designing Learning Systems for Rural Development

When designing any contemporary education programme there are advantages in considering the programme as if it were a learning system. To be responsible, designers also need to consider this within a context of global sustainable development which encompasses environmental decision making (Blackmore *et al* 1998; Open University 1997a; Blackmore and Smyth 1998). The main advantage that can accrue from this perspective is that the system that is realized is more likely to be learner centred than teacher or institution centred. As Laurillard (1999) has argued, not only is a theory of learning for the individual needed, but there is also a need to extend theories of learning to the organization and the higher education (HE) sector.

High (1998) distinguishes two forms of knowing from which learning can be said to arise: learning to do or capacity for action and learning to perceive or awareness. Thus, in the context of process design for sustainable development two primary outcomes of a learning system may be usefully recognized: (i) awareness raising and (ii) capacity building. A learning system necessarily involves an observer (even if the observer is oneself) acknowledging that learning has occurred and this is generally recognized through some form of behaviour. Of course critics of current designs of HE argue that learning, or the wrong forms of learning, do not emerge from the processes and structures which currently dominate (see Ison 1990 and papers in Ison 1999).

The same type of systems thinking is needed when considering rural development. As Ackoff (1990) recognized, the only form of development possible is self development – it is not possible for one person to develop another. Historically this has been one of the strengths of the OU(UK) because the curriculum has not been prescriptive (i.e. with very minimal pre- and co-requisites) and the learner has been welcomed in to the institution via the open entry policies and the diversity of options available for study. This provides an emotional environment for the student which is very different to that of a traditional HE institution. Because rural development is not always considered in these terms (too often it is something someone does to someone else) I shall refer to rural livelihood systems rather than rural development (Ison 1998; Ison and Russell 1999).

In 1994 I was fortunate to be in South Africa just after the historical elections; the experience of euphoria and the sense of possibility will always remain with me. My reason for being there was a month long "process or learning-based consultancy" - the first ever funded by ODA (now DfID) - involving a team of 13 people made up of South Africans and non-South Africans (Cousens 1994). We developed co-learning processes with a range of stakeholders in the area of agricultural research and extension and land reform. This process surfaced the prevailing view then existing in the Ministry of Agriculture that the trajectory for "development of black farmers" was to provide the conditions for them to become like white farmers. This embodied particular views of what it was to be a farmer (rarely a woman), a focus on productivity (rather

than stability or sustainability), often through commercial cropping and a range of other unquestioned assumptions. Senior officials found it impossible (at the time) to conceptualise agriculture as only one part of possible rural livelihood systems despite the local realities of widespread artisanal activity, extended kinship networks, complex livestock owning patterns and the importance of remittance wages from miners (who often invested in cattle as a form of saving). Similar complexities apply in South-East Asia and also many western countries where there are increasing concerns about the viability of rural communities.

Thus a critical question that requires attention in this seminar is how can distance education and open learning contribute to the emergence of viable and sustainable rural livelihood systems? This is a question that traditional agricultural R&D and education has not addressed particularly well (see Ison 1994; Ison & Russell 1999). Agriculture, like many other domains of disciplinary study, has often been too focused on a narrow set of concerns. The challenge for the designers of any “Greater Mekong learning system” would be to develop awareness and capacity in all graduates so that they could contribute to the maintenance and development of rural livelihood systems. This represents a major challenge for rural policy makers and educators.

Lawrence (1998) argues that globalisation is providing opportunities for regionally based groups "prepared to accept the conditions for [international] interaction". The extent to which local people in a region will be able to identify its needs and act to co-ordinate their activities may mean, he suggests, "moving 'beyond' the state" and "fostering the growth of self-help organisations aimed at securing globally linked production and other activities". If this is to be the case then it is unlikely that it will be achieved without such groups entering meaningfully into the discourses around "sustainability", including Agenda 21. This presents challenges on a number of fronts including (i) education; (ii) funding and (iii) political will, including new coalitions. With regard to the first, the U.S. President's Council on Sustainable Development (1996) sees the imperative in the following terms:

‘Education for sustainability is the continual refinement of the knowledge and skills that lead to informed citizenry that is committed to responsible individual and collaborative actions that will result in an ecologically sound, economically prosperous, and equitable society for present and future generations. The principles underlying education for sustainability include, but are not limited to, strong core academics, understanding the relationships between disciplines, systems thinking, lifelong learning, hands-on experiential learning, community-based learning, technology, partnerships, family involvement, and personal responsibility’.

Such a strategy may not be seen by some as culturally desirable in some areas within the Mekong region; a potentially fruitful process in the seminar would be to surface contributors value positions regarding the purpose of a “Greater Mekong Learning System”. Only by engaging in this process will a sense of what is culturally feasible be gained.

Whilst a number of mega-universities involved in open learning have emerged (Daniel 1996) I would argue that success comes from a combination of scale and internal diversity. In my view the success of the OU(UK) has been associated with economies of scale combined with (historically) a high degree of local autonomy that has given rise to a type of self-organizing

system. This raises the question as to what forms of organization and structure are needed in open learning institutions to effect the design of learning systems for sustainable rural development?

Organization and Structure of Open Learning as Part of a Rural Development Strategy

Systems studies have for many years been concerned with the emergent properties and complexity of whole systems. These concerns encompass non-linear dynamics and self-organising systems as well as the metaphor of chaos. A particular distinction, relevant I believe to the design of learning systems, and which arises from this field is that between the *organisation* and *structure* of a system.

The organisation of a system is defined as a particular set of relationships, whether static or dynamic, between components which constitute a recognisable whole - a recognisable unity. Organisational relationships have to be maintained to maintain the system - if these change the system either "dies" or it becomes something else. On the other hand the structure of a system is defined as the set of current concrete components and relationships through which the organisation of a system is manifest in particular surroundings. Thus for the OU(UK) we might consider the key organisational relationships as those between a course team, the course, open entry, the learner at a distance, tutor support and the exam board (accreditation). If these relationships cease to exist then that which is uniquely the Open University ceases to exist. If the OU were a biological organism this would mean the death of the organism. Because the OU is not a biological organism we could choose to become some other organisation remembering that the *same* organisation can realise or manifest itself through *different* structures.

The failure to distinguish between organisation and structure, and in the process the failure of stakeholders to articulate what forms of organisation (i.e. which relationships) they desire to conserve can, in my view, result in a most profound trap in thinking – i.e. there is a mismatch between current or proposed structures and the organisation that would be desired if it were articulated. Often there is no apparent will or means to change organisation, structure or both (Ison 1997).

A frequent constraint to matching structure with organisation is the traditional approach to planning. Dwight Eisenhower is reputed to have said that he regarded plans as useless but that he would never go into battle without planning. He was clearly a process thinker. Yet in many Universities there appears to be a pervasive RUGS view of organisations. In the OU(UK) course Managing in Organisations (T245) this view is "deconstructed". A RUGS view of organisations, that they are *rational, unitary and goal-seeking*, would appear to permeate the thinking and practices of managers, administrators and academics. Of course at the heart of a RUGS view of an organisation is a belief in, and concern with *means* and *ends* and that *organisations apply knowledge about cause effect relationships* in the use of human, financial and technological resources. Also that we can name what it is we wish to do in terms of "aims", "goals" or "objectives". Systems thinking rejects such "goal seeking" conceptions as inadequate and recognizes that any form of human activity is a much messier than this theory conveys. For this reason any attempt to situate open learning in a broader rural development strategy has to consider the national, multi-national and international political context.

Experience in many parts of the world suggest that unless rural development is “everyone’s business” within the ministries and bureaucracies that make up government then it is likely to fail or at most be severely constrained (Cousens 1994). Within any one country this suggests at minimum a cabinet level committee of the relevant ministries and agencies formulating a common and cooperative strategy and approach to implementation. In the absence of this structure at national level then the contribution of open learning would be likely to be limited if it were the province of just one ministry (e.g. education or perhaps agriculture). The issue of the political and bureaucratic context of any open learning initiative between a number of countries is thus more complex. The potential for competition and political in-fighting is large and for this reason any new initiative requires the involvement of all relevant stakeholders in the conceptualisation and development of an “open learning project” (for examples of strategies for stakeholder involvement see Open University 1997ab). This challenge also exists for Britain as the current government proceeds down a path of devolution in Scotland, Wales, Northern Ireland and to the new Regional Development Agencies in England.

It is not necessary always to create new organisations from scratch; in an increasingly global economy made smaller in education by technology (see Morris and Naughton 1999) it makes sense to forge international strategic alliances, partnerships and networks. In the next section I outline some of the forms of collaboration and partnership entered into by the OU(UK).

Collaboration and Partnerships

The OU(UK) already works successfully with partner institutions around the world who use Open University learning methods and materials to teach their students. The main types of collaborative agreements are summarized below. We offer the flexibility to tailor the partnership arrangements to a partner’s specific requirements².

- *Local Delivery Partnership with Open University qualifications*

This offers a complete solution to developing new open learning programmes or building capacity. Students at your institution register with The Open University and are awarded Open University qualifications. Your institution recruits students to the courses and teaches to the same timetable, using the same materials, and carrying out the same assessment as in the UK.

- *'Whole-Course' Use with your qualifications*

Using Open University 'whole courses' saves you development time and costs, as well as giving you the benefit of using proven, up-to-date learning materials. Students register at your institution and study for your awards using Open University Learning Resources.

- *Joint Development of New Teaching materials*

We are in a position to consider joint development where collaboration on any projects is formed from the outset, with agreed arrangements re the use of the materials, and where the parties are able to pursue external funding;

² Based on material from Open University (1998b)

•*Validation of local presentations*

The Open University Validation Service provides a validation service for higher education awards for institutions outside the UK. This includes Open University 'Whole Courses' as outlined above.

•*Consultancy and training*

We have a highly skilled team of consultants who can provide training and consultancy on the methods for delivering open learning, developing and improving your own open learning materials, and feasibility studies on setting up open learning.

•*Material sales and licensing*

You may purchase the learning resources from around 150 Open University courses without having to enter into a formal contractual relationship with us. The materials can be used in your own teaching programmes. You may apply for a licence which allows you to reproduce them locally or you may buy the rights to translate them into your local language.

Concluding Comment

I would like to thank the organizers for the opportunity to have this paper presented at the seminar. As an institution we in the OU (UK) would welcome discussions which might further enhance the place of open learning in the Greater Mekong sub-region and in South East Asia more generally. I trust that this overview of the OU(UK) and some reflections on the place of open learning in rural development might assist seminar delegates in formulating an on-going and successful project. May I also extend my congratulations and that of the OU(UK) to STOU on the occasion of its 20th Anniversary.

References

- Ackoff, R.L. (1990) Ackoff's fables. Very short stories with very sharp points - On development. *Systems Practice* **3**, 3-6.
- Blackmore, C.P. and Smyth, J. (1998) Systemic approaches to learning in the context of Agenda 21. . *Proc. Second Australian & New Zealand Systems Conference*, University of Western Sydney (Hawkesbury).
- Blackmore, C., Carr, S., Corrigan, R., Furniss, P., Ison, R.L. and Morris, R.M. (1998) Environmental Decision Making - a systems approach. *Proc. Second Australian & New Zealand Systems Conference*, University of Western Sydney (Hawkesbury).
- Cousins, B. ed (1994) Issues and options for institutional change for rural development, agriculture and land reform. Summary and Overview. *Policy Paper 9, Land & Agriculture Policy Centre*, Johannesburg. 69pp.

- Daniel, J.S. (1996). *Mega-Universities and Knowledge Media. Technology Strategies for Higher Education*. Kogan Page, London.
- High, C. (1998) Learning systems design for sustainable development. Unpublished Manuscript, Open University.
- Ison, R.L. (1990) Teaching threatens sustainable agriculture. *Gatekeeper Series No. 21*. International Institute for Environment & Development, Sustainable Agriculture Programme: London. 20pp.
- Ison, R.L. (1994) Designing learning systems: How can systems approaches be applied in the training of research workers and development actors? *Proceedings International Symposium on Systems-oriented Research in Agriculture and Rural Development Vol. 2. Lectures and Debates*. pp. 369-394.
- Ison, R.L. (1997) Organising for flexibility and change in universities. UK Deans of Science Spring Meeting, Cambridge, May.
- Ison, R.L. (1998) The Future Challenge: The Search for System. Invited Keynote Paper, *Proc. Australian Agronomy Conference*, Wagga Wagga.
- Ison, R.L. (1999). Guest Editorial: Applying systems thinking to higher education. Special Edition *Systems Research & Behavioural Science* (in press)
- Ison, R.L. & Russell, D.B. eds (1999) **Agricultural Extension and Rural Development: Breaking out of Traditions**. A second-order systems perspective. Cambridge University Press, Cambridge, UK. (in press).
- Laurillard, D. (1999) A conversational framework for individual learning applied to the 'Learning Organisation' and the 'Learning Society'. *Systems Research & Behavioural Science* (in press)
- Lawrence, G. (1998). Proceedings *Australian Agronomy Conference*, Wagga Wagga.
- Morris, R.M. and Naughton, J.J. (1999) The future's digital, isn't it? Some experience and forecasts based on the Open University's technology foundation course. *Systems Research & Behavioural Science* (in press)
- Open University (1997a). Environmental Decision Making: a systems approach. T860 Module. The Open University, Milton Keynes.
- Open University (1997b) Capacities for development management. Tu870 Module. The Open University, Milton Keynes.

Open University (1998a). *The Learning Age: a Renaissance for a New Britain: an Open University Response*. <http://www.open.ac.uk/news.html>

Open University (1998b) OU Worldwide. <http://www.open.ac.uk/ouw/>
President's Council on Sustainable Development (1996). *Sustainable America. A new consensus for prosperity, opportunity and a healthy environment for the future*. US Government Printing Office, Washington.