

# Towards Expanding Open Learning for Special Needs

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A number of demands exist in respect of higher education. One is its efficient and effective provision to groups which do not normally have easy access to it; the disabled are one of these groups. Another demand relates to the European context, overcoming the problems of a heterogeneous European educational system. The use of computer delivered interactive transcultural European open/distance learning courses is identified as one way to satisfy these demands.

## 1. Introduction

This paper is really an exploration of some of the factors that appear to be moving universities towards the adoption of technology based open learning, and the positive consequence that this should have for education designed to service the needs of the disabled as well as ablebodied.

In the United Kingdom there have been a few conceptual developments that have influenced the university sector in a significant way: (i) one of these is the perceived need for efficiency and effectiveness in the British university sector; (ii) another is the realisation that it is essential for the UK to expand its provision of higher education to include a larger proportion of the population in order to attempt to match the standard in Europe; (iii) a third concerns the relatively slow but inevitable development of European networks of universities, and the difficulties associated with the different approaches and courses that the different university systems have; (iv) and finally there is the perceived need to ensure that UK universities retain their quality of education.

The recessionary environment in which the UK has existed for the last decade has been paralleled by retentive government policies which

have looked towards cutting unit costs and thus a drive for educational efficiency. Since high levels of efficiency can often be obtained in highly structured environments with strong central control, this has led to an ideological pressure on reform in university environments.

While the UK has tried to conserve finance in universities, it is also being driven by its membership of the European Community (EC) to develop some parity with the other European member states in the provision of potential access to its population. It is trying to do so while at the same time trying to spend less money on education.

Another demand which arises through EC membership is the development of closer association with other universities abroad. This however, is not an activity which directly costs the government anything. Some of the funding comes from the EC itself, some from the limited resources of the universities, and some from the students themselves.

Throughout all of this the quality of educational provision is hailed as important. Perhaps the quality issue is one which is tied to the definition of the objectives of university provision, which in the UK may be undergoing some adjustment.

The European dimension is one which demands that distance enters the equation that relates to the establishment of any open learning system. A research programme at Lancaster University provided an approach to deal with the problem of distance through the use of technology through its ITOL concept, designed to offer a networked system of information to users in a

semistructured environment. In this paper a more structured approach is also considered.

## 2. Efficiency and Effectiveness in British Higher Education

In the UK the university sector at one time consisted of both the universities and the polytechnics. The universities included those older institutions of many hundreds of years standing, as well as the newer universities the most recent of which were established in the 1960's. They often regarded polytechnics as second class higher education institutions, without the traditions or organisational culture that would normally be found in the universities. The polytechnics have now become the new universities with the same status and rights as the older universities, a result of a political decision the rationale of which said that the two were equivalent in fact and should be in practice.

In the UK the rise of the political right, its dogmatic adherence to monetarism and its total unthinking investment in independent enterprise at the expense of a mixed economic platform have ensured that the concept of efficiency in public institutions has replaced other priorities, in particular as a result of the recession that has lasted about a decade. Governments have used the application of efficiency as the excuse by which to involve themselves in making educational changes, and sometimes demonstrably without the understanding essential if these changes are to be positive or useful.

The edge of the monetaryistic axe hit the university sector with force through the polytechnics whose organisational and administrative procedures originally more related to those of the local councils (who controlled them) than to university environments. The polytechnics with perhaps a more authoritarian culture, were easier to control than the universities with their traditional cultural orientation of peer evaluation. Even so, the universities were gently being forced to comply with government demands for restructuring and efficiency through its control of funding.

The political position that has promoted the concept of efficiency in higher education has had many influences on academic life. In the worst

cases it includes the operation of larger organisational subdivisions which are emasculating the professionalism of academics. In some institutions this move has meant the demise of the Faculty with its democratic peer processes, replacing it with the School and its central decision making and control mechanisms. Thus, instead of there being a number of rather small independent departments in the Faculty, there are Schools with perhaps around 100 academic staff or even more. The management of larger units can often be seen as more efficient, but not necessarily more effective.

Effectiveness relates to the prime objectives of the organisation, and the traditional objectives of the university sector are broader than the narrow perceptions that monetary conceptions often perceive. For instance in the larger School unit, there is a tendency for academic staff to appear to operate as blue collar educational workers whose priorities concern the satisfaction of schedules which maximise staff teaching loads. Thus, academic staff become production units rather than qualified staff who operate to enhance educational processes through activities which include research. Such an approach has distinct limitations as even manufacturing industries have discovered.

In the end, efficient higher education must be viewed through the requirements of quality, and some academics in the UK are worried about how the quality of university teaching will be influenced. This concern is highlighted further when one considers the moves afoot to expand the provision of higher education to match the intake levels in Europe, thus providing more people with an opportunity to gain access to degree qualifications.

## 3. Expanding Student Access to Higher Education

The UK educational system is different from that in most of Europe in that it operates an elitist educational system. Government rationality for changing the professionalism of the university academic includes the attempt to expand the numbers of students who are able to pass through the university system. However, in Europe large numbers of students are processed

without the need to dilute the nature of the academic's professionalism or their commitment to research.

The UK operates an elitist university system because of its tutorial based system which requires a heavy input of academic staff, while most other European countries offer a lecture based system that requires fewer staff. This difference holds in its wake significant distinctions in the way in which students learn, and the nature of the knowledge acquisition.

In Europe, outside the UK, all students who satisfy minimum entry qualifications can gain access to higher education. This typically means that large numbers of students occupy the first levels of higher education courses. This mass approach means that the student failure/drop-out rate can be very high, in the region of 60% (more in some countries), and a large failure/drop-out rate is expected. More specifically, a small failure rate in a particular module could in fact suggest that the examination which has been set is too easy, and may require *explanation*.

In the UK universities are smaller, frequently not having more than 5000 or 6000 students, though there does tend to be a greater density of university grade institutions than in other countries. The UK approach to higher education is contrary to that of Europe in that it finely selects students to enter University and limits entry above set numbers; it expects that the vast majority will pass through to the conclusion of the qualification. A large student failure rate can be highly embarrassing to a lecturer in charge of a subject module, who will be required to *explain* the situation to his peers.

Tied in with this difference between the two approaches is that of the function of tutors. In Europe, university tutors tend to be subject related, like tutors in the UK. Some of the larger European universities may have a populations of more than 100,000 students, and a tutor may be responsible for more than 600 students. The amount of time a tutor can spend with a particular student under these conditions is therefore quite limited, with an impact on learning and the ability of some students to pass examinations.

In the UK there are two forms of tutor: one is subject related, and the other is in reality a student counsellor usually called a personnel tu-

tor. The way the subject related tutorial system works in the UK helps to establish a low student drop-out rate. Its basis is the low Student to Staff Ratio (SSR) which enables small group interaction to occur with a tutor helping to guide the learning process and instil understanding of a subject. As most Europeans will acknowledge, this is an exceptionally good way for students to learn. In the past the SSR has typically been between about 8:1 to 15:1, which is unknown in other public sector European University environments. The European private sector has an advantage because it is expensive compared to the public sector, and can afford to operate a more exclusive approach like that of the British system. This is one reason why private sector education is relatively well developed in Europe, but hardly exists in Britain.

All higher education is subject to financial controls. In the UK the tutorial system is an expensive option which drives its university exclusiveness. This is reflected in the poor UK participation rate per capita in higher education compared with other European countries. The establishment of the Open University in Britain was an attempt to expand the provision of education more broadly to encourage greater per capita participation. The techniques it pioneered were a compromise between mass education and an exclusive tutorial system, and it has worked well through the use of distance learning course delivery, a proportion of tutorial group seminars regionally based and populated by between 10 to 25 students per tutor, and residential "teach-in" sessions. To cater for the student in trouble, it also operated the role of counsellor.

In the British system there now seems to be a movement to open up higher education to more people, at least in the subject domains for which there is a great demand or perceived necessity like Business Studies or science. The negative pressure for this is reflected in the policy implementation by government to make entry to the Social Sciences more difficult through imposing university constraints on fees. The movement to increase student numbers while keeping costs down is shown by the tendency for an increase in SSRs (say towards 25:1), and the relative frequency of tutorials reducing. Small as this may be in comparison with the SSR in other countries of Europe (for instance La Sapienza

in Rome with its 180,000 students and an SSR of 180:1), this ratio could increase and will erode the effective traditional way of UK university teaching.

The quality issue is again raised when one considers investment in libraries. Further difference between some European Universities and those of the UK lie in the provision of library resources. In the UK library facilities tend to be well endowed in proportion to the number of students who attend courses. European Universities often have more restricted access to books because there are so many more students. Libraries frequently operate in a batch mode in that students go to a counter with a request for a specific book, with little possibility of browsing. More frequently, therefore, courses in Europe (at least in at the lower levels of university education) tend not to require students to use their initiatives in developing the subject as occurs in the UK, but tend to be more directed, not encouraged to explore the subject areas, and dependent upon a single set text.

Expanding student populations is part of the difficulty that is being faced. Another relates to its internationalisation through EC initiatives to encourage universities to develop and implement formal links across national borders, thus needing to address the problems of differences in course design, content, and structure. This is done by addressing the cultural environment of the university to make internationalism perceived as an important part of its primary activity.

#### 4. Heterogeneous Education in Europe

In the run up to Europe 1993 and the perception of a European educational systems, another problem raised its head — heterogeneity in structures and criteria for higher education courses. It is not appropriate to deal here with SPAR (e.g. professional) qualifications, but rather the principal ones of different countries.

In Britain there are two tiers of programme of higher education; the first is referred to as the undergraduate programme, and typically lasts a minimum of 3 years (though in Scotland with its independent educational system it more normally last 4 years). Many universities operate

mixed mode courses, introducing a placement period into courses. In Britain, the length of this placement is unusual in that it can last a year. In other countries it will not typically be longer than three months. The second tier lasts a minimum of three years, and includes two forms of qualification: the *master*, and the *doctorate*. In Spain they have a structure which was originally modelled on the French approach. It has three tiers of programme, termed cycles: the first cycle leads to a *diplomada*, the second to a *licenciado*; together they last a minimum of four years (recently reduced from five). The third cycle leads to a *doctorado* and can last an additional two years, though in new developments a one year master programme is becoming a popular optional entry course into the third cycle. The German model follows a five year degree course which takes the student to a higher level than does the UK degree. In Italy, the undergraduate degree is also five years, though they have recently introduced a three year programme (*laurea brevi*) to try to combat the 70% drop-out rate that their laurea generates. These are the minimum periods of study that students need in order to complete a degree. Students who study for instance in Germany, Italy, or Spain, however, typically spend more years than the minimum specification pursuing their course to its successful end, and this can be costly in human resources as well as for the students. This is not the case, however, in the UK where it is an exceptional case for students to study more than the minimum number of years to complete a degree.

These differences provide an indication of the difficulty in matching courses between universities across Europe. This is aggravated further if we consider that there are differences in course curricula. For instance in Spain, Germany, and Italy the requirement is for a very broad based education during the first tier of study which also tends to be highly theoretical. British courses tend instead to be more directed, requiring less depth in areas which do not relate to the subject directly. For instance, in Business Studies, the level of mathematics taken by a student is much lower than in the other said countries. Where the British system does appear to score well, however, is in the provision of the application of an appropriate subject. For example, a British student in

Business Studies may not know the theoretical constructs of essential statistical and mathematical methods, but will know the appropriateness and application of different methodologies to various problem types.

In the UK, the stream-lined 3 year course in the UK aims to provide the same quality of education as the other 4 or 5 year courses in Europe. Certainly this is true in respect of the ability of a student to appreciate a breadth of subject matter and apply it. Comparing it to the 4 year European qualifications, however, the student tends to lose out in respect of an extended diet of final year options. In this way the Scottish system is perhaps closer to the rest of Europe than in particular the English one.

One way in which the EC has addressed the heterogeneity of the European system of higher education, is to introduce the European Credit Transfer Scheme (ECTS). This enables each year of study to accumulate 60 credits, and a student can in theory pass between different European Universities accumulating credits and qualifications. Thus, after three years a student could gain an undergraduate degree in the UK, and after a further year could gain a licenciado in Spain, licence in France, or a laurea in Italy providing that no language obstacle existed.

All the current ECTS programmes that exist at present are negotiated between Universities, and little free movement generally exists.

A number of areas of concern exist in the pursuit of these ideas. They include the following:

- Credit Transfer Schemes
- Mutual Curriculum Development
- Assessment and Methods of Learning
- Mutual Cooperation between Universities Internationally
- Partnership and cooperation with Enterprises and Other Interests

Credit transfer schemes are essential to ensure the mobility of students between educational domains. Mutual curriculum development does not necessarily mean curriculum convergence, but rather curriculum compatibility; it would do little for European educational integration if the academics of one nation were to advocate, for example, that their own higher educational system presented a model that should be adopted within a European context because it is

superior to others. Assessment and methods of learning are also distinct within different educational domains, and require study and comparison in order for compatible approaches to develop. Mutual cooperation between Universities internationally is an essential ingredient if educational compatibility is to be achieved, and this is being approached for example by the ECTS. It may be said that a network of universities through which mutual developments and educational innovation can develop easily is essential. Finally, in concert with modern trends, the involvement of enterprises and other interests having educational concerns can be highly rewarding, and mechanisms for such cooperation are a component of a suitable network.

## 5. Culturally Broad Education

Distance learning is a feature of a number of countries within Europe, and is being encouraged by the European Community (EC) through programmes such as COMETT, ERASMUS, and DELTA. There is also a movement towards the creation of compatible qualifications across European cultures.

Not many subject areas within the academic sphere have traditionally been involved in international education. Language/cultural studies is one of these which probably has the oldest tradition in developing international relationships between universities across nations. Business Studies is another area which has developed a significant international flavour.

While one may talk about culturally broad education (CBE), it is appropriate to first define what we mean by it. CBE is that education which relates to more than one cultural group or country, and typically involves cross cultural perspectives and multifaceted perceptions of subject areas and teaching approaches. It eliminates student insularity and parochialness, and can encourage pragmatism. With the development of the EC, and the accelerating interest in the development of greater integration in a number of areas including Education, the climate is favourable to pursue a goal which includes compatibility between courses and qualifications within different countries. Another aim includes credit transferability to encourage greater international student mobility.

Innovation in higher education in the international arena may not necessarily be the same as innovation in a national educational environment. In some countries like Spain there is a core curriculum, while in Britain peer mechanisms have been established to ensure that course standards are satisfactory. Each national educational system with its own higher educational approach, having its own structure, validation and assessment techniques, and *modus operandi*, is an independent educational domain. The need is now perceived to develop domain intersection to a much greater extent than has previously existed. That is, to develop educational compatibility across domains in a more than ad hoc way.

Certain subject areas have had a strong investment in such domain intersection for many years. In Language teaching for instance, there is a long standing practice for students to pass from one domain to another so that language experience can be enhanced. Another area slightly more recent to the scene is that of Business Studies. The history of domain intersection — of the way in which courses have related to each other across national boundaries, began with the servicing of needs. For example, students studying Spanish in a British University would find a work study placement in Spain, say, and might never see a University environment. Then, with the development of University cooperation across these educational domains, students could be supervised within a work placement in another host country by staff within a local university. This has evolved into the situation where students may actually take courses in a host University as part of their normal educational process. The development of specialist programmes has also evolved where students may receive either a joint qualification from two Universities in different countries, or two separate qualifications from each University. However, the magnitude of this domain intersection is still small, and each scheme must be carefully negotiated and developed, and closely monitored over years.

In Business Studies, it was found that a given pairing between two Universities was often supported by only a small group of staff in each institution, of which sometimes one member might have been the fulcrum. In such a case take away the fulcrum, and the group collapses.

This experience led institutions to move away from a one to one University pairing across two countries, and the many to many model developed. Here, the collapse or inactivity of one group of staff interested in international education, would thus permit a redirection of students to other Universities with which a mutual arrangement had occurred.

While such developments are increasing and welcome, it would also be useful to have mechanisms where mutual course development and credit transferability across educational domains to other Universities could become easier, and where joint qualifications — or better still European or international qualifications, are common.

Europeanism is also important for the disabled, for European intergration and transcultural relationships must have the potential to apply to everyone within Europe. While there may well be problems associated with the exposure of some classes of disabled persons to university and enterprise environments in other countries, this does not mean that cross cultural education will not benefit them, nor that they will be able to make use of cross cultural understanding in their future life.

## 6. Special Needs Education

It is all very well talking generally about the provision of higher education to the disabled, but not all classes of disabled person can apply themselves to this. It may well be useful to look cursorily at which groups might find higher education of use, realising that there is an educational prerequisite referred to as entry qualifications intended to enable the material studied to be meaningful.

The U.K 1944 Education Act was originally responsible for defining a set of categories for the disabled. The categories that are frequently referred to today include:

- Blind — visually impaired
- partially sighted
- deaf — hearing impaired
- partially hearing
- delicate
- educationally subnormal — special needs
- epileptic

maladjusted  
 physically disabled — motor disability  
 speech impaired

and the more difficult cases are classed as:

severely mentally disabled  
 deaf-blind  
 autistic  
 severe dyslexia.

These categorisations of handicap are inadequate because the development of medical technology has enabled multiple-disabled individuals to survive. What the classifications do provide, however, is a reminder to the general educationalist of the diverse qualities of disability which exist, and which must be catered for within an educational environment. One of the approaches now adopted in Britain is the generation of a needs statement for a given case of disability, which includes educational provision. It is doubtful that it includes, however, a perception of the need for higher education which in any case tends to be a requirement identified by a given individual.

The application of an appropriate form of higher education is tenable to many of these groups of disability, particularly when the appropriate mechanical/electronic aids can be used to provide assistance. In the case of some categories, for example the severely mentally disabled, higher education may not be provided to the disabled themselves, but more appropriately to their parents; master level courses of higher education have, for example, already been aimed at such parents. In another example, severe dyslexia can in some cases be benefitted by the application of computer based education, especially when it titillates the learner sufficiently to overcome a particular aspect of the disability.

There is an ongoing debate that concerns the question of whether disabled people should be placed in integrated environments, or special ones. It may be that this has only peripheral concern with higher education, which should be available to those in any case who are unable to leave their special environments for any length of time, like renal patients. Relatively few also, have demonstrated that they have been able to take up higher education through normal forms of distance learning. But then this may be the fault of the usual way that distance learning course are delivered.

## 7. The Nature of Open Learning

The awareness of the requirement of efficiency and European development in education has led to an encouragement of open learning, particularly when it is technology based. This has been further encouraged by EC programmes like DELTA and TIDE which have been interested in funding technology based developments.

Since the development of the concepts of programmed learning [Leith, 1964] the concepts of open learning have been developing and contributing towards the evolution of a pedagogic paradigm. Part of this concerns the nature of knowledge because both knowledge as well as skills transfer occur within the learning process. Another part of the paradigm relates to the nature of learning, and indeed open learning and the identification of its parameters and constraints.

There is a paradigm of open learning, in which there are no taught students but learners. Learners should be provided with mechanisms (which should where possible involve interaction) that enable them to better develop their self learning abilities: computer aided learning and video are technological examples of this. Those involved in open learning undertake the learning of subject matter at their own pace and without direct supervision, unhindered by the time pressures normally experienced in classroom situations. Within overall time constraints, they permit learners to travel the educational road at their own pace. Open learning programmes must be delivered as relatively structured units of material, so that learners are able to pursue their learning activities along a clearly defined and directed pathway; this should not of course discourage exploration of a subject. For this reason open learning programmes are also suitable within full and part time educational environments, and in Britain are used as such within some Universities to assist the normal full and part time educational process.

Open learning normally includes the definition of distance learning, that is mass education through the widespread availability of self-instructional materials supported where necessary by tutoring, assessment, and counselling,

and includes the concept of open access to education [Snell et al, 1987]. According to some authors, dissemination is a key concept. Three classes of dissemination are highlighted by Snell: stand alone: surrogate sources of tutoring; institution-monitored: ongoing contact between tutors associated with an educational institution and learners; expert networking: the sharing of information among the members of the institution (rather than handing it down from a higher authority).

Open learning may also be seen as development, meaning that learners take on the responsibility of learning, and contribute towards an identification of the content. Various forms of development have been defined to exist [Snell et al, 1987, pp166-8] including accreditable and supported. The concept of meta-learning is here important, that is learning how to learn. In a technology based learning environment, where learners operate learn with the help of computer systems, learner progress in metalearning can be monitored by an intelligent system, evaluated, and guidance provided.

Attention must also be placed on the pedagogy of learning, though there is insufficient space to do so here in a significant way. Considerations on this includes the notion that learning can be painful [Snell, 1990], the concept that learning can be deep or at surface level [Marton, Säljö, 1976; Strang, 1987], and motivating learners [Elgood, 1987]. A fuller account of some of the concerns of the pedagogy of learning, and the use of computer technology to aid open learning can be found in [Yolles, Pirani, 1991].

While the British Open University model normally satisfies accepted University standards internationally, and has a style which has become an international norm for distance learning, it tends to differ from full and part time University courses in its structure and timing. Open University courses tend not, therefore, to complement full and part time University education. However, open learning approaches can be made to do so.

Special education for the disabled is so classed because special facilities are required to suit their special needs. The development of computer based tools for learning is appropriate to all learners, including many categories of disability, and has meant that many types of educational requirements for the disabled can be less

special. This is true at lower levels of education as it is at higher levels.

The use of Computer Aided Learning (CAL) and Assessment (CAA) has developed over the last decade to a position where training courses are available to individuals via a computer, rather than via the traditional route of classroom or workshop contact. This approach has provided a major degree of flexibility to those being trained because in many cases they can develop their skills unsupervised, and at a pace which is according to their own learning ability. Such a development has been referred to as open learning, and is particularly appropriate to the disabled.

In many cases computer based training courses are offered to learners at training centres, and for special needs where there is the availability of equipment in the home of learners. A more recent stage in the development of computer based training courses is the delivery of those courses at a distance using computer networks. The latest stage is the provision of full blown degree courses on a computer network which satisfy both the requirements of open and distance learning, and can incidentally provide disabled persons with access to higher education in a way that has been unavailable previously.

## 8. Use of Technology in Learning

Technology of some form has been available to the disabled for many years. The most well established technologies lie in the provision of sensory aids and mechanical devices which have enabled individuals with poor motor ability to become more mobile. These devices have been enhanced with the development of new microchip technology.

The revolution in microcomputer technology has meant that the provision of special higher education to disabled persons has been possible. Part of this revolution relates to cost, and part to benefit. The dramatic reduction in cost due to very large scale integration processes in the manufacture of microchips has meant that the hardware is a more minor cost in the development of educational and other aids. The benefit of the technology to a large extent lies in the



major change in accessibility that disabled persons have to learning and developing communication. If learning and communication problems for the disabled can be surmounted, then his/her ability to contribute better to the quality of life and inevitably to society increases considerably. For instance, Brennan [1982] has argued that many emotional and social problems can be partially attributed to learning difficulties. The use of computer aided learning (CAL) techniques provides the potential for much more highly useful lives for disabled persons.

The utility facilitator of computer hardware is the software that drives it. As computer software engineering develops with new development tools and the use of artificial intelligence, so the development of CAL suitable for disabled persons has become a leading edge for the provision of higher education to this group. O'Shea and Self [1983], and Sleeman and Brown [1982] show that considerable advances are being made in machine teaching systems which show the characteristics of intelligence and flexibility.

Individuals are born with a potential to explore and learn about their world, and an environment which will include personal, interpersonal, physical, psychological, economic, social and political aspects. This exploration involves the acquisition of information, as well as information extraction as they learn about their environment, and build models of it which can enable them to function effectively. This applies to all individuals whether disabled or not; for the former, it applies equally to physical or mental disability, and effective functioning is seen as a thing relative to the degree of disability.

The major attribute of higher education is that it enables models of environments to be created. These models are created via interactions with the real world. In the case of disabled persons, the interactions tend to be restricted; the level of disability will be related to the restrictions on possible environmental interactions.

The process of developing the potential for environmental interactions is referred to as learning, and learning can be optimised when there is communication between the individual and the environment. Significant improvement of such communications for disabled persons has occurred through the use of microtechnology. Significant improvements become optimal im-

provements under what may be referred to as open learning conditions.

## 9. Structure within Educational Environments

It is useful to consider an appropriate structure for the development of learning delivery at the higher educational level to disabled persons.

A system is something which has parts, shall we call them entities, each of which has a relative position and function. Each entity has attributes which describe its properties. Each entity may itself be a subsystem (a system within a system), and will exchange something with other entities within the system. Processes also occur within the system, and there are inputs and outputs. So we have a general definition of a system. Within the educational sphere, the systemic process is that of education, and we may seek to know the way in which it occurs, and relative credit evaluation associated with the qualifications that are generated.

Concern with structure may relate to the institutions of an educational system; for instance it could provide a description of the relationship between universities, polytechnic universities, and university colleges in Spain; or in Britain of Universities and Colleges of higher education. Concern with structure could also relate to qualifications, and the relative position they hold within a country. Thus one could identify the mutual relationship and the function of the diplomado and licenciado in Spain, and if you can, determine a broad comparison with the relationship between the diploma and first degree in Britain.

The concept of structure has become important too in the way in which teaching has occurred. We can probably blame Chomsky and his work on language structures for heralding in the period of "structured" thinking. Computer languages were undoubtedly the first area to fall under its influence, and the era of highly structured artificial computer languages was born. The nature of teaching has also been influenced by the structuralist movement. While courses have always been structured, the way in which material is being conveyed may well be under the influence of a "structure" reform, using modern computer technology and self study

techniques to aid the educational process in a way not possible before.

A structural movement also hit another important area of education, that of distance learning. This is an essential requirement because no teacher is available to impose a learning structure, and the learners must fend for themselves. A high level of structure within course material and the provision of satisfactory guidelines and strategies for learning therefore becomes of major importance.

## 10. Computer Based Education

The advantage of computer based systems is that they can be harnessed to make special needs education efficient, providing investment for suitable user interface devices for the students such that they adequately access educational facilities. Essentially, special needs computer systems can be matched with other standard provisions available to students who do not have special needs. Some of the developments in these standard provisions will be considered here.

Experience in the distance learning courses run by the Open University using Computer Mediated Communication (CMC) have proved successful; the experience at Lancaster University in its Information Technology Open Learning (ITOL) programme have proved highly promising. Other courses run in the United States,

Australia, Canada, and UK all demonstrate the utility and advantages to student centred learning of computer assisted course delivery.

In the ITOL concept, students are learners and use Information Technology to learn at their own pace while identifying their own needs. Learning in this context is often connected with the needs of information associated with either research or decision support. Many requirements in lower levels of higher education, however, are for a more highly structured approach than ITOL; referred to here as Information Technology Structured Open Learning, or ITSOL it relates to distance learning courses delivered by computer network having intelligent terminals. Thus, ITSOL provides a high level of structure for student centred directed learning to enable goal achievement in the form of course module credits and a final qualification. A comparison between ITOL and ITSOL approaches is made in fig. 1.

### 10.1. The ITSOL Approach

The ITSOL proposal is not particularly new; it brings together various ideas that have been about for a while.

The ITOL model already referred to as Information Technology Open Learning defines how PCs and access to large databases can be employed in the provision of up-to-date, relevant and supportive forms of open learning for

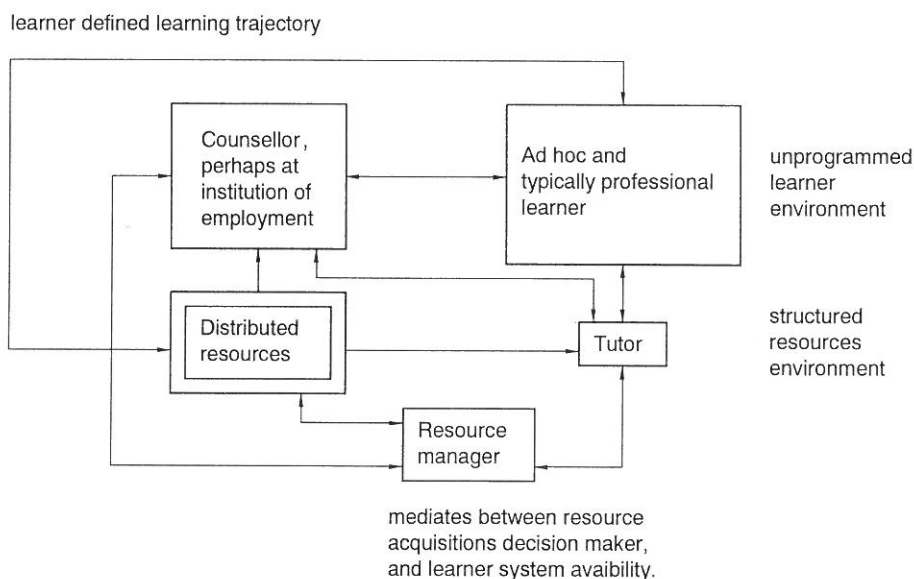


Fig. 1

people geographically distant from one another and from a university. Students are perceived as learners who are responsible for identifying their needs.

Learners at the lower level of European higher education normally are constrained in order to ensure that they satisfy goals which contribute to a credit accumulation that contributes to the gaining of a qualification. They may not be as knowledgeable as ITOL learners, and will not be able to identify their own needs overall. These learners must study within a more structured environment. This defines the ITSOL model, a structured and directed form of ITOL. The interactions between learners and other elements of the model may include the following:

- \* with tutors and other learners by computer mediated communication (CMC)
- \* with local counsellors
- \* with tutors in both electronic and face to face mode
- \* with student group moderators by CMC
- \* with course resource managers by electronic mail
- \* with resources, for example university library catalogue, abstract databases and document retrieval system, by on-line interrogation.

Each student would be assigned a tutor who will provide in depth feedback on assignment and tasks submitted for assessment. The communication channel between the student and the tutor will be electronic, through the computer network.

Computer Mediated Communication (CMC) is the core of the student centred communications related learning process. CMC includes

- \* electronic mail
- \* teleconferencing for study group real time and batch interaction
- \* access to on-line databases and information banks
- \* electronic phone for real time interaction

Additionally, course units and ancillary materials will be available through CD ROM, and tutor communications and comments on courseworks are included as part of the teleworking system. Courseworks may be assignments, or student self study tests.

Some of these considerations will be mentioned briefly below.

### 1. Electronic Library Facilities

It is much less expensive for organisations to provide a CD ROM library than to establish a more traditional paper based library even considering the laws of copyright. In many cases the library material can be provided to students on the ITSOL network either by real time access, or one of the library copies from a CD ROM sent in the mail. In some cases, if special arrangements have been made with a publisher of the reference material, all students may have access to copies of certain CD ROM library material. Normally all quoted references should be available to students through CD ROM medium.

### 2. Student Support Groups

Student support or special interest groups should be initiated by a group leader appointed by the tutorial centre. This leader will ensure that the student support groups operate successfully. The student support group will encourage student self reliance in the development of their learning skills and enhance their understanding of the course material and its context.

In the context of computer mediated communications (CMC) a group leader will also act as a group moderator whose functions may include:

- \* to moderate the teleconference and file store
- \* to encourage full participation of members of the study group
- \* to highlight discussion problems
- \* to generate discussion summaries

### 3. The Students Own Contacts and Resources

All students will be encouraged to draw on their own resources and contacts. For example, the students own experience will be utilised.

### 4. Teaching and Learning Inter-relationship

The inter-relationship between the teaching and learning techniques outlined above is illustrated in fig. 2.

It is important that students and staff recognise the wide variety of resources available to support the distance learning programme. Distance learning should not be seen as simply a correspondence course, whether the correspondence is delivered by the traditional mail service or

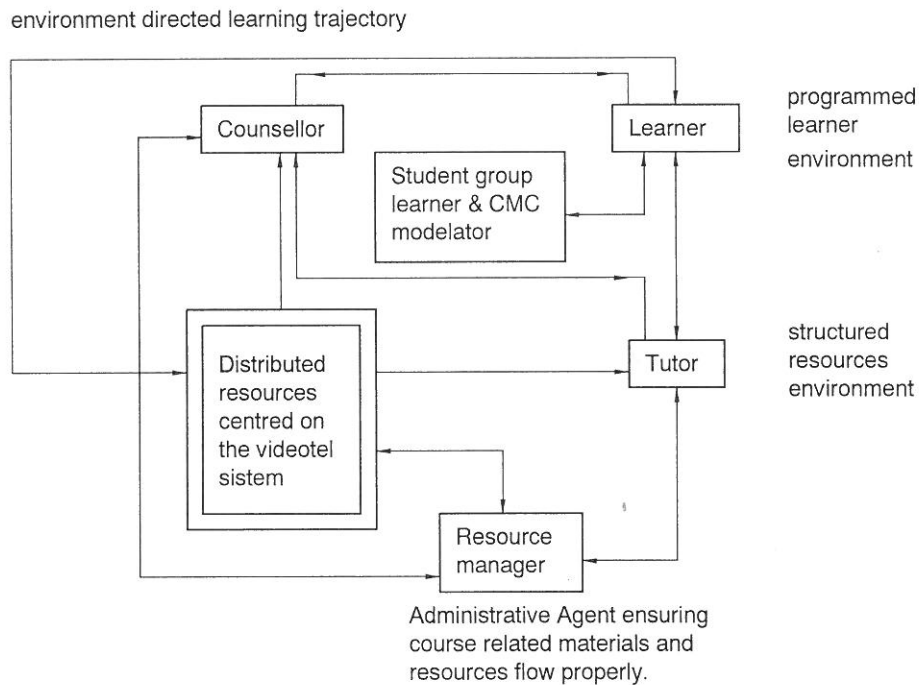


Fig. 2

electronically. There are many different techniques that can be used to facilitate the learning process, particularly in respect of CAL and CAA when delivery is electronically based.

### 5. Seminars, Symposia, and Conferences

Students will come together at predefined times in order to attend conferences, symposia or seminars designed to enhance their knowledge, awareness and skills, and to develop a social identity with tutors, counsellors, and other members of the course.

### 11. Conclusion

A number of pressures have affected the UK university sector including budgetary constraints, the consequential demand for efficiency which may perhaps be regarded as inconsistent with the traditional orientation of university operation, and the resulting impact of changing organisational structures and culture, and possibly the nature of the academic's job in effect attempting to indirectly de-professionalise it while perhaps also succeeding to demotivate staff and generating a generally low level of morale.

In addition the development of international co-operation between universities by running common or joint programmes pressured by the UK's

membership of the EC, as well as expanding the potential for access to university education within the population has pressure universities.

One of the ways in which universities have responded to this is by taking up the idea of technology driven open learning. Approached in the right way, this may assist the universities in satisfying their objectives through these pressures. This would of course be easier to do if it were properly resourced.

As important, however, is the consequence that it provides access to special needs education in a way which has not before been possible.

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