

European Distance and E-Learning Network (EDEN) Conference Proceedings

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Open and Distance Learning in Europe and Beyond Rethinking International Co-operation

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Edited by

Dr. Erwin Wagner, Dr. András Szűcs
on behalf of the European Distance Education Network

European Distance Education Network

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Introduction

As internationalisation is developing, moving on European and global scene, the challenge to review international co-operation in education is relevant again. This was an issue long debated already in the nineties, particularly regarding its perspectives in open and distance education. With the progress of the Bologna process, the creation of a European higher education area, efforts for opening up international study experience for all European students, relying also on the developing perspectives of virtual mobility, issues of internationalisation appear in new light and carry inventive messages.

The EDEN 2002 Annual Conference has the focus "within and beyond Europe", in ODL and eLearning and aims on one hand the survey of the European internal situation, on the other review the international scene beyond it, investigating the possibilities how to enlarge the scope of co-operation. It is intended to provide an evaluative approach, including exploitation of the collaboration potential of the European higher education with the rest of the world, concentrating on the added value of the multicultural, pluralistic attitude which has nowadays a new meaning and emphasis.

We invited to participate and contribute all those with experience, involvement, aspirations and progressive scenarios in mind about new connotations of internationalisation - going beyond simplified processes of globalisation - looking for the potential of an even more intelligent co-operative trans-European environment.

I am delighted to state that the 2002 EDEN conference has again proven its potential to attract and gather the leading practitioners and their valuable contributions at this probably most important professional yearly event of open and distance learning and eLearning in Europe. The impressive list of keynote speakers and the high number of submissions received from over 30 countries and to be presented at the conference cover well the thematic spectrum envisaged: the manifestation of international and networking dimension in eLearning, the transnational experience and partnerships in Europe and beyond, the worldwide panorama of national initiatives on distance and eLearning implementation, the socio-economic and cultural aspects of ICTs in learning, professionalisation and internationalisation of training of teachers in ODL and eLearning but also the traditional professional fields like managing and sharing knowledge and information, collaborative learning, design, evaluation and standardisation of eLearning systems and solutions, virtual classrooms and laboratories, new technology applications, learner needs, styles, motivations in international context.

We thank for the institutional sponsorship of the leading national institutions in Spain: UOC and UNED which helped to earmark and position properly the conference in the semester of the Spanish EU Presidency. EDEN is most delighted to co-operate with the University of Granada in organising the conference. Granada in itself is a symbol of fruitful symbioses of cultures and a stronghold of academic reputation. With 470 years of tradition, the University has been an exceptional witness to history, as its influence in the city's social and cultural environment grew until it was to become, over a period of almost five centuries, an intellectual and cultural nucleus in Southern Spain in its own right. The invaluable support of Scierter Espana has to be acknowledged as an essential asset in the preparation and implementation of the conference.

Dr Erwin Wagner
President of the European Distance Education Network

Acknowledgement and thanks are given to the Conference Committees

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BRIDGING THE DIGITAL DIVIDE

HOW DEVELOPMENT CO-OPERATION MAY BENEFIT FROM NETWORKED E-LEARNING IN HIGHER EDUCATION

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Introduction

The Digital Divide

There are still at least two billion people out of the global population of six billion that lack essentials like adequate nutrition, primary health care, basic education, safe water, and sanitary living conditions. Many of these people are located in remote rural areas, with limited or no access to formal educational systems, health care, potable water, electricity, or jobs related to the new information economy. Even in urban areas, many people lack access to the Internet and its great potential to improve education and health. These deficiencies are core to what has been described as the 'Digital Divide', the gap separating those who have computers and Internet access from those who don't, separating the 'cyber-haves' from the 'cyber-have-nots' [1, 2, 3].

Many studies have been performed on how to bridge this digital divide, especially by broadening and enhancing access to the newest information and communication technology (ICT) for a larger population. Indeed, the Internet, with its rapidly expanding and improving infrastructure, could be a key element in bridging the digital divide. It has been extended to most countries, albeit with slow to medium speed in most developing countries, even in large parts of the developed world. It is well understood that the full potential for achieving revolutionary advances in e.g. education and healthcare in developing countries cannot be realized with the currently available ICT infrastructure and at currently prevailing market prices. Since the ICT infrastructure is not so well established and distributed in the developing countries, they can immediately jump into the newest and most recent technologies, which is in their advantage. Therefore, different proposals have been put forward to improve the infrastructure and to handle the investment and maintenance costs in a sustainable way. Some of these proposals are finding their way to realisation, others are still looking for firm partnerships and more important, for necessary funding.

It is good to emphasise again that the digital divide is really tied up with other social problems and that there are many other divides that are closely connected to it. Access to ICT cannot be useful unless such needs are also met at the same time. Even if a primary school in a village is equipped with computers, a child will not benefit if she is malnourished, if her parents are struggling to make living, or if her family cannot get medical care. As we try to bridge the digital divide, our goal should be to use the new technologies to make sure we close all the other divides that have plagued, and continue to plague our society. One particular solution is to focus on education and the educational system as well.

Impact on Education and Learning

Conventional approaches to train new teachers (and doctors, etc) cannot possibly meet the needs. In fact, there are more people to be educated in the next fifty years than have been educated up to this point in human history. Other educational systems have to be put in place and distance education or e-learning may pave the way: it allows students in rural or remote areas to start or continue their studies in the city. Also rapid transfer of knowledge from developed to developing countries needs to be actively encouraged along with support for higher quality local educational program development.

All actors, within both the public and private sectors should help and bridge the international information and knowledge divide. They should create and expand opportunities for training, education and knowledge sharing for people living in rural and remote areas through distance learning and the interconnection of education and research networks among developing countries and industrialised countries. The actors should include key international organizations such as the International

Telecommunications Union (ITU), the UNESCO, the WHO, as well as multilateral development banks (the World Bank and the regional development banks for Africa, Asia, Latin America and the Caribbean, and Europe and Central Asia), also bilateral aid agencies, foundations, and companies as well as organizations contributing education, healthcare and other knowledge.

Providing ICT and network infrastructure is an absolutely necessary condition to disseminate information, learning services and educational applications. But, each country should have the own capacity to develop new information and applications, tailor-made based upon the needs of the local communities and the local economies. Only then we avoid the trap of neo-colonialism: imposing the technological solutions of the developed world on the situation in the developing countries, without taking into account local culture, tradition, and educational systems is unfair and will never imply the targeted result.

The information society is a learning society where the competences of today are not necessarily the competences of tomorrow. This is a challenge for both the developed and the developing countries.

Networked e-Learning in Higher Education

What is Networked e-Learning?

As already mentioned it is important to rethink the educational systems in the developing countries (and maybe also in the developed world). E-learning and especially networked e-learning may be the new paradigm with this respect.

E-learning is learning supported with the aid of all kinds of ICT: not only the Internet, but also more traditional media as video, television, radio, telephone, CD-ROM, or even satellite communication are envisaged. And actually, many examples on pedagogically sound use of those technologies for educational purposes in higher education may be found at the other side of the digital divide, with more or less success.

Networked e-learning goes one step further. It assumes that more than the two direct partners (teachers and students) are involved. Different possibilities may arise. It could be that students at different universities in different countries establish a learning community and take the same courses, collaborate on the same projects and communicate in a sophisticated virtual way. It could also mean that teachers across institutional or national borders find each other and jointly develop courses, share learning material and divide the tutoring activities. It could include far-reaching collaboration and policy making amongst institutes of higher education on the educational use of ICT at the highest strategic level. It could interest other parties as well, like financial institutions, local municipalities, ngo's, etc. enriching the network partnership by adding different competences and possibilities. As a summary: networked e-learning should not be restrictedly defined as learning through the Internet, although it is certainly of utmost importance and probably the most obvious and most visible format.

EuroPACE: a European Network for e-Learning in Higher Education

Different networks are in place when it comes to networked e-learning, especially in higher education. We highlight only one in this paper, namely EuroPACE [4], since they have recently decided that development co-operation should be one of their focus areas in the near future.

EuroPACE is a transnational network of more than 40 traditional universities and higher education institutes, together with their partners (like professional organisations and companies), with a strong participation from Central and Eastern European countries. There is also close collaboration with other networks as well, including EDEN, EADTU, SEFI, Coimbra, EUA, etc. EuroPACE is stimulating its members to become an active node in a network for learning-on-demand, an international network of knowledge, the concept of a Virtual University for Europe. It is a member organisation, offering a service package in return of a membership fee. The package consists of the following services:

- *An information service:* A one-stop information and communication portal site for EuroPACE members and others, concerning networked e-learning or the use of ICT in higher education and training,

- A *course* service: A European Virtual Campus where you find all (information on) available courses or learning material in the network and where you can easily participate in learning activities offered by EuroPACE and its members,
- A *project* service: EuroPACE as the Brussels' connection for European inter-university projects, helping the members with information, support, management, research and development,
- A *training* service: Specific training modules with a EuroPACE quality label on the efficient and effective use of ICT in education and training in a (European) networked environment, based on the results of own research and development projects,
- A preferential *partnership with EPYC*, the commercial spin-off from EuroPACE, K.U.Leuven and Gemma Frisius Fund,
- *Special Interest Groups* (SIGs) related to actual themes or network oriented topics in e-learning or the use of ICT in higher education

The Board of EuroPACE decided in April 2002 that a SIG on Development Co-operation will be set up, in order to define its strategy and to identify concrete action plans towards bridging the digital divide, based on its own experience in (models of) networked e-learning. The decision of the Board has been inspired by the fact that EuroPACE has been involved in many intercontinental projects in the last few years and that several universities or similar institutes in developing countries were interested in the models developed or practised by EuroPACE.

Development Co-operation and Networked e-Learning

Looking at development co-operation or bridging the digital divide with networked e-learning in the context of EuroPACE, two different modes of operation are to be considered.

Knowledge Transfer

The most obvious collaboration is based on North-South knowledge transfer, by simply transferring EuroPACE courses to other continents. EuroPACE courses are defined as courses developed by individual members and offered to the network, either as courses that are organised by different members in the EuroPACE network or as courses that are made available through EuroPACE partnerships with collaborating networks. Those courses constitute of particular (multi-media) learning material embedded in a variety of learning activities, both either or not web-supported. Stimulating European universities in jointly developing e-learning material and making it available to universities at the other side of the digital divide is sometimes easier to achieve, than trying them to share e-learning material with European partners. On the European scene, which is a highly competitive educational market, universities indeed seem to suffer from the 'not-invented-here' syndrome, while this barrier disappears almost completely when they together address peer institutes on the other continents.

Nevertheless, one important remark should be made here. Only transferring e-learning material will not help in bridging the digital divide at all. It is considered as a mere information drain from North to South, which has its value of course: it is probably the best way to rapidly transfer information to those developing countries. However, care should be taken on the possibilities for the local learning communities to transform this information into own knowledge as well, and therefore appropriate learning activities should be elaborated for the local educational system.

Network Model Transfer

EuroPACE has worked in the past a lot on different models for networked e-learning in higher education, ranging from small scale virtual class to sophisticated virtual university concepts. All these models have in common that they heavily rely on network activities amongst students, teachers and institutes or organisations. They in a way provide the means for transforming available information somewhere in the network into real, individual knowledge.

For the latter reason we have discovered the potential of these models as possibly transferable to the developing countries as well. The same models for networked e-learning activities as developed here in Europe may be applied (or even better: adapted) to the local situation in other continents. Universities at the other side of the digital divide are eager to start their own networking with their own (local) partners, based on empirically approved European models. EuroPACE is willing to transfer its own networking knowledge to foster this South-South collaboration.

Case study: The Virtual University of Congo

We illustrate the current work done by EuroPACE on development co-operation with one concrete case, namely the Virtual University of Congo.

The project started early 2002 with mutual visits of staff members to the University of Kinshasa (Congo) and the EuroPACE headquarters in Leuven (Belgium). The result of these visits is a blueprint of the Virtual University of Congo. The main partners are the University of Kinshasa (UNIKIN), the University of Leuven (K.U.Leuven) and EuroPACE, as network links to other potential partners. There is also (financial and technical) support from industry in both Congo and Belgium, and from the respective governments. Collaboration with the African Virtual University and the Global Service Trust Fund is aimed at in the near future.

The main goals of the project are twofold:

- The primary academic goal is to solve basic problems in line with the strategic plan of the UNIKIN, i.e. insufficient capacity to meet the societal demand for student places, the lack of basic (ICT) infrastructure, the need for training of academic staff, and the isolation from the academic and scientific world.
- The general development goal may be stated as the introduction of the educational applications of ICT in higher education in Congo, as both a powerful motor for a fast and sustainable development of education at all levels, and as a tool for demand based professional training and lifelong learning by linking well-defined training to industrial investment and employment.

The specific objective is the development of educational applications of a broadband Internet connection and videoconferencing, based upon the needs and interests formulated by the UNIKIN faculties themselves.

- Broadband access to the Web will be established by a glass fibre backbone for the on campus network and a wireless connection between the campus and an asymmetric satellite link. It will allow a global connection with the academic and scientific world for professors, researchers and students and it should enable access to virtual libraries, scientific databases, research papers, online courses, virtual laboratories, scientific seminars, Ph.D. programs, professional training, lifelong learning, etc.
- Two-way and multipoint videoconferencing facilities will be installed with foreign sites, and audio feedback is provided from domestic sites. On campus videoconferencing will be used to solve the problem of overcrowded local lecture theatres. Outside the campus it will tackle student mobility problems within downtown Kinshasa and teacher mobility within the periphery or even within the country (e.g. Lubumbashi). International videoconferencing is also envisaged, to have access to EuroPACE courses and to foster participation of the Congolese academic and scientific world in the global social, economical and political debate and in the international cultural exchange.

The concrete action plan for the near future includes the following steps:

- Installation of broadband Internet connection and two PC class rooms on the campus of UNIKIN,
- Development of a Web portal site in concertation with the African Virtual University and linked to the EuroPACE portal site,
- Installation of videoconferencing infrastructure and demonstration of educational applications,

- Training of key actors: teachers should be trained in pedagogically sound ICT based education methodologies as well as in up-to-date discipline contents, and technical assistants or jobbing students should be offered short practical training sessions,
- Running pilot courses with experiments of conceived mixes of face-to-face, on-line and videoconferencing components, with 'triple decker' curricula in the second cycle of higher education (combining on-campus, on-line and learning abroad), with virtual laboratories, with mixed Ph.D. programs, etc.

The project is now near to start. What are the chances for success? We believe they are great. First of all, the project stems from real UNIKIN demands, certifying that the necessary motivation, expertise and support by the UNIKIN itself will be provided. Next, the project may rely on the expertise at K.U.Leuven and in EuroPACE in the area of ICT-based distance learning and international networking, with effective links to other European partner universities and companies, eager to network and to bridge the digital divide.

Conclusion

In this paper we described our view on the digital divide and its impact on learning and education. We defined networked e-learning activities as a possible way to bridge that digital divide and to close the gap between developed and developing countries. We used the EuroPACE membership organisation as exemplary in showing its potential for knowledge transfer, and even better for network model transfer, not only North to South, but also South to South. And finally, we illustrated how in practice this could work with the case of the Virtual University of Congo.

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EMERGING COUNTRIES FACING TRAGIC INCREASE OF STUDENTS' POPULATION: THE CHALLENGE OF AVICENNA VIRTUAL CAMPUS

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The Avicenna virtual campus is a model for involvement of EU higher education institutions within Europe and beyond Europe. The Bologna process take into consideration EU higher education institution without thinking about all the bilateral relationships linking universities on both sides of the Mediterranean sea. The notion emphasized by Bologna declaration of "European area of higher education" has to be corrected by this aspect. The signatories of Bologna declaration who pledge "to establish the European area of higher education and to promote the European system of higher education world-wide through world wide recognized standard of Education" don't respond to this challenge. The Avicenna virtual campus, UNESCO response to EUMEDIS call, aims at filling this gap but doesn't come from nowhere. The contributions offered by the EU partners will very carefully draw upon their experience in developing ODL in Eastern and Central Europe in the PHARE program, over the past 12 years. It is this process of educational partnership grounded in multicultural diversity and practical actions, which informs Avicenna.

1. Needs and requests of Mediterranean countries facing tragic increase of students population

a) A tragic increase

Open Distance Learning, now accelerated in scale, scope and space by ICT, risks creating a digital divide in the Euro-Med region. Open Distance Learning is a key part of regional development by providing initial or continuing access to higher education to segment of the population who cannot attend Universities. For instance Tunisia has today 200 000 students. According to a forecast of Higher Education Minister of Tunisia they will be 500 000 in 2010. It would be impossible to build up traditional university infrastructures to meet those needs.

b) Fight against digital divide and brain drain

EU ODL actors but also International actors are now increasingly recruiting, supporting and retaining students both on a national and trans-national level through web-based systems. **The lack of web-based systems in Mediterranean area jeopardizes the sustainability of higher education planning.** For example, of the total student body of the Open University (UK), some 200 000 strong, 80 000 are on-line daily. The Mediterranean sea area is not only far to reach those statistics but didn't benefit before Avicenna of a meaningful pilot project. This gives enormous capacity for expansion globally, and could widen the "digital divide" in terms of access to and use of ODL in an e-inclusive world. If the Mediterranean Region is to retain its "e-students" within its own academic institutions it must become an actor and a recognized supplier of ODL services. It is this challenge which the Avicenna Virtual Campus will meet through a unique partnership which will link strong ODL partners with Euro-Med universities who want to be pathfinders, on behalf of their wider communities, to trail, embed and develop the culture and style of IST-led ODL. Some, if not all, have already made a commitment in this direction, but they urgently need the support, training of key actors, and transfer of knowledge and know how which experienced EU Open Universities and ODL providers can give through this project to enable significant cohorts of faculty, learners, tutors, managers and specialists to be trained.

c) Avicenna meets social needs

One of the project's most challenging result in the area will be to develop the capacity of **Universities of transferring knowledge to populations which are unable to attend courses** on campus or to students on campus who need complementary or specialised studies not offered in situ. The University through ODL may also provide continuing education to professionals who are unable to leave their jobs.

Furthermore the use of ODL will provide access to higher education for segment of populations such as the female population and the visual handicapped who are for different reasons being somehow put apart from the regular flow of entrance to university.

Avicenna should bring some answer to the lack of access to higher education of marginalized populations, including blind students (by providing adequate technology), and in some case women. This fully meets UNESCO objectives to contribute further to the development and use of ODL and information services toward less privileged segment of the population.

At a wider social level this project will also have an impact offering **to young generations an access to e-society** in which they will find information, and updating of their knowledge as well as adequate training in the use of ICT, giving end-users a new confidence in learning, in self development. It will demonstrate that education and ICT are crucial pathfinders to socio-economic developments in the region, capable of making the region a learning-rich zone, able to retain its young people, educate them in situ, provide them with worthwhile jobs and careers.

Open, distance learning, now fostered by ICT, is therefore a critical factor in economic and social development. Technological diffusion and the emergence of a learning society able to tackle, not retreat from, globalisation is a real social challenge:

Avicenna is a partial response to the challenge of e-inclusion by targeting academic institutions and helping them embed and develop the process of ODL many of them have already begun. Both during the pilot phase and in the mainstream period, the objective is to fan out a new culture of IST/ICT-led ODL for campus-based students, for independent learners, for professionals and for teachers and learners across the region. For while the project is grounded in robust partnerships and realistic assumptions on outcomes, it will retain and reflect a vision: creating a new community of Universities sharing best practices and pedagogical innovation, as well as a larger community of e-learners across the Mediterranean.

d) Main objective of Avicenna virtual campus

The aim of the Avicenna network is to accelerate is to accelerate the adoption and use of ICT-assisted ODL in eleven Mediterranean non-EU Member States (MNMS). Demand for ODL in the target Universities and societies is clearly identified, as ODL may bring wider access to University based initial and continuing education. The network organisation will be stimulated and comforted by the engagement of some of the EU's leading Open Universities, under the aegis of UNESCO.

The Avicenna project wants to build up a networked ODL production and communication platform adjusted to a multicultural and multilingual context. The Avicenna network mobilizes target Mediterranean and European universities, some of EU major Open Universities and ODL providers and international organisation which will individually and collectively bring and create training, experience, course content, and pedagogical innovation.

The main objective of Avicenna is to outline a self-sustainable campus as ground for extension to all universities campuses. For this Avicenna mobilizes existing resources, combined with the commitment of targeted Mediterranean institutions to build up a strong and cost effective move toward a full implementation of ODL in the Euro-Med region requested by the students increase in the next ten years.

2. Methodology of the project

The proposed methodology is fully adjusted to the project strategic objectives with a strong accent put into feasibility (realistic project plans grounded into context knowledge, and take off from existing experience and content), quality checking (the project outcome must be "visible" and replicable for an extension to all universities of Mediterranean sea to meet the needs of the countries). It is user-oriented (with a strong input into training and guidance)

a) The Avicenna Knowledge Centres

Avicenna aims at creating - in the long run - a self-sustainable virtual campus, based on the co-operation between institutions of the countries mentioned below. Installation of adequate infrastructure and intensive training of trainers are the crucial part of the project. The nodes of the network: the “Avicenna Knowledge Centres” (AKCs) will be installed in each partner institution and country to support a fully operational euro-mediterranean network for ODL services production and delivery. Pedagogical resources (available and created during the project) will be stored and managed into the “Avicenna virtual library”: the network knowledge data base where all learning and pedagogical resources, tools and knowledge will be referenced

To operate the network, deliver ODL courses and services and create content faculty and staff in charge of the knowledge centres will receive training. Multimedia production experts will be trained to interact with media engineers and faculty members for course production, while teachers and tutors will be shown how to interact with and support students for ODL course delivery. Student will be offered courses to better use the ODL services and associated technology.

The Euro-Mediterranean partnership will reinforce the cross-fertilisation of expertise and innovation in the field of distance education and training.

The long term project objective is to root the Virtual Campus concept in the Mediterranean region by promoting the transfer and exchange of pedagogical knowledge and experience in the field of computer and ICT led applications in higher education acquired in the most developed countries, thus creating a time/cost effective starting block for networked ODL services within the Mediterranean academic institutions. We want to use the experience we have from the implementation of national contact points in Central and Oriental Europe in the PHARE programme which have shown their efficiency both in the modification of the vision the countries had of distance education but also in the realisation of a network efficient with respect of the dissemination of new courses to new populations. This is the reason why we will implement Avicenna Knowledge Centres in the different countries as the nodes of this network. They will have the job of making visible the different courses available and the associated technology. It is important to note that the Avicenna Knowledge Centres will be implemented in all the countries of the consortium; thus enabling the network to function in all directions: North-South, but also South-North, South-South or North-North.

b) Location

The following institutions will host an Avicenna Knowledge Centre (AKC):

•	Université de la Formation Continue	Algeria
•	University of Cyprus	Cyprus
•	Faculty of Computing and Information	Egypt
•	Université de la Méditerranée (Marseille II)	France
•	Network per l'Università Ovunque NETTUNO	Italy
•	Philadelphia University in Amman	Jordan
•	Lebanese University	Lebanon
•	Malta Council for Science and Technology	Malta
•	Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes	Morocco
•	Al Quds Open University	Palestine
•	Universidad Nacional de Educacion a Distancia UNED	Spain
•	University of de Damascus	Syria
•	Institut Supérieur de l'Education et de la Formation Continue in Tunis	Tunisia
•	Middle East Technical University	Turkey
•	Open University	UK

c) Concepts

- **Avicenna is based upon the concept of networking:** We feel that setting up the AKCs network as a network of University ODL center is the most efficient way to take on board the expertise of such well experienced partners as the Open University, UNED, Nettuno, CNED, CNAM, as well as other network such as. This networking will also allow for a cost effective production and co-production of course content, within a common pedagogical chart and quality control
- **Avicenna methodology is based on “modelling”.** At the project completion, not only will the Avicenna Centres be fully operational but they will be able to play the role of experts for other universities to help them set up similar ODL centres. The network model (operational model, pedagogical model, including standards and best practices), validated during the project, will be replicable within each country (or within wider regional areas) enabling Mediterranean universities to gain from the project experience, knowledge and resource to set up their own network or adhere to the Avicenna network, to become ODL services experts and providers.
- **Networking and autonomy:** The roles of partner Universities will be enhanced through the shared innovation process and a consensual application of new methodologies, and best practice whether in course provision and content, technology, and services. The networking process (completely different from a transfer process) will strengthen Mediterranean academic institutions and will enable them to fully play their part at the end of the project either as members of a renewed Avicenna Network or (at the same time) as central nodes for future ODL national/regional networks, or even as stand alone ODL services providers. The decision will be theirs.
- **The existing “stock” of course modules provided through partnerships:** To start implementation of the Avicenna ODL Network with a sufficient amount of educational resources available for ODL, the project aims to quickly build up an Avicenna Educational Virtual Library. To that purpose the project will fund the production, co-production, adaptation and translation of **90 to 100** selected multimedia courses. As this production process will run over the project duration and specifically over the last 2 years, to give access to the existing course modules. A project expert will also concurrently refer into the Avicenna virtual library existing on line courses and pedagogical resources. The network will therefore have adequate content at early phases of the project.
- **Avicenna outcome will be more competent and skilled human resources able to take up the project activities** provided there is multilingual and multicultural acceptance and recognition. The project members recognise that learning is the leading way to bring about changes, that teaching always a social activity, can only be changed through dialogue, respect for local cultures, and languages.

d) Course production

One of the main objective of Avicenna is to concentrate on course production (through adaptation, co-production, translations) in order to build up in the 3 years project period significative course content, thus creating a critical mass of resources to be used by all partners as tests bed and through their operational ODL services. The implemented strategy will focus on identifying existing resources and on the use of ICT to produce, deliver and exchange courses, bearing in mind the necessity to develop curricula in an innovative and multilingual way within a multicultural context. The Avicenna Virtual Campus will be a networked learning and production platform, mobilizing major EU and international organisations who have agreed to combine resources and know-how with targeted institutions in the Euro-Med region, in order to provide a cost effective production and co-production process to the network.

TRANSNATIONAL COLLABORATION THROUGH E-LEARNING NETWORKS

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Introduction

Lithuania has been making significant progress in its efforts to reform its economy and society. There is a wide spread agreement that the development of its human resources through the expansion and innovation of the education system using information technologies is a cornerstone for further economic and social transformation and the attainment of a primary economic policy goal of integration into the European Union. Within this context, the upgrading of the skills and knowledge is essential.

The government and educational sector have determined that distance education has enormous potential to meet this challenge and significant policy groundwork has been laid for the development of an advanced and comprehensive distance learning system.

ICT in higher education in the context of life long learning is one of the main research and development priorities in every country. The encouragement of life long learning and the successful use of ICT in the learning process should expand all the time if its aimed on the ground of collaboration and dissemination of good practice.

Higher education institutions should also join, stimulate and recognize ICT based educational initiatives. Hopefully higher education institutions will participate actively in life long learning while employing modern ICT not only as a part of a context in various subjects/programmes but also for the dissemination of education and teaching. Moreover, it is expected that higher education institutions would train future researchers and experts and act as mass training institutions.

The education itself became quite an important good and new technologies allow choosing a place for learning despite of time and pace. Besides the improved accessibility of education and training, ICT could also improve the quality of education. Thus why it is so important that higher education institutions would pay a huge attention to the quality while creating ICT based education. Institutions should take more pains for the use of possibilities provided by new technologies – not only to ensure that education would become independent from time and place but also that the content would be provided in such ways that stimulate students' motivation. ICT enrich education with new methods. We mean learning not teaching. We have in mind active, participating learner. And as it was already mentioned, technology is for the satisfaction of requirements that aims are accomplished. In the learning process the technologies themselves should become an impulsive force.

As new technologies have been employed in education only recently there are not many researches analyzing how those technologies could be used for the improvement of education quality. So it is very important that higher education institutions would expand research activity about the use of ICT in education. Those researches must be spread widely along with good cases and the best practice.

Co-operation between Kaunas University of Technology and local authorities

In the last few years, Kaunas University of Technology (KTU) cooperates closely, not only with other educational institutions, involving them into ODL activities, but also with representatives of Chambers of Commerce, Industry and Crafts, and Municipality of Kaunas and other cities. Some of the civil servants of the Kaunas municipality are taking part in ODL courses.

The main goal of cooperation with the counties and municipalities is not only to train their civil servants, but also to promote ODL, to make them interested in ODL, to involve municipalities and counties in ODL development.

Our objective is to go step-by-step and purposefully towards the main objective: to use current ODL courses; to seek ways to develop other courses (using international and national funding, and inviting funding from industrial enterprises); to develop ODL, both, for single modules and for diplomas.

Some problems remain

- There is a lack of information about ODL. Today there is no unified infrastructure, which could accumulate and disseminate all information about ODL courses. Most educational institutions are able to prepare and deliver ODL courses, but they do not have mechanism for the selection of courses, which could have highest demand. Different organisations need to participate in the development of ODL, as educational institutions present only one link in this process.
- It is necessary to prepare an ODL development programme for the whole country as soon as possible. At the moment, every active education institution is developing ODL in the way it perceives it.
- The absence of initial funding for ODL course development restricts progress. At the moment, most of the courses are prepared by enthusiastic lecturers.
- Among some members of the society (and even among many lecturers) a stereotype exists that ODL courses are of a poorer quality than the courses taught in a traditional way.
- 2 way communication: industry → university → industry is needed. ODL is mostly devoted to adult education to provide lifelong learning. There is a need for the effective co-operation among industrial enterprises (which are able to decide the knowledge they need) and teaching institutions (which are able to prepare teaching modules and provide the courses).
- The difficult economic situation in the country means that most Lithuanian citizens are not able to pay for education.

Advantages

- ODL activities started at the Computer Training Centre (CTC), which provided computer literacy for people with different occupations. CTC already had experience in carrying out user needs analysis, had accumulated administrative skills in the preparation of advertisements, methodological material and invitations to teachers to deliver the lectures. It provided face-to-face courses. After the establishment of Kaunas Regional Distance Education Study Centre, this accumulated experience was adopted to distance education.
- The staff of KTU is enthusiastic, creative, aiming at knowledge and responsible for the work it undertakes.
- The positive and encouraging standpoint of the Rectorate has been helpful. The University is aiming to include ODL in traditional education. In different ways the University encourages teachers (who usually are very conservative) to take part in transferring traditional modules into ODL. The University is also assisting in gaining funds for the development of ODL.

Overall, the Kaunas University of Technology does see a huge potential in using new media in ODL. Lithuanian students have a positive attitude towards computer net use in teaching. The opportunities for continuing education in Lithuania are increasing, but it is possible to meet them only with the help of shared efforts of universities, governmental institutions, and business enterprises in the creative process of Open and Distance Education.

The employment of modern information and communication technologies, the variety of teaching and learning services give new opportunities for the creation of harmonious, balanced future society, as well as the fostering of individual capabilities of the citizens.

University and its departments very actively participate in the international projects and are involved in the trans-national networks, as well. We gain a lot of benefit being and acting in the networking related with e-learning and ODL issues, and we are very proud to share our experience among other educational institutions. Two international projects of networking are presented in this report below as our experience.

Multi-Country Integrated System Support for Improved ODL Networking

In 2001, a group of the representatives of ODL Centres from different European Countries initiated a project “MISSION - Multi-country Integrated System Support for Improved ODL Networking” in the framework of the SOCRATES programme.

Mission project aims to strengthen the links between the CEE PHARE ODL Centres - recently established by the support of the PHARE Multi-Country Programme for Distance Education. At the same time it aims to improve the effectiveness and long-term stability of collaboration between EuroStudy Centres (coordinated by European Association of Distance Teaching Universities - EADTU) and PHARE ODL Centres. As a more generic objective, it focuses on enhancing the awareness of ODL as the most effective, innovative and flexible methodology for supporting the European dimension of Life-Long Learning.

The typical beneficiaries of the MISSION project are expected to be: HRD policy makers and decision makers, ODL providers, course developers, ICT application developers, management staff and academics of universities working in dual/mixed mode education systems, staff developers and advisers, evaluators, distance learners all over Europe.

Background

The PHARE Multi-country Programme for Distance Education (1995-99, managed by ETF - European Training Foundation) resulted in a huge human and infrastructure potential accumulated in the Central Eastern European Countries: establishment of 45 ODL Study Centres with state-of-the-art equipment and networking facilities, development of more than 200 ODL courses and programmes dedicated to different subject areas and target groups, staff training programmes for more than 1000 experts tailored to all actors in ODL system, focusing on development, delivery, marketing, management in ODL, etc. Thousands of cooperative links offering mutual benefits have been established between East and West European ODL organisations and experts, enhancing further development in ODL and European dimensions of innovative Life Long Learning. Recent survey of ETF (see details under point 8.) has shown, that the PHARE ODL Network has become sustainable and has been operating without central financial support since the closing of the PHARE support.

However, central coordination in Networking, operable framework for exchanging information, enhancing further collaboration would be essential. Without it, efforts and results of the previous trans-national programme may be spread and dissolved too dispersedly, without utilizing the synergic effect offered by further networking. PHARE SCs have established beneficial collaborative connections with several ESCs – EuroStudy Centres Network of EADTU – being the widest and most prestigious trans-national ODL network of EU; it may offer the best models, examples of the best practice in all aspects to the PHARE ODL SC Network. Missing the opportunity for collaboration between the existing ESC Network of EADTU and forming a PHARE ODL Network would lead to low effectiveness in establishing collaboration frameworks (reinventing the wheel) as well as working out non-compatible structural and operational frameworks, arising the problem of integration in the future.

Collaboration between the PHARE SCs and ESC Network of EADTU may be considered as utilizing synergy of an outstanding scale of collaboration, offering significant contribution to European integration in one of the key elements: Human Resource Development.

Aims and objectives

General objectives of the project:

- Strengthening the cohesion between the PHARE ODL Centres, promotion of good practice and avoiding duplication of efforts through building up and maintenance of a central, multi-lingual WEB-site of the Network.
- Improving stability and effectiveness of long-term collaboration between East and West European ODL Study Centres - identifying and widening the range of benefits offered by ODL Networking in a European dimension.
- Enhancing the awareness of ODL as the most effective and flexible methodology, the most innovative tool for supporting the European dimension of Life Long Learning, for globalisation in education.

Direct objectives of the MISSION project:

- Facilitating the exchange of information and sharing of experiences within and between the Networks – mutual links between existing Web based information, home pages, useful links, etc. Duplication of fundamental pages in bi/multi-lingual format. Compilation of useful information on aspects of common interest of previous and current ODL projects supported by PHARE, SOCRATES, Leonardo and other EU programmes.
- Investigation, systematisation, documentation (paper and electronic catalogues) and subsequent dissemination of practices, services and resources applied/offered by involved ODL centres; - special platform to be built for course exchange, partnership in delivery.
- Offering Internet-based collaborative tools and platforms to different actors in ODL activity (course developers, media-experts, managers, tutors, learners): discussion forums, on-line conferences for sharing experiences.
- Collaboration in ODL staff development (survey of special needs of the staff of ODL Centres in the aspects of course material development, ODL course management, QA issues, ODL Centre management, etc., review of existing resources, exchange of experiences and programmes), considered as a key element of ODL implementation by traditional educational bodies – Establishment of a portfolio of Staff training courses, programmes and activities.

Innovative aspects

Advanced ICT application has recently made it realistic, that educational organisations may collaborate in a networking system. As the most innovative character of our proposal it should be mentioned that a very effective and intensive electronic communication and collaboration is the major element of our programme. Another innovative aspect of the project is its rapid prototyping methodology: as soon as the project will start, some elements of the ICT supporting system will be launched and continuously revised and refined, moreover extend with further elements. In the meantime, all stages of the progress will be open for the public via the Internet, this methodology will not only offer the possibility for all the partners to contribute to its improvement, but monitoring of the progress as well as dissemination of the results will be as effective as possible.

European Network of the Adult Education Organisations Working on Women Employment Issues

Another example of the trans-national collaboration through the e-learning network is the Socrates' project, titled "European Network of the Adult Education Organisations Working on Women Employment Issues". This project started on 1st of September, 1999. The project proposes, over of a period of three years, the establishment of the European Network of the Adult Education Organisation dealing with the non-formal education for unemployed and socio-disadvantaged women. During the first year eight partner organisations from six countries (LT, FI, NL, SE, DK and IS) created a platform for this network, shared the experience of good practices and developed the mobility training module for women on the extensive experience of the Scandinavian countries. First year project focused on

promoting and developing individual demand for education, supplying education activities, developing support service and dissemination of the project result to new network members.

- While implementing the project activities the following results were achieved during the first year:
- Creation and development of the network of the adult education organisations working on women's employment issues.
- Creation of the site on Internet about network activities.
- Creating the database of the organisations providing training for unemployed and disadvantaged women.
- Publication and distribution of a booklet on Women's Employment and Gender Equality in Europe (in English).
- Developing the curricula and a handbook (in English) on counselling and mobility training for unemployed and disadvantaged women to increase their self-confidence and enhance their employability.

During the second year, the Kaunas Regional Distance Study Centre at Kaunas University of Technology was invited to join this project. The main task of the KRDESC is to develop the mobility training programme as ODL program on CD. The experience of University is very useful in the achievement of the project goals, which are: promoting and developing individual demand for education; supplying education activities; developing support services. The outcomes of the project are the result of fruitful collaboration of different organisations, working on educational issues.

Each partner has gained something useful and benefited from the project, and has become more aware of the dimension of European citizenship. Also, as another international project, this networking project with 18 partners in the second year has had to overcome some problems which arise in the beginning of the project activities: to keep in mind the multicultural aspect in the project and to manage the language question in the project. Of course, there were some problems and some misunderstanding because of some cultural differences, especially in the educational traditions, but partners have found a "common language". On the other hand, we have managed to find the solution of these problems and our outcomes of the project are the examples of the multicultural dimension. Communication in English as in the second language has brought some difficulties to express the thoughts and ideas, especially that the skills are very different, but all partners were able to manage this problem.

The information age and the new surge of global integration impose heavy demands in terms of new and updated knowledge and life-long learning for all. A capacity for 'learning to learn' is very essential today. The sharing of experience and good practices in education, training and personal development with a life-long learning perspective for disadvantaged women improves their social status and conditions and decreases the risk of polarisation and social marginalisation.

Conclusions

1. During the last few years there has been realized the importance and essence of ODL in Lithuania and has been started the initial work to apply the newest IT in ODL. The use of modern ICT as well as flexibility in teaching and learning provide new opportunities to create the information society and develop the individual skills of the citizens. The main purpose of ODL is to provide equal learning opportunities to all Lithuanian citizens. The establishment of new ODL teaching technologies may significantly improve education in Lithuania.
2. The integration of new means of mass media into the higher education raise important problems of study reform, including teaching quality, accreditation and certification, quality assurance and shortening of an average study duration. Along with the education production and learning software we should take care of a quick integration of new means of mass media into the higher education (as well as into teaching, everyday life of the university), employment of all means of mass media in the education process (e.g. in the interactive lectures and virtual laboratories) and the use of the newest information about education.

3. Still there are some remaining obstacles which should be overcome in order to employ ICT in the learning process as much as possible: accessibility (equipment and infrastructure), new types of exercises, teachers without adequate skills and experience, time and resources needed for the development of ICT based education, etc.
4. The use of ICT in education is a material contribution into education with different objective that is no longer teaching oriented but learning oriented. Now in the centre of education is a learner. The role of a teacher and a student has been changing. Many of the teachers do not have necessary skills and experience in the use of ICT in education and there is a need for further training of trainers.
5. The synergistic effect of the shared experience of the participating countries is resulting in better training models and methods to develop personal growth. Information communication technologies help individuals, communities, and countries to collaborate, share ideas and good practise, and to understand different cultures better.

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THE EUROPEAN UNION COPYRIGHT DIRECTIVE AND DISTANCE EDUCATION

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The Implementation of the European Union Copyright Directive to EU national laws presents a substantial opportunity for distance education to manage costs and administration of copyright

The March 2001 directive (EUCD)¹ is in the process of being converted into national laws by member states and candidate states. The implementation deadline is 31 Dec 2002.

The EUCD effects the World Intellectual Property Organisation (WIPO) treaty covering electronic copyright issues.

This paper examines the EUCD from the distance education perspective and explores possible advantages and disadvantages for electronic distance teaching. The current position of national legislation implementation of the EUCD will also be examined but this will, of necessity, be subject to change as the time to the December 2002 advances.

The European Union Copyright Directive

The EUCD is referred to as “2001/29/EC of the European Parliament and of the Council of 22 May 2001”

The rights conferred on Authors are the rights of permanent or temporary reproduction (Article 2) and on distribution to the public (Article 3)

The relevant “Exceptions and limitations” are

2. Member States may provide for exceptions or limitations to the reproduction right provided for in Article 2 in the following cases:

- a) in respect of reproductions on paper or any similar medium, effected by the use of any kind of photographic technique or by some other process having similar effects, with the exception of sheet music, provided that the rightholders receive fair compensation;
- b) in respect of reproductions on any medium made by a natural person for private use and for ends that are neither directly nor indirectly commercial, on condition that the rightholders receive fair compensation which takes account of the application or non-application of technological measures referred to in Article 6 to the work or subject-matter concerned;

and

3. Member States may provide for exceptions or limitations to the rights provided for in Articles 2 and 3 in the following cases:

- a) use for the sole purpose of illustration for teaching or scientific research, as long as the source, including the author's name, is indicated, unless this turns out to be impossible and to the extent justified by the non-commercial purpose to be achieved;

These exceptions are affected by paragraph 5

5. The exceptions and limitations provided for in paragraphs 1, 2, 3 and 4 shall only be applied in certain special cases which do not conflict with a normal exploitation of the work or other subject-matter and do not unreasonably prejudice the legitimate interests of the rightholder.

¹http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=32001L0029&model=guichett

1. Why is copyright relevant to distance education?

The words of the EUCD are as good as any. For the “purpose of illustration for teaching”. As soon as we move beyond the limited experimental use of electronic distance education and as soon as we teach students who do not darken the doors of our campus libraries, we come up against the need to illustrate our teaching with third party material. Remember, many distance students will not have access to library services. In any event, if we are to teach electronically, it rather defeats the purpose if we have to send readings out in paper format.

2. Why is use of third party material different over the electronic medium?

I argue that there is nothing different in the medium of the copying or the medium of transmission. If I make a photocopy I have a second copy. If I scan to my computer I also have a second copy.

If I post the copy using snail mail the additional copy goes from me to the student. If I e-mail it the additional copy also goes to the student. The only difference is that it is faster and easier and usually of better quality. The difference is only a matter of degree, not one of substance. Why change the rules if I change my type of copier or the postal provider?

However the copyright owners and the European lawmakers believe that electronic copying and transmission is of a different substance so we have new rules applying to this.

3. How do the words of the EUCD impact on e-copyright?

On the face of it the exception seems to give the green light to electronic use of copyright material to illustrate teaching. However the qualification in paragraph 5 will colour the detail of the use in teaching:

“5. The exceptions and limitations provided for in paragraphs 1, 2, 3 and 4 shall only be applied in certain special cases which do not conflict with a normal exploitation of the work or other subject-matter and do not unreasonably prejudice the legitimate interests of the rightholder.”

What are the “certain special cases”? Does this mean the exception may only be used occasionally? Does it prohibit its use in a special case that nevertheless occurs regularly?

The history of the application of EU directives into national law, even the ‘compulsory’ directives like this show a flexible application of ‘certain special cases’. In any event the copyright treaties and EU national laws on copyright always give room for what is called loosely “fair use”.

Everyday educational use of a reasonable proportion of a work under restricted conditions has always been permitted.

So we are left with the application of “*which do not conflict with a normal exploitation of the work or other subject-matter and do not unreasonably prejudice the legitimate interests of the rightholder*”

I view normal exploitation and the owners legitimate interests as the same thing.

What are the rights of the copyright owner arising from the normal exploitation?

The United States application of fair use is the most detailed.

The most significant and, perhaps, murky of the limitations on a copyright owner’s exclusive rights is the doctrine of fair use.² Though now embodied in statutory language, the doctrine of fair use is rooted in

² FINAL REPORT TO THE COMMISSIONER ON THE CONCLUSION OF THE CONFERENCE ON FAIR USE Nov 1998 (CONFU guidelines)

*more than 200 years of judicial decisions. Fair use is an affirmative defense to an action for copyright infringement.*³

The American Conference on Fair use (CONFU) guidelines do not specify ‘exactly’ how much can be multiple copied for students but practice evolving from this has led to an accepted ‘rule’ of one article and some portion of a book. The underlying test is commercial. In essence, will the copying prevent a sale?

Fair Use In Europe

The fair use principles exist in different ways in European legislation and are also effected by paragraph 5 of the EUCD.

So we have an additional question:

Will the electronic availability to copy by a student of part (say 3 pages) of a work prevent a sale?

Clearly a whole work will not be purchased to get a right to see 3 pages. This is especially so where personal fair use will permit photocopying of at least this amount and an institution could copy this amount on paper and post to the student. If this restriction were to apply then it would prohibit effective electronic distance teaching. This outcome is not acceptable and is especially not politically acceptable. (Here the institution must have as many original print copies of the book that they would have had if all students were contact).

What happens if part of the work is available electronically under a direct licence from the publisher? If the cost were reasonable then using ‘fair use’ or paragraph 5 would deprive the owner of a sale. It would not be fair use.

For journals an article is in many ‘fair use’ definitions. Applying the strict commercial test in paragraph 5 you could not ‘fair use’ an article if it was available on an electronic journal consolidation service like EBSCOHost. These services are by subscription. So use for education leads to achievement of the legitimate interests of normal exploitation of the work. I qualify this by saying the costs for EBSCOHost are reasonable so it can reasonably replace fair use.

If a journal is not available electronically at a fair price then I argue the EUCD will permit an institution sending an article to a student electronically. This is on the condition that the institution has a print subscription to the journal at least to the extent they would if all their students were contact (which would enable the student to enter the library and make a copy for themselves)

Where does that leave us?

Electronic distance education students can be sent a “portion” of a book (1 chapter?) or an article of a journal where the original is held at the institution and a commercial electronic service at a reasonable price is not otherwise available.

This however is based on the words of the EUCD. Exact application in each country depends on the words of the legislation in each country.

At time of writing I had found reference to only 3 EU countries position on applying the EUCD. I am certain between writing this paper and presenting it there will be many more countries making the hard decisions on the EUCD.

I will examine in detail one EU country where legislation on the EUCD has been drafted and commented on and is due to enter parliament for debate and passing.

³ FINAL REPORT TO THE COMMISSIONER ON THE CONCLUSION OF THE CONFERENCE ON FAIR USE Nov 1998 (CONFU guidelines)

The Netherlands

The Dutch approach in their proposed legislation to be submitted to their parliament in April 2002 is to require equitable remuneration to be paid for all educational use:⁴

Article 16

1. The reproduction or communication of a literary, scientific or artistic work for the sole purpose of illustration for teaching shall not be deemed an infringement of copyright, to the extent justified by the intended, non-commercial purposes, provided:

- 1°. the work from which was taken over has already been lawfully communicated to the public;*
- 2°. the taking over is in conformity with that which may be reasonably accepted in accordance with social custom;*
- 3°. the provisions of Article 25 have been taken into account;*
- 4°. insofar as is reasonably possible, the source, including the author's name, is indicated; and*
- 5°. an equitable remuneration is paid to the author or his legal successor(s).*

This may not be so unreasonable as it sounds as there is room to apply the principle of zero levy (used in the Netherlands as zero-heffing). Here for low level use there is no commercial impact to the copyright owner so a zero Euro payment is equitable.

What does remain is two things. First is the level to apply the zero-heffing. Is it the one paragraph that publishers usually permit their authors to quote without receiving direct permission? I argue it must be more than this. Is it a page or say 2 % of the work?

If the zero-heffing is the application of article 5 (3) (a) of the EUCD then it is as much copying as will not “unreasonably prejudice the legitimate interests of the rightholder”

Clearly it can affect the rights (must be read as financial rights) but just not to an unreasonable extent.

The test of loss of financial rights is the loss of a sale of a work or subscription. If the action of copying and electronic distribution would deprive the copyright owner of (say) more than one sale then we have exceeded the zero-heffing.

Note we must use the substitution test here. If we cannot electronically copy and send, what else would we do? Not use the material? Send a print version? Make the text a compulsory purchase for students? Many of these alternatives have a financial cost and a financial advantage to the copyright owner.

Where this advantage exceeds one sale (assuming that is the ‘unreasonable prejudice’ limit) then we now must make an equitable payment.

The Quantum of the payment

The second thing to apply is the quantum of the equitable payment.

Recital 35 to the EUCD addresses the philosophy that should be used to ascertain this payment.

35) In certain cases of exceptions or limitations, rightholders should receive fair compensation to compensate them adequately for the use made of their protected works or other subject-matter. When determining the form, detailed arrangements and possible level of such fair compensation, account should be taken of the particular circumstances of each case. When evaluating these circumstances, a valuable criterion would be the possible harm to the rightholders resulting from the act in question. In cases where rightholders have already received payment in some other form, for instance as part of a licence fee, no specific or separate payment may be due. The level of fair compensation should take full

⁴ http://www.minjust.nl/a_beleid/auteurswet/uk/10118englegislation.doc

account of the degree of use of technological protection measures referred to in this Directive. In certain situations where the prejudice to the rightholder would be minimal, no obligation for payment may arise.

It is not what the copyright owner decides they want. This can easily be a prohibitive figure imposed to prevent the application of the law. Also from my experience copyright owners have a much higher expectation from electronic use than from print use.

The amount set must be based on an objective test. I argue that the test must be a financial 'loss of sales' test and limited to the 'profit' accruing to the copyright owner after the cost of production and re-sellers margin are removed.

In the end it will be the courts to set the figure if the parties cannot agree on a reasonable figure.

What are the copyright payment regimes in Europe?

How does this fit into the existing copyright payment regimes currently applying in Europe?

The Dutch regime is one of a legal licence⁵. The law imposes a licence and a mechanism (by decree) for payment of equitable remuneration. Division of the money between rightsholders is by survey.

Other countries use a levy system on reprographic products (paper) and devices (photocopiers) and have an operators fee where the copying is done by an institution (say a university).⁶ (Austria, Belgium and Portugal). How this applies where there may be no paper involved is not yet clear, as I have not seen the proposals to implement the EUCD. Greece and Spain use an equipment levy without an operators fee.

Another option for making payment for rights is a voluntary licencing system with or without a statutory mechanism to resolve arguments over rates. This method is used in the remaining EU countries.

The EUCD recitals see no inherent conflict between the operation of the Directive and the different payment schemes used in the EU nations.

This is the opportunity to have the new law and practice fit Distance Education

I believe that the application of electronic copying and transmission to existing payment regimes will herald a sea change in payment and licencing practices. Firstly there is significant public and official concern that the payment from equipment and operator levies and licences calculated by sampling survey is ineffective.

There is a suspicion that payment from the levies gets stuck in the licencing organisations and payment does not get to the authors, meaning they are not thus 'encouraged' to produce more works. This suspicion is to an extent unfair.

- Licencing bodies are set up by authors and publishers to act as their agents to collect licence fees for use of their copyright material. Money spent by these bodies is for the benefit of rights holders.
- Payment under the various schemes are, in spite of much rhetoric, to the copyright owners, not to authors. Copyright owners are by and large publishers rather than authors. Authors receive their benefit when they contract their rights to the publishers.
- The information gained by survey is little better than random as to how much is copied and what material is copied. Consequently on payment of the licence fees and levies is similarly inaccurate. Many smaller publishers and authors will miss out.

In the electronic environment a great new opportunity presents itself. Third party copyright material will mostly need to be scanned from paper to digital and even digital originals will need to be formatted. Thus each piece of copyright material will be worked on.

⁵ http://www.ifro.org/laws/law_netherlands.html

⁶ http://www.ifro.org/laws/law_germany.html

It is a small step to apply a unique identifier to that material. This would be the ISSN/ISBN and page numbers used together with an institution and course code. From that a calculation could be made at the end of each year as to how many students enrolled in that course. The database of information could be sent to the national rights organisation or even a single European rights organisation together with the payment. The division of the payment to author or publisher would be automatic based on the pages used and the ISBN/ISSN.

This would be fast simple and fair. It would be more accurate and cheaper to administer than the fee calculation and payment system used for print based copyright. Consequently the rates should be lower than for print based copyright.

The opportunity also presents a huge risk

That is the remaining issue of concern. If we record usage on a per page basis the copyright owners will be tempted to licence and charge on a per page basis as well.

We are a solely distance teaching institution. We have no contact students. We pay a licence fee based on about 2 Euro (equivalent) per equivalent full time student. We pay 12,000 Euro per year. We record all copying including what would be student copying at a contact institution. (We assume students can not get to a library so we copy all readings for them.)

On a conservative per page basis of 0.1 Euro per page our annual fee would go to 400,000 Euro per year! This is not of a little concern to us and will not be to you.

Pay but PAY FAIR!

It is thus essential that in the implementation of the EUCD into your national laws that the substitution or 'actual loss' principle be used to calculate equitable remuneration. We do need to pay copyright owners but we must pay fair!

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INTERNATIONAL CO-OPERATION IN OPEN AND DISTANCE LEARNING THROUGH REGIONAL NETWORKING

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1. European Study Center Network North-West Germany (ESCN)

To enable more cost-effective methods to be utilized for the design, the production and the dissemination of multimedia learning resources, institutional co-operation on a regional, national as well as european or international level becomes more and more important. There is also a necessity for co-operation to pass on information about open and distance learning in Europe and to provide cross-national support for students, who take part in distance education programmes.

Facing this background, the five centers for distance education at the Universities of Bremen, Hamburg, Hildesheim, Lüneburg and Oldenburg set up the European Study Center Network North-West Germany (ESCN) in 1992.

Each of the five centers is a central academic unit of their respective universities. They are engaged in the development, implementation and evaluation of programmes in distance education and open learning within their institutions.

All of them are related to the FernUniversität, Hagen, by agreement to provide counselling and tuition to the distance students, living in their regions.

The centers are headed by directors. The management responsibilities are comprising the organisational development, the co-ordination and consulting functions in programme and project development as well as the responsibility for counselling and tutoring in distance education courses. The budgets are based a state funds for degree courses of distance study. Other income derives from continuing education and training programmes as well as from other funding sources.

Right from the beginning of their distance education activities, the member institutions of the European Study Centre Network North-West Germany (ESCN) started to establish international links and co-operative structures. In many aspects, the members did this together as a regional group of study centers. This strategy was meant learning the others experience, to strengthen one's own position in a competitive environment, to contribute to an international professional community and to launch joint projects. As a result of this "going-international-strategy", there have been many developments which have proved to be of high value.

To mention some of the outcomes: the members of the ESCN are in a position to

- co-operate with almost all of the relevant institutions on the field of open and distance learning and teaching in Europe,
- play a relevant role in international networks and organisations (like for example the regional ICDE-office in Oldenburg with its present commitment for the organisation of pre-conference-events of the World Conference 2001 and the current presidency in the Distance Education Network/EDEN by the director of the Hildesheim center),
- establish co-operative links to ODL-institutions around the world,
- organise international conferences and workshops (like the series "Approaches to Co-operation" and other workshops).

In collaboration these five university centers are also involved in various European distance study programmes and joint projects; the ESCN, for example:

- offers information about opportunities in European open and distance teaching universities,
- collaborates with the Open University (UK) by agreement, represented by its member unit at the University of Hamburg,
- is partner in an European consortium of university institutions of five European countries, offering the “Euro*MBA”, which provides an opportunity for managers to complete further education focused on management in Europe and to earn the degree of an “European Master of Business Administration”,
- takes part in an international certificate programme in online education and training.

These projects, which will be presented with more details during the EDEN conference are described in a short version as follows.

2. ESCN Projects

2.1 Collaboration with the Open University (UK)

In 1996 the University of Hamburg and the Open University (UK) signed a co-operation contract to establish a local contact point for those interested in Open University programmes of study, to spread the knowledge about these and to participate in the knowledge and expertise in the area of open and distance learning.

The co-operation is based upon the principles of equal status and mutual trust.

There are several categories of the Hamburg University activities which can be described as

- enquirers centred,
- student centred,
- tutor centred,
- marketing related or
- administrative.

In more detail these are

1. Enquirers centred:
Enquirers in northern Germany contact the AWW and order brochures, ask for individual information and advice and are invited to information sessions and open events. The AWW website contains a section about the OU (written in German) and interested people put a brochure order online.
2. Student centred:
Students get advice and support through the AWW. There are special study skills sessions run in the study centre, the establishing of self-help groups is supported by offering space for them to meet, course choice meetings are held in the study centre usually with an advisor from the UK joining in. We have a small library of course material to look at for students who are not sure about the course they want to study next or who want to prepare for next year's studies. Exams are held in the study centre.
3. Tutor centred:
The AWW supports the OU in finding suitable candidates for tutor jobs. This is done by advising on appropriate media for adverts as well as using the AWW database and the local contacts for recruiting tutors. Tutors who are travelling from other EU countries to hold face-to-face tutorials in the study centre are administratively supported by the AWW.
4. Marketing related:
These activities run from sending brochures and leaflets some of which are translated into German, to running open events and information sessions, organising guest lectures at Hamburg University and

participation in special events like “British Day”, “Lernfest” etc. Moreover contacts to the local British community as well as business networks have been established and are followed up. The local advertising of events and offers is managed by the AWW – and if the national aspect is involved – issues are being discussed among the team of OU-representatives in Germany. Of course the ESCN partners are involved in almost all of these activities as well. All these activities are based on a marketing plan which has been developed by the AWW combining the knowledge of the OU offers as well as the German academic educational system and the local situation, it also includes recognition issues.

5. Administrative:

These activities comprise the management of local exams including the invigilation. Face-to-face tutorials are held in the study centre throughout the year, tutors coming over from other EU countries are supported locally in order to make the face-to-face tutorials most effective. The library is kept up-to-date with the students’ demands.

Hamburg University is partly being paid for these activities.

The second part of the collaboration focuses on joint projects or activities which are based on it:

- The AWW has designed courses which are based on OU material. The AWW is pursuing two aims with these courses: On the one hand we want to offer interested people a taste of the OU way of studying: concept of open and distance learning, level of English needed for taking an OU course, study skills, time management and on the other hand we are widening our customer group by offering a course in English for those who are just interested in developing their education without studying for a university degree.
Two of these courses are currently available: “Issues in Social Sciences” and “Introduction to Literature”
- The AWW is currently pursuing an E-Learning project (OLIM) of which the Open University Business School is one of the partners. That’s how German universities can also profit from the OU knowledge and expertise in open and distance learning and teaching. Moreover it is a chance to introduce courses in English written and designed by native speakers to the local programmes of study.

2.2 European Master of Business Administration (Euro*MBA)

2.2.1 Main characteristics, institutional and organisational structure

The Euro*MBA offers an innovative, international executive study programme, which enables managers to perform strategically in an international environment. The

- two year part-time executive MBA
- is jointly offered by business schools and universities from 6 European countries
- with participants all over Europe and beyond
- combines E-Learning courses with a multi-locational residential week programme all over Europe

Right from the beginning the European Study Center Network, North-West Germany (ESCN) has been involved in the planning and organisational activities to start the Euro*MBA study programme in 1996. On behalf of the ESCN the Centers for Continuing and Distance Education of the Universities of Bremen and Oldenburg are engaged in the management of the Euro*MBA programme.

The ESCN is together with its partner institution, the Academy for Continuing Education, Delmenhorst, member in a consortium of altogether 8 educational institutions from 6 different European countries:

- Open University of the Netherlands
- Institute of Business Administration Aix en Provence - France
- Groupe ESC Nantes Atlantique - France
- University College Dublin - Ireland
- Escuela de Alta Direccion y Administracion (EADA), Barcelona - Spain

- University of Jyväskylä, Advanced Management Education Centre - Finland
- Academy for Continuing Education, Delmenhorst - Germany
- European Study Center North-West Germany (ESCN) - Germany

The idea behind the consortium was to ensure a truly European MBA programme, which guarantees high quality by the diversity and academical standards that each institution represents.

The network, especially set-up for the Euro*MBA, includes over 200 faculty members. Their substantial scientific and business background brings new conceptual approaches and analytical methods to course materials without neglecting practical issues and their impact on the business environment.

In addition to the academic staff over 600 associated experts (executives and business consultants from different countries) work hand-in-hand forming a dynamic liason between the universities and business. This exchange is formalised on the way training and research should be adapted to new management approaches in an ever changing international economy.

The consortium is organised around a Board of Directors, an Academic Council and a Programme Manager.

The Board of Directors assumes final responsibility for all decisions related to the consortium.

The Academic Council consists of an academic representative of each partner. The main duties of the Academic Council are

- to ensure the quality standard of the Euro*MBA programme and the integration of diverse national perspectives in an European context,
- to define the curriculum for the distance teaching and residential modules,
- setting standards for the faculty involved in the programmes and
- develop and implement quality standards for the programme and exam regulations.

The Programme Manager is appointed by the Board of Directors. He is the executive responsible for the implementation of the strategy, day to day operations and operational results.

The office for students registration and all central administrative activities is linked with the center of the dutch Open University in Heerlen.

2.2.2 Curriculum

The Euro*MBA curriculum combines an exciting range of courses, with advanced telematic tutoring technology. Furthermore, soft-skills training and real business scenario analysis are dealt with during the multi-locational residential week programme.

The Euro*MBA is a two year part-time programme combining ten E-Learning courses and six residential weeks plus a introductory weekend. Each year is divided into three terms of four months each. Separating each term is a residential week at one of the partner institutions. Each term contains two courses of 7-8 weeks in length.

The E-Learning component of Euro*MBA programme, combined with internet technology, allows managers from various cultural, national and sectoral backgrounds to work together, without having to cross borders. Moreover E-Learning also allows flexibility in when to study and where. As no lectures are required, participants can study when they want to, making it easier to plan study and work schedules alike.

Materials such as books and readers are sent to students via regular mail services. However, in order to know what to do with the materials, students need to consult the course database, which can be accessed either via Lotus Notes or via the Web. In the course database, students will find information about the objectives of the course, what is expected of them and extra reading materials. One of the advantages of putting this kind of information in a database is that extra materials can be added during the course, making the course far more dynamic. Typically, the assessment for each course will be a group

assignment, an individual assignment and a final exam. Furthermore, all three assignments are case oriented, thus focusing students on real life situations.

Nevertheless distance study and E-Learning cannot replace all the activities of an MBA programme, which is why there has been introduced the residential week programme. This allows the students to deal with soft skills, group work, company visits and networking as well as providing students with lectures by leading business economists.

New students start the programme with an introduction weekend during the first weekend of the residential week. The introduction programme allows new students to:

- get to know the Euro*MBA staff and the Euro*MBA programme and procedures,
- get to know the colleague students,
- make a good start with the group consultancy project,
- acquire skills needed to perform well in the Euro*MBA programme

2.2.3 Programme Schedule

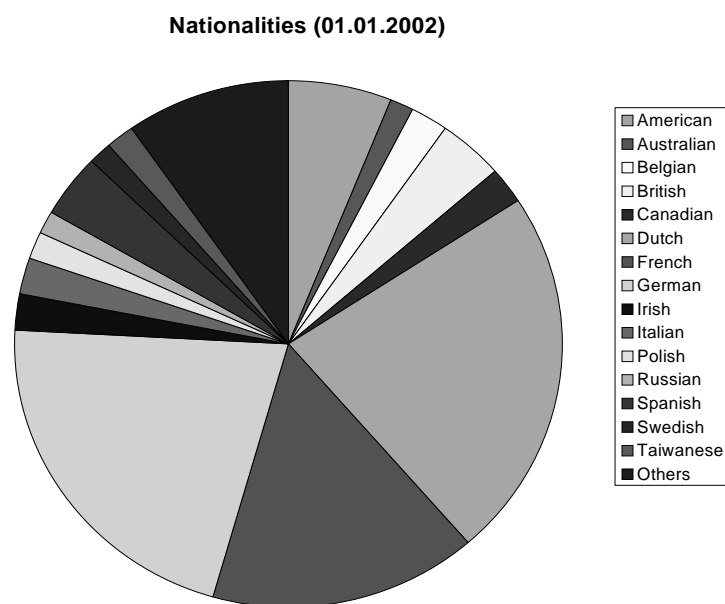
Students begin the programme either in January, May or September.

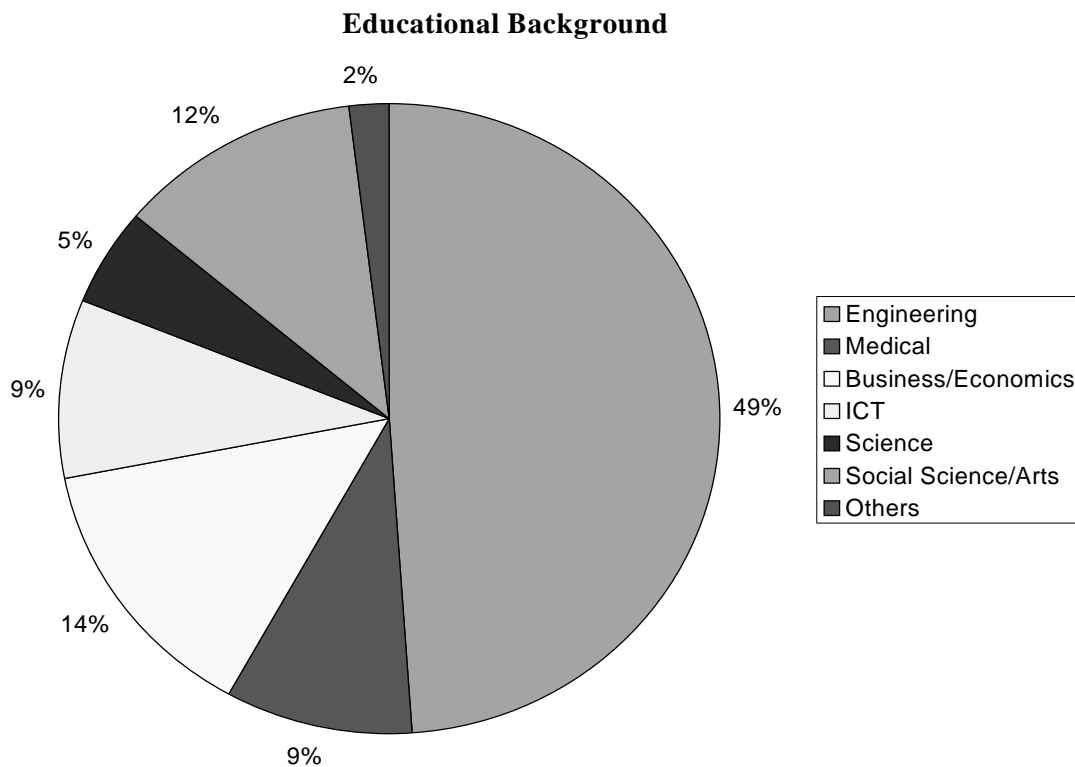
The enrolment system of three times a year makes that participants join and leave the programme at different times. The advantage means that you have the flexibility to begin when you want to. Furthermore, as people come and go, the number of contacts you make is almost doubled (with 42 students in the programme at any one time, and assuming that there is an intake of approximately 7 people each period, students will meet 77 people in total).

As well as the E-Learning courses and the residential weeks, participants are also obliged to complete two extra pieces of written work: a group consultancy project and an individual master's thesis. Students complete the consultancy project in their first year of study, and the master's thesis in their second year of study.

2.2.4 Student Profile

Programme participants come from a range of employment, educational and cultural backgrounds (see diagrams below). Participants are aged between 25-54, with an average age of 35, with 80% of them being men. Almost half are expatriates although virtually all have international assignments.





2.3 The International Certificate in Online Education and Training (OET)

2.3.1 Introduction: The dual structure of OET

The Course *Certificate in Online Education and Training* is presented jointly by the University of London, the Mailand Bocconi University and the European Study Center North-West Germany (ESCN). On behalf of the ESCN the Center for Distance Education of the University of Lüneburg is co-ordinating the course activities. The course is open to everyone who wants to begin structuring their educational offer with Internet support. They should also learn how to define their own communicative wishes in the virtual learning space as well as develop an applications concept for the transfer of traditional educational offers to the virtual.

The main objectives of this course include:

- The development of job-related competences in the usage of the Internet
- The combination of traditional criterion of course structure with the construction criterion of telelearning
- Co-operative project and product oriented teamwork as well as
- Interest-lead and self-directed learning

The course is based on a similar course which was offered in England at the University of London from 1993 to 1998 in a purely English version. In its current form, there are two English language modules and two in the respective national language (cf. Fig. 1). The focus of the first two modules is learning to handle telelearning and its Internet supported course design. The third and fourth modules were developed by the Fernstudienzentrum Lüneburg as part of the European Study Center North-West Germany and are offered in German. In the foreground here is the personal use of the net in the form of conceptional planning of an Internet supported educational offer. The course can be completed with a certificate issued by the Institute of Education of the University of London.

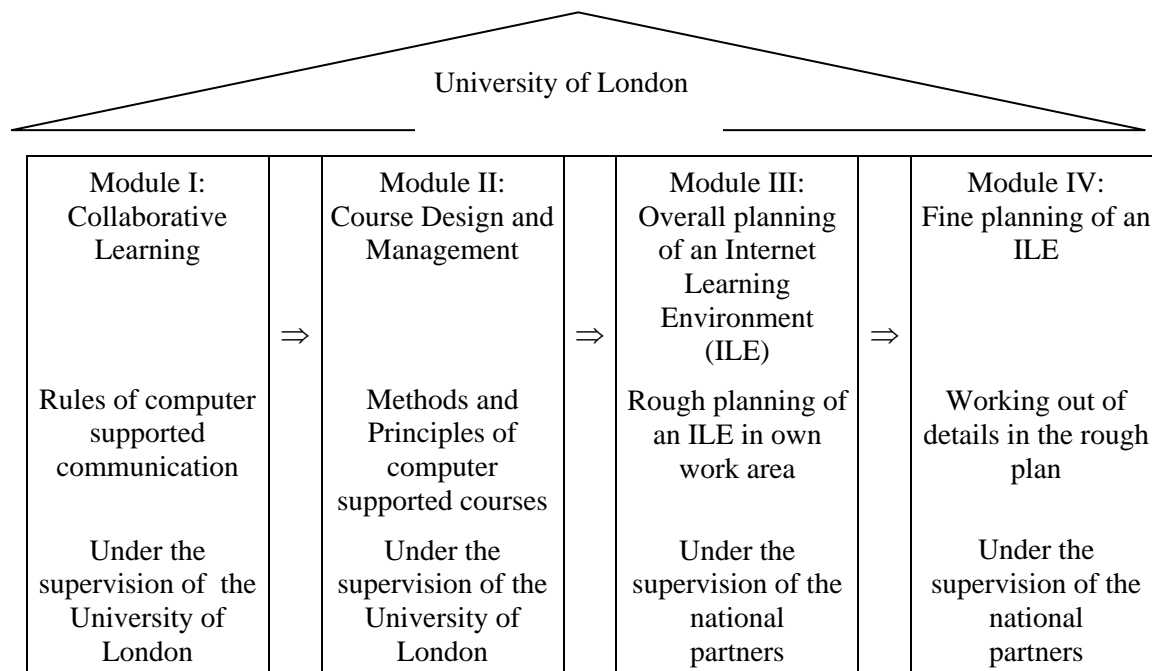


Fig. 1: Dual structure of OET

The first course in the new form with European partners began in the autumn of 1999 with approximately 50 participants; the second presentation in the autumn of 2000 with approximately 70 participants, and the third in autumn 2001 with about 200 students. In each presentation, the content division was maintained as two international modules and two national modules.

In the following, the basic dual structure will be presented: first, the conception of the international modules and finally, the national modules. A short summary of the experience with the first presentation of OET will follow.

2.3.2 The international modules

In order to accommodate the needs of participants who came from all over Europe, the international modules were limited to the first ten weeks, whereas the second ten weeks took place in English, German, Italian and French groups. The final essay about the advantages and disadvantages of online learning (compulsory for the issue of the certificate) was still graded by internal and external assessors of the University of London.

(1) Objectives

The objectives for the international modules are that through the utilisation of the telelearning tools, the participants themselves learn to make a self-assessment of telelearning. Here you will be given the opportunity to both discuss in groups and try out the possibilities and constraints of computer supported communication as a learning and teaching medium.

The OET course also places emphasis on the experience of collaborative learning as it is made possible through computer supported communication. In the main, this involves asynchronous communication in groups, like offered in First Class on a user-friendly interface.

The objective of the international part of the OET course is that by the end of the course, the participants are able to decide how far a computer supported communication presents a possibility to overcome pedagogic problems in the learning-teaching process through computer supported communication and, of course, that they are able to develop a suitable concept which will then be pursued in the national modules. On the discursive level of the international part, this involves the four elements of: presentation components, teaching-learning components, teaching material components and databank components, for which a suitable virtual conception for the national part will be developed.

(2) Course design

Before the actual course begins, a face-to-face meeting takes place in the institution of the national partner organisations where the partners will be connected through chat-sessions and, if applicable, through video conference. Also those participants who did not take part in the face-to-face meeting; for example, in Lüneburg (the participants in the first presentation came from all over Germany) could still participate in the first group experiences.

The actual course procedure is linked to a task-discussion structure. Individual preparation for the activities of the week are effected through work materials which are made available either in print or digitally. These 'weekly' materials are to be differentiated from those basic materials which comprise the course. The mentors attach an 'online task' in the respective First Class file. The answers of each participant form the basis of the discussion which is usually completed through a comment by the mentor. The course design is in this way very simple as participation in the course is possible without specific software knowledge at the beginning, as well as being possible from home. This means that the Internet applications using First Class are kept relatively simple.

2.3.3 *The national modules*

The partner institutions of the University of London are open regarding the structure of the courses in that they can choose the content themselves as long as they conform to the general framework.

(1) Objectives

The objectives of the national modules in the presentation 1999/2000 are oriented on the work of the German 'Bund-Länder-Kommission' for Educational Planning and Research Advancement in Germany, who, in an analysis of the meaning of multimedia and new media in higher education assume that:

"the educational market will become de-centralised and globalised to an extent that is hardly imaginable at the present" (BLK 1998).

For this reason, the focus during the conception of this module was also on the consideration of developing a concept for a market-capable Tele-learn product in addition to the typical conceptional features of Internet learning environments in the German-speaking community.

This conception of the OET courses is aimed at one of the assumed insoluble differences between rational, 'economic action' and 'communicative-oriented pedagogic action' described by German adult education authors. In contrast to the past, future pedagogic action will be expanded to include the aspect of 'resource-conscious' action which can encourage economic categories to consider above all questions of efficiency. This action should lead to a dissolution of the often too strongly perceived differences.

(2) Module design

The national modules follow the concept of the international modules in that the learners have to tackle special tasks every week.

The activities of the national modules were developed with this background of the communicative approach of the entire OET course. For this reason the primary objective is not for all participants to develop a prototype of an application of a traditional course into a virtual learning space by the end of the course; but rather, to develop such an application with a partner. In the transition from the third to the fourth module, the difference between the planning of a virtual education offer and the pedagogic-technical requirements of such a learning space will be laid down. The optimisation of such an offer should be worked out through discussion with the other participants.

2.3.4 *Experience with the OET-course*

All in all, there was a preponderance of positive experiences with the course by the end of both international presentation. These are rooted primarily in the simplicity of the user interface of First Class which hardly presented any technical 'frustration experiences', as well as the fruitful work through computer supported communication in the individual groups. A further positive aspect to emphasise is

that nine of the 12 participants in the German module had a fully developed Internet supported learning space to show after the course on the basis of which the final essay could be written.

Facing that outcome, the great transfer potential of the OET course should be pointed out. Three of the Internet learning environment concepts were put into practice with some modifications after the course completion. It was also ascertained in follow-up talks that at least half of the participants could apply their newly learned skills from the course as mentors to virtual educational offers. In one case, a participant actually became a mentor for the second presentation of the OET course in autumn 2000. The achievement potential of the OET course on the First Class platform is founded in the fact that through the communication of the participants, competences come together which are developed through the strength of their achievement in the group project work.

Here a serious disadvantage of First Class comes to light. It concerns the lack of provision of synchronous communication tools which was also criticised by the participants by the end of the international module at the latest. The original English author's own claim to minimise the drop-out rate must therefore be qualified since the asynchronous communication did not always form sufficiently close bond between the participants so that indeed two participants in the German module participated only more or less passively in the course. A further problem also became apparent in that First Class is a simple and heavily text-based virtual learning space and the connecting points on the Internet depend heavily on the work of the respective mentors. In addition, the text-based procedure – especially the lack of hyper-media preparation – is not satisfactory for the participants when they have already acquired experience in web-based learning. Nonetheless, of consideration here is that the course applies above all to novices in web-based learning in order to impart proficiency in producing virtual teaching-learning-offers through a digital distance learning concept – which was indeed achieved.

In order to both increase the sense of belonging in a learning community yet also improve the quality of supervision at the beginning, the international and national modules were staggered and thematic modifications were introduced in the second presentation, solving which solves the typical structure of the course at least within the practical presentation.

NEW TECHNOLOGIES AND OLD TRADITIONS: THE ROLE OF ELEARNING IN STUDY ABROAD EXPERIENCES

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Introduction

Distance learning and study abroad, at first sight appear to be opposing concepts. However this paper will explore the role one type of distance learning, *eLearning*, can play in internationalising the experiences of undergraduate nursing and midwifery students. I would like to share with you models and practices of international work that I think are vital for meaningful learning to be maximised. These are derived from 10 years experience of developing international curricula and running overseas elective placements for students and teachers within a nursing and midwifery department, at the University of Brighton, in the United Kingdom. I am in the process of introducing *eLearning* to the students international experiences and will explain how I think *eLearning* can be used to significantly enhance learning and increase the international nature of the experience.

It is widely acknowledged that international education helps students develop global perspectives (1), provides awareness of the importance of their own and other cultures and assists in personal and professional growth (2) (3). It has been found that cross cultural travel programmes lead to substantial emotional learning (4). Moreover, for health care professionals such as nurses and midwives, a developing awareness of and sensitivity to culture are vital in order to provide culturally competent care (5) (6). This is especially important when providing health care in multi-cultural societies in an increasingly globalised world.

Maximising learning from study abroad

Many educationalists involved in study abroad programmes, emphasise the importance of appropriate student preparation if learning is to occur from overseas experiences (7) (8). I believe that the preparation stage to be the most vital if students are to feel comfortable, enjoy and gain maximum benefit from their time abroad.

My experiences of the preparation stage are variable depending on the programme of study the students are undertaking. The Institute of Nursing and Midwifery runs a BSc (Hons) European Nursing course, which provides a nursing qualification, the award of a Bachelor of Science and a Certificate in Language for Professional Purposes. The two and a half years study prior to their three month exchange period can be seen as intensive preparation. This is in contrast to the learning experience from the European Nursing Module, a four week module which comprises one week preparation, two weeks exchange and one week reflection and assessment. It has been argued that complete immersion in a culture is necessary if meaningful learning is to take place, (9) however one of the aims of setting up the European Nursing Module was to maximise learning from the minimum time abroad.

Short periods overseas can be attractive in terms of finance, for mature students whose family commitments prohibit longer periods away from home and to meet professional education needs. Students of nursing and midwifery from the UK have specific difficulties in longer periods abroad due to the structure of their programmes, the need to be able to speak the language of their patients and the constraints of the professional bodies governing their education. Emphasising the importance of preparation for the students was therefore seen as crucial; evaluations have found that significant personal and professional growth and learning does occur from the two weeks overseas.

The rest of this paper will focus on those students undertaking short study abroad periods, through the European Nursing Module, the working language of which is English.

Nature of the preparation

Teichler's (10) extensive evaluation of ERASMUS programmes in 1997 shows that preparation for exchanges is widespread and often takes the form of meetings, briefings and the use of handbooks and specially prepared packs. Personal experience has shown however that in reality preparation has often been minimal.

I have developed preparatory learning that focuses on developing an understanding of the nature of 'cultures', societal and professional. They are encouraged to begin to think anthropologically, consider their own cultures and explore how 'culture shock' may prohibit and enhance their learning. Cultural understanding, awareness and sensitivity is vital if misunderstandings and difficulties are not to arise. (11)

They learn about the country and the health care system they are to visit. 'Survival language' is introduced and they consider some of the difficulties they will experience undertaking observational practice, a specific nursing and midwifery constraint. Their fears and anxieties are explored and individual learning objectives are finalised. Information packs prepared by the colleges they are to visit support this learning.

The role of eLearning in the preparation for study abroad

The eLearning media discussed in this paper are synchronous and asynchronous on-line conferences, chat rooms and email. Computer and video conferencing is often used as a replacement for face to face international experiences, for example the Canada-Norway Nursing Connection (12) which was set up to explore nursing leadership issues and help students develop a global understanding of health care issues. However here, the technologies are intended as an adjunct to the study abroad experience. Video conferencing is not suggested here due to the need for significant support networks and the technical difficulties sometimes experienced with this medium. The short period of time often available for preparation prohibits the use of technology that may require adjustment.

One of the aims of the study abroad experience is the development of confidence, self-directed learning techniques and autonomy. Students are therefore encouraged to email the exchange coordinator and/or their 'student buddies' throughout the preparatory period. Some suggest emailing their 'buddies' daily in the preparation period (13). This, in a gentle way, often highlights language difficulties that they may experience later and helps them become aware of the need to consider the style of English they need to use.

Chat rooms will be available for students throughout the preparation, exchange and reflective periods. Students can use these how they wish, although participation will be expected in order to share the international experience, open up debates, broaden the multi-cultural nature of the dialogue and offer support to fellow students. Participation in the chat rooms can be used as form of student assessment if wished. Similar criteria can be used as those used to assess participation in student seminars and group work. Topics can range from asking directions to the nearest MacDonalds, to issues of professional practice and guidance to local learning resources.

It is hoped that increasingly that specially prepared information packs and suitable learning resources will be available on-line for all students.

One of the aspects of the exchange that students often find most challenging and difficult to identify is the subtle differences in approaches to professional practice. In order to prepare students for the type of international variance in nursing care they may witness and to highlight the many commonalities inherent within nursing, care scenarios will be used. Students can study these during their preparation time.

For example, patient scenarios can be shared with the students on line. They will then analyse these, identify the main problems, prioritise these, generate aims of care and identify the nursing care required to alleviate these problems. Issues of resources, local policies, custom and practice and the role of the multi-disciplinary team, relatives and patient expectations will be illuminated. Examples of local protocols, models of nursing, philosophies of care, types of documentation required can all be shared. Teacher access to the site can add information or change the focus if thought useful. Students will become

aware of the international nature of nursing while at the same time identifying how culture, economic and political influences and national differences impact on patient care. The student's 'buddy' can work collaboratively on the scenarios or they could be used comparatively, making overt both the similarities and differences in approach between the two countries. The scenarios must be internationally generated so that all students can relate to the situations offered.

By working collaboratively and internationally on the scenarios the students are not only relating their learning to actual nursing practice, something they crave, but they are 'learning by doing'. One of the criticisms that has been levied at internet-based distance learning is that the learning by doing paradigm has not been applied (14). In addition many of the students studying in the UK have improving English as one of the key aims. The above strategies all assist these students develop their written English, their comprehension as well as gaining colloquial, slang and professional language skills.

The exchange experience

Most exchange experiences comprise supervised practice placements, study sessions, cultural and social experiences and reflective sessions. An important part of nursing and midwifery education is reflective learning which it is hoped helps create the reflective practitioner a vital quality for the health care professional (15). Increasingly reflection is being used as part of professional education programmes globally, however personal experience has shown that not all nursing and midwifery students are familiar with this style of learning, find language constraints inhibit reflection and find reflection sessions an extra stressor in an already stressful and 'foreign' situation. Reflective diaries are suggested as a useful addition to their learning repertoire and most students keep these in various formats. Some colleges expect students to use these as part of their assessed work, whilst for others, these are the students' personal property and remain confidential.

The role of eLearning in the exchange period

As previously stated, the chat room will remain open during the exchange period; however its focus will change. Although contact with teachers can continue through the use of email or the chat room throughout the exchange period probably its most useful role will be for online reflection. Although reflective sessions and the use of reflective diaries may well be used, the chat room forms an ideal venue for reflective learning. Students often find the use of reflection easier on-line where they have longer to consider their thoughts and generate the appropriate language than in face to face contact which may seem threatening. Male students may well find this more comfortable (16). It has been found that men prefer internet counselling and use these facilities more readily than face to face counselling. Asynchronous reflective sessions can be facilitated by posting reflective cycles, for example those by Gibbs (17) and Johns (18), on the site to assist students less used to this style of learning. They also allow students to take part in the reflective process at a time suitable to them.

Another important benefit of online reflection and discussion during the exchange period is that other students undertaking an exchange in other countries can access the chat room, thus greatly enriching the multi-cultural experience.

The return home

Once home it is important that the processes of reflection and evaluation continue. This is usually facilitated by debriefing sessions and presentation of the student's work, either as written work or poster and verbal presentations. Many different styles of assessment are undertaken internationally, but most include a comparative element, a consideration of culture and professional learning and development. These can be specific, for example of comparison of approaches to wound care or a cross cultural comparison of the role of home nurses or broader in focus, for example a comparison of approaches to sex education.

Traditionally I have required students to present their chosen topic to the student group who have undertaken the overseas exchange and to the students who are considering this as an option the following year. Students are assessed on their presentation skills, the comparative element, demonstration of reflective learning, awareness of the impact of culture on their topic and professional learning.

The role of eLearning on return home

The chat room will stay open for an agreed time, approximately 2 weeks after the students return home. Great friendships are made and there is often gossip and 'thank you's' to be sent. Final information seeking can be made through this mechanism in preparation for their assessed work. After this period of time, students will continue to keep in contact with their new friends and colleagues via email.

I have plans however for the student presentations or other assessed work to be posted on the site. This would continue the international nature of the experience. I hope that in the future, these will be jointly marked by teachers from the home and host colleges, over the internet. This will further internationalise the programme and form useful links between staff in colleges of nursing, adding to their own professional development and experience. However before these plans can come to fruition, several bureaucratic and educational procedures and structures have to be overcome, for example, current university assessment regulations.

Conclusion

It is hoped that I have illustrated a fairly simple way of combining new technologies with old traditions. The technologies suggested are simple to use and access, enhance the learning experience and greatly add value to the study abroad experience rather than being used for their own sake.

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SUCCESS FACTORS IN IMPLEMENTATION OF INTERNATIONAL PROJECTS – APPROACH AND EXPERIENCE

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Introduction

International co-operation and knowledge about different cultures is becoming a necessity in all education these days. One aspect is the consequence of the political development of a European Union, and the wish to create a common European platform. Another aspect is the movement of people, mainly from poorer to richer countries. The result is different cultures mingled in every school class at all levels. The third aspect has existed for a long time, the wish to compare school systems, living conditions, cultures etc. across borders, both to learn from each other and to become more conscious of one's own identity.

Whatever the motivation may be, with the development of the ICT it has become possible to "cross borders" with groups of teachers, students or children without travelling. The intention is to widen the horizon, enhance the knowledge and develop open-minded attitudes towards people from other cultures.

To develop an international project is a process that may be rather painstaking for beginners and indeed also for more experienced planners. To a certain extent you have to learn from your own strivings, but it is perhaps possible to learn from each other. I will therefore contribute with reflections after having participated in different projects at Stavanger University College. The planning period is in my opinion most demanding for a satisfactory result. You meet foreign partners and have to structure a realistic, future work with mutual understanding. The co-operation, communication and process evaluation between the partners are thereafter basic elements during the implementation. You may meet unforeseen problems and have to be open-minded enough to revise parts of the plan. Last, but not least, the final evaluation of both the process and the result is important for the consciousness of what is learned. The international aspect will, however, vary, depending on the kind of project, the target group and the participants as exemplified in the three models presented.

The planning period

Conditions of making a plan

Some institutions are rather eager to support international contact. Supportive interest from leaders of the institution is necessary. Many of the institutions have, however, few possibilities to give financial support. Economic support from European Programs like Socrates or Comenius, has so far, been rather important. Even with getting European money, the institution has to secure half of the cost. Therefore, it is a good guard to have a notion of the economic possibilities at the institution, to know if it has to be a low-cost project or if you can count on some money. The more it is possible to make the project part of the ordinary teaching program, the easier it is to argue for internal direct expenses that will be less then. There are detailed guidelines and pre-set formulas for applications for support from the European network.

The next is to find a team of relevant colleagues in your own institution who want to participate. Most kindergartens, schools or universities still have an organisation meant for traditional teaching (Shoemaker, 1998). Projects may become "personified". Daring persons who start on their own, may at some stage or another feel rather lonely in their projects, being the only contact person. Even with a positive leader, it may cause problems to find place for projects for students or children. A couple of colleagues give possibilities for more flexibility both in project ideas and work load.

Having an idea of what you want to investigate together with colleagues in other countries, you have to find external partners. Then the European Socrates network is rather useful, because you can make an announcement presenting your interests or read others' expressions of interest. (<http://partbase.eupro.se/frameuk.htm>). It is possible to find presented schools of different level on-the

Internet, either for a nation or a region. You may also ask a school authority or a university for relevant addresses, and thereafter apply for contact persons interested in the subject at different institutions. It may seem to be a “blind date” with a possibility for “misses”, but it works.

Communication and planning

Meeting the partners face to face gives the process of planning a flying start. Mutual presentation of the country, the institutions and participants, supports later communication and understanding. It is possible to give a virtual presentation, but spending one or two days together gives the opportunity to correct misunderstood information immediately. Videoconferencing is also a possibility, if the different partners have the means of participating.

It is unnecessary to stress that all details of the project plan have to be analysed and discussed.

Who is going to have the co-ordinating responsibility? What kind of project is realistic? What is the aim of the process? What kind of product is expected? Do you intend to produce learning material? Is it a project where students or children may be included? What kind of equipment do you have or need? What may the contributions be from the different participants? Which activities to choose? How does the time schedule fit in for everyone? How do you communicate during the project period? How to handle problems in the co-operation?

The period of analysis and discussion takes time. The more of the implementation process you foresee and agree upon, the better. The plan has to be written in detail and signed by the participants. It gives a certain guarantee against later misunderstandings. Even then, you may later realise that people from different cultures have different opinions of, for example, teaching. Some may define it as development of understanding, others think of transmission of knowledge. This may be the case when technical staff and teachers in education have to co-operate. The gap between different opinions may be enlarged over national borders.

The project process

Most of us, I believe, have experiences with administration of projects or problem-based teaching. It is evident that the quality of the work is dependant on a realistic plan, the quality of contribution from the partners and communication between them, and to a certain extent available resources.

In one international project the group raised the following self-evaluating questions:

- Was the aim too ambitious compared to resources and interests?
- Did we underestimate the time needed to communicate adequately?
- Was it strength or a weakness that the institutions had different experiences to contribute?
- Was our contract of collaboration too loose?

The whole project was a rather positive one, but the questions gave a hint of some weak points that perhaps could have been improved. Questions of this kind might be relevant in many projects and are therefore included in the following.

Evaluation of the aim

There has to be a coordinator of the project. Even if he/she is a “primas inter pares” it is his or her responsibility to keep in focus the aim, activities and the time schedule agreed upon.

Discussions of aims do not only belong to the planning period. If you are somehow insecure beforehand about what the group can manage to develop together, you are more likely to present the aim in general terms. With several participants it may also lead to fruitful discussions on open aims, because it often leads to different interpretations. Different interpretations have, however, to be clarified. It is therefore necessary to have joint discussions of aims throughout the process. Even in a final meeting it is relevant to raise questions as mentioned above. Systematic evaluations have to be part of the project.

Sufficient time to communicate?

The language question is always there. English is the most used language between partners. In one project a participant said: *“Even a bad English may give good communication.”* The will to understanding was strong, so was the capacity to spur misunderstandings and the language competence developed. It is not always the case. One thing is to understand the words being used; another is the comprehension of meaning. It may be hard to realise that you do not speak about the same reality even if you use the same words as in the mentioned example of associations of “teaching”; is it mainly “development of understanding” or “transmission of knowledge”?

It is a long process to become conscious of cultural differences, and there are different levels of understanding. To understand a school or child-care system you need to know something about a nation’s policy and program, the population, urbanisation and living conditions. The *International Handbook of Child Care Policies and Programs* (Cochran (ed.) 1993, ref. Ingerid Bø, 2001 p.53) presents a model of the factors, influences and responses behind a system for childcare that makes every national system unique. To which depth the mutual understanding has to reach, will vary from project to project.

The above question of perhaps underestimating *“the time needed to communicate adequately”* is a difficult question to answer. How long is “the time needed”? It is, however, important to be conscious of the importance of mutual information and communication. To be conscious of cultural differences and language problems as sources of misunderstanding is always necessary in an international project.

Different competence, strength or weakness?

There is always dynamism between partners in their co-operation. In international projects differences between the partners are greater than in campus projects. Distance adds possibilities for imprecise interpretation; therefore it is necessary to keep an eye on consequences of the diversity during the whole project period. It is not always easy to make your partners understand your possibilities to contribution and what you expect of them, or vice versa.

The co-ordinator has to keep a “watchful eye” to “co-ordinate” the competences in the team. It is difficult to foresee how people work together; therefore again, communication between the partners has to be secured. There has to be agreement about the regularity of communication. The intention of bringing people with different competence together is to enhance the project, but this intention can only be fulfilled through concrete tasks agreed upon.

A too loose contract of collaboration?

This question points to possible weak points in all projects. A time schedule has to show the rhythm of the work, dates for discussions of sections of the project, expected levels of contribution. Often international activities have to be carried out on top of the ordinary job, therefore to a certain extent one has to be liberal. There may be a variety of reasons for being a bit behind with the work.

The reality often shows that project activities will be more intense near to meetings or videoconferences as partners try to fulfil agreed obligations. This is more often the rule than the exception.

There will, however, need to be a limit to sins of omission. Then it is beneficial to have a mutual agreement of how to handle problems of that kind instead of suppressing them. It is fair enough to discuss rules for co-operation. It must also be acceptable to say: “Sorry, I can not manage to contribute due to my current work-load”.

The result

The result is dependant on the intention of the project, the plan and the process. Sometimes the process is regarded as the most important, sometimes the result has to be a defined report or some other kind of product, as can be seen in the following three examples. Even if the aim of the project lies in the project processes, it is important to present the experiences in a written form. You need reflection and discipline to write a systematic presentation. This will enhance the subjective experience and consciousness of the

writers. It also makes the experiences available for colleagues. It is easier to communicate on the project processes and experiences.

Three project models and the international aspect

The models

Three different projects may give a notion of how different aspects of internationalism are dependant on the type of project. These projects were as follows:

- for teachers and children in child care institutions
- for student teachers
- for teachers in teacher education

A project for teachers and children in childcare institutions

One model we examine is in an ongoing project for kindergarten staff with the title “Role Play and Cultural Heritage”. The project is part of the work with the children, and the play activity is part of the project. In this project teachers have a joint yearly meeting, a videoconference and the possibility of a teacher exchange, visiting one other partner institution and receiving visitors from a different partner.

The “knowing each other” is secured through a weekly E-mail portfolio (“weekly update”) of the children’s play, which sometimes includes photos or even videos. Sharing the portfolios both with the staff and the children gives the opportunity of presenting and discussing national differences and pedagogic questions.

The second part of the “cultural heritage” is an agreement about role-play for the children on the topic of fairytales. In the first term every country has chosen a national fairytale. In addition to making it a subject in the playgroup, the fairytale and role-play are recorded in the “weekly update” e-mail message. In the next term participants have to let the children dramatise a well-known fairytale, the same one in all countries, i.e., “The three goats”. Throughout the whole work the inclusion of all children regardless of nationality or social background is part of the pedagogical philosophy.

The project could stop with that, but in this case an online learning module about “Play” will become a subject in the staff group to give the work a more theoretical perspective as well. The “Play” module is created in an earlier international project (<http://odl2.wit.ie>). Throughout the project the processes in the children and staff groups will be regarded as more important than a final report.

A project for student teachers

A simpler model for a project is examined next, where teachers let students form an international group, give them the challenge of discussing an international problem via E-mail and ask them to present a pedagogically based conclusion. The teachers plan and set the framework for the project, including a main topic. The target group is the student teachers that have to form their own problem derived from the main topic. Meeting each other before the start is almost a “must”. Clarification of background, analysis of possible interpretations of the problem and the rules of communication are important elements in the students’ planning and work. Supervision of the students has, however, to be part of the plan.

These two projects could be accomplished through E-mail contact alone, but are evidently enhanced through supplementary meetings. It is possible to gain a deeper mutual understanding in discussions a couple of days than E-conversations a couple of hours.

A project for teachers in teacher education

The project between universities for teacher education is more ambitious and complex and needs economic support. The main intention of the project is the promotion of social inclusion. The more practical product is to develop an online course on the theme of social inclusion, to be used in different

countries. Besides, the project will give a report on the use of a virtual learning environment. Shortly the work is to be presented like this:

- a) By exploiting the functionality of a Virtual Learning Environment we hope to develop a course that is very collaborative in nature, incorporating elements of action research.
- b) The course content will take the shape of a series of documents within the Virtual Learning Environment. These documents will consist of a variety of text files, multimedia files and web pages.
- c) More importantly we will use the discussion forums and assessment instruments available within the Virtual Learning Environment to encourage interactive teaching approaches.

The learning material (an online course) may be organised in two levels, an undergraduate one and a graduate level.

It is evident that in this project the institutions need educational scientists, technical expertise and a defined standard for the technical equipment. Some institutions have the technical expertise and some others represent the pedagogical expertise, and these two groups have to co-operate.

The international aspect

These three projects represent three different levels of complexity, but have the international aspect as part of the aim.

The kindergarten project aims at bringing different experiences to one another. This will give an impetus to discuss cultural differences and similarities both in the classes and the staff groups. In addition they all have children from other nations inside and outside Europe, and they hope to share experiences of successful ways of including these children.

The model of the students' communication on a particular problem makes them clarify and state the reason for different views, so as to be able to give a joint presentation. The comparative, international element lies both in the problem presented and the process of the project.

In the third model the discussions on specific topics, to be presented in a module later used in different countries, have to be rather demanding and precise. To contribute to a module that in next turn can qualify staff for this task of "Social inclusion", one has to take into account how varied living conditions and social settings are in different populations.

Later, the subject-matter has to be presented through virtual means. This brings in a need for technical expertise. Educational ideas and technical possibilities have to be coordinated in a way that is effective and functional for the target audience and is a further challenge for both teachers and technicians.

Summary

These projects are different but need the common elements of mutual understanding and agreement on the aim and subject-matter, grouping of persons, assessment of resources, workload and realistic time-schedules. They intend to contribute to international understanding and acceptance in groups from pre-school children to students and teachers. The kindergarten and student projects also include intentions of developing competence to handle migration questions, a task that all kind of teachers meets today.

At one level you may widen your horizon by getting information about another culture, sharing experiences with international colleagues or visiting foreign institutions.

At another level you will be forced to widen this understanding in co-operation in a joint task or activity with international colleagues.

At a third level you have to do all this, and go further in mutual discussions to get a deeper understanding of similarities and differences so as to be able to develop a teaching programme which can be useful in pre-service or in-service courses for teachers.

The means of technical communication allow for information and communication possibilities that have earlier not been imagined. The competence of exploiting these means, combined with pedagogical and scientific knowledge, strengthens the internationalisation processes, even if virtual impressions can never replace direct experiences. The use of ICT, however, enhances the processes of understanding and communication in all projects.

Whether we plan smaller or larger projects, in an international context, the most important thing is to realise that there is no single answer to creating more acceptance or understanding, but it always requires will, work and communication possibilities.

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A NEW APPROACH TO BRING SPECIALISED TRAINING TO INTERNATIONAL STANDARDS

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Introduction

With occasion of an EC TEMPUS-TACIS project named SILKTOUR1, the Vrije Universiteit Brussel together with its project partners ESTB and Kazsuirwl started by the end of 1999 the challenging enterprise of creating and developing their own educational electronic platform for new curriculum design application and student learning interaction to be applied through the development of a postgraduate master program in the Republic of Kazakhstan.

A large number of distance learning programmes are aimed at upgrading subject-expertise of lecturing staff and designing new- and/or adapting existing curricula towards more professional/interdisciplinary skills areas focusing upon internationally recognized standards. However, few contain components that allow university to revise electronically curricula, teaching and learning formats at the same time. Whereas educational institutions cannot avoid the question of what results are produced at the level of learning process in the student which is at the core of both learning and teaching strategies, the design of this platform has positive implications for the course-design process and curriculum-planning methodology which is in function of the student learning needs.

The purpose of this article is therefore to describe the curriculum-design methodology and design process approach that has been applied during these last three years even though analysing the student learning outcome with a number of verification tools is a step still to be undertaken. The design hereby presented represents a complementary and strengthening support for the application of educative models that can be applied worldwide while respecting the national norms and regulations of the applicable institution.

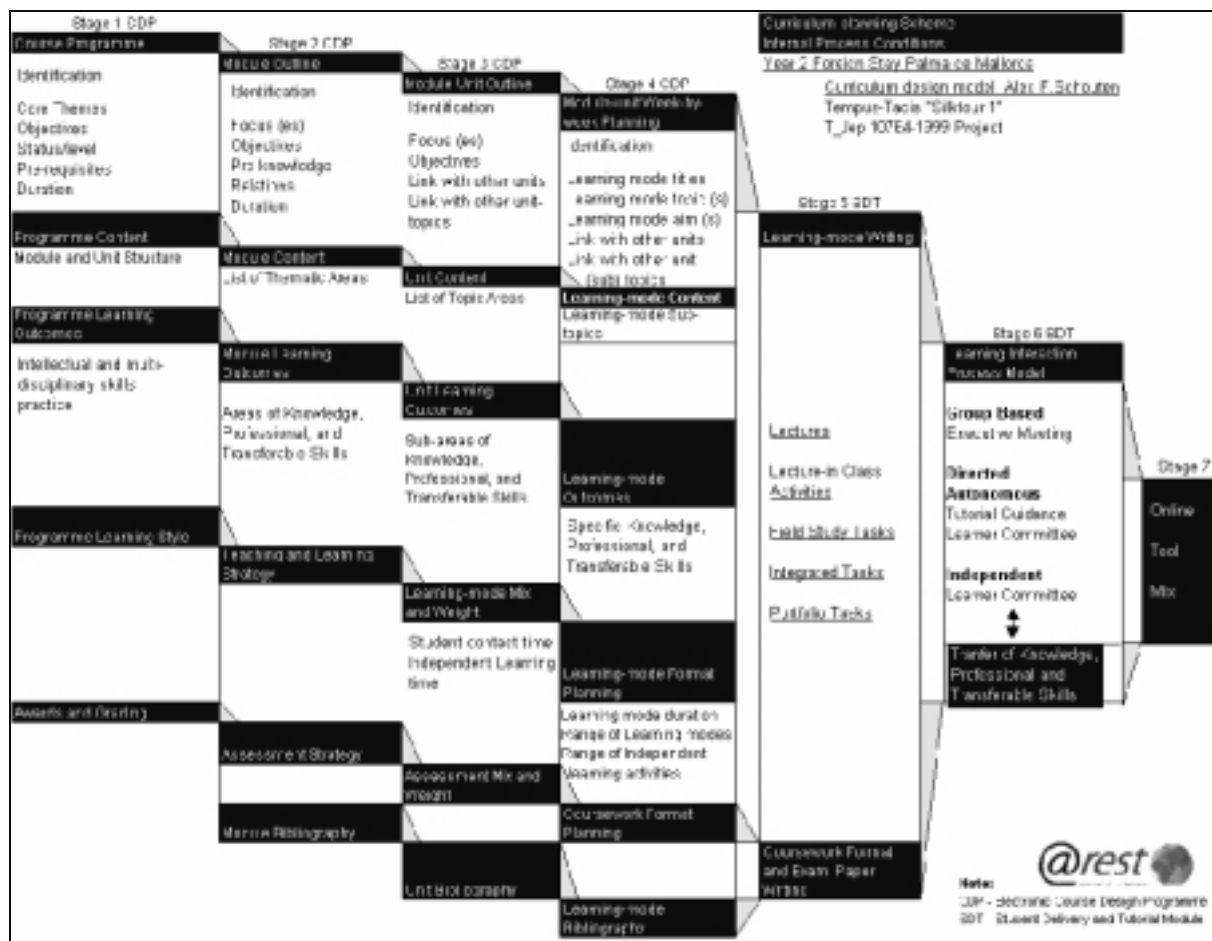
It is our hope that this article will shed some light on the importance of the proposed curriculum-design model and its electronic implementation. The model and approach allow course designers carefully to examine and reflect upon their actions as a range of pre-established internal and/or external process conditions and provide them with tools that help explore and develop learning content in a meaningful and holistic way on both teachers and learners.

Curriculum design: structure and process

The curriculum-design scheme

The curriculum-design scheme implemented distinguished seven interrelated stages, four of which focus upon curriculum planning from macro-towards-micro level and vice-versa (stage 1 – course programme; stage 2 – module outline; stage 3 – module-unit outline and stage 4 – module-unit week-by-week planning). However, the final three stages (stage 5 – learning mode writing, stage 6 – learning interaction model and stage 7 – online tool mix) consider the micro-teaching/training level. The process outcome of the final three stages of the model is used as input for the electronic student delivery and tutorial module (SDT). The seven stages of the proposed design scheme are closely interrelated at each planning level and curriculum design decisions for one stage of the scheme have their effects on the next and vice-versa

Table 1. Stages of the curriculum-design model



The curriculum-planning scheme defined above revolves around five broad internal process conditions, which are identical for each curriculum planning stage and are designed to shape the curriculum design process and outcome of individual designers and as a team. The conditions also invite designers to integrate their process outcomes in an interdisciplinary or holistic resultant.

The five broad internal process conditions are the following: identification, content, learning outcomes, teaching and learning and assessment. In the curriculum-planning scheme the internal process conditions reflect the notion of "the structured style of leading". On the other hand, each of the five broad internal process conditions are subdivided into smaller elements or range of parameters for each lower planning stage and are designed to guide the designer and team of designers to be more specific and more precise in the planning process and curriculum writing.

Besides horizontal inter-relations between the seven planning stages, there is also a very strong integration among the five broad process conditions within each individual planning level. As the process outcome is the centre of a curriculum design process and streamlined by the five broad- and sub-process conditions designers not only examine curriculum issues from an individual subject-, but also from a holistic point of view and, therefore, have to take more responsibility for the process outcome as a whole.

While progressing through the design stages of the curriculum-planning scheme new curriculum issues and situations have to be encountered. Specific process outcomes are produced at each planning stage and the sum of the all the specific process outcomes make up the curriculum in our case of the master's degree programme.

The same design-process approach has been applied to stage five and six i.e. - learning-mode writing and learning interaction process model. The choice of the most adequate on-line tool-mix (stage 7) is considered as a logical consequence of stage 5 and 6. Stage 5 and 6 reflect the idea of "to a more self-directed and individualised approach and practice" as most curriculum-planning issues have been

planned and decided on in previous stages, verified forwards, backwards, downwards and upwards individually and as a team.

As the final three stages aim at the future transfer of planned curriculum into student learning and acquisition, therefore, designers work much more individually, writing the detailed learning mode formats, deciding on the interaction process, planning the on-line tool mix or combine them with face-to-face group or individual student contact time. After implementing the newly planned master's programme with real students the level of knowledge and skills acquisition or the student learning process outcome can be verified by appraising the quality of the produced assessed coursework elements, individual unit exams, dissertation papers etc, and the process outcomes of the broad and sub-internal process conditions stage of the designed curriculum can be continuously reviewed.

The process of the curriculum-design model

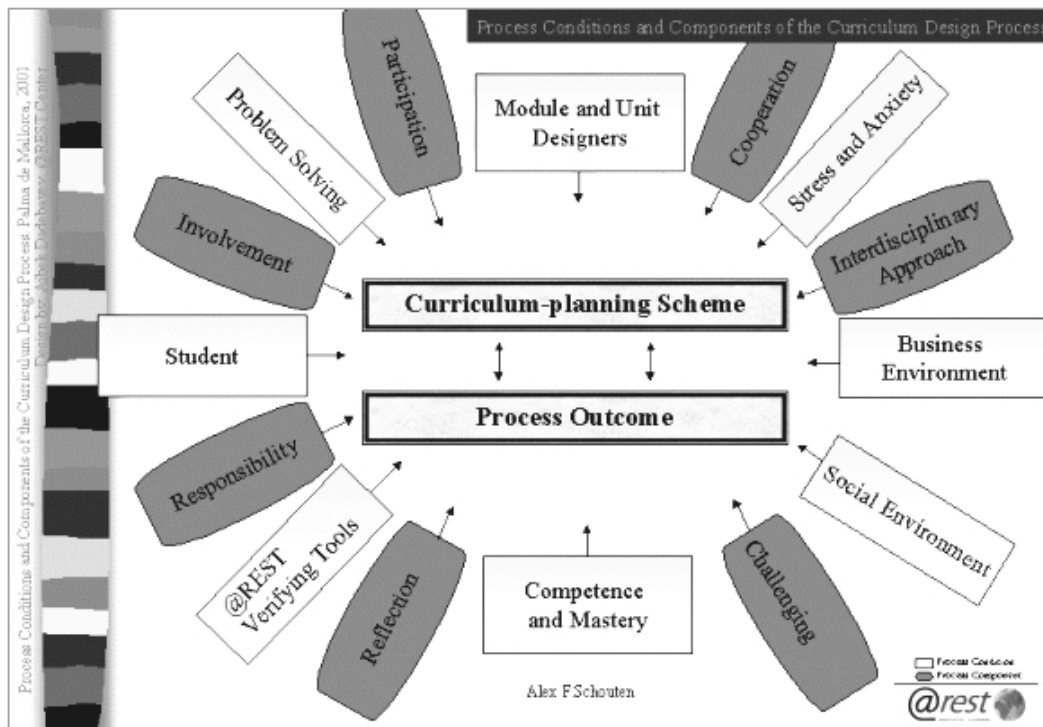
The curriculum-design model hereby elaborated focuses upon a range of external process conditions and components which influence the internal curriculum conditions and, consequently, the curriculum design process outcome (see table 1). Any internal curriculum condition in the model refers to those process components which conduct the individual or team of designers from one curriculum planning stage to the other and have been integrated in a curriculum-design scheme, which is found in the core of the model. External process conditions and components are those elements which influence the interaction process of individual designer or team of designers initiated by the internal curriculum conditions and strongly effect the quality of the desired design process outcome.

The design-process approach underlying the curriculum-planning scheme is inspired by a humanistic education methodology approach. The notion that "individuals progressively move from a structured style of leading to a more self-directed, individualised approach within a non-threatening environment" is represented in the curriculum-design scheme and its different design levels by its pre-established internal process conditions.

The "non-threatening environmental context" along the curriculum development within the SILKTOUR1 project goals is reflected by creating a close interaction between train-the trainers and future instructors. For example, during the first two years of the project two foreign stays took place both in Belgium and Spain for a period of six months each. In Palma de Mallorca, by using a specific-purpose built room fully-equipped with the latest info-technology and printing facilities connected to a separate server for testing purposes of the electronic Course Development Programme, every designer from Kazakhstan could work on his/her own station with no differences in role. He or she can be a module co-ordinator, but at the same time, be an assistant or unit leader in another module.

The team of designers was led by a weekly course-committee meeting consisting of four individual module co-ordinators who act as chairs of a team of six module-unit leaders; a team manager for practical organisational issues and the course-design manager acting as chair of the weekly course-committee executive meetings. The minutes produced by the weekly executive meetings identify curriculum issues presented by the four module co-ordinators, offering solutions and or improvements together with an action plan and responsibilities that were verified at the next course-committee meeting. Module co-ordinators arranged and planned their own learning meetings to discuss identified design issues, cause other members to reflect upon improvements, and have feedback from their module-unit team members. In the learning committees, members had the opportunity to exchange opinions, share expertise and experiences and, so positively influence the quality of design, and group- and individual learning.

Table 2 The curriculum-design process model



Evaluating the outcomes after the foreign stay we can reflect on the words of one of the designers in Palma before their departure: “I’ve found it useful to discover inconsistencies in planning; I enjoy the process but the problem-solving required was very hard at the beginning, but it helps eventually; What I’ve learned, I will apply to the under-graduate programme; I’ve improved a lot, I know more than 20 research techniques; Working in planning my unit, it gradually turned into a challenge; my background is not economics and it caused me a lot of problems in designing my unit. I read much and compared different methods used in my training now and before. I have had a lot of stress because I had no experience in design, but I have improved the quality of design. The verifying tools improved the quality of my work, in particular the work process.”

Project outcome: distance learning student oriented education

The fundamental implications of the curriculum-design model lays on the possibility of being transmitted through new technologies. The final aim is to satisfy the student learning needs regardless the form of education. Instead of a mono-direction in the transmission of knowledge, whether through traditional methods or only new technologies, our main concern is to be able to ascribe through the implementation of the course some knowledge to the student as the result of his/her activities during the sessions within the proposed environment.

A second and essential element of the curriculum development design is the adequacy of the model to be adapted to different backgrounds in the field of education. For example, Kazakh cultural roots put the emphasis in an oral tradition which also affect interaction in distance education. The transition from a traditional educational system based on patronage and memorization to one that requires no human support and less memorization is a challenge for future Kazakh distance learners. The explicit aim of this system is to allow teachers and students (i.e. end-users) to perform efficiently as the result of their interaction with physical devices, in our case computers.

Implications of the cultural context for interaction in distance education reside primarily in the process of design and development. The graph designed below illustrates this process. In brief, when applying the model to distance learning materials, the instructional designer first asks a variety of questions about the need, learners, task, and available resources. The cultural context frames the designer's responses to these questions. Based on the responses, the designer makes decisions about design and delivery of the instruction. At the design stage, the designer defines the learning objectives, determines the instructional

sequence and structure, and decides on the teaching strategies. Delivery issues include the technologies to deliver the instruction. Due to recent on-line technologies all this processes can be verified transnationally, in our case from Europe, bringing curriculum design to international standards which enhances a further recognition and accreditation.

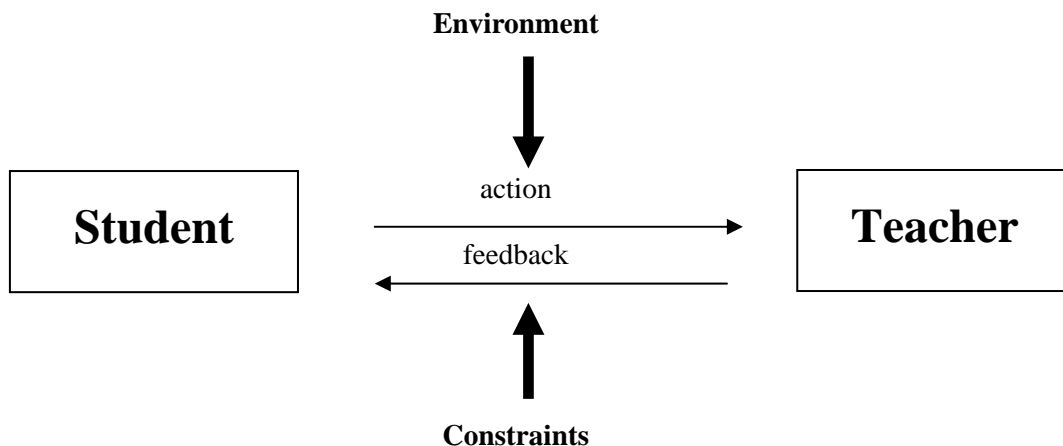
Table 3: Model of cultural influences on interaction in distance education

Cultural context	influences responses to: →	What is the need? Who are the learners? What is the task? What are the resources?	to decide: →	Design - objectives - sequence - strategies - evaluation Delivery - technologies	to verify: ←	International context
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Although the project runs in its later phase and no results are provided concerning the level of student satisfaction, drop-outs or student mark-rates, the integrative educational platform addresses both teachers and students in developing their teaching strategies using the different methodological tools available, on-line, off-line, synchronous, asynchronous, etc. Some e-learning and distance programmes are solely content-interactive in nature. They are a one-way communication with a subject expert in a specific field, with the purpose of helping learners or students in their study. This is nothing more than an extension of traditional teaching methods (face-to-face). The instructor makes a presentation, a demonstration of certain knowledge or skill that is memorized by the student. However, the learning outcome in the long-term is to become low.

Other programmes are more bi-directional with a closer interaction between instructor and student. This is regarded as essential by many educators. The instructional model presented pursues as well this objective. Through this platform, the goal is that the instructor is especially valuable in responding to the students' application of knowledge. Whatever students can do alone for self-motivation and interaction with the subject presented by the teacher, they are vulnerable in many cases at the point of application. They might not know enough about the subject to be sure that they are applying it correctly, or they are not aware enough of all the potential areas of application, for example. Indeed, knowledge cannot be reduced to the learning of a text since students have to be active constructors of meaning interacting not only with instructors but also between them (e.g. through workshops, chat, etc.).

In this sense, knowledge can be characterized by the dynamical equilibrium of the loop action and feedback of interactions between students and professors within an specific milieu in the context of certain constraints. When the interaction between instructor-machine-learner is shown as an adequate one, a positive learning outcome is reached for learning is a dynamic process.



In this scheme, we identify environment not with the whole ‘exterior’ factors that affect the interaction teacher-learner but with the part that relates to the distance learning environment. The ultimate objective of this environment is to give some state of equilibrium to the interaction instructor-learner so that the individual receives some piece of knowledge. We intend to follow the rationale that for any student learning needs, there is a learning process and a learning outcome. When this is attained, the system can be validated.

However, there are a number of constraints, in particular during the teaching and learning process that determine the outcome of the interaction. In the case of any instructional electronic platform the environment is provided by a technological device and some of the constraints may stem from the interaction with its interface. The way the student understands and interpret the interface is likely to play an essential role. Other constraints are endogenous such as cognition capability or skills of the individual that nevertheless are to be considered as well.

Many other questions can be related to the management of this interaction, others to the development of the interaction, to the teaching process, to the teaching outcomes. But answering these questions means, in our case, that one has clear that the ‘ student learning outcome’ is the final stake of any educational system, and consequently of the platform proposed. Therefore, combining traditional methods with new on-line approaches serves to introduce students from developing regions to new forms of education while maintaining their cultural environment and approach to education.

Conclusions

The internal curriculum process conditions are significantly influenced by a series of external process conditions and components as described in table 2. Process conditions i.e. designers, competence and mastery, the business environment, quality-verifying tools, stress and anxiety, social environment, future students, problem-solving approaches heavily affect the process outcome of the internal curriculum conditions of the curriculum planning scheme. On the other hand, process components such as participation, co-operation, interdisciplinary approach, challenge, reflection and responsibility either influence positively or negatively the external process- and the internal curriculum process conditions and the overall process outcome. It is this interaction process that causes whether a specific process outcome of a curriculum planning stage achieves the level of adequate quality. Differences in quality of process outcome per planning stage have been observed. However, the evidence produced by the internal curriculum conditions can be verified objectively and feedback or suggestions for improvement can be given by the module co-ordinator or by any other team members. Undoubtedly, the designers in Brussels and Palma became much more aware of their weaker areas such as subject expertise, level of responsibility, designed content, and level of co-operation within a team shifting from an individual working approach towards acting as a leader when needed.

The mix of internal and external curriculum process conditions has positively influenced the process outcome. Not only has it led to much reflection, but it has also given rise to high levels of interaction and exchange of experiences and, therefore, to higher levels of quality in process outcome.

Although the design team is still working on the last stages of the curriculum model and a number of process outcomes are still under revision or have to be produced, the intermediate outcomes of the project already confirm good levels of design quality which need to be tested both on teachers and students in the months to come.

STAYING THE COURSE: RETENTION AND PARTICIPATION IN ON-LINE LEARNING IN SINGAPORE AND THE UK

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Abstract

In 2001 the Singapore Institute of Management (SIM) in collaboration with the British Open University (OU) ran a successful presentation of the Level 1 Technology Course 'You, Your Computer and the Net'. The 30 point foundation level course was delivered to 9,000 students in 13 UK regions and simultaneously to a cohort of 200 students in Singapore. One of the striking factors about the results of this course was the difference in retention and ultimately the final pass rates of the two cohorts of students. This paper will describe the course and its delivery in the two countries, attempting to offer some explanations for this discrepancy in drop out rates using a cross cultural perspective.

Description of T171/TZS171

The course consisted of three modules: Module 1 - 'You: computing with confidence' aimed to introduce beginners to the 'wired world' and help develop the practical skills (word-processing and other office applications, web-browsing, email and conferencing) needed to work confidently within it. Module 2 'Your computer: the story of the PC' told the story of how the personal computer came to be one of the defining technologies of our age. It took a narrative approach to explaining how a PC works and the development of the PC industry. Module 3 'The Net: where it comes from and how it works' again took a narrative approach covering the evolution of the Internet from its origins in the inter-war years through to the explosive growth of the World Wide Web in the 1990s.

The course was not specifically designed for an international target group but in common with other OU teaching material was aimed at a wide audience of mature students who were returning to learning and studying. While it is true that "the design of software systems designed to support group activities is "often based on the customs of the particular culture in which it was developed"" (Collis 1999), T171 was designed, as OU courses all are, to ensure that all aspects of the course material including the tutor group activities did not provide any unintentional cultural barriers to students inside or outside the UK.

T171 was designed to be delivered primarily in an online environment. Each student is allocated to a tutor in their own region to whom they can turn for support and advice. For tutors of first year students their role includes not only academic tuition but also a wider role as 'tutor counsellor' offering students support in areas of study skills, additional tuition where necessary and personal counselling if required. Students allocated to the same tutor become part of a tutor group who in traditional Open University courses will meet at monthly face to face tutorials. In T171 these Tutor Groups are virtual and students meet using the First Class conferencing system. However, most regions organise an initial introductory meeting to enable students to meet their tutors before the course begins. Throughout the course material there are activities and exercises that require the students to work together using the First Class conference. In some of the activities they form small groups or teams for collaborative working, in others they use the online forum for discussions and clarification of issues related to the course materials. All assignments including the final End of Course Assessment (ECA) are submitted electronically.

What were the difference in results?

The retention and completion rate for Singapore students was considerably higher than for UK students. Of the total percentage of those registered at the start of the T171 course, only 41% completed and passed the whole course (39% of male and 44% of female students). This consists mainly of those who withdrew from the course - only a very small percentage of those who completed the course actually 'failed' as a

consequence of poor course assessments or exam results. In contrast 73% of the TZS171 students who registered for the course completed it and passed. (see Table 1) ¹

Table 1: Comparison of results of TZS171 and T171 students 2001

	Started	Passed ⁽¹⁾	Passed ⁽²⁾	Exam ⁽³⁾
T171 2001 ALL STUDENTS				
Total	11519	41	49	96
New	8435	39	48	95
Continuing	3084	45	51	96
TZS171 2001 ALL STUDENTS				
Total	213	73	73	95
New	209	73	73	95
Continuing	4	75	75	100

As part of the cohort of students on T171, 589 were not resident in Britain and therefore may have differed slightly in their experience of the usual tutor support model outlined above. These include those living in and outside the EU (including those in the armed forces) who are supported by British based tutors and those in the Republic of Ireland who have their own local tutors. However the delivery of the course remained substantially the same as for students in the UK with one or often no face to face tutorial.

Table 2: Non UK students performance on T171 2001

	Started	Passed ⁽¹⁾	Passed ⁽²⁾	Exam ⁽³⁾
NON-UK REGIONS				
European Union	222	50	59	96
Republic of Ireland	240	53	62	97
Outside European Union	11	45	56	100
BFPO	116	40	48	96
Total Non-UK	589	49	58	96

Structural differences in the delivery of TZS171

More face to face tutorials

While the content of the Singapore presentation of the course was entirely the same as that presented in Britain, the way in which the tutorials were organised differed, and may be one of the factors responsible for the lower withdrawal rates. The Singapore course

"had the one Introductory Lecture (for all the students). This was followed by 4 face-to-face tutorials which were arranged for the individual TGs. They were scheduled to help set the scene for the 3 modules and provide help to students in attempting the assignments and project." (Moorthy, 2002)

¹ ⁽¹⁾ Percentage of students in each category who passed the course based on the number of students starting the course.

⁽²⁾ Percentage of students in each category who passed the course based on the number of students still registered one third of the way through the course

⁽³⁾ Percentage of students in each category who passed the course based on the number of students who sat the exam/assessment.

The face to face tutorials were often mentioned and referred to within the on-line tutor group conferences by students and tutors indicating that these were seen as an integral part of the course delivery.

Separate conferences and Notice Boards

All T171 students have access to a set of computer conferences which provide information updates from the course team as well as the opportunity to discuss issues with other students outside of their own tutor group. The Singapore students were set up with an identical set of conferences which meant that initially they could communicate with each other but did not have contact with the UK students. About halfway through course, following requests from several students, all the SIM students were given access to a regional UK conference - however only a small number of them ended up participating in these discussions.

“it would be very interesting, exciting, rewarding and challenging to understand more from our peers over at UK how they would learn this module. It would really be very fun to be able to communicate with UK students and to participate in their cafe conferencing.”

Shook Han Low

“I did manage to get onto the chatroom and found it to be an enriching experience being able to chat with students doing the same course in different parts of the world.”

Wei P. Wong

Academic intentions

All students on the TZS171 course were expected to register as part of a named degree course programme, either BSc (Hons) IT and Computing or BA (Hons) Business Studies and were also studying another Maths Level 1 course - MSZS121. In contrast, less than 70% of British students stated their intention was to gain a named degree, and half of these were aiming for a wide range of degrees other than the BSc (Hons) IT and Computing. Feedback from students suggested a lower commitment to gaining a qualification may have been responsible for the increased 'drop out' rate.

About halfway through the T171 course it was noticed that some students had stopped participating in the tutor group conferences as the course progressed and failed to submit later assignments although had not formally withdrawn from the course. UK tutors were asked to contact these students and find out about their plans for continuing their studies. Anecdotal evidence from these tutors suggested that many students were studying the course for interest rather than the credit points and that many only really wanted the skills developed in the first Module. This was confirmed to some extent by the IET end of Course survey for 1999 (sample 400 - 194 respondents) pilot and 2000 (sample size 231 - 128 respondents) which revealed that 78% (1999) of respondents gave their reasons for taking T171 as 'to develop their subject interest' and 28.9%(2000) were 'not bothered about getting the credit points'.

Cultural differences

So far I have suggested that structural differences in the delivery of the course may have had some impact on the retention and subsequent pass rates of SIM students. However it is worth considering additional cultural factors which could have contributed to this differential and which would be interesting for further study. Using the Technology Acceptance Model (TAM) proposed by Davis (1986, 1989) and Hofstede's model of national cultural variation (Hofstede 1991), Veiga et al predict that "the likelihood of technology acceptance will be influenced by an individual's culturally induced belief system" (Veiga, 2001). Five dimensions of cultural variation (power distance, uncertainty avoidance, individualism, masculinity and long-term orientation) are used to analyse different national cultures and their implications for IT acceptance and implementation. Singapore culture can be seen communitarian rather than individualistic, with a strong authoritarian tradition of control and regulation that might inhibit the acceptance of technological change but "Singapore's small size, excellent telecommunications infrastructure, well-educated populace and societal proficiency in English all bode well for its effort to become an 'intelligent island'" (Warschauer 2001). More specifically there are three areas in which cultural differences may have had an effect on the differential retention rates of students.

Motivation or 'kiasu'

While retention of students is a high priority within the Open University and tutors are expected to support and encourage students to continue their studies, the ethos of the Open University is very much on self directed learning responding to the individual motivation and needs of students rather than any external expectations or pressures, which extends to respecting their 'right' to withdraw from a course at any point during its duration. Chen (1999) has identified the Singaporean concept of 'kiasu' or fear of failure as an important factor in motivating students by causing them to over-compensate in order to achieve higher examination grades to the extent that "students from Singapore being ... kiasu (ie afraid if doing badly or losing out) showed more anxiety in not achieving their intended goals" (Chen 1999). This difference in perception of what it means to withdraw from a course may be crucial in understanding the differential retention statistics outlined earlier.

Attitudes towards education

Traditional Singaporean education has an excellent track record of producing students who score highly in international test results in mathematics and science subjects, but there has been increasing concern that the system relies too heavily on rote learning of facts with not enough emphasis on "thinking and leadership skills needed for scientific and entrepreneurial leadership" (Warschauer 2001). This has led to the launch of the "Thinking Schools, Learning Nation" initiative in 1997, a policy designed to "enhance information technology (IT) provision and emphasise learning/teaching through the use of IT and an emphasis on developing critical and creative thinking" (Chen 1999). However the legacy of the existing system means that adult T171 students would have been through their education with a "strong teacher led culture" (Chen 1999) where there is "a strong emphasis on order, discipline and uniformity" (Warschauer 2001). This again could have an effect on retention rates with students feeling reluctant to disappoint or act disrespectfully towards their tutors by dropping out of the course before completion. Moreover, since three-quarters of the Singaporean population is culturally Chinese in origin (Chen 1999) - and this is reflected in the T171 student population - it is worth considering the conclusion of a comparative study of British and Chinese students by Jin et al (Jin 1998) who found that "In terms of what characterises a good student, Chinese respondents were significantly more impressed than British students by students who respect the teacher, study independently, develop a good character, answer the teacher's questions, ask questions during and after class, and prepare for the class in advance. The British students in contrast saw a good student as someone who learns from others and pays attention to the teacher" (Jin 1998).

Previous educational attainment

While Internet usage figures have soared in Britain over the past two years, many of those who registered for the T171 course were new to computers and the Internet and when they registered in mid 2000. Furthermore, only 25% of T171 students had high level of previous educational achievement whereas all the Singaporean students had a professional or graduate qualification. Finally, Singapore is "known to have one of the highest density of Internet users in the world and boasts the biggest number of Internet messages and chat groups" (Teo, 1997) and although there is no data available on relative ICT skill levels of students who registered for the course it is possible this may have had some impact on the results.

Conclusion

For institutions thinking about implementing an international model of distance education there are a wide range of factors that should be considered which could alter the outcome and success of a learning programme. In the case outlined above, the Singapore cohort of students achieved relatively better results than their UK counterparts, the reasons for which are not entirely clear and require further research. What is clear however is that cultural and educational norms within partner countries can make a considerable difference to the acceptance and success of a course that in all other respects is structured and delivered in the same way.

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ON-LINE LEARNING: CROSSING BOUNDARIES

A MEXICAN-UK COMPARATIVE CASE STUDY ANALYSIS

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Introduction

Although e-learning has been an important topic within education and training for more than a decade, it is probably fair to say that the development of this style of learning is still evolving. Within the UK for example, a debate still flourishes on whether electronically-based education will enhance student learning and be more cost effective for institutions or pose a risk in both financial and pedagogic terms (Bacsich & Ash, 1999, Sloman, 2001). As Collis (2001) points out, regarding the implementation and effects of ICTs, a variety of differing views and opinions have emerged. One end of the spectrum perceives ICTs as “really changing education”, while there is an opposite view that ICT has “little effect”. But what is the opinion of those most affected by this revolution namely the learners? And how can such information be used to inform and support international cooperation in allowing full maturity of the e-learning industry to evolve?

Using data from two research projects, one carried out in the UK and one in Mexico, this paper focuses upon four elements that most affect the learner experience and need to be taken into consideration when developing e-learning courses, namely:

1. Strengths and weaknesses of e-learning courses
2. Instructor and student interaction
3. Different models of learning delivery
4. Experience of team teaching

It will evaluate information elicited from the learner perspective from these two different projects. This comparison will add to the already developing vision of what is possible in terms of the development of electronically delivered learning, identify strengths and weakness in differing approaches and suggest a way forward that combines the best of both approaches for the benefit of learners.

Background

The concept of ‘e-learning’ suffers from the fact that it has numerous definitions and interpretations. Deciding upon which definition fully encapsulates the concept is not an easy task. At a basic level it can be defined as the use of technology to delivery or support learning. E-learning bridges distance, but goes beyond anything that conventional distance learning offers (e.g. through correspondence or CD ROM courses). For Rosenberg (2001) it is based upon three fundamental criteria:

1. It is networked, capable of instant updating, storage/retrieval, distribution and sharing of instruction and information
2. It is delivered to the end-user via a computer – using standard internet technology
3. It focuses on the broadest view of learning – learning solutions that go beyond the traditional paradigm of training

This definition appears to be endorsed by others (McFaddean & McKenzie 2001; Salmon & Giles 1998) who describe the learning through computer-mediated communication (CMC) as the transmission or reception of information through a networked computer system using Web-based or collaborative software.

Collaborative learning occurs when learners use this technology to interact with each other and course instructors, and to gain access to a wide variety of resources. It is the potential it offers for learners to work collaboratively and in accessing an almost infinite, reconfigurable and constantly updated information source, perhaps structured around a core course delivered by instructor/facilitators, that constitutes the major strength of e-learning. However, when developing electronically delivered courses, tapping into the learner experience to gain an understanding of the weaknesses must be given equal consideration as the strengths (Bruffee, 1999).

Strengths and weaknesses of virtual learning

There is a perception that the use of ICT in education will be of benefit in higher education and management and development alike. However good use of ICTs is failing to occur because of a lack of comprehensive policies and strategies. Courses run using ICTs tend to manifest as isolated experiments and pockets of good practice and are often not part of a whole university based plan (Collis, 2001). Literature on the subject (Meredith & Francis, 2001, Bates, 1995, Ryan, 2002) suggest the following as major strengths and weaknesses.

Strengths	Weaknesses
Knowledge Generation: The instructor becomes a facilitator in the educational process. The learner takes on responsibility to retrieve information and knowledge and use facilitator's guidance in a meaningful way.	Work overload occurs on part of students in having to access information themselves and through working more independently.
Collaborative learning: The learners develop together original thought as they build their own knowledge and meaning.	Time restrictions , culture differences and other difficulties have been found when distance students need to engage in collaborative learning with distance partners.
Customised approach which focuses learning and administration on student rather than curriculum, instructor, and institutional needs (student centred approach).	Inequality of learning experience: Current lack of institutional vision-and policy for the integration of ICTs into teaching programmes can cause discrepancies in quality of courses.
Strengthens the relationship between learning, work, leisure, professional and personal development of the student.	Work based courses can give rise to conflict between employee role and learner role and division of time.
Global competition over course production and delivery encourages Universities to produce higher quality learning and focus more on student requirements.	Global competition poses a threat to institutions unwilling or unable to participate in the e-learning revolution.
New educational markets that will cut across age groups and national boundaries in line with life-long learning.	Traditional universities – by nature collegial and zealous defenders of their culture and traditions – not taking sufficient account of changing nature of student body and flexibility of learning they now demand, may find themselves marginalised.

Instructors and students interaction

Perhaps the most important factor that e-learning has brought to instructor – student relationship is the level of flexibility of interaction and communication. Instructors are freed from both time and geographic constraint and are able to contact students whenever they wish, from wherever they wish, answer

questions and even mark and give results of assignments. For the students, the possibility of accessing the instructor through e-mail or other asynchronous software allows them to organize their time schedule. Learners can save communications, forward messages to other students, contact and communicate with the instructor when he/she is away. Distance and time are rapidly becoming irrelevant in the teaching process and hence no longer a barrier to the learner or the instructor.

Different Models of learning delivery – computer conferencing versus website

Online learning could be delivered through the use of different course authoring tools, such as WebCT or Blackboard or in combination of other computer-mediated technologies, such as computer conferencing (Palloff & Pratt, 2001). Computer conferencing facilitates the development of a time- and location-independent learning environment that with the use of images and sound may simulate educational interactions, both cognitive and affective, that occur on-campus. Harasim (1990) underlines that computer conferencing has found important practical application in education, including delivery of university and graduate credit courses. Computer conferencing was first employed for educational delivery in 1982. Questions are still being asked about the validity of fully on-line courses and some discussion is now focused on the ‘blended’ approach, whereby the use of technologies is balanced with a certain level of face-to-face.

Experience of team teaching

Johns (1996) underlines the importance for “new model universities” to operate in a variety of partnerships. In fact one of the key differences between traditional modes of teaching and virtual ones, is the fact that a virtual (online) lecture is produced by a team. This team is formed by a group of people who are in charge of the different elements to design an electronic course, such as the instructor, the website designer, the instructional designer, etc. By doing team teaching, the instructor is not longer the ‘knowledge holder’ as he/she shares this knowledge not only with the team but also with the learners.

Students and instructors use of the Internet for virtual learning

The access and use of the Internet that e-learning provides represents for the learner a possibility of interaction with different sorts of activities provided by the website. Groups come together outside the university environment and share workplace tools. Furthermore, the Internet provides learners with different sorts of software and different source of information that facilitates the course enrichment and the interaction with distance colleagues.

As Harasim suggests, apart from enhancing and expanding educational access, “computer-mediated communications suggest significant potential for effective new learning and research interactions”. (Harasim, 1994).

Students may connect, using the Internet, with experts in their field of study, other universities, and learning communities, or discussion groups that have form around interest in the area under study. As they do this, their ability to use these skills while working in other course areas also increases. (Palloff & Pratt 2001).

Empirical evidence

The Mexican experience

Research was carried on in Mexico at the Monterrey Institute of Technologies (ITESM) during August - November 2000, and October 2001. The ITESM is a Mexican private university with 30 campuses in Mexico and 9 other countries in Latin America. Founded in 1943 by a group of Mexican entrepreneurs, computers were incorporated in their teaching process since 1997.

The ITESM as a university using technologies is innovative as it does not only use one technology at a time (TV, video, computers...) but uses multiple technologies simultaneously, covering more than 70,000 students. The ITESM is the only Mexican university massively applying the use of computers into their teaching model. This use of computers seeks the interaction between lecturers and learners through a computer mediated learning process. Undergraduate students receive their lectures through a mixed mode that combines teleconferencing lectures with website courses. Registered students in the first and second year of their bachelor degrees, use a mixed face-to-face and computer-supported mode while registered students at the third and fourth year cohorts use a combine on-line/teleconferencing mode.

Open-ended interviews were conducted with both distance students and virtual lecturers in the Department of Engineering and Computer Sciences and the Department of Management and Business. Students were asked about their skills and confidence to use computers, their interaction with the distance instructor, their participation in on-line learning, engagement and motivation in collaborative work and future benefits of the use of technologies in the workplace.

Strengths and weaknesses of virtual learning

Even though lecturers and students stated that the teleconferencing/online mode demands from them more work, they both agreed regarding the advantages that this kind of teaching and learning brings compare to traditional modes. Similar findings to those of Linda Harasim (1994) showed that not only the fact that in the new model lecturers are now considered more like facilitators and not like knowledge holders, but also the possibility of students to access an enormous amount of information was underlined as important. Furthermore, students in this model engaged in collaborative work activities with their distance partners and participated in group discussion.

Instructors and students interaction

Technologies' presence in the lecture room was considered of vital importance regarding the possibility of interaction between the virtual lecturer and the student. In the so-called "virtual lecture room", students received a lecture from a distance instructor who would transmit it through teleconference. Inside the lecture room, students will have a TV monitor with a satellite connection to the remote site, a computer with connection to the Internet and a telephone line. Therefore communication with the lecturer was seen as permanent as students may contact their instructors through e-mail as often as they needed to, either during the lecture itself, or after it. Most of the interviewed instructors agreed that their distant students value a permanent contact with them. However, distance students complained that the interaction with their lecturers was not as efficient as it should be and that virtual lecturers should attend the work of more than five hundred students at once.

Different Models of learning delivery – teleconferencing and website

At the ITESM, a mixed mode to learning delivery was used. The lecture was transmitted in a computer conferencing mode and students accessed the course materials through a website. Students spent 3 hours a week inside a virtual room where they received the satellite transmission of the lecture and complemented this session with readings and research done in the web. Furthermore, they also engage in collaborative activities with distance colleagues through the use of this web.

The experience of team-teaching in a virtual mode.

In the case of the ITESM this team was formed by the lecture him/herself, one or two instructional designers, two or three tutor lecturers and course' facilitators in each campus. The lecturer responsible for the course is no longer working on their own. Most of the interviewed lecturers agreed that even though working within a team was challenging for them (because they have to develop innovative pedagogic techniques), it was an enriching experience that made them realized their new role in the distance lecture room. As lecturers stated, in order to work in team they have to complement each other regarding the knowledge of the field they are teaching. They emphasised the importance of co-operative working.

Students' and lecturers' use of the Internet for teaching and learning

All of the interviewed distance lecturers and students agreed that the Internet played a crucial role in the process of teaching and learning in this teleconferencing/online mode. Apart from the web content, distance lecturers placed several links to other relevant sites where students could find interesting information regarding their courses. Furthermore, students use permanently research engines to look for information relevant to their courses. The interviewed distance lecturers underlined the importance that the process of innovating hardware and software had in the improvement of a virtual lecture. Both lecturers and students stated that the use of electronic methods of interaction - like ICQ or chat spaces – made possible the synchronic and asynchronic interaction between students and their distance lecturers.

The UK experience

The Centre for Research in Innovation Management (CENTRIM) is a research department located in the University of Brighton in the UK, a university catering for twelve thousand students. CENTRIM, in collaboration with eight other universities and organisations within the UK, was responsible for developing and delivery of two courses (TISCAM and TIME) as part of an e-learning research project funded by the European Union. Each course consisted of ten modules of learning, each module having ten units to be covered over a period of 10-20 weeks, according to the learner.

CENTRIM took the opportunity to approach the project from a variety of different levels. Firstly, it was an experimental learning process for all concerned in the creation of electronic learning materials; secondly, it was research oriented, designed to test out the methods of authoring and gaining an understanding of the learner experience in work-based situations; and thirdly the project could be seen in terms of a collaborative innovation process, whereby each partner was playing their part and integrating their skills in the creation of a 'new product'.

The writing and developing of the learning materials began in 1998 and the delivery stage took place between 2000-2001. In all 28 learners agreed to undertake the courses and were willing to be debriefed following this experience. The CENTRIM project differed from the ITESM, in that although both are universities, CENTRIM's learners were all part-time and work based, whilst The ITESM learners were full time students. The UK learners were from small and medium-sized manufacturing companies. They were a self-selecting group, responding to information disseminated via government agencies and were required to fit study time within working hours.

Learners were interviewed using a interview schedule which included questions on learner's background, responsibilities, previous training pattern and learning style. Informants were asked about their motivation for participating in on-line learning, personal development aims and benefits that they hoped to gain. Their experience of understanding this process of learning was considered, including obtaining permission, difficulties, learning patterns and emotions experienced as they interacted with a computer rather than a human being.

Strengths and weaknesses of virtual learning

As a piece of research the TISCAM/TIME projects were valuable in revealing the strengths and weaknesses in embarking upon the e-learning route. Firstly, it became very apparent that a great deal of background preparation has to be very rigorously carried out to ensure learners receive effective and valuable experience. The technological aspects appeared a priority in the first stance, but in retrospect the research team began to realise that some understanding of learners needs (how best they learn, levels of IT skills and patterns of learning) must first take place. In other words learner needs should inform technology and software used and not vice versa.

Estimate of tutor support per learner was also difficult to predict and learner requirements varied greatly. Especially in the early stages each learner requires a great deal of support, both for negotiating the technology and the course content. Ensuring sufficient and fast support response was found to be very resource intensive. Theoretically, the fact that tutors were available at the other side of the email was seen as very positive, but in reality this could be overwhelming for the tutors concerned.

Instructors and students interaction

A weakness in the TISCAM project was the failure to give an adequate level of tutor support to learners. Although it was hoped that learners would experience a process of more or less self-managed learning by entering a virtual classroom, interacting with a community of teachers and learners in order to meet individual or organisational learning and development needs (due to problems with technology and management of the project) this was not fully achieved. But the need for interactive communications, with tutors and with other learners, was highlighted by almost all students. This problem was mitigated somewhat by the fact that each SME had small groups of learners, who supported each other and benefited greatly by discussing problems and ideas during work time. Even though some learners were following different courses, within the same companies, they were sharing the same experience, and problems arose to which all learners could relate, which contributed to an effective working environment.

Different Models of learning delivery – teleconferencing and website

It was decided that the learning modules would all be designed and developed for full on-line delivery. Working alongside the universities who were responsible for the course content, was an IT company who designed the website and placed the course material on the internet and was in charge of maintenance and changes to the text. Each unit of the course was made up by the core text, case studies, additional articles and materials, exercises and assessments, as well as hyperlinks to live sites, chatrooms for students collaborative work and email to tutors and IT company.

Experience of team teaching

The TISCAM/TIME project was supported by a team of academics. It was important that each partner felt part of the team and able to exploit this relationship to ensure effectiveness of the group. The project was supported by technicians and academics who provided covering authoring guidelines, guidelines for learners, learner support systems, tutor, mentor and facilitator guidelines and the role of Regional Delivery Centres (Oliver 1999, Anderson and Oliver 1999).

Students and instructors use of the Internet for virtual learning

In general the UK learners found that it was easy to start following the on-line courses, but difficult to continue and actually complete them. There were many reasons for this, and as may be expected with an experimental research project, where the technology is being simultaneously developed, some were due to technical 'teething-troubles'. Five specific issues emerged:

- **Critical moments** – when problems occur with technology and learner is unable to solve
- **Seamlessness** – ensuring that the technology, media and content work together so that the learner feels that the experience is seamless rather than disjointed
- **Support** – ensuring that learner feels adequately supported in the learning process both on content and technology
- **Language** – Is the language used and style adopted 'right' for the learner?
- **Fit** – does the use of technology and course content fit into the learners broader programme for personal development?

Conclusions/Recommendations

Undoubtedly e-learning has the capacity to change education and training in a radical way. Already it has opened up new ways of teaching and learning and compelled both tutors and students to review their roles.

In reviewing the experience of Mexico and the UK, the following learning points emerged:

- The UK's reliance on delivery of course in a fully online exposed the weaknesses of this model of delivery, especially in terms of robustness of the technology. Mexico's decision to use a mixed-mode model of teleconferencing and online, with some element of face-to-face instruction,

proved to be more effective and reliable.

Learning point: from the learner perspective the use of multiple-technologies/blended approach was preferred and from the instructors' point of view, a lot less of a risk.

- Both Mexico and the UK found it difficult to estimate tutor time required to support learners, especially in the early stages.

Learning point: Learner support needs, in terms of content, feedback, assessment and in the negotiation of the technology should be carefully assessed prior to course commencement.

- In both the Mexican and UK case the experience of team teaching proved an enriching and beneficial experience to both tutors and learners. However, the question must be posed as to whether cultural and professional differences would 'travel well'?

Learning point: Future course development for global markets would benefit from an international mix on the course design and delivery team.

- In both the UK and Mexican case it became evident that appropriate training in the use of the technology was absolutely crucial in order for instructors and learners to extract the full benefits of this mode of learning.

Learning point: inadequate preparation and training prior to commencement of the e-learning process can ultimately cause major problems or even failure.

The use of technologies and the Internet is proving to have a powerful impact on learning on a global basis. This research suggests that the complexity involved in the successful delivery requires a continuous improvement attitude from both universities and organizations using technologies to deliver learning and training materials. The learning points above begin to contribute to the understanding of e-learning course development, but undoubtedly further research is needed before true boundaryless e-learning becomes a reality.

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AND NOW TO RUSSIA: INTERNATIONAL CO-OPERATION IN DISTANCE LEARNING FOR HEALTHCARE MANAGERS

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Introduction

Distance learning materials produced by the Open University in partnership with the British National Health Service, under the title *Managing Health Services* [1], were designed to develop the effectiveness of existing and new British healthcare staff in operational management roles. These materials have now also been used in Hong Kong, Australia, the Cayman Islands, Slovakia [2], Russia, South Africa, Namibia and Egypt.

Concepts of management and management development differ in different cultures and countries, but increasing international collaboration has raised the question of the extent to which management education can travel successfully [3]. Much management theory was developed in America and can be inappropriate in cultures where attitudes and values are different. For example, motivators vary according to what is valued in a culture, some leadership styles are inappropriate in some cultures, and approaches to conflict management and performance management vary according to cultural norms and expectations. Trompenaars and Woolliams [4] showed that the ability to reconcile opposing values is very important in working across cultures as a manager, which might suggest that this is an equally important factor to consider in attempting to extend management education across cultural boundaries. But although the legislative and funding frameworks for healthcare differ across the world, there are similarities in delivery systems and common concerns in the areas of people management, services management, information management and the principles of basic financial management.

This paper reports on a recent evaluation of the use of the *Managing Health Services* learning materials in Russia, comparing the experience of Russian healthcare managers with that of managers from Australia, the Cayman Islands, Hong Kong and the United Kingdom.

Development of the learning materials

Research conducted into the management of health services in the United Kingdom [5] identified that very large numbers of healthcare staff, such as doctors, nurses and therapists, had taken on first-line or middle management roles without adequate preparation. The British Government began, in 1989, to provide funding to the Open University to develop learning materials designed to assist the development of basic management skills.

For a number of reasons, open and distance learning was the approach chosen. It was considered that well resourced, high quality learning materials could be developed centrally, thus creating a 'national curriculum' for management development in the British National Health Service. Local delivery of centrally developed materials would provide opportunities for 'tailoring' to meet local needs. Delivery that provided open access and flexibility in when and where managers study was considered to be very important in a service in which many staff work unsocial hours and some are geographically isolated. It was recognised that flexible assessment systems, based on work-related assignments, could lead to a nationally recognised and transferable management qualification that would enable healthcare managers to continue to study for higher level qualifications to build on this foundation. It was also important that open learning was considered to offer good value for money [6]. These characteristics built flexibility into the design of the learning materials that allowed different approaches to adaptation for use in other countries.

To develop the *Managing Health Services* curriculum, a large number of managers at all levels in the British Health Service were asked to identify the skills they believed healthcare managers needed to be

effective. The learning materials reflect concern that competent and effective managers need to be able to apply theory and techniques appropriately in their work.

Managing Health Services consists of 18 workbooks. These are not textbooks. They are interactive – constructed around activities which encourage learners to relate the concepts they are studying to their workplace experience and to try out models and techniques in their own working environment. Charles Handy's book *Understanding Organizations* [7] is included in the package and managers are directed to parts of this at appropriate points. There is also a book of *Readings*, which consists mainly of reprinted journal articles. There are six audiotapes with twelve sequences, most of which are conversations with practising managers about how they apply some of the concepts, models and techniques described in the workbooks, and a videotape, with six sequences of case material for analysis. There is also a personal computing pack, designed to develop basic word-processing and spreadsheet skills.

Delivery and adaptation

Managing Health Services was designed to be delivered in the United Kingdom both through open-learning provision by training and development centres based in healthcare organisations and through the Open University as supported distance learning. The delivery was supported by the Department of Health and by the Institute of Healthcare Management, which provided accreditation.

Different approaches have been used to adapt, translate and contextualise the learning materials. The Open University (then the Open Learning Institute) of Hong Kong was granted a licence in 1993 to adapt and reprint the materials. They made minor alterations (such as changing the names in the case studies to Chinese ones) and more substantial ones (such as replacing the finance section with material on the funding system in Hong Kong). In 1995, Edith Cowan University was similarly licensed to produce an Australian adaptation. Tuition is provided in the form of four two-day workshops and by telephone, and assessment is through assignments and 'open book' examinations. An open-learning centre was set up in April 1996 by the Cayman Islands Government. Because of the relatively small number of health service managers in the islands, adaptation of the materials would not have been cost-effective, so 'tailoring' was provided through the tutorial process, which included a one-week non-residential block.

The learning materials were first used in Russia in 1997, in a collaborative venture between the Open University, Project HOPE (a non-governmental organisation working in the field of health care), the British Know How Fund, LINK (the Russian International Institute of Management LINK) and the British Institute of Healthcare Management. A pilot group studied the programme in English and were supported to become the tutors in the second phase, in which the materials were translated so that the whole programme could be delivered in Russian. The first four groups of Russian healthcare managers – based in Moscow, Samara, Barnaul and Tyumen – began studying the programme in November 1999.

Evaluation

The first comparative evaluation of the use of the *Managing Health Services* learning materials [8] focused on cohorts of managers who had completed their studies of the programme more or less simultaneously in Australia (12 students), the Cayman Islands (14 students), Hong Kong (122 students) and the United Kingdom (96 students). The questionnaire was based on one which had been piloted on an earlier *Managing Health Services* cohort studying with the Open University. The same questionnaire, with further slight adaptation, was translated into Russian, and data were obtained from 16 students.

The first part of the questionnaire sought participants' opinions on a range of aspects of their experience of studying *Managing Health Services*. Part 2 of the questionnaire listed, in random order, 40 management competences that the learning materials were designed to develop.

The responses to the first part of the questionnaire were scored by calculating the percentage of respondents who responded 'very' or 'fairly' to each question. The results are displayed in Table 1, which compares the views of the Russian respondents with those of the respondents from Australia, the Cayman Islands, Hong Kong and the United Kingdom.

The 18 workbooks that constitute the core of the learning materials received very high ratings in Russia, as in all other countries (Q1). Respondents in Russia, as in Hong Kong, but not elsewhere, found the *Readings* (Q3) and the set book (Q4) rather less useful.

Satisfaction with group tutorials (Q5) and assignments (Q8) was as high or higher in Russia than in other countries, but Russian participants were slightly less satisfied with the residential school (Q7) and with tutors' comments on their assignments (Q9) than those in other countries. This may be because this survey was of participants in the first pilot programme in Russia, where tutors were less experienced, whereas the surveys in other countries involved later presentations by more experienced tutors. However, Russian participants were very positive about the amount of face-to-face tuition offered (Q10) and with the quality of the tutorial support they received (Q11). The low rating given to telephone contact with tutors (Q6) is not surprising, given the difficulties commonly experienced with telecommunications in Russia.

Questions 12–20 sought opinions about the course as a whole. Russian participants rated the course as highly as participants in other countries on interest (Q12), enjoyment (Q13), relevance (Q14) and presentation (Q17). In terms of value for money (Q15), convenience (Q16), ease of learning (Q18), linkages between one part of the course and another (Q19) and clarity (Q20), Russian participants were slightly less positive, but more than 60% chose the 'very' or 'fairly' responses to all these questions.

Questions 21–26 asked respondents to report their understanding of the extent to which the course had required them to learn in various ways. The responses of Russian participants focused strongly on understanding concepts (Q22), synthesising ideas (Q24) and applying learning (Q26), but none of their responses were very different from those of students in other countries. This is a very positive finding, given that much Russian education traditionally places strong emphasis on memorisation (Q21) and much less on analysis (Q23), synthesis (Q24), evaluation (Q25) and application of learning (Q26).

In response to the final group of questions in the first part of the questionnaire, the Russian participants agreed with those from other countries that the course encouraged an active, problem-solving mode of study (Q27), that it was intellectually challenging (Q30) and that it was not pitched at too elementary a level (Q31). This latter point is particularly significant in view of the fact that most of the Russian pilot group had a high level of previous education in their professional fields.

However, only one-third of Russian respondents thought that the authors of the learning materials were in touch with the health service environment (Q28) – a much smaller proportion than participants from other countries. This almost certainly reflects a concern that the learning materials would have benefited from more extensive adaptation to the specific needs of the Russian health service, although over 60% said that 'the course was written for people like me' (Q29), a not dissimilar percentage to that found for respondents from other countries. Finally, half the Russian respondents said that the pace of study was too fast (Q32) and only a little over two-thirds said there was enough time to study the course (Q33), though this concern was no greater than that expressed by participants from other countries.

The second part of the questionnaire asked respondents to report their judgements of their management competences before and after the course. A much higher proportion of Russian respondents than in any other countries considered that they had 'no competence' or 'very little competence' on every one of the 40 competences before they studied the programme, suggesting that the Russians, on average, started from a considerably lower base of management competence than healthcare managers from Australia, the Cayman Islands, Hong Kong or the United Kingdom. More than 75% of the Russian respondents considered they had made gains in relation to 34 of the 40 competences as a result of studying the programme. In more than a third (14) of the 40 competences, more than 90% of the Russian respondents considered that they had made gains. These were:

- Identifying and minimising interpersonal conflict
- Defining personnel requirements for your department/section
- Managing stress
- Establishing and maintaining relationships with colleagues
- Approaching decision making in a systematic way
- Setting objectives for yourself
- Developing teams
- Communicating with others in writing
- Participating in meetings
- Adopting a 'customer' perspective towards your service
- Delegating tasks
- Setting objectives for your staff
- Taking quality initiatives
- Analysing the need for change.

In terms of competence development, these data suggest that, despite the significant cultural differences, the *Managing Health Services* programme was at least as effective, if not more effective, in Russia than in any of the other countries where it has so far been evaluated.

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Table 1: Participants' views of the learning experience

		<i>Percentage responding 'very' or 'fairly'</i>				
		<i>Australia</i>	<i>Caymans</i>	<i>HK</i>	<i>UK</i>	<i>Russia</i>
How helpful for your study of the course were the following components?						
<i>Learning materials:</i>						
1	Workbooks	88	100	93	97	94
2	Course Guide	75	80	79	82	75
3	Readings	88	92	56	82	69
4	Set book	88	91	49	81	75
<i>Tuition:</i>						
5	Group tutorials/workshops	88	73	65	81	81
6	Telephone contact with tutor	75	33	51	69	43
7	Residential school/non-residential block	—	75	—	87	69
8	Assignments	88	100	86	96	94
9	Tutor's comments on assignments	88	83	81	85	75
Were you satisfied with:						
10	The amount of face-to-face teaching and/or telephone teaching offered?	88	17	49	73	88
11	The quality of the tuition/support you received from your tutor during the course?	75	45	60	88	81
The course as a whole						
12	Did you find this course interesting?	100	100	74	99	94
13	Did you enjoy this course?	100	82	74	93	94
14	Did you get what you wanted from this course?	100	82	79	91	88
15	Was the course good value for money?	88	—	44	87	73
16	Did you find the course materials convenient to handle?	100	75	58	94	67
17	Did you find the course materials professionally presented?	100	92	74	96	88
18	Did you find the teaching material as a whole easy to learn from?	100	58	53	93	63
19	Did you feel that each part of the course linked well or appropriately with the rest?	88	100	70	97	69
20	How clear overall did you find the teaching in this course?	100	100	63	94	75
To what extent did the course require you to:						
21	Memorise facts/concepts/procedures	50	100	88	87	75
22	Understand concepts/ideas/principles	100	100	91	96	94

Table 1 (continued)

		<i>Percentage responding 'very' or 'fairly'</i>				
		<i>Australia</i>	<i>Caymans</i>	<i>HK</i>	<i>UK</i>	<i>Russia</i>
To what extent did the course require you to:						
23	Analyse data/description/arguments	100	83	70	72	75
24	Synthesise and put together ideas	100	91	74	82	81
25	Evaluate using your own judgement/values	100	92	77	81	75
26	Apply your learning to your own experience/life/job	100	92	84	91	88
How much do you agree with the following?						
27	This course encouraged an active, problem-solving mode of study	100	92	81	87	88
28	The course authors seemed in touch with the health service environment	100	100	79	90	36
29	The course was written for people like me	75	58	67	79	63
30	The course was intellectually challenging	75	100	77	73	88
31	The course was pitched at too elementary a level	13	8	37	38	31
32	The pace of study was too fast	13	75	42	34	50
33	There was enough time to study the course	75	8	53	69	69

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AFRICAN STUDIES AT THE NORWEGIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY – AN EXAMPLE OF INTERNATIONAL CO-OPERATION IN AN E-LEARNING PROGRAM

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Introduction – background of the programme of African Studies, NTNU

During the last couple of years six different departments at the Norwegian University of Science and Technology have developed a multi disciplinary programme of African Studies. Some of the subjects have been thought for several years, but for the last two semesters we have expanded our programme and can now offer 7 different subjects from the following departments: Social Anthropology, History, Geography, Music, Linguistics and Social Medicine. In addition to the one subject from each department we also have a multi disciplinary introduction course.

Most of the subjects are taught on ordinary basis on campus, but more interesting in this context is the fact that we have started offering lectures on the internet, enabling distant education students to sign up for the courses. Having in mind that this is only our second semester, the response from eLearning students has been overwhelming. More than a hundred students signed up this spring semester for the 4 courses we had running. You might want to ask why Norwegian students are so interested in African matters, and I think the answers to why we have so many students are several:

- **Variety:** We offer a wide variety of subjects thus attracting persons with very different backgrounds: teachers, journalists, engineers, social workers and so on. The variety of the programme gives students a chance to either concentrate on the one theme they are interested in, or for those who wish to deepen their knowledge about Africa, we offer an excellent opportunity to do this. It is evident that people feel the need to widen their perspectives and be part of the processes of globalisation.
- **Extent:** Each of our subjects gives a credit which equals half the points of what ordinary students are expected to achieve in one semester. To do one such subject per semester is therefore manageable for most eLearning students, even with a full time job and family commitments.
- **Flexibility:** For distant education students the flexibility of the study programme is of great importance. We do offer seminars during the semester, but these are not compulsory. Students who do have the opportunity to join the seminars express that they profit greatly by attending, but since many of our students live miles away or might not be able to get off from work, we intend to keep such seminars voluntary. There are also possibilities for the students to join discussion groups on the net, and for they do of course get guidance from the teachers when writing papers, or if they just want to discuss some part of the curriculum.

When it comes to adult eLearning students, we have had many instructive experiences during the 2 semesters we have been running African Studies on the net. We know that their studies are only one of several obligations, so the point about flexibility should be dwelled upon some more. Since these students have so many things that occupy their time, it is obvious that they are in need of planning ahead. When we start the semester and arrange the opening seminar we therefore aim to have all important things ready. The students will receive an introduction of the Learning Management System (LMS) we use, and so can start studying the lectures right away. We have also learned that there is a quite big difference between ordinary students and eLearning students who are not on campus. Students not on campus cannot be expected to acquire the same type of information that “normal” students do. It is therefore important to make sure that all crucial dates of the semester – such as date of exam, date of the next seminar, date of when their term paper is due and so on – are repeated both at the physical meetings and made easily available on information sites on the net.

A few words on technical issues

To impart the lectures in African Studies on the net we use an LMS called Coursekeeper. This is a fairly new system developed by a Norwegian firm called Boxer Technologies. The first semester we were trying out this system it had lots of faults and caused much annoyance amongst both teachers and students. The biggest problem of all was that the Coursekeeper server could not handle the quantity of data from the university. This made the server collapse very often in the start. For the department purchasing this system it has been important that the LMS is *scorm* compatible, so that one will be able to transfer the material to another LMS if that is desirable at some point. During the test period – of which African Studies were a part – most of the problems have been solved, and things have been running much smoother this semester. It seems though, that the user interface is a bit too high for most teachers with no special technical background. The lectures themselves can be done in normal Word or Power Point documents, but the process of getting these into the LMS and open for the students is a bit complicated and requires too many steps before it is done. We are also somewhat surprised that not even in a small country like Norway with only 4 universities, there is no standardization of Learning Management Systems. Co-operation across borders would of course be much easier with a standardized system.

The lectures we offer on the net are of course very diverse, depending on the subject. The music lectures for example contain samples of African music and have a better opportunity to make use of the interactive possibilities on the net, than do traditionally theoretical subjects such as history and social anthropology. We are in continuous work to find better and more exciting ways to impart the subjects we offer on the net, but so far most students seem to be pleased with the way we are arranging the course now: lectures with text, pictures, maps and links to related issues combined with a couple of seminars each semester, and guidance from the teachers when papers are due.

Why eLearning?

To start with distance education on the net offers a whole new set of possibilities; we reach a great number of students who otherwise would not have had the chance to study, either because they live far away or because they have jobs that cannot be combined with regular study programmes. Another very exciting possibility with eLearning, which our programme of African Studies is now starting to explore, is the possibility of involving foreign teachers. In March this year we signed a Memorandum of Understanding with the Institute of African Studies at the University of Ghana, Legon. This will open for an exchange of both students and teachers, and we are especially keen on developing the co-operation with the teachers. We feel that by getting African scholars to join our programme it will enhance the academic value greatly. The Internet will make it possible to arrange “meetings” between the Norwegian students and the African teachers from time to time, and of course they also will produce lectures on themes of current interest.

Our programme also has an arrangement with The Nordic Africa Institute (NAI) in Uppsala, Sweden, giving our students the opportunity to use their library. Furthermore we have had the fortune of having one of their eminent researchers to hold a lecture at one of our seminars, and this will probably be repeated in the near future. With the researchers in Uppsala lies the same great opportunity as with the staff at Institute of African Studies in Ghana, namely the chance to get updated lectures on relevant issues quickly out to the eLearning students. When it comes to the use of NAI’s library this is an important subject also for developing countries, where the lack of books often is flagrant. We hope that the deal we have with NAI in a while can be extended to include our partner in Ghana, also giving them better opportunity to get hold of a wide variety of literature.

Visions for the future

New information and communication technology is rapidly transforming our societies. The new networks reach across cultures and over great geographical distances, thereby contributing to globalisation processes. It creates fundamental changes on a number of areas of social and cultural significance and in a whole range of practical matters. This is the case also in the areas of education and research.

For developing countries the network revolution poses both great opportunities as well as challenges. On the one hand, ICT can provide cheaper and better access to information. But on the other hand the increasing importance of ICT may deepen already existing gaps between rich and poor countries. Countries and people without access to the new technologies risk being even further marginalized. This so-called “digital divide” is to a large extent a reflection of fundamental inequalities between countries and between social groups.

What can then be done in order to inhibit this divide to widen, what can the educational and research societies in the wealthy parts of the world do to on the other hand enhance and contribute to enable the people of the poor countries to really obtain improved access to information via ICT? This is the sort of questions we in the academic sector of the rich countries really ought to ask ourselves.

We in the Programme of African Studies in the Norwegian University of Science and Technology in Trondheim are already working on and struggling with some of these questions. And we firmly believe that the answer lies in the increased opportunities for co-operative programs between the developing and the industrialized countries. As we are operating on the university level, we will concentrate on this.

We have already established a co-operative Program of African studies with the University of Ghana, based on exchange of both teaching and research staff, including students. This is a program that combines the new opportunities of the ICT-technology with more traditional university studies. In practical terms it means that we may combine efforts between Ghanaian and Norwegian university teachers for the production of eLearning materials on African issues. This can then be made available to both Ghanaian and Norwegian students, as well as students from other countries.

The eLearning component is then also combined with on-site studies. Under the umbrella of an exchange agreement between the two universities we can send Norwegian student to Ghana for studies once or twice a year for courses being arranged there, and the university in Ghana may send some of their faculty to Norway for doing research in a very modern and well equipped university there.

In this way it appears to be a kind of win-win situation; both countries and universities get something out of it. Another important aspect of this is that it is very easy to expand the co-operative part of it by including other countries, both in Africa and in the West. As it is we are now in the process of expanding our research co-operation by including a research institute on Ethiopian research in Hamburg, Germany. This will again give both western and African increased access to research on a particular part of Africa.

But there are of course also limitations and constraints in these processes. The main one is definitely economic. The lack of modern hardware and modern and efficient connections, in short electronic infrastructure, in the developing world are a most serious restraint. It is therefore a necessity to have baked-in budgetary allotments for these kinds of expenditures in co-operative programmes between the west and the developing countries. But there are also great discrepancies between countries when it comes to this sort of inadequacies. Some countries in the developing world are already quite well organised and set-up with regard to ICT and infrastructure. The picture on this is a mixed one, but definitely not entirely negative. And the situation is improving rapidly in many countries. As for now we can observe the Internet-Cafes sprouting up everywhere, also in the developing countries. Not only in the big cities, but also out in the countryside and local communities.

But also other constraints exist in this picture. One of these is conservative attitudes and resistance towards change and renewal among the academic communities in the western world. Researchers and teachers in the universities are in many ways traditionalists when it comes to sharing experiences and publicize research and teaching materials. It is therefore important that there are provided for incentives to do so, and the other side of this is that there must also be worked out clear-cut rules and regulations regarding copyrights and ownership to publicised materials.

Structural and administrative matters in this sector are other matters of importance. Administration of higher education and research is carried out on national, regional and institutional levels. At the national level it is normally the ministries of education holding the responsibility, which implements the political decisions regarding higher education. Frequently there are specialised units/institutions taking care of higher education and research.

The administrative set-up and structures on national level in many developing countries are very much influenced by the colonial heritage. This is so also in Africa south of Sahara. Some of the characteristics of administrative measures are highly developed bureaucracy, high degree of centralised authority and control, lack of coordination between different ministries plus lack of relevant information/data which makes policy-making and planning difficult and inhibits efficient decision-making. Within the educational sector for example, the lack of relevant and correct demographic data makes planning for the future difficult.

Yet another problem is the shortage of qualified administrative personnel in the ministries of education that is a prerequisite for efficient implementation of political decisions. This shortage of personnel is both a consequence of brain-drain to the developed world, weaknesses in recruitment policies and weak planning regarding needs of expertise within the educational sector.

The fact that the administrative structures in developing countries are poorly developed may have financial reasons, but as important are cultural and structural factors that inhibit streamlining and improvements to take place. There are frequently also a problem that political authorities feel a need for controlling the universities, while the universities and research institutions feel a need for autonomy, self-governance and manoeuvrability. This is a dilemma with considerable elements of tensions and conflicts with lack of development and necessary modernisation is slowed down or blocked.

On this background we can observe that there are a number of considerations to take into account, and limitations to reckon with, in order to organise or enter into cooperative programs between European academic institutions and the developing world. But, and this may be the main point, in this picture ICT may play a crucial role. Not only as a mean for exchange of academic teaching and research results, but also in helping out some of the administrative and structural constraints in the developing world. As the western world already has the necessary administrative means to administer higher education efficiently, there is a possibility in cooperative program, by the use of modern and efficient technology, that cooperative programs may also provide a contribution to levelling out some of the problems within this field.

On the cultural and social side it appears obvious that ODL and ICT will facilitate great, maybe dramatic changes, both for society as such and for the individual members/actors. As we by the help of ICT are developing from societies very much organised around production towards societies organised around handling information, this will lead to structural changes of great importance.

By this we mean that individual identity, self-esteem, group affiliation, feelings of belongingness etc., are not any longer related to production, but to **access to information**. Previously access to information was much more linked to social relationships. Nowadays access to information is made through technology. In social scientific terms this means that the transformation from the industrial society to the information society is also a shift from ascription to achievement. Information is now in principle available to everybody through personal and independent achievement.

When we consider this in terms of identity and self-esteem, it logically follows that different identities are optional to the individuals to a degree insofar unknown in history. It means that individual actors on the social scene may create or shape their own identity and lifestyle by achievement and their own effort – independent of traditional structures and limitations. But achieved identities are by nature more insecure than ascribed ones; as they are gained by achievement, they may also be lost.

But in any case will this lead to greater freedom for the general public in developing countries. When access to information and hopefully also higher education is made available to the majority of the populations in the developing world, the possibility is there for more open democracies, with increased public participation democratic processes, politics and governance.

This will include increased interest and participation in higher education as well. Education is everywhere an important mean to self-esteem, confidence and gaining of access to influential participation in society. Universities and academic institutions in the north do therefore have a strong responsibility and obligation to let the developing world take part in these historical changes brought forward by the opportunities in ODL and ICT. As we see it, and on the background of the experiences we have made so far in Trondheim

through our Program of African Studies, cooperation and joint ventures in this field between developing and developed countries is one possible way to move.

This is also very much in tune with recent signals from the Executive Board of UNESCO, who stresses that access to information and higher education is becoming more and more of a prerequisite in an increasingly complex world, not only so on high levels, but also for the ability to cope and manage one's own daily life and relations to society as a whole. Improved access to information and the ability to cope with the challenges of modern information society is to be viewed as the basis for growth, opportunity and development. Increased attention and efforts in this field of higher education and academic cooperation should be given the highest priority now that the means and opportunities are available in the form of ICT.

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TECHNOLOGIES AND PEDAGOGIES OF TRANS-CONTINENTAL ONLINE LEARNING: TOWARDS REMOVING THE BARRIERS TO ACCESSIBILITY

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Abstract

In this paper we look at the use of the Internet for online learning and the problems that web-based learning technologies pose from the various stakeholders' (developers, educators, learners, technical support, legislators) viewpoints. We also provide a brief outline of the infrastructure of two successful implementations which have been developed and are being used for delivering and managing online learning internationally.

The paper outlines three areas, which present problems for the stakeholders of learning environments:

- Multiplicity of media: What is the combination of different learning media, which recognises diversity of students and seeks to support the full range of possible users?
- Learning management: What support (technical and pedagogic) is needed to help staff to move from face to face to online teaching?
- Network requirements: What is the necessary infrastructure to support these distributed complex environments for shared interactive use.

We conclude with a summary of the lessons learned and their implications for online learning.

Introduction

Advances in Information and Communication Technologies have made it possible to reach a large number of distance learners beyond the correspondence tuition models traditionally used in distance learning.

Designers and developers are increasingly working with virtual learning environments (VLEs) for distance teaching and learning. However, designing and implementing such learning systems remains an interesting but difficult exercise and research area. The reason is that there are many interrelated choices and many possible approaches. Designers and developers of such systems have to address a large number of issues:

- Such learning environments are frequently characterised by technical inconsistencies such as poor technical infrastructure or limits in network performance meaning that users will experience delays.
- The real campus is of such richness that any computer based interactive learning environment, however sophisticated and technologically advanced cannot approach a realistic rendering of the real campus.
- Tested and successful face to face teaching practices do not translate and transfer easily to successful interactions inside the learning environments.
- Online courseware and communication tools are not as accessible for the learner as they claim to be due to the technologies involved being not as natural or intuitive to use.

Fig.1 emphasises the fact that many components, factors and interactions are at play when we design and use Online Learning Environments (suggested by Odysseos <http://www2.unl.ac.uk/%7Est006/>).

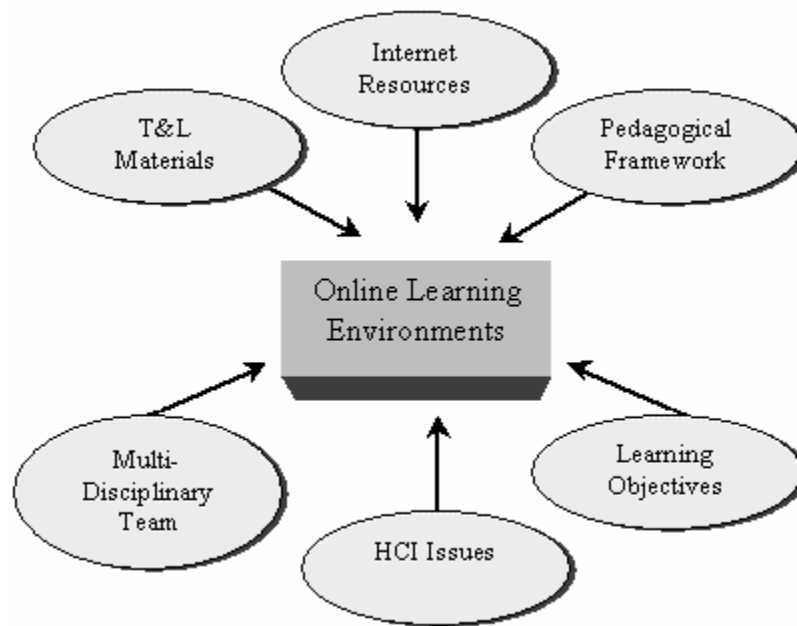


Fig1. Components of online learning environments.

This paper looks at the infrastructure of two systems which have been used for delivering and managing online learning:

- The Global Campus project in the School of Computing, at Middlesex University develops and uses learning materials, in a form suitable for online study, to offer interactive open and distance learning for students in, Egypt, Hong Kong, Singapore and Shanghai (<http://www.gc.mdx.ac.uk>).
- The Hong Kong Computer Institute Programme offered by the School of Informatics and Multimedia Technology at the University of North London where a phased introduction moved from an accelerated traditional (face-to-face) approach to a hybrid phase during the development of the web-based materials and finally to a substantial online resource and minimal face-to-face contact approach.

The Global Campus project at Middlesex University (MDX-GC)

The Global Campus (MDX-GC) project in the School of Computing, at Middlesex University, UK, uses computer-based and online learning materials to offer interactive open and distance learning MSc programmes in Hong Kong, Shanghai, Singapore and Cairo. All the learning materials and support mechanisms are also utilised, in a resource-based learning format, with local campus-based students studying in London. The resources include web-based and CD-ROM versions of the learning materials, online assessment and monitoring of the student progress, synchronous/asynchronous communication tools (access to bulletin boards, virtual chat rooms and whiteboards, an email hotline) and also weekly locally-held, face to face tutorial sessions. All students, wherever they are located are subjected to the same assessment tasks and assessment processes.

In earlier work (Woodman et al, 2001; Hatzipanagos et al, 2001), the pedagogic model used and the learning environment that was constructed when the project was initiated, as well as experiences since its inception were discussed.

In particular, it was described how ICARE a pedagogic model conceived by Hoffman & Ritchie, (1998) had been adapted to serve the requirement to bring a multiplicity of courseware authors to a position where a reasonably consistent style and format could give coherence to provision. It was also described how the support mechanisms available in WebCT, a commercially available Virtual Learning Environment, (Friesen, 2001) had been utilised to facilitate student-tutor and student-student interaction.

Student feedback from project evaluation (Hatzipanagos et al, 2002) indicates that both tutors and students have positive views towards the online resources and are not resistant to the idea of an increasingly large component of the course activities taking place in each course's online learning community.

The UNL Hong Kong Project (UNL-HK)

In earlier work Georgiadou et al (2001) reported on the implementation of an Open Distance Mode course. The course involved the delivery of eight advanced modules comprising the final year of the BSc (Hons) Computing in part-time evening mode to students who achieved their pre-requisites through studying for a Higher Diploma or equivalent. Most students work in the IT industry often in positions of responsibility (project managers, operations managers, systems programmers etc).

In parallel, the modules are running in the UK as part of the modular scheme of the University. The students in the UK are primarily exposed to traditional methods of teaching and learning with a gradual but steady take up of modern methods and technologies.

Silvester and Berki (1999) reported on the technical issues, considerations and implications with emphasis on the need for continuous development and improvement of the on-line resources to ensure correctness, robustness and quality of educational experience.

Berki and Georgiadou (2001) carried out an outcome-centred evaluation monitoring the results of the Information Systems Development Methodologies modules at three different stages (before webbased materials were available, during their development and after the first version was fully developed and available on the web), and two different geographical locations (UK and Hong Kong). The evaluation indicated that students studying in different modes and in different countries achieve comparable results. These similarities can be attributed to the fact that those engaged in Open and Distance Learning are empowered to carry out their own learning at their own pace, place and time.

Multiplicity of media

The UNL-HK project was developed in three phases. In the initial phase the emphasis was on conventional teaching and the bulk of the teaching was undertaken by visiting lecturers. The second phase was a transitional one where face-to-face support is partially withdrawn and replaced by online learning resources. Finally, a full transformation into distance learning mode was made through the use of online, WWW-based resources and computer conferencing. Throughout, the students in Hong Kong received tutorial support from local academic staff and utilised the facilities provided by the Hong Kong partner institution where they would normally have graduated with a higher education diploma.

In MDX-GC a mixed approach involved use of a CD-ROM to substitute for online access. The CD-ROMs contain all the course material except for the activities, which the students have to complete online. The weekly pattern of learning involves student use of the learning materials, coupled with a classroom tutorial conducted at a local learning support centre with locally employed tutors. In addition the VLE communication tools have been used as a forum for exchange of information and discussion, thus complementing and enhancing practical activities. As the project developed, the emphasis shifted towards a greater concentration on the design of appropriate and meaningful activities and review questions, so as to reinforce and develop the content material. Continuity between the face to face and online aspects of the courses was achieved by linking face to face tutorials with online materials with emphasis on VLE-based collaborative activities and online self assessment. This continuity enhanced independent learning.

Synchronous/asynchronous collaborative communication tools (e.g. discussion forums) were used effectively when they were set up in a way that facilitates communication in small groups and activities were linked to assessment to encourage participation.

Learning management

Technical Support

Technical support in both projects has been instrumental in development and delivery of online learning. Technical support in developing the learning materials was also necessary, as the task was too big to be undertaken by individual authors/developers.

Academic support

Authoring of online learning materials does not simply involve the uploading of lecture notes and slides on a web server. A pedagogic model is needed which in online learning does not necessarily follow the common linear approach dictated by conventional face-to-face teaching. Commercial Virtual Learning Environments sometimes offer facilities for developing course content but these mostly linear narratives are not always adequate/appropriate for online learning. These must explore (as in MDX-GC) non linear connections between the course components and they must also be augmented (as in the case of UNL-HK) with detailed study guides which only an academics can construct based on their knowledge of the subject and also on the understanding of the learning processes.

The development of technology-based teaching and learning materials also demands a multidisciplinary team consisting of academics, developers, administrators and even legal advisors. Issues of Intellectual Property Rights (IPR), Exploitation Rights (ER), Ethics and Culture need to be addressed particularly as such environments are aimed for international use across time-zones, national boundaries, national cultures and languages.

The amount of administrative support as well as the time required for continuous feedback to students grows in tandem with the growth of awareness within the body of students.

Network requirements

Our experience of network requirements points towards a network infrastructure beyond the standard VLE functionalities (such as user authentication by username and password). Even, when commercial VLEs offer these functionalities, their parameters need to be “tweaked” to optimise performance. Additionally, there are other features of an effective VLE such as 24-7 access to the servers where the materials are located, minimal average wait between pages and functional quick-response communication tools.

Access to the VLE functions can be impeded by substandard technology or busy networks, especially for users who access the environment from home or work (Hatzipanagos 2001). However, in the next few years restrictions on average wait between pages and response time in communications will be alleviated.

Discussion and conclusion

The paper looked at two learning environments which have been used for delivering and managing online learning. In both MDX-GC and UNL-HK projects particular emphasis was put upon assuring that the quality of the student experience was at least equivalent to that of on-campus students. In MDX-GC, these quality assurance mechanisms were facilitated by comparing the experiences of both campus-based and distance learning students that use concurrently the same resources and communicate with each other in online communities.

Regarding multiplicity of media in open and distance learning the right balance between online and face-to face learning has yet to be configured. There are many courses where face-to-face interaction is held intentionally to a minimum, however a mixture of face-to-face and online learning increases motivation for students, bonds the online learning communities and creates the “right” context for online collaborative learning activities. In both projects there has been a combination of face-to-face and online learning. In UNL-HK this consisted of a gradual increasing component of online learning which represented a transition towards independent learning, whereas in MDX-GC a minimal component of face-to-face teaching was combined with a significant component of online learning materials and activities.

Authoring of online learning materials involves the adoption of a pedagogic model. This model will dictate the multiplicity of different media and the level of interactivity in the resources. Online courseware and communication tools need to be accessible to the learner and they can be combined with an appropriate level of face-to-face tuition.

Technical and academic support is needed to help staff to move from face to face to online teaching. Overcoming the initial resistance of staff and students is a common phase of the transition from face-to-face to online learning. This transition builds on institutional policies towards online learning, however it also needs to be accepted and uptaken by academic staff.

Finally scalability and network requirements are significant issues to consider in these environments, to ensure that the environment can cater for an increasingly bigger numbers of stakeholders.

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SUPPORT FOR DEVELOPMENT OF OPEN AND DISTANCE LEARNING IN MOLDOVA

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Introduction

One component in the EU Tacis ERA Project in Moldova is to support a programme of agricultural education reforms. The ERA Project in total is the support for Development of the Agricultural Education, Research and Advisory Services, lasting from 2001 to 2003. The ERA Project is collaboration between Moldova, United Kingdom and Sweden and the purpose is to, in Moldova, improve access for the rural population to relevant educational, training and advisory support services in agricultural and small-scale agribusiness sector.

The education reform programme contains a open and distance learning, ODL, component. The motive for people in Moldova participating in distance learning is economical and social reasons as the main causes.

The primary objective with the ODL project is to investigate the possibilities of distance learning in Moldova, establish a network with key persons, form a working group, prepare for an internship between the State Agrarian University, SAU, in Moldova and the Swedish University of Agricultural Sciences, SLU, and to give a seminar on the basics of distance learning. The first step in developing distance learning in Moldova is to create a distance model course and this is the first task for the working group.

Target groups for ODL

The overall objective with the whole ERA project is to improve the possibilities for distributed knowledge to different target groups and agricultural specialists, and for Research Institutes, Agricultural Advisory Service Providers, SAU and other actors to strive together for this objective. The target groups are for example:

- Students enrolled at the State Agrarian University as part time students
- Advisors and other agricultural specialists
- College students
- Growers and farmers

Students Part Time Study Program

Students can choose to study the content of the four years University program on part time over five years. At the SAU approx. 40 percent of the students are “part timers” that is an amount of 2000 students. The content, the curriculum and the requirements are the same as for full time students, but the contact time is reduced to about 40 days a year. The students visit campus for 8 weeks divided in 2-3 occasions. The part time study program students are a suitable group for transfer to a distance-learning program.

Advisors and Other Agricultural Specialists

These target groups are all living and working at the countryside, often at Extension Centres, necessitating training and up-dating of their knowledge and also with small resources to travel for access to further education. Although the need for it essential to develop the production for the market and the capability in the advisory services.

College students

The need to get some connection to higher agricultural education is very important. For College students partly for building up knowledge, partly to get in contact with the university to continue their studies after the college.

Growers and farmers

This target group consist from people involved in the production with the intention of getting knowledge about new techniques, procedure used in agriculture. In this case DL course is designed in a more simple way stressing on applicable aspect. They also are limited in resources for travel and a need to develop the production for the market.

Possibilities to deliver ODL

Preconditions in the rural areas

Some of the rural colleges have a small number of computers. The access to faxes and Internet is not common. Telephones are available in small numbers.

The centres for advisory service providers will in near future be equipped with fax, telephone and computers with Internet access.

Internet-café's are beginning to occur in other towns than Chisinau, the capital, but not yet in the villages.

The compulsory schools even in the rural areas have started to use computers in education but have not yet access to Internet.

The ODL courses have to be available both by mail and/or by information and communication technology, ICT, to make sure that everybody how wants to participate can communicate at distance.

Collaboration

Pooling the resources from the different parts in the ERA-project, which are connected to distance learning, will make the work with forming courses possible. The resources to be pooled are the IT- and publishing department and the library of SAU, the Colleges, the Research Institutes, and the Advisory Service Providers.

The Faculties, together with the IT and Publishing Department and the Library at SAU will, be the two most important resources for the performance of distance courses given by SAU. It is important that these two key departments can function well together in the process of producing material for the courses and in the process of providing course participants with necessary services. Before and during a course the activities that need collaboration are:

supplying authors of course material with information, authoring tools etc.

Introduction of ODL methods

It's important that the persons responsible for ODL and developing courses, as fast as possible get hands on experience in ODL. As a start a working group was formed with responsibility to deal with all the questions and problems to handle the introduction of ODL at the university. An introductory ODL seminar was given to a wider group of leaders and teachers at the university and the working group visited Sweden on an internship to gain knowledge about how ODL can be organised in different ways.

As always there are a lot of questions to be answered and problems to be solved. Because of the complexity with teaching methods, communication, targets groups, collaboration etc. it was decided to keep it simple and as close to the daily teaching activities as possible. The most efficient way is to build a

model course with few teachers and IT persons involved for testing the ODL model and to get feed back from course leader and participants.

There also has to be an acceptance and formal approve for ODL in the university education system.

Conclusions

We would like to expand this with some thoughts of our own about distance learning in Moldova

General motives up close

It is obvious that distance learning can lead to economical and practical advantages in the education system. However it is not always easy to say how and for whom. There is a need for awareness and direction in the spread of advantages among the stakeholders in distance education. Both the board and executives, and the team who creates the course have the tools to distribute these advantages. The input must be aimed precisely to make the best possible use of the resources, for example budgeting communications, personnel, course material production etc. The expectations of what distance learning is and how it works must be accurate. The sensitivity to the market for education needs to be developed to meet the demands from potential customers. Finding the medium and means for successful marketing is necessary.

Creators of a course have the tools to decide where the practical and economical advantages will occur. When designing the course the team must have in mind:

- Development costs for the course
- Costs for travel
- Costs for communication
- Social advantage in fewer days away from home
- Use of hidden rural personal capacity suitable for education and training
- Use of new opportunities for business and the benefit of the knowledge gained in the course
- Difference in the level of the content and technology suited for the target group

Emphasising the learning process

It is important to clarify the content and structure of the learning process. Concerning distance learning the responsibility for learning, feedback to and communications with the student is crucial for the results. It is a rather common misunderstanding that self-study is similar to distance learning. This is not the case. Self-study does not require any communication and feedback during the time away from school, but this is a basic foundation in distance learning.

The learning environment has to be created with the idea of improving access to information and knowledge. This means that it has to be flexible and adjusted to the different target groups.

One of the parts in the revised curricula concerns participating education. This will hopefully encourage the teachers to reflect on their own view of learning. In the long run the use of Problem Based Learning and other active learning techniques may be interesting for the higher education system.

Computer Literacy

Running distance learning has a dual purpose in the early stage. When the use of ICT is immature for both participants and teachers, there will be a need for learning how to handle computer software and new ways of communicating, parallel with the actual subject.

Technological infrastructure for communication and information

The lack of ICT infrastructure will have to be considered when putting the instructional elements together in a specific distance course. On the other hand the need for infrastructure will make the development move forward to some extent.

Thoughts about the future and how to attract youth

Implementing distance learning can make the SAU the leading actor in the use of modern methodology and technology. This can be an advantage when attracting young people to a sector that is not usually so appealing to them.

Finding ways to make money in the agricultural sector will be important for the country. One profitable activity in distance learning for the SAU could be to develop a course in the popular field of economy. "Making business in the food sector" or "IT in food production" could be course titles that attract interest.

The colleges have a possible future role as providers of distance education for their students and teachers and also to act as study centres for other participants.

The Research Institutes have a very important role in the access to valid and up-to-date information for authors of course material. An active and supporting attitude is important in the contact with the author in order not to lose time in the process of spreading new knowledge and research results.

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GRADUATE TRAINING IN REHABILITATION COUNSELLING USING INFORMATION AND COMMUNICATION TECHNOLOGIES A TRANS-ATLANTIC EXPERIENCE

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Abstract

The paper describes the delivery of a Master of Science (M.S.) Degree in Rehabilitation Counselling through distance education from the Dept. of Community Health, University of Illinois at Urbana-Champaign (UIUC), to Irish based students. The programme (Jan. 1998- Aug. 1999) was preceded by a feasibility study and a pilot project. The in-career students attended biweekly for two-day video-conferencing sessions. The paper describes the nature of the programme and its start-up, the pedagogical strategy and the information and communication technology (ICT) systems. The technical topics addressed include, the ISDN-based audio-video conferencing systems, the use of Internet assisted content delivery, email and access to the Digital Library. The pedagogical and technological experiences of this trans-Atlantic undertaking are included. The potential of this initiative for other training needs both for professionals in rehabilitation and persons with disabilities in Europe is noted.

Introduction

The possibilities offered by the newest information and communications technology (ICT) to professional development and training are increasingly being recognized as significant and full of potential for educators and students alike. The implications range far beyond the latest techno-wizardry. They go to the heart of improved pedagogy, strategy for enhanced training and development, cost-effectiveness and the scope for accessing international best practice.

In recent years the potential offered by distance education has been identified by experts in both the United States and Europe. Various media have been utilized ranging from postal correspondence courses to videotape, television and satellite. The advent of the internet has now created a new medium for distance education and new opportunities for place-bound learners.

The availability of such technology raises immediately the question of access. This is the guiding issue in all such initiatives. The objective is to bring quality education, training and information to those individuals and sectors who have traditionally been denied opportunity through reasons of geography, economics, time or disadvantage. The experience of the Open University in the UK has shown the extraordinary demand that exists for education among populations traditionally excluded from more traditional routes. It has also demonstrated how quality educational materials and standards can be maintained in innovative delivery formats.

In the United States the Western Governors University was founded in June 1996. It is a degree granting "virtual" university with support and programs from eighteen member states. Hundreds of other US institutions, both public and private, are entering into the business of online instruction. In this rapidly changing environment, Ireland has the option of accessing best practice in a number of areas. This article looks at a recent experience in the provision of post-graduate training in a state-of-the-art distance education project with the University of Illinois.

The University of Illinois

The University of Illinois is one of the premier universities in the United States with a worldwide reputation in engineering, physics, computer science and psychology. The university has also prided itself

in being at the forefront of accessible educational initiatives both within Illinois, nationally and, increasingly, internationally. From the development of Mosaic, Eudora and Telnet to the ongoing contributions of the National Computational Science Alliance (NCSA) on the Urbana campus and the Electronic Visualization Laboratory (EVL) on the Chicago campus, the University has been an international leader in advanced applications of computer and networking technologies. In recent years, the university has initiated the use of advanced technology within both the regular curriculum and in its continuing education services.

In the emerging global market for educational services, the University of Illinois was determined not to wait while new meta-universities were working to establish themselves as viable alternatives. At a policy level, the university decided to ensure its expansion in the next millennium by using networked information technologies to extend its reach far beyond the physical boundaries of its three campuses. In January 1997 it established the University of Illinois Online, an umbrella organization to co-ordinate and support off-campus educational and public service educational offerings.

University of Illinois Online is not a separate, degree giving "virtual" campus. All of the courses, certificate programmes and educational resources offered under the umbrella are grounded firmly in the academic programmes of the university, taught and managed by the same faculty and subject to the same quality controls. Today, some 150 courses are being taught online, including one at doctoral level in pharmacology.

The emphasis reflects a deliberate focus on adult education. Adult learners tend to be more motivated, focused and self-directed and therefore better suited to learning in less structured environments. In addition, in today's economic climate, working professionals are increasingly concerned about enhancing existing skills or developing new ones. They are thus a receptive group for programme initiatives.

Professional rehabilitation in Ireland

The Department of Community Health of the University of Illinois in Urbana-Champaign is currently delivering a M.Sc. in Rehabilitation Counselling in Ireland, the first programme of its kind in the field to be delivered internationally. It has underlined the need in Ireland for new forms of course delivery while at the same time indicating the potential for the development of Irish expertise in a rapidly evolving field. The highly innovatory character of this programme and the impressive results to date point to a strategic focus that can marry adult education approaches and technological excellence with the social and human sciences in providing advanced qualifications.

Modern rehabilitation may be characterized as a range of services and processes designed to enable all people with disabilities to live their lives as fully and independently as possible.

A new focus has been placed on rehabilitation in recent times by developments in employment practices, budgetary accountability, the impact of change on living and working conditions and the need for compliance with quality standards, European norms and regulations. The trend has been to move away from developing separate structures (especially in training, education and employment) and towards integration into mainstream schools, training and employment.

In Ireland, people with disabilities are believed to constitute one of the largest socially excluded groups. In 1992 the ESRI estimated that there were over 240,000 disabled persons in the Republic – about 9% of the economically active population. Despite the size and impact of disability, it remains one of the more complex and obscure areas of social marginalization. Policy formulation, service planning and evaluation have been hampered by factors like:

- Lack of clarity and agreement on definitions of disability
- Lack of comprehensive statistics and research
- Subservience to medicalized models of care
- Organizational complexity in service provision
- Fragmentation and underdevelopment of professionalism.

As a service based profession, rehabilitation is not well established in Ireland and training is done largely on an in-company basis or with reliance on recruitment of recent graduates in the traditionally perceived cognate fields of psychology or social work. It is estimated that some 6000-7000 people work in rehabilitation in Ireland.

Recent years have seen the emergence of specific courses normally at certificate or diploma level. The development of these has been largely aided by EU funding. In addition, the focus has been largely sectoral with a strong emphasis on the role of vocational training as a means to social integration.

No specific postgraduate training existed. The need for a professional qualification in rehabilitation was recognized by service providers, practitioners, national agencies and the EU itself.

Rehabilitation Counselling

In the United States, the profession of Rehabilitation Counsellor was established by Congress as a response to the huge expansion in services following the Second World War. The development of the profession has been influenced primarily by the fields of education, counselling, psychology and sociology. To a lesser extent it has encompassed contributions from medicine and engineering. Rehabilitation Counsellors work closely with individuals and families to provide expert and professional evaluation, assessment, counselling and placement interventions which maximize independence and quality of life for those marginalized by the experience of disability.

With the passage of the Americans with Disabilities Act in 1990, an increased emphasis on rights and independent living has underscored the importance of the role of Rehabilitation Counsellor in enhancing the lives of those with disabilities. There is no equivalent profession in Europe.

The rehabilitation services that have emerged to meet the needs of those with disabilities in Ireland have been extensive. They have, however, been marked by fragmentation, voluntarism, charity and a high reliance on ESF sponsored vocational training programmes. With the longest established and most extensive offering of Postgraduate rehabilitation courses in the world, the US has vast expertise and over 100 university programmes to draw upon. Widely recognized as a leader

In the field, the University of Illinois has been successfully engaged in delivering its M.Sc. in Rehabilitation Counselling from Urbana to a site outside Chicago through its extramural programme since 1992. This uses a combination of ICT and face-to-face instruction to cohorts of in-career students. It was thus a potentially suitable partner with whom a similar programme could be developed to meet Irish needs.

The Irish Experience

It was recognized from the outset by all involved that any such joint US-Irish undertaking would require significant alteration for its Irish context and to address in a culturally sensitive way specific Irish conditions. Nonetheless, the strategy would have the benefit of building up a cohort of professionally trained Rehabilitation Counsellors in a focused way over a relatively short period of time. It would also avoid the alternative ad hoc model of individual professionals travelling from Ireland to the US to undertake such training directly.

Such a project called for interdisciplinary and interagency collaboration. Ireland's newest third level institution TRBDI (Tipperary Rural and Business Development Institute) had a stated commitment to ICT, sustainable rural development and inclusive community and educational approaches. It sponsored the feasibility study undertaken by Universal Learning Systems. This study involved in-depth consultation with agencies, government departments and universities concerned with professional training and development in the disability field.

Following the delivery of a pilot module and evaluation, the full M.Sc. Programme commenced in January 1998 with 17 students.

This project entails a partnership approach between the University of Illinois, TRBDI and the outreach host delivery site of St Anne's in Roscrea, Co Tipperary. The programme is directed by an Advisory Committee representing service providers, people with disabilities, statutory bodies, health boards and DCU. An Irish Academic Director acts as coordinator for the course.

Over 350 applications were received for the M.Sc. from around Ireland. The background of the students represents a wide range of disciplines. They include:

- Teachers/educational administrators
- Occupational therapists
- Psychologist
- General Practitioner
- Art therapist
- Training specialists
- Addiction counsellors
- Placement specialist.

The average age of the class is 30, with a spread from 24 to 60. Students come from all over Ireland. One is from Zambia. Course sessions are held every other Friday and Saturday in Roscrea. There are twelve modules in the entire two-year programme. These are:

- Introduction to Rehabilitation
- Theories of Counselling
- Research Methods
- Vocational Evaluation
- Medical Aspects of Disability
- Psychosocial Aspects of Disability
- Independent Living
- Job Placement
- Advanced Theories of Counselling
- Disability Policy
- Supervised Practicum
- Thesis or Supervised Internship.

Delivery design features represent a hybrid combination of technologies, ISDN for point-to-point video-conferencing, Internet based data sharing and asynchronous information and communications support, adapted written materials and extensive use of e-mail. The first ISDN line is used for video-conferencing; the second for Internet access and the third is back up for additional conferencing as required. A ceiling suspended High intensity LCD projector allows display of course materials controlled by the remote tutor through Microsoft NetMeeting software.

All class material are mounted on the University of Illinois website and are remotely accessible to all concerned. All students are required to have e-mail with addresses acquired through the Tinet/HEA agreement or by listed on free web sites. The full resources of the University of Illinois library are available to students (the second largest library in the US) and all articles or materials can be downloaded. The Academic Director in Ireland is available to students at all times in a consultative or supporting role via telephone or e-mail.

Summary

Rehabilitation policy in Ireland is changing rapidly with the establishment of the National Disability Authority this year, the mainstreaming of all vocational training for people with disabilities as the responsibility of FAS, the development of equality legislation and the increased European emphasis on

assistive technologies. The parallel growth of the independent living movement has underlined the need for professional competence and qualification in meeting the needs and aspirations of the disabled community.

The development of the Master's programme is the first ever distance learning course at post-graduate level between the United States and Europe. The involvement of consumers, practitioners and academics has been an innovative feature. It is anticipated that the lessons for collaboration and staff development will be relevant to other EU countries in future years. The potential for Irish rehabilitation professionals to extend their research and teaching capacities in such a scenario is considerable. The project has attracted a considerable amount of national and international interest. Student reaction and evaluative responses have been positive and enthusiastic. Study and research visits have been hosted for interested professionals from the US, Switzerland, Zambia and France. It has been viewed as an innovative development both in terms of continuing education for the profession and in terms of the use of distance learning technologies. Finally, the project shows how Ireland can act as a bridge – using both student-centered adult learning principles and the latest new technologies – between best practice in the United States and the social needs of an emerging Europe.

Background

Modern rehabilitation may be perceived as a range of services and processes designed to enable all people with disabilities to live their lives as fully and independently as possible. A new focus has been placed on rehabilitation in recent times by developments in employment practices, budgetary accountability, the impact of changing technology on working and living conditions, the potential of new assistive technologies and the need for compliance with EU norms. These changes have been encapsulated in the 1996 EU Report (*R.01*) on a new Community disability strategy. The report highlighted the trend across the Member states away from the traditional response of developing separate structures, particularly in the areas of education and employment (*e.g. special schools, sheltered workshops...*) and towards initiatives promoting integration into mainstream schools and into open and supported employment. The need for professional qualification in rehabilitation in tune with these changes has been recognised by service providers, practitioners, national agencies and the EU (*R.02-06*). Indeed, the lack of a post-graduate training and qualification is a major concern (*R.07-08*). This paper about an initiative that responds to these needs and Figure 1 indicates its schedule.

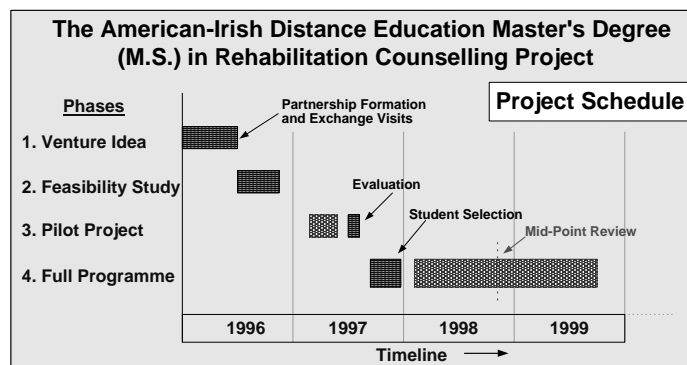


Figure 1: The Project Schedule indicating the Phases of Development 1996 –1999.

1. The Distance Education Strategy

There are numerous working models of distance education with different varieties of information and communication technology (ICT) systems support in operation today (*R.9*). Indeed, the very rapidly changing ICT situation served to enrich the tools available to educators. The Internet and ISDN provide two good examples of new tools. Along with changing technologies, there is international economic liberalisation of telecommunications. These techno-economic factors combine to challenge educators, as learning theories and pedagogical principles and practices are presented with innovative technological

options. While a larger debate ensues on the relative merits and demerits of distance education versus the more classical model, guidelines on the best practice for modern distance education are starting to emerge (*R10-R.13*).

The strategy adopted for the Illinois-Ireland programme was essentially a hybrid distance-non-distance educational approach. Its principal design features provided for:

- a) The pedagogical needs of the post-graduate students and tutors (*e.g. interactivity*)
- b) Point-to-point video-conferencing for two-way live communications (*synchronous*)
- c) Synchronous presentation of course materials /slides
- d) Asynchronous access to videos/slides, library resources and group communications (*e.g. email*)
- e) Simplicity of set-up and operation for the ICT systems
- f) Initial real/local tutoring for each individual module
- g) Work experience /thesis elements
- h) A 'high touch' local Programme Director
- i) A local Advisory Committee
- j) Cost effectiveness.

2. The Master of Science (M.S.) Degree Project

A pilot experiment was undertaken in early 1997 and evaluated. The first cycle of the Master of Science (M.S.) programme then commenced (January 1998 – August 1999). A fully structured Programme Advisory Committee was set-up to guide the Irish aspects of the programme in liaison with the University of Illinois at Urbana-Champaign (UIUC) faculty.

2.1 The Students: In response to nationally placed advertisement some 350 plus in-career applicants applied for the course. A short list of candidates sat the Miller Aptitude Test (MAT) and were interviewed by a University of Illinois faculty member prior to acceptance. There are 17 registered students taking the course. The employment backgrounds represent a wide range of involvement in the rehabilitation field. They include: addiction and disability counsellors, an art therapist, a psychologist and a medical practitioner. The average age of the class is 30 years.

2.2 The Course: The sessions are normally held biweekly. There are 12 modules to be completed. Ten of these are course modules and include, Theories of Rehabilitation counselling, Psychosocial Aspects of Disabling Conditions and Independent Living. The remaining modules are:

- a) Supervised Counselling Work Placement assignment with a UIUC approved mentor and
- b) Full Thesis or a Supervised Internship Assignment.

2.3 Class Structure: All classes are co-ordinated in Ireland by the presence at all times of a Course Director assisted by administrative and technical support staff. The 10:00-14:00 hours Saturday periods are used by the Director for small group activities, the viewing of videotape course aids and support activities. This helps create a rich group context for learning which is combined with the distance education strand. The video-conferencing sessions run from 14:00 – 20:00 hours local time (*GMT*) Fridays and 13:30– 18:00 hours (*07:30 –12:00 Central Time (Illinois)*) on Saturdays. The formula is that the first session of each course module is conducted in person (real presence) by the responsible professor/tutor. This is used to establish a personal relationship to the group and to assist the professor's understanding of the educational and contextual environment.

3. ICT Systems

The main ICT system design features represented a hybrid combination of technologies, principally, ISDN for point-to-point video-conferencing and the Internet for data sharing and for asynchronous information and communications support. The description here relates largely to the remote or Irish end.

3.1 Network & PC Infrastructure: On the telecommunications side the facility consists of three basic rate ISDN lines and two normal analogue (Public Switched Telephone Network or PSTN) lines. Category 5 cabling, an 8 port hub and an ISDN router were installed together with six networked (10Mb/s) 233MHz. 32 MRAM Pentium II PC's with NT 4.0 operating systems in a separate PC laboratory. Internet access at ISDN rate (64Kb/s) was at this time available through the dial-up.

3.2 Video-Conferencing System: For the conference room facility it was decided on the basis of student satisfaction ratings, to proceed on the basis of 128Kb/s conferencing as the norm (H.261 upgradable to H.263 video coding standard) rather than at 384Kb/s bandwidth service. Two different video-conferencing systems with 128-384Kb/s specifications were evaluated, one PC based and the other a remote control TV based room system. The latter was installed mainly because of its ease of use as its function was solely to allow two-way audio-video communication. The incoming remote video images are displayed to the class on a single 27" TV monitor mounted at the normal standing height and directly adjacent to the wall screen. This provides a single point of focus for the students as well as avoiding the cost of multiple monitors. The outgoing video is available on a 14" TV screen directly below the larger set.

3.3 Presentation Display: A ceiling-suspended high intensity LCD projector (SVGA) was installed together with a wall-mounted two metre wide screen. This is normally used for the display of course materials /slides which are normally controlled by the remote tutor through Microsoft's Net Meeting (v2.1) software. The ceiling projector is also used for display of videotape materials. For playing of videotapes a multi-standard (NTSC/PAL/SECAM) unit is employed.

3.4 Audio System: The local audio system allows for the multiple microphone inputs to an audio mixer and amplifier. A conference (boundary) microphone serves the main student need. A wireless microphone is also available and is primarily intended for local tutor use when in conference. The incoming audio is normally fed through the TV monitor but is switchable to wall mounted speakers. For videotapes the audio system of either the LCD projector or the wall speakers can be used. A conference phone system with good echo-cancellation is also installed and this is present as backup for ISDN outages or for audiographic sessions.

3.5 Internet based Services: Class materials are mounted on the UIUC web site and are remotely accessible to all involved. They can be viewed and downloaded as slide presentations typically in Powerpoint or standard web browser (HTML) format. To ensure their availability to students the files are downloaded in advance of the relevant sessions and stored/archived on a local PC. Slide presentations are also archived on a UIUC web site and are thus available for review by students at home or in other locations where they have Internet access. All students have acquired email addresses. A class distribution list service has been set-up which allows both tutors and students to broadcast messages to all others on the list by means of a single message.

4. Experiences with the Programme

A full review of the findings of the project is in the course of completion, but a number of observations can be made at this time.

4.1 Pedagogical Observations: Perhaps it suffices to state at this stage that at the general level the pedagogical performance is quiet satisfactory. Much preparation and effort has been applied by all sides – tutors, students and the administrative and technical support functions to ensure fulfilment of a quality service. The student body is highly motivated and steadfastly committed to its task – indeed its opportunity.

For the instructors, the technology has not been perceived as a substitute for developing a student-teacher relationship. The initial sessions of each module brought the instructors to Ireland for that weekend and allowed them to directly meet their students. This has been found to be immensely important in establishing personal connections that persist during the later distance education classes, email interactions and other applications of ICT that otherwise might be highly impersonal. In line with the findings of the pilot, the video-conferencing sessions are conducted in a highly interactive manner to

enhance pedagogical effectiveness by using the two-way capability of the technology and so avoid the less effective 'TV mode' or 'talking head' delivery.

The video-conferencing transmission has been noted to introduce a slight time delay which alters normal conversational patterns. Because of the slight delays, interjections timed to occur during pauses in a speaker's statement arrive belatedly after the speaker has resumed speaking. Thus, incidental gestures intended to provide positive feedback ("Good !") can be perceived by the speaker as an inappropriate interruption or an attempt to terminate the statement. This can introduce an awkwardness into two-way conversations and requires understanding and adjustment by both students and instructors.

4.2 Technological Observations: With the additional investment in infrastructure and equipment described above, the operation of the ICT systems was very much improved over that of the pilot project. From an overall technical support perspective the technology has indeed functioned to a satisfactory level or above.

The video-conferencing system has operated quite satisfactorily at 128Kb/s. The availability of the ISDN service has been excellent. Picture quality has been largely satisfactory with less frame freezing. An additional wide angle lens was fitted to the zoom camera to allow to whole class to be viewed by the tutor without the need to pan. The audio still needs some improvement to assist easier student participation. Echo-cancellation remains a problem when sound amplification levels are raised and also G.722 quality is not consistently possible for some undetected reason. The ISDN Internet dial-up network node initially caused 'freezing' problems with the remote tutors presentation of Net Meeting session, but this has been overcome by increasing the time-out on the router.

The use of email has been a very positive aspect of communications. Assignments are uniformly sent as email attachments. The distribution list is being increasingly used by all. A few students have experienced the initial difficulties with the encoding/decoding of attached documents.

The area of the digital library is the one area which was slower than the others in reaching the required level of performance. The challenge here was a combined technical, procedural and a skills issue. Copyright restrictions require that for certain library resources different levels of security apply. Searches of certain databases only require a 14 digit Patron ID to be entered. Hard copies of requested articles are sent by air-mail by air-courier and are received locally within 48 hours. This service has been well received. Other databases, particularly those with full text holdings normally have access restricted to on-campus terminals together with Net ID and password security. Currently, this additional Internet Protocol (IP) based security has been adapted. Direct downloads of full text are possible in such cases.

Technical support has been available throughout to assist the process of gaining ICT skills as well as for the operation of the ICT systems. It has proved to be a significant factor. It is to be noted that while the ICT systems are more easily manageable, local technical support is required for numerous functions. Examples are, the start-up and closing down of the facility, initialising the conferencing sessions, camera, audio and lighting control, initialising the Net Meeting sessions, software upgrades, archiving, email problems, library access support and individual and group briefings.

5. Outlook

The development of this M.S. programme is the first ever distance learning course at post-graduate level in the field of rehabilitation between the United States and Europe (*R.14*). The first cycle has been favourably received and the hybrid model developed for distance/technology based delivery has proved satisfactory. As the demand remains high, it programme has the potential for developing a specific rehabilitation profession at the national and European levels.

It is anticipated that the final lessons of the above collaboration using ICT technologies will be directly relevant to further applications, both for rehabilitation professionals and persons with disabilities throughout Europe in the years ahead.

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EDUCATION FOR EMANCIPATION OR PROFIT? THE CHOICE FOR THE 21ST CENTURY

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This paper explores issues arising from how the pressures of globalisation may cause education to consider profit before its emancipatory role.

The context of globalisation

The globalization of capitalism is one of the major socio-economic forces influencing life in the world today. This has arisen from the rapid growth in technology, the search for new markets and cheaper zones of production and has been fuelled in recent years by the gradual deregulation of international trade. A major problem of globalization of the capitalist market is that the very basis of modern capitalism is profit optimisation for investors. Early industrial capitalism was often community-based, manager owned and with a degree of paternal care towards the local workforce. Modern organisations, by contrast, are often owned by distant investors, who may be individuals, banks or investment funds, and whose only involvement and concern in a business is for an optimum return on their investment. Chomsky (1998) observed that although 90% of transactions related to the real economy in 1970, by 1995, 95% were speculative with 80% of these focussing on returns of less than a week. Communities across the world are therefore in danger of allowing short-term investors to determine social policy.

The globalisation of the marketplace has forced all countries, commercial organisations, institutions and individuals into world-wide economic competition. The system is amoral in that it has no philosophical concern for social justice, only for profit. Many of the worlds largest corporations have more economic power than many Nation States (Giddens 1990), and the unequal power relationships caused here and between the richer and poorer countries creates, imposes and maintains huge inequalities on many peoples of the world. It is in this global market context that both rich and poor countries struggle to maintain or improve their relative economic positions for the sake of their communities. Countries rely on employment and productivity for the economic wellbeing of the economy which provides the financial basis for the collection of revenue. This in turn gives the government the means with which to support the social infrastructures within the wider community such as health, education and other social services.

The commodification of the individual / learner

In 1976 the then Prime Minister of Great Britain James Callaghan delivered his now famous 'Ruskin Speech' in which he blamed the education system for failing to provide British industry with the skilled workforce to keep the country economically competitive. Since then successive governments have seen education as an instrument for economic success and have pursued policies that engage the whole UK education system in vocationalisation of the curriculum, moving away from the liberal humanistic traditions of learning. Along-side this there have been strong drivers in Further and Higher Education to expand the numbers and move from an elite to mass system of education. Successive UK governments have pursued this policy partly for economic and partly social inclusion reasons.

Carr (in Wellington, 1993) argues that the political perspective which underlies the rising vocationalism has not been fully explored and that this tendency in our education system relates closely to the first of Feinberg's (1983) two paradigms of the major social functions of education. This views the social function of education as mainly economic and vocational, providing:

"...deliberate instruction into a code of knowledge, a set of principles and techniques designed to further the participation of an individual in the market through the mediation of skills that possess an exchange value... it is primarily concerned with the transmission of technically exploitable knowledge."
(Feinberg, 1983, 228)

Feinberg's second paradigm views the social role or function of education as mainly political and cultural:

"...primarily intended to further social participation... through the development of interpretive understanding and normative skills... General education, as education for participation in a public, ideally implies a community of equals, active partners engaged in a process of self-formation. Its ideal is a process... where arguments are heard and judged on their own merits and where all have equal access to the debate."
(Feinberg, 1983, 228-9)

From these two paradigms it is easy to identify the first as describing the model of education which has developed since Callaghan's speech. It is a model that commodifies the individual and rates their value to society in direct relationship to their economic viability. The education system exists primarily to support this economic function of the individual. It must be acknowledged that given the present economic system, and for practical purposes of surviving in any form of society, that the development of skills relating to the needs of that society are a necessary part of the remit of an education system. There is, however, a question as to the balance of vocational to humanistic learning. This model would tend to promote the commodification of the individual as almost an end in itself, whereas Feinberg's second paradigm reflects a view of life that is geared to the creation of democratic communities in which individuals are encouraged to take a full part. In his focus on the, "development of free persons... who are... capable of making unmanipulated judgements on the basis of reason" (Feinberg, 1983, 228-9), Feinberg reflects a model of education based on emancipation as espoused by such adult education luminaries as Freire, Horton, Rogers, Illich, Mezirow, Brookfield, Gelpi and many others.

Feinberg's second paradigm describes a form of participatory community where learning supports the individual's ability to actively engage in the development of community. This concept is central to the ideas of educators such as Freire (1972), Brookfield (1987), Mezirow (1990) and Nussbaum (1997), who see such approaches to learning as fundamental to the creation, growth and maintenance of a democratic and free society. They see the ability to think critically as a crucial skill for full participation in society in having an awareness of differing values which underlie socio-political ideas and the thinking processes with which to think through and compare concepts for themselves.

The emancipatory educator Paulo Freire (1972) described the predominant system of state education as a 'Banking' system in which the students are 'containers' to be filled with deposits of knowledge by teachers. He saw this method of knowledge transmission as part of the process of oppression, a way of maintaining the power relationship and suborning human kinds potential:

"The more completely they [the learners] accept the passive role imposed on them, the more they tend simply to adapt to the world as it is and to the fragmented view of reality deposited in them."
(Freire, 1977, 47)

Knowledge in this sense is a finite, known and ultimately dead commodity. Freire, however, sees knowledge in the emancipatory process as something which is re-invented by the learner making meaning in their own situation and transforming their understanding, whereas in the banking model, knowledge masquerades as an unproblematic given.

"For apart from inquiry, apart from praxis, men cannot be truly human. Knowledge emerges only through invention and re-invention, through restless, impatient, continuing, hopeful inquiry men pursue in the world, with the world, and each other."
(Freire, 1977, 46)

The banking process of teaching and learning maintains the duality of the roles of teacher and learner instead of forming a partnership in learning. It also, through reinforcing of the passive role of the learner,

reinforces the state of what Freire calls 'false consciousness' within the individual, a state in which they accept their situation without question. To empower the individual and society to develop towards their potentials, people have to engage in critical reflection about their situation, in order to transform their understanding and make meaning for themselves. This process that Freire calls 'conscientization' is similar to Mezirows (1991) 'transformative learning' and Nussbaums (1997) idea of the 'examined life' from Socrates, and Habermas' (1991) dialogues as part of developing communicative action. Ettore Gelpi in his work 'A Future for Lifelong Education' observed that education could be used for purposes of both emancipation and subjugation.

"Education for all, and at all ages; but with what objectives and with what means? 'Lifelong education' could result in the reinforcement of the established order, increased productivity and subordination; but a different option could enable us to become more and more committed to the struggle against those who oppress mankind in work and in leisure, in social and emotional life." (Gelpi, 1979, vol. 1:1)

Ultimately educators have to ask themselves what kind of society they are trying to create, and if the answer is a freer, developing, humanistic, reflective culture then we have to rise to Mezirows challenge:

"...adult educators who administer programs for the public have a professional obligation to foster transformative learning by offering challenging programs designed to encourage learners to critically examine internalized social norms and cultural codes in courses, workshops, and conferences dealing with public issues, consumer education, understanding of the media, self-understanding, and with political controversy involving dissent and alternative meaning perspectives." (Mezirow, 1990, 357)

The Commodification of Education

During the 1980's in the UK, the competitive forces of the marketplace, were introduced by government into the education system in an attempt to make it more efficient. As the students and parents of students learned to become consumers, choosing between a selection of course possibilities, so the education institutions developed keen marketing strategies and learned to compete for customers/students in the new education marketplace. Some voracious institutions took over others in actions more reminiscent of corporate mergers. As the knowledge economy emerged, education institutions realised the commercial value of both their store of knowledge and teaching processes. Research knowledge, courses and teaching were equated to commercial value for the first time in education, and Intellectual Property Rights (IPR) evolved from a reasonable defence from plagiarism, to a legal protection of an institutions main financial assets. As well as internal competition for students, HEI's are increasingly facing competition from predatory institutions in other countries and in some cases have expanded themselves beyond the UK. The international market in learning is huge and international moves to remove trade barriers have included education. Indeed, corporate universities, have been created by multi-nationals such as MacDonalds and Motorola, and these are now entering the broader commercial field offering courses to non-employees.

As contributors to the knowledge economy, education institutions increasingly see their products as marketable commodities in an increasingly lucrative and expanding education market, both national and international. Whilst moves within the European Union to share knowledge and good practice between member states and help developing countries expand their educational provision are laudable aims, there are both positive and negative potentials in these complex scenarios. Though humanity world-wide shares many common needs and cultural traits, there are considerable differences between cultures, the diversity of which keeps alive a multitude of different views on both the meaning and process of life. As with colonialism of the past, carried out by force of arms, so cultural colonialism is today spread through improved communications, commercial trade and the global media. Now a pseudo western/Americanised culture is being spread through the global media which often proffers an illusory lifestyle which is both inappropriate and unattainable to many of the people who receive it.

There is a danger that educational exports may fall into the imperial colonial trap and become another form of cultural hegemony creeping across the world. At the very least, and with the best of intentions, programmes, courses and knowledge may not transfer simplistically from one culture to another without some adjustments being made to account for cultural and contextual differences. In a worst case scenario, the education commodity is akin to Freire's 'Banking' model of teaching and learning where the process maintains the international, national, economic, social and political imbalances.

The danger of unconscious cultural arrogance, however well meaning in intention, especially when it is linked to a commodification of education and a corporate marketing model, is that it leads to or reinforces a duality of roles between institutions and cultures, and within cultures. A simplistic transfer of knowledge or processes or teaching and learning methods is likely to fail or be only partially successful. This, what Freire called, anti-dialogical stance preserves or creates unequal power balances, maintaining the economic and academic edge. There is definitely a need to share good practice between industrialised societies and with developing societies. However, a more humanistic and emancipatory approach would involve a dialogue, a partnership between peoples and cultures, creating a meld of knowledge in a creative crucible of learning. There is a need to overcome intellectual arrogance, especially when dealing with less industrialised cultures and to foster humility in our relationships in learning.

Conclusions

One way forward may be for institutions to form partnerships with other institutions, services, commercial organisations, governments etc., with clear educational purposes arising from agreed aims and values. Funding could be secured appropriate to the purpose. It is important that the funding partners, whether in public or public/private partnerships, also support the common aims that should include social development and individual emancipation. Educational institutions such as universities have the power to choose to engage with partners in ways that value educational principles above financial ones.

The choices outlined in this paper, between emancipatory or banking approaches to education, the balances to be made between humanistic and vocational education, allied to the dangers of commodification of learning and the emerging marketing model of education, create both great opportunities and threats for the future of learning world-wide.

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AN ETHNOGRAPHIC EXPLORATION OF THREE EUROPEAN DISTANCE TEACHING UNIVERSITIES: THE BRITISH OU, THE SPANISH UNED, AND THE PORTUGUESE UA

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Abstract

This paper gives a general description, of an ethnographic character, of the three Universities - the British Open University (OU), the Spanish Universidad Nacional de Educación a Distancia (UNED), and the Portuguese Universidade Aberta (UA). It comprises three levels of analysis: institutional, departments and MA Programmes associated with distance education and educational technology at each of the Universities. The purpose for this analysis was to undertake a preliminary description of these Universities as a background that would inform the interview process, at a later stage, as well as the theoretical reflection ensuing therefrom. Apart from the intrinsic limitations of this paper, it needs to be borne in mind that the actual time frame for these descriptions is situated around 1997, and that significant changes have taken place since then in each of the institutions, particularly with regards to their implementation and expansion of their online provision of programmes and student support. A fuller discussion of these institutions in relation to the role of educational technology in their respective contexts can be found in González (2002).

Key Words: distance teaching universities; educational technology; ethnographic studies; MA programmes; intercultural studies.

Institutional Level

Universidade Aberta was established in the context of rapid changes, although it was preceded by a long history of visionary efforts and piloting processes that did not crystallise until 1989 (Carmo 1997). Its creation was ultimately justified as an emergency solution (having to do with the urgent need to provide a way of access to accreditation to a large number of teachers who lacked them) rather than as recognition of its social usefulness. Also the educational policies within the Portuguese panorama were divergent, if not contradictory at times, questioning the whole continuity of the UA once established. Only in March 1994 were its Statutes approved, granting UA the same juridical status with the rest of the Portuguese Universities.

UA as an institution stands firm in its commitment to promote the Portuguese language and culture, both at home and abroad, and to do this not only as an educational thrust but also from a political stance. Its first years of operation were mainly concerned with enabling teachers to obtain their academic qualifications in accordance with the commissioning of the Ministry of Education. In terms of its background, the UA constitutes a unique case in the history of educational politics. It was officially established in the mid-seventies, its operations subsequently suspended *sine die*, and in spite of this mere 'virtual existence' for a number of years managed to keep an active presence in the international world of distance education, even becoming a founding member of the European Association of Distance Teaching Universities (EADTU). The university was then 're-born' and launched as a fully operational university in 1990. UA has specialised in areas of multiculturalism.

The **OU** has a well-established international reputation of excellence in distance education. It not only re-defined the concept of distance education, but established a solid academic credibility within the rather conservative British higher education establishment. Its successful implementation inspired the creation of other national distance teaching universities, among them UNED and UA. The Open University has not only demonstrated significant organisational competence, but also an ability for connecting with market orientations in the British society, as well as with global market trends as it seeks to internationalise its operations. The OU has broken new ground for educational innovation exploring and

exploiting the educational possibilities of available technologies. In this respect, its partnership with the BBC proved crucial in order to establish an image of excellence in the educational use of broadcasting media. However the more widely recognised and radical innovation of this university has been of giving access to higher education to any individual, without requiring previous academic qualifications. This is an innovation of tremendous proportions in the history of education and toward the goal of universal access, thus raising a flag and making a statement of major educational consequence and possibilities. Furthermore, its real genius has been not simply in stating this ideal of open access but in making it viable by putting into place the necessary systems and processes to enable its students to achieve the recognised standards of academic excellence. Due to this original policy of access, the OU was bound to be seen as a 'bird of a different kind' not only in contrast to traditional British universities, but also with regards to the majority of distance teaching universities world-wide that do require prior academic qualifications from students that wish to gain access to their educational provision.

The political will for the creation of the **OU** rests firmly on the vision and commitment of a prominent political figure, Prime Minister Harold Wilson. This vision was only later adopted by his Labour Party. The university has a central headquarter and a number of regional centres, plus an extended network of study centres using the facilities of other academic institutions. The OU demonstrates aspects of an industrialised form of educational 'production system' as characterised by Peters (1983), i.e. rational organisation, carefully planned programme of production and marketing, division of labour, standardisation, economies of scale, etc. The sophistication by which this university exemplifies these characteristics sets it apart, in comparative terms, from the experience of the other two universities.

UNED represents not so much a break with the conventional Spanish university culture but rather a successful extension of it. Its creation met a deeply felt need in Spanish society and was warmly welcomed in the educational landscape. The network of Associated Centres that emerged across the country did so through the local initiative of people and institutions that saw in UNED the possibility of adopting it as their own local or regional university (García Garrido 1976). These Associated Centres were in fact financed through local initiative which provided facilities, resources and funds to sustain academic and administrative costs. UNED, like the OU, is a large university in terms of student numbers. UNED has a comparable size of student population to that of the OU, even in spite of the fact that UNED does not offer an open access policy to its students, neither the sophisticated administrative and support systems, nor the quality of its instructional materials. In spite of this, UNED has established a notable presence and reputation among the Spanish Universities. Its success is achieved through the determination demonstrated by its students from sectors of the Spanish population for whom the university represents a previously undreamed of opportunity.

From its early stages in the 70's UNED has attracted significant numbers of doctoral students both in Spain and Latin America. These links with Latin America have been strengthened over the years with a solid development of international programmes supported by Spanish and Latin American governments. In spite of these strengths, UNED has still to develop a university wide strategy of improving the quality of its distance learning materials with the needs of the distance learner in mind. Apart from recurrent recommendations and workshops that seek to engage academics in innovative forms of distance learning methodologies, there is no unifying criteria for course productions and the quality of materials within and across the different Faculties shows great disparity. To some extent this reflects upon a rather individualistic academic culture that would have difficulty embracing the course team approach characteristic of the Open University.

UNED presents an organisational structure which is heavily centralised (in its programmes, material production and systems of evaluation), and yet is significantly autonomous regionally in terms of the administration of its teaching, carried out in 'Centros Asociados' (Associated Centres). UNED was born with strong political support and a widely shared recognition of its social usefulness. This is also reflected in the extraordinary response of local Institutions to develop partnerships with UNED in order to establish Centros Asociados (which could be considered as some sort of university level community education projects).

Departmental Level

Relevant to this research is the consideration of any departments associated with educational technology in each of the universities.

The Institute of Educational Technology (IET)

In the OU, the IET represents the most notable expression of educational technology within the institution. Its creation with the status of an academic faculty – not as a mere technical support unit – constitutes a major innovation as it was originally designed by the first Vice-Chancellor of the University (Perry, 1977 pp. 81,82). The IET attracted academics from a rich variety of academic backgrounds. The initial justification for this was the need to contribute educational technological expertise to different faculties in the development of their courses, with the obvious advantage of educational technologists sharing similar academic experiences with the faculties they were to assist. Just as the OU represented a ‘bird of a different kind’ amidst British universities, the IET became another such ‘bird’ within the Open University itself, and has encountered significant resistance to becoming fully accepted by the other faculties. The academic prestige and status of the IET has been enhanced by its repeated successes in recent Research Assessment Exercises, in which the Institute has received the highest recognition as a world class research centre. Since 1997 the IET has been offering an MA Programme in Open and Distance Education, electronically delivered and attracting students from all over the world.

Instituto Universitario de Educación a Distancia (IUED)

Institutional and methodological research for distance education in UNED is carried out by the IUED. This is a relatively small department made up of academics seconded from two faculties - Sociology and Sciences of Education - that contribute to the functions stated above. The director of the IUED has always been an academic from the Sciences of Education Faculty. The IUED activities result in recommendations that seek to improve the various aspects of the university but which carry with them no decision-making power. The Institute maintains a documentary centre and develops guidelines for the production of Audio-Visual and Printed Material. The Institute is also responsible for co-ordinating an annual International Course on Distance Education with participants from Latin America.

Centro de Ensino a Distancia (CENTED)

CENTED at Universidade Aberta was conceived as an experimental unit in order to develop and test prototypes for use in distance education, such as the production of advanced multimedia Portuguese language courses or the development of expert systems to carry out discourse analysis of their own teaching materials. The Centre is linked with the Institute of Multimedia Communications, which is responsible for implementing the production of the university’s teaching materials. The CENTED is also the academic basis from which an MA program in Educational Multimedia Communications is being offered.

MA Programmes

From the point of view of this research on educational technology in distance education it is of interest that each of the universities is currently offering an MA programme in related areas of educational technology, and this as a rather recent development.

UA was the first of the three universities to offer a type of MA called **Educational Multimedia Communications**, launched in the first year of the university’s operations (1990). This reflects the importance attributed to the programme, a role defined in the university’s Statutes. Its purpose is to contribute to the development of an educational technology culture for the university at large through a strategy described as ‘diffusion’, that is of permeating the institution rather than the setting up of a separate unit of educational technology. Consequently, a majority of the university’s personnel have been participating in this MA. The programme itself has been offered face to face only in Lisbon, but with the recent incorporation of videoconference is now being followed at other university locations in the country.

UNED – MA in **Educational Informatics** was launched in 1996 and constitutes an initiative undertaken by two academics based in the Science of Education faculty, one of them a lecturer in educational technology, which incidentally is one of the disciplines offered within the Science of Education curriculum. This MA has been designed predominantly with teachers of primary and secondary education in mind seeking to stimulate the incorporation of new information and communication technologies in the different curricular areas. The programme attracts many students and the Spanish Ministry of Education endorses it by making available a number of studentships. Furthermore, the MA has a large proportion of its students in Latin America with centres in Buenos Aires, Argentina and Santiago, Chile.

OU - The MA in **Open and Distance Education** benefits from the international prestige of the IET as a centre of academic excellence in educational technology. It also has an extensive consultancy experience in helping to design distance learning systems and materials in different parts of the world. This MA became a reality through the vision of Professor David Hawkrige, the founding director of the IET, who had anticipated since the beginnings of the IET that it should offer distance courses in its own discipline. The MA, launched in 1997, has served to some extent, as a catalyst for the IET to articulate its own expertise and know-how in the area of educational technology, as well as providing an opportunity to take a critical look at its own curriculum. It may also constitute the needed basis for developing the theory of its own academic field. As it stands at present, it offers three courses of very different pedagogical nature. It has a wide range of styles, from the more established distance education approaches to a highly interactive and a constructivist web-based design. This curriculum highlights the diversity of experience and understanding of educational technology across the members of the IET, but at the same time it reveals the gaps existing in the conception of its curriculum as well as its position as a contested field, due to its internal ideological tensions.

Each of the MA Programmes have a very different target group. The UA's is primarily focused on the internal university personnel. In UNED it is directed mainly to teachers in first and secondary education. And for the OU it is very much conceived for professionals already active in distance education and training both in academic and corporate sectors.

Other Characteristics

The demand for **UNED's** services has developed consistently over the years with an impressive increase in student numbers and diversification of its students profile, with more students following courses on a full time basis. Also within the Centros Asociados themselves there has been an increasing demand for specific, non-degree courses (with an Open Admission policy) to respond to felt needs within the local communities.

UA's demand, within the first five years of its existence, fluctuated in accord with the commissioning of the Ministry of Education to attend urgent and politically pressing needs, i.e. the accreditation of large number of teachers. This particular constraint had the negative effect of making it difficult for the University to develop its own curricula, and to choose and attract its own students. It was only in its fifth year that the University was able to develop a strategy of diversification and to establish its own strategy of sustainability for its student population.

OU serves a majority of students who are in full-time employment. In its early years it also attracted a large contingent of teachers in need of accreditation. The university was keen from its inception to develop extensive and diversified curricula across the academic disciplines. In recent years it has been recruiting an increasing number of students from abroad, particularly from continental Europe, reflecting a policy of institutional expansion in accordance with global educational trends.

Curriculum Design

UNED's *carreras* (the whole curriculum of a particular professional qualification) are rigidly structured in *asignaturas* (subjects), *cursos* (an academic year, usually comprising five *asignaturas*), *ciclos* (Diplomado: three academic years; Licenciado: five academic years; and Doctor, usually four more years). Only recently the Nuevos Planes de Estudio (the latest Educational Reforms) are introducing a

measure of flexibility in the curriculum, with more options for students to choose from and the incorporation of a system of *créditos* (credits), following the Anglo-Saxon model.

UNED's fundamental teaching material comes in written and audio form (both tape and radio broadcast). Its Unidades Didácticas - specifically designed text materials for this mode of Distance Education- are generally perceived as one of the weak aspects of the system, and there has been some tendency to abandon their production and to resort to existing textbooks supported by Study Guides. It constitutes an area of major concern within the institution itself. Face-to-face tutorials are provided at the Centros Asociados, with a more recent incorporation of additional online student support. Students can also access their Professors (who are at the same time responsible for the final student evaluation), through personal visits, letters, and more extensively, by telephone. These Professors are based at the Madrid Headquarters and have a required weekly group consultation of about five hours in which they are available to assist students.

UA's offer is based on a flexible design of the modular type, with a system of credits as its *modus operandi*. Each subject is presented as a multimedia package with written and audio-visual materials. The educational support is offered via telephone tutorials from the teaching team at the Lisbon Headquarters, with the additional possibility of the student receiving some face-to-face tutorial assistance at the Support Centres of the University, presently existing in a rather limited scale.

OU effectively created a new standard regarding the quality and development of instructional materials (thus breaking away from the poor reputation attached to correspondence tuition) by bringing together academics across the various fields into course teams, in which educational technologists, BBC producers, editors and designers advise and comment at each developmental stage of the course materials. External assessors further ensure that these materials are consistent with the standards in the respective academic fields. This course team approach is quite distinct with respect to the academic cultures of the two other universities. A description, in Spanish, of the OU model of course development can be found in Mercer and González (2000).

Learning Support

UNED's network of Associate Centres, operating very much as a peripheral campus represents one of the most dynamic elements within its system. It generally enjoys a strong local support and has demonstrated its great capacity as a focus for cultural development within its particular area. Financing is undertaken by the local Patronatos (Board of Trustees) constituted at the time of the creation of the Centre.

UA, on the other hand, conceives its support network rather differently, that of having a supplementary and secondary role. The whole system is designed to render the students as autonomous as possible in their own learning experience. To this end special care is given to the quality of their instructional materials, as multimedia packages, along with the tutorial support via telephone with the teaching staff at the Lisbon Headquarters. Consequently, the role played by its Support Centres is rather weak, with little attendance by the students who mainly use them as a place where they take their examinations. The financing of this network is wholly assumed by UA.

OU has also developed a national system of Regional Offices responsible for organising tutorial support, continuous assessment and, to some extent, counselling that allows for interaction between students and tutors in a variety of ways. Tutors mark assignments submitted by students and support students through tutorials, day schools, while also being available for contact by telephone or, increasingly, via computer networks. Residential schools, usually held during the summer for one week or at weekends at other times of the year, are an integral component of some OU courses.

International Activities

UA's commitment to international involvement contrasts with the situation of UNED, which though being an older and significantly larger distance teaching university, has shown some limitations in making its institutional presence felt in the international scene. A notable exception to this being UNED's major role

towards Latin America (i.e. its Iberoamerican Course). The remarkable success of UA in the international arena may be credited, to a large extent, to its first Reitor (Portuguese for Vice Chancellor) Trindade in the realm of inter-cultural relationships. So far no Rector (Spanish equivalent of Vice Chancellor) of UNED has demonstrated comparable linguistic and/or political ability in this area. A factor that would account for this situation may be that, just like the OU in English, UNED has found itself sufficiently challenged, and relatively at ease, by the large Spanish speaking community. Yet, overdependence for institutional reach based on the linguistic factor may prove, in the medium-long term, a handicap. Professor García Garrido (in personal conversation) has pointed out that institutional monolingualism may cripple the ability to grow and participate constructively in the global dialogue. The internationalisation of the OU and its aspirations for global leadership in distance education are discussed elsewhere (González 2002, chapter 7; Mason 1998; Goodfellow, Lea, González and Mason 2001).

Some Risks and Challenges

The following are some perceived risks and challenges as expressed by informants during research visits to these institutions:

UNED seems to be facing the risk of becoming a legacy of the industrial society, unless it succeeds in reinventing and repositioning itself within the new social and global environment. Also the increasing demand for face-to-face provision brought about by the growing number of younger, full time students, generates heavy demands on its system as a distance teaching institution. Another factor of challenge, and potential opportunity would be to address the monolingual nature of UNED's formal courses, offered only in Castilian Spanish, and not in other languages, such as Catalanian, Basque or Gallego that enjoy a significant population. Finally, there is a need to efficiently respond to curricular diversification and flexibility required by recent national educational reforms.

During its formative years (1990-1994), **UA** was faced with an absence of consistent political support. This greatly conditioned its ability to establish itself with the necessary initial investments as well as its strategy to reach their own target populations within the country and abroad, as well as having to cope with the stress entailed in the continuous effort of persuading the political authorities as to the validity of the model. During the first years of its operation the university had a rather limited academic offer, circumscribed mainly to areas traditionally recognised as the "Humanities", which produced an impression of an immature institution, yet its curriculum has significantly extended and diversified in following years. Finally its tutorial support network remains particularly weak.

OU is also facing a number of challenges. Among these are: the growing competition from conventional institutions also adopting open and flexible learning methodologies and offering their courses in a dual delivery mode; the additional competition from non-UK based universities that offer their programmes in the English language, making use of computer and information technologies. The difficulty of maintaining the level of student numbers at home brings the challenge to recruit students abroad, and with it the challenge of meeting the educational needs of those from a multicultural background. The university must also develop academic partnerships with academic institutions abroad. It must reposition itself within the UK society as being at the forefront of educational and methodological innovation in the age of the Internet. From a more philosophical perspective there is also the need to reconcile (or at least alleviate) the internal tension between the commercial thrust of the university to sell its courses world-wide, and the academic ethos of the university, with it the necessity to re-think its international policy in the light of its institutional values (exporting 'products' versus sharing values).

Opportunities

UNED can boast of a strong social legitimisation in the country, which coupled with a high academic reputation provides two pillars on which to build further developments. A major opportunity for UNED, as a mega-university, is seen in its potential to reengineer its organisation to meet the educational needs of the 'Information Society' and to share in the leadership of the globalisation process.

However, it remains to be seen whether UNED will be able to improve the quality of its Unidades Didácticas, to become more "student friendly", and thus empower its students. Furthermore, a better use and deployment of its various educational media (*campus telemático*), including the use of local radio and of regional TV, plus a more extended use of CMC, may prove decisive if UNED is to position itself advantageously in the new post-industrial educational environment.

UA has built its credibility and academic excellence based on the reputed good quality of its pedagogical materials. It has also to its advantage a more flexible curricular model, which would allow it to expand its offer at a relative low cost. Its rich experience in national and international partnerships is recognised as an invaluable asset. It needs to strengthen its role inside and outside Portugal, thus serving the Portuguese-speaking communities around the world.

OU enjoys an international recognition as the institution that re-defined distance education in the seventies and gave it a solid foundation of academic credibility. The quality of the course materials is widely acknowledged, not least by the extensive use made of them by other UK universities and abroad. It has also demonstrated great competence in managing its complex operations – for an institution of such dimensions – while at the same time maintaining a strong human support of its students through its extended network of Associate Lecturers (Tutors). It boasts of having severed the link between exclusivity and academic excellence that prevailed in UK academic culture until quite recent times. Certainly the OU has not been lacking in critics, most of them, understandably, raised in conventional universities that perceive the success of the OU as a threat to their own academic styles, or even as an 'unfair competitor' in the technological society and the way that funding agencies would seem to endorse its systems and procedures. Yet the university may not lean too heavily on this 'love affair' with the technological culture, e.g. the way in which anything technological is favoured with prestige and funding may create imbalances within the broader educational mission of the university and provoke the neglect of important educational and ethical areas for the sake of more pragmatic, short-term objectives.

Conclusions

This paper has described some of the main traits of the three universities giving especial attention to their educational technology dimension. Their experiences show that they have become, in spite of initial resistance from conventional political and educational sectors, effective instruments for the development of human capabilities and for overcoming barriers of social and geographical distance in the service of their respective student populations. Furthermore they have proved the viability of their educational model, some of their methods and approaches being increasingly adopted by the wider academic community. The function of educational technology in support of distance learning methodologies can be discerned in each of the universities, particularly at the departmental level. However, no comparability can be established between them since it is only at the OU where educational technology is fully established as an academic unit in its own right. In spite of this, it is noteworthy that the educational technological functions are identified and reckoned with, to some extent, in the other universities. An indication of this being the MA Programmes in related areas of educational technology that each of the universities is offering and which reflect a desire not only to extend the know-how of distance learning systems but also an aspiration to articulate its own distinctive curriculum. On the international front, each university has significant involvement in regions of the world where their languages are spoken. It would be interesting to see whether these institutions would be prepared to explore ways in which they could co-operate, and pull together their significant resources and expertise, to advance educational developments in developing countries, even for the sake of reaffirming the social and humanitarian values that inspired their creation.

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THE INTRODUCTION OF VIRTUAL MOBILITY FOR CAMPUS STUDENTS AND ITS IMPACT ON A „GLOBAL SOCIAL COMPETENCE“

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This paper deals with a survey on three case studies of various arrangements for intercultural learning via the Internet in Europe. On the one hand the empirical research is based on theoretical reflections about intercultural competence needed in a multicultural society, on the other hand it is grounded in the pedagogical discussion of media competence. The main goal of the research is to determine the sustainability of Internet-based learning arrangements and a virtual mobility for campus based students.

1. Introduction

With the technical development of the world wide web in the early 1990's, the Internet was theoretically accessible for everyone, at least in the industrial nations. Without a doubt, the traditional electronic media could never have triggered such a development as has the fusion of computer, telecommunication and electronic media (Willke 1997). This can be largely traced back to the optimization and redesigning of communication processes which present a possibility for businesses to respond to the higher demands regarding costs, quality and flexibility in the international marketplace. According to OECD estimates, 30% of the volume in the areas of communication, finance and smaller trade and 20% in education, public health and government will be influenced by the electronic trade (OECD 1999, 9).

A general increase of Internet users can be counted on worldwide. Virtual contact situations will be thus influenced especially by the giants of intercultural and media competence. An intercultural competence in virtual contact situations can contribute to both a globalized and regionalized society, permitting peaceful co-existence since they lead to a large degree to the dismantling of prejudices and stereotypes. Yet the interaction between intercultural and media key competencies is rarely considered, let alone the subject of social competence, which can be regarded as decisive in global as well as regional contact situations in the Internet. This contribution will deal next with the relationship between intercultural competence and internet based virtual mobility situations, in order to enrich consciously the very technically oriented discussion with one further aspect. Based on the mutual influence between Internet and intercultural competence, the influence of a social competence through virtual mobility will be discussed through the demonstration of three case studies. Due to the paradigmatic character of the chosen case studies, this can be of definite importance for the development of a 'global social competence' via virtual mobility.

2. Intercultural competence and virtual mobility

Just how far the Internet poses a chance for intercultural learning depends very much on how far the Net lends itself to learning processes. The question is which new opportunities the Internet-based learning environments for virtual mobility offer for the development of intercultural competence for learners of different anthropological backgrounds. With that, two central problems are raised:

- How should the target size of an intercultural competence be designed in relationship to the development of a virtual world?
- Which Internet learning environments should be chosen from the existing multitude in order to arrive at lasting design criterion?

One possible target size lies in the connection of the effects of the new media with a differentiated understanding of society. Today, a meeting of cultures is let loose from a central nation state through the new media. This is due to the continually progressive supplementation of the national electronic and printed media through new international media, which obey other principles altogether (Schröder/Zimmer 1995). If media in the nation states is on the whole only planned for its linguistic region, global media of

international communities orientates itself toward its multilingual users¹. At the same time, technical development makes the integration and interactive design of various media possible. At this point the process of community creation becomes increasingly important since social actors can join forces with one another or with many others out of common interest. This process will be made easier in the international context through the Internet. And with it, a substantial importance of the new media could be in making possible the formation of transnational societies which themselves consist of many sub-societies. The new media therefore has the ultimate effect of being identity-founding. These transnational societies unite people of different cultures; for example, through trade, immigration and emigration or through common activities in the Internet by virtual mobility. This doesn't mean that the state and the related concept of the international society becomes obsolete or that the artificial partialization of the society must increase (Kleger 1997). This transnational space is at the same time transcultural, requiring a corresponding competence from the social actors which can no longer be fixed to an intercultural understanding. It must concern itself with a transcultural competence which allows the social actors to deal with many cultures of the transnational society, since with the multitude of contact possibilities, not all specific cultural competencies can be conveyed. Objectives for a virtual mobility can therefore be culture-overlapping fundamental competences, to which a transcultural social competence belongs, consisting of sociability, communicative flexibility and sensitivity.

To the solution of the second initial problem – which Internet learning environments should be drawn upon for the analysis of intercultural learning via virtual mobility in the Net – a categorization lends itself which has been obtained from the analysis of world-wide collaborative learning environments for presence universities. It is concerned with learning environments which work by sensitization through explanation and training (Type 1), through consensus creation (Type 2) and through knowledge construction (Type 3) (see Ribold/Weber, 1998). For Type 1, case study CCED (Cross Cultural Explorations and Dialogue) has been chosen, whereby it should be mentioned that since winter 1998, this training with online-communication has been expanded with accompanying video conferencing. At the time of the interviews, this feature hadn't yet been predicted. DEMETER (Distance Education Methods in Teacher Education and research) was chosen for Type 2 and HALÜBO (Hamburg/Lüneburg/Bochum) for Type 3.

3. Analysis

The data collection in winter 1997/98 for the three case studies works with a combination of qualitative and quantitative methods. In order to receive specific information about the environments within a university system, the data, which is analyzed here, has been taken from the data pool of the German universities about the three projects. There were three collection methods in total. A questionnaire was distributed before and after the courses so that distinctive personality characteristics of the learners of the environments could be identified. A qualitative analysis of the communication environments, such as message boards, ensued from a look at the intercultural or rather, transcultural learning process which included the comparison of the categorization according to the Software Typology of Baumgartner and Payr (1994). With regard to the enduring effects of the study results, interviews with experts were conducted in connection with a workshop.

The main objectives of the study are as follows: the study should indicate effects of the technical and pedagogic variations of Internet learning environments. It should also indicate the typical changes in distinctive personality characteristics in regard to the target size of a transcultural competence. The study should finally determine general construction criterion of Internet learning environments with regard to pedagogic constructivism.

¹ In this contribution, we will address the tendency toward globalization through the Internet only, not that of regionalization, which exists as well. The analyses of the language usage of websites indicates that the 'globalization language' English does not play the dominant role as was supposed. Websites are mostly bilingual, in a national language plus English: this points out the further creation of regional and local virtual space, in which the intercultural and media competences remain indeed as equally important as in the global space (Databank Consulting 1997).

4. Results ²

The results of the exploratory study conducted before the start and at the end of the courses (with 173 students who had rather weak international and technical knowledge beforehand) can be divided into three areas: efficacy of the learning environment on the learner, typical distinctive personality characteristics and their changes after the courses and finally, the potential for innovation of the Internet learning environments of these three types. In the following, the results regarding the distinctive personality characteristics will be introduced by way of examples. These characteristics constitute the core of the study since it is through them that the question of which learning environment best supports the development of transcultural competence will be investigated. Transcultural competence was set within a sub-construction of the question which consists of 16 dimensions and 41 variables. The variables were adapted from the personality research for transcultural inquiry. The analysis pursued Latent class analyses (LCA), in order to procure typical answer patterns (Rost, 1990, 1996).

Figure 1 shows an example of 4 typical answer patterns in the dimension sociability, as appearing before and after the Internet courses. The largest group before the course is the "hesitant" type who, although having only minor anxiety towards other cultures, is quite hesitant in establishing and maintaining contact themselves. Less hesitant is the second type before the course (the "sociable" type), who also demonstrates strengths in establishing contact. The evidence for mistrust towards people from other cultures is rather ambivalent, existing only at the beginning. The "sociable" type reappears again after the course and in this case, comprised over 60% of the students. A learning effect had taken place as the sociable group is by far the biggest; even when the individual LCA types don't have to be composed of the same people.

The hesitant type no longer appears after the courses; rather a more active type with noticeably little anxiety regarding foreign cultures. A general finding is that the Internet courses led to increased sociability for most participants. This result is repeated for nearly all 16 dimensions of the measured distinctive personality characteristics. After the courses there was a general gravitation by all the types toward the categories of transcultural competences and at the same time towards a higher positive response niveau. One can therefore assume an overall positive influence of the Internet learning environments on transcultural learning success.

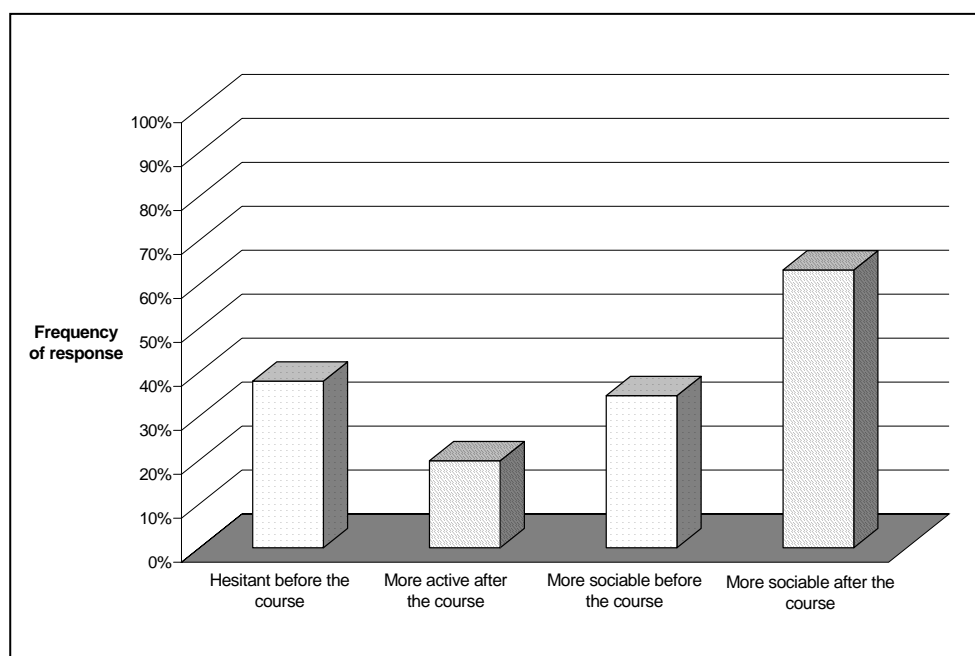


Figure 1: Sociability dimension

² Some preliminary results were published in: Pascal Marquet, Alain Jaillet, Stéphanie Mathey, Elke Nissen (eds.) (1999). *Actes d'IN-TELE 98*, Peter Lang, Berlin.

The point of departure for a look at the changes in the differentiations after the three Internet courses is the classes or types of the LCA analysis, as described above. According to these types and with the help of crosstabulation, it will be investigated in which typical response pattern differentiations occur after the course. Within the first dimension, hardly any differentiations in the strengths can be found in the discrete examinations of the courses for the categorization of the types 'Hesitant' and 'Sociable'. All three courses in this dimension more or less reach the objective of increasing sociability in the participants after the course. This can be explained by the design of the courses, in which all three included a phase of direct contact with the help of the medium of Internet (e-mail, chat, etc.). Two special features result through the technical construction stipulations of the Internet. Firstly, independent of the pedagogic design, it is apparent that the participants are more sociable in intercultural situations through the inclusion of electronic communication possibilities which they themselves specify. Secondly, it became obvious that limits to the technical implementation of problem oriented environments exist due to their enhanced complexity which can lead to undesirable learning results despite the allowance for communicative target categories.

5. Discussion

On the whole, all three learning environment types studied proved capable of initiating a learning process centered especially in the area of social competence, going beyond culture toward a sociable, open and considerate learner. Within the framework of the exploratory character of the study, it can be suggested that the Internet is well suited to the construction of transnational societies since, through the development of social competence, the process of community creation will be supported. People of very different nations and cultures band together out of common interest. This bond can also be understood in terms of the perceptions of one's own subjectivity which are part of identity and culture developmental processes. In this way, culture can be understood as a complex bundle of subjectivities (experiences, values, norms, ideas, attitudes, dialects, etc.) and objectivities (activities, behavior, language, artifacts) which assist everyday orienteering and life mastery (Roth 1996, 260). With regard to Max Weber (1972), community creation can now be seen as the more subjective process, whereby individuals come to a group formation out of subjective reasons, in contrast to society creation in which the rather objective motivations play a role. For the future multicultural community, it is exactly the process of community creation which may possess the greatest creative potential. And with it one great importance of the new media for the world society could be that the new media actually has the effect of being identity-founding in a world of international and multicultural communities where it is possible to form international communities of various actors (organizations, individuals, businesses, etc.) consisting of many sub-communities. All these communities will cohere out of common interests and, from the start, need in no way, for example, follow the majority of any nation state.

It is also to be borne in mind that the best learning effect could be a result of a combination of the three types since a comprehensive transcultural competence cannot be provided by just one type of the Internet learning environments. This would be conceivable in serial modularity, although it would be problematic in the European university system which is neither institutionally nor organizationally very flexible. The teletutoring structure should therefore greatly influence the virtual and partially virtual universities of the future (Geyken/Mandl/Reiter 1998). At the same time, only few universities are likely to prevail as truly virtual institutions (single model) such as the University of Phoenix. They are rather likely to become more Add-on or More-Quality models (dual mode), which perform parts of their services virtually (Krempel, 1997).

6. Conclusion

In the future there will surely be more people who will have tertiary educational experience in a virtual space, even without being explicitly prepared for it by an educational institution. Therefore the existing concepts of multicultural education must automatically be questioned as to whether their concepts are adequate enough to prepare people for increasingly enmeshed cultures within corresponding learning processes. This doesn't mean that the area of tertiary experiences should obscure the other experience areas, but it should be prognostically assumed that it will play a larger role in hypermodern societies than in postmodern ones (Telepolis 1997).

Of much greater importance is that the ephemeral life-models of postmodernity – just as in hypermodernity – will retain their validity. It will be impossible for the individual to be prepared for the life-long challenges in the rapidly changing social roles, structures and duties. The decisive factor should be world-wide technical and trans-cultural competence since they make the individual citizen flexible in the specific creation of private and professional life-plans. As they are primarily coupled with the new media, they should also be striven for within its frameworks. The results of the studies, introduced here by way of example, advocate that virtual international Internet learning environments lead to a change in the learner's social competence with a view to a global social competence and virtual mobility. Hence, it is to be in future even more intensively investigated how multicultural education concepts concerning the new media can be complemented.

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EUROPEAN CITIZENSHIP, A NEW EDUCATIONAL FOCUS SOME OPPORTUNITIES FOR ODL

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Introduction

The Internet is spreading and expanding rapidly in Europe (Calandra, 2001). By the end of 2001 it is estimated that there were more Internet users in Western Europe (200 million) than in the United States and that the European eLearning market will be worth nearly 6 billion euro by 2005 (NUA, 2001). The significance of the Internet for education and training has been highlighted through the establishment of an eEurope Action Plan (European Commission, 2002a). eEurope's objectives are to accelerate the development of the information society in Europe and to ensure its potential is available to everybody - all Member States, all regions, all citizens (European Commission, 2002b).

The use of modern Information and Communication Technology (ICT) is the most significant development in school education in Europe. The use of the Internet in the EU's schools is growing (European Commission, 2001), 90% of schools in the European Union have the Internet and pupils have Internet access in 80% of them. Strategic trans-European education ministry initiatives such as the European SchoolNet have encouraged developments through activities such as the European Year of Learning, eScola and Comenius Space. The European Commission (2002a) says that the provision of the Internet in schools remains a priority in all Member States.

European Citizenship: a new educational focus

Increased awareness by Europeans about their common cultural heritage has led the Member States to confer on the Community a specific role in the field of cultural affairs (European Commission, 2002b). By including provisions for cultural policies, the Member States demonstrated their resolve to mark a new stage in the process of European integration, to deepen the solidarity between their peoples while respecting their history, their culture and their traditions, and to establish a citizenship common to nationals of their countries. There is thus a clear movement towards European unity through a multi-cultural, multi-lingual European society requiring understanding, tolerance and solidarity between diverse national, ethnic and migrant communities and one in which work, study and leisure are characterised by mobility, interchange and communication (Donert and Bosschart, 2001); in short, a society in which the daily lives of Europeans will increasingly take on a 'living european dimension'. The European Union thus aims to build a cohesive and inclusive society based on solidarity seeking to reduce economic disparities leading to a democratic and peaceful Europe. Member states are thus encouraged to stimulate the development of European Citizenship.

Until recently, the concept of citizenship has been more commonly understood in rather static and institutionally dominated terms: being a citizen was primarily a question of the legalities of entitlements and their political expression in democratic polities (European Commission, 2000). However, citizenship can also be described in a broader sense, in which culturally-based understandings are more prominent. The latter concept of citizenship deals with the extent to which individuals and groups feel a sense of attachment to the society and the community to which they belong (Donert and Bosschart, 2001). It is therefore closely related to the promotion of social inclusion and cohesion, responsibility towards society, as well as to matters of identity and values. This implies that learning to live positively with difference and diversity is a core dimension in the practice of citizenship in Europe.

There are many definitions of citizenship in education (Albala-Bertrand, 1995; Beck, 1996). Most relate to the extension of knowledge, skills (social, intellectual, technological), attitudes (respect for cultural and political diversity, respect for rational argument, interest in community affairs) and values (justice, democracy, rule of law) to stimulate participation (Kerr, 1999) in the democratic and culture process of

identity (Huntington, 1991; Dekker and Portengen, 1996). So citizenship education focuses on the relationships between a individual and society in terms of the legal, social, economic and cultural dimensions, resulting in educational goals of knowledge, skills training, participation, values and attitudes.

Cullingforth (2000) comments on the complexities of citizenship as a subject based on research into young people's attitudes towards other countries. These related closely to attitudes to home and school, to neighbourhoods and communities and to groups. Other influences, such as the media are also significant. Andrews and Lewis (2000) analyse the ideas inherent in citizenship curricula through four theories of citizenship, active citizenship (participation), cultural citizenship (tradition), global citizenship (responsibilities) and comprehensive citizenship (involving all actions).

Citizenship in the curriculum, Citizenship and Geography

In principle, all areas of the school curriculum can make a contribution to European citizenship as a part of education for international understanding. For example, young people are often very interested in issues associated with the environment (Roker, Player and Coleman, 1999). As a traditional discipline, Geography can play a pivotal role in realising the European dimension in education (Chevalier, 2000). Embedding citizenship studies in Geography can be accomplished by establishing a curriculum which will encourage an awareness of: the geographical diversity of Europe regions with its natural, social and economic features, the political and social structures in Europe, the forces that shaped Europe and the patterns of development and characteristic features of European culture in its unity and diversity (EURYDICE, 1998). This should also help students conscious of their common European identity, the growing unity between European peoples and countries without losing sight of their global responsibilities or their national, regional and local roots, such that young people should be inspired to take an active part in shaping Europe's future.

A further dimension is the nature of responsibility. Crick and Porter (1978) argue that we should be looking towards fostering citizens who are equipped to be of some influence and can understand and respect the values of others. For many this can best be understood by seeing education for citizenship as having three distinct strands: understanding, involvement and values (Maitles, 1998; Maitles, 2000). Citizenship education thus needs to be supported by a broad range of teaching and learning approaches with structured opportunities for pupils to be actively involved in discussion and debate on topical and contemporary issues (Janoski, 1998) and through case studies, projects and activities in school and in the local community. Thus there are opportunities to establish and develop suitable Open Distance Learning tools to support the delivery of citizenship education more effectively.

What kind of ODL for delivering Citizenship education?

Information Retrieval

Teachers still often doubt the relevance and efficiency of ODL for learning support. However, as new technology has become an integral part of the socialisation process for an increasing number of citizens (Europinion, 1997), the relationship between students, information and knowledge is changing. So, teachers need to realise that the number of pupils online is rapidly increasing and that most of their pupils already have access to a wide variety of digital information sources (BBC Online 2001; VirginStudent, 2001; Which Online, 2001).

The use of ICT for information retrieval has been at the core of most classroom activities. The combined use of different media is often incorporated to enable a multi-sensory approach to studying. However, not only can pupils' learning be enhanced by enabling access materials, but also in preparing and sharing authentic information and materials with others across Europe as in the case of the Ethnokids Project (<http://www.ethnokids.net>). The obvious pedagogical benefits associated with the process include pride in presentation, ownership of information, sharing, social interaction, sense of purpose through active engagement (Somekh and Davies, 1991) with great flexibility and opportunities for real interaction and collaborative working in real time (Norman, 1997).

Reliable links to sources of relevant and useful resources are critical in order to provide teachers with citizenship information and to save pupils or teachers wasting time with random searches to find what is really relevant. The Minerva-funded Euro.GEO Project (<http://www.eurogeo.org>) seeks to do this by supporting teachers who want to promote the European citizenship by encouraging greater European awareness through Geography (Donert, 2001). In order to do this, Euro.GEO will:

- establish an interactive, teacher-focussed environment
- create an on-line geography teaching resource in various languages
- provide a searchable information base including a database of European geography curricula
- provide a communications or networking area and
- links to national geographical associations

Opportunities for experimentation and reflection

The information society has led to the blurring of boundaries between knowledge and information. Pupils can access information, but this does not help them to understand the complexity and dynamics of a given situation nor allow them to interpret their attitudes to decide on possible actions. This is one of the key ways in which young people can develop a sense of citizenship, taking responsibility for their own actions (Crozier, 1999) and even their own learning. Bard (1999) argues that the best way to educate citizens is to give them a genuine share in responsibility for themselves.

Pupils have often been excluded from decision making and in developing attitudes and values, most of them have never had a chance to develop critical thinking at school. ODL can provide a liberating influence by providing tools to enable pupils to understand and interpret situations. So a combination of tools for experimentation and reflection would be required to support these activities. These tools might include modelling, simulation and scenario building to help interpretation and understanding of causal links and factors, but also cybervenues for individual and collective reflection and systems to encourage action planning, critical skills of analysis with a view to decision making. This is being addressed by the eNews ODL Project (<http://e4news.net>). This two-year Minerva project will enhance ability to read, handle and evaluate news and information sources by establishing an environment that will enable and enhance cooperative learning on environmental issues, developing an infrastructure and tools to support teaching and learning about issues in the news. The likely outcomes of this will be a series of suitable tasks that will require pupils to consider the complexity of the content under consideration in order to engage them in higher order cognitive processes (such as synthesis, analysis, restructuring of information and ideas, reflection and evaluation).

Collaboration and communications

Learning outside schools will increasingly take place with networking playing a crucial role in enabling students to become constructive, creative learners through the use of available resources (Autori, 1997). ICT provides access to information which will help citizens participate even more actively and meaningfully in the life of their local, regional and national communities and allow them even to contribute at an international level through communicative interaction (Luisoni, 1997). It is thus expected that participatory processes will become increasingly individualised, yet collaborative.

More significantly, information transfer is not simply travelling in one direction but increasingly it will operate in the form of a multi-user dialogue (Donert, 2000). Teachers need to be able to explore and exploit, functionally and efficiently, the facilities provided by the ODL technologies concerned in order to foster these activities. There is a danger that schools and teachers remain unaware of the opportunities that are provided by the 'C', or Communications, component of ICT (Tardif, 2001). Studies extending beyond the classroom, so vital for cultural understanding, are now at our fingertips, but there is little awareness of the opportunities available and challenges that these new technologies pose despite the fact that the potential benefits in terms of collaboration, autonomy and support have long been actively promoted (NCET, 1996).

Mason (1994) identified the nature of the challenge of using communications to enhance citizenship education. In particular in providing support, interaction, access to experts and the delivery and refinement of information but with the added novelty of immediacy and excitement to naturally increase

motivation and with it learning (Norman, 1997). Issues dealt with in class can be presented, described and discussed on on-line sites and off-line documents. Communications technologies can enable collaboration but as Davis (1997) suggested that the structure of teaching and learning may need to change to permit it to play an important role (Eraut, 1995).

It is clear that in order to incorporate all three components of information, experimentation and collaboration that teachers will need to be able implement appropriate learning situations. Mosely *et al.* (1999) commented that teachers who favoured ICT were likely to value collaborative working, enquiry and decision-making by pupils (Somekh and Davis, 1997). This implies a learning process that does not encourage the search for knowledge and understanding but also one that will allow pupils to develop their own critical opinions and ideas which can be communicated in order to express their views with others. This will allow a greater understanding of the European Dimension and promote the actions of responsible citizens.

Conclusions

The information society has created new demands on education, bringing profound changes to the fabric and framework of the school system (Scheffknecht, 2000). Serious questions have been raised concerning the effectiveness of integrating ICT as a teaching and learning tool in normal classroom situations (Parker, 1999; Hepple 1997), however recent surveys suggest growing benefits of ICT in schools (DfES, 2001). New tools, approaches and pedagogies are likely to emerge but perhaps the greatest impact is likely to occur in situations where ICT can deliver choice and independence with sufficient flexibility for allow learners to manage their own learning, individualise their education process (Boonen, 2000) while enabling opportunities for both reflection and collaboration.

All European countries are confronted with the development of an appropriate citizenship curriculum for the 21st century with the goals of promoting European unity (EURIDICE, 1998) and a democratisation of learning. This requires that our students are given opportunities to establish cooperation and mutual understanding with others in Europe. Distance Learning can provide improved opportunities for learners with exciting learning experiences to enable deeper understanding of the issues through review, reorganization and written expression of ideas, reflection and careful consideration of individual and collective responsibilities.

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SELF-MANAGED LEARNING IN PRISONS VIA ICT - FIRST RESULTS FROM THE HERO PROJECT

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Introduction

“The vision, on which the Programme directions are based, is very simple: “Our surrounding is the interface” to a universe of integrated services. This will enable citizens to access IST services wherever they are, whenever they want, and in the form that is most “natural” for them.” This quotation, taken from the web-site of the Community Research & Development Information Service (CORDIS), summarises the direction and the purpose of the Information Society Technologies Programme (IST).

Although there have been huge efforts and big steps towards this vision, one sector of society has been discriminated substantially: the penal system. Despite of counter-examples and partly substantial budgets, the penal system suffers from the necessity to cut off some of the most important advantages of the new technologies: free access to information and uncontrolled communication.

The HERO project (*Health promotion and Educational support for the Rehabilitation of Offenders*), funded by the European Commission in the framework of the IST programme, tries to overcome these and other obstacles – like access, data protection, social isolation and poor motivation – by a combination of pedagogy, technology and support.

Previous initiatives

In Germany, several attempts have been made to introduce ICT within the prisons for inmates’ use. Some examples:

- Closed, physically independent and permanently monitored LAN networks:

JVA Geldern-Pont in North Rhine-Westphalia is a closed prison facility for male high-risk inmates with a maximum operational capacity of 551 prisoners. In general the inmates are serving sentences of more than 18-month duration. The study centre, which was opened in 1983 as the first of its kind in Germany, is comprised of 15 study places placed in separate cells, two rooms for group work activities and a dedicated room for the library including a small number of PCs.

- Stand-alone, non-networked PCs with educational resource materials

The study centre of JVA Hannover in Lower Saxonia, opened in 1987 is situated within the general educational establishment of the prison. The maximum capacity is about 1.000. 15 imprisoned, exclusively male students are living and studying together in an independent unit or group forming a small “learning community”. The unit has a maximum capacity of 15 students and is equipped with two study rooms for group learning activities. The basic therapeutic approach is to modify the inmates’ social and emotional inadequate behaviours alongside with distant course to raise their educational levels.

- Freely accessible study centre with 10 networked, but monitored PCs

Last but not least, JVA Freiburg in Baden-Württemberg is a penal establishment for 770 juvenile and adult offenders, of whom 600 adult prisoners serving sentences from 15 month to life sentences), 150 juvenile and adult prisoners on remand and 25 prisoners placed in a high security unit. In 1997 15 prisoners were studying at the study centre in distant education course to achieve academic grades. The centre is equipped with a computer lab equipped with networked PCs with permanent and uncontrolled access for the group of prisoners registered at the ‘Open University’. In contrast, regular inmates participating in classical education and vocational training courses the use of the ICT infrastructure is only allowed with prior approval and under supervision of prison officers.

The HERO technology

The HERO system consists of 9 notebooks in prisoners rooms (singular cells) connected to a dedicated “prisoner server” by a closed LAN. Prisoners thus have access to the HERO system between 8:30 a.m. and 10 p.m. Due to the in-built security mechanisms (e.g. restricted user profiles), these computers have Windows 2000 (equipped with standard software e.g. Office 2000). Two dedicated staff notebooks are connected to this LAN (i.e. 1 notebook for therapists, social workers and the system administrator of the site; 1 notebook for the officer who is checking the emails), for the purpose of monitoring, answering e-mails, etc. Furthermore one reference notebook is situated at FIM-NeuesLernen.

The LAN and the connections to the prisoner notebooks are interrupted by closing down the power supply of the prisoner HUB every night between e.g. 10 p.m. and 8:30 a.m. During this period material is transferred to this network from outside the prison (e.g. to the gateway computer, to the main HERO server etc.). At the same time any prisoner feedback is transferred back to the gateway computer and if necessary to HERO, and prisoner e-mails are forwarded at this time.

A gateway computer, sitting between the prisoner server and the Internet, was installed to facilitate archiving. According to a request of the prison site, the gateway computer is located at FIM-NeuesLernen and is connected via an ISDN line to the prisoner server. To guarantee maximum security both machines are connected via a temporary ISDN line with phone number authentication. Therefore only the gateway computer can call the prisoner server with only one specified number. On the other hand the prisoner server line is blocked to call any outside number. In case a prisoner would be able to access the prisoner server illegally, he would then have no chance to access the outside world.

The monitoring and censorship of outgoing prisoner mails is done on the ‘Prisoner-Server’, the mails are sent after approval by the prison staff. Monitoring can take place either on the ‘Prisoner-Server’ and if necessary on the gateway computer at FIM. Incoming HERO material and both incoming e-mails (via gmail) are monitored and approved on the ‘Prisoner-Server’. They are ready for delivery one day after receiving them on the ‘Prisoner-Server’.

The training course

Within penal institutions, three main target groups in need for ICT training can be localized:

- prison inmates who come from low-income, urban communities, which are also the most likely to be under-served in terms of educational support programs,
- long-term inmates due to release who got incarcerated before ICTs appeared,
- mid-term inmates who had the chance to acquire first skills, but who need up-to-date-training due to the fast technological development in the “outside world”.

From the beginning of the project it was quite clear that it would be better to concentrate on one group than to develop a broad programme, running the risk to cover the needs of every group only partially. Due to practical reasons we opted for the group of the “absolute beginners”, because here the starting point of the course was clear.

Due to the special needs of prisoners, HERO aims at providing inmates with :

- a computer course (including WINDOWS, MS Word, Excel), “COMT”,
- social skills resources, “TOP”,
- information about drugs, alcohol, diseases, etc.,
- selected and useful pages from the WWW,
- excerpts from newspapers and journals.

The inmates have their “own” computer (laptop) in the cell and can learn whenever they like. Apart from the laptop and the CBTs for computer programs, they obtain print-material with step-by-step explanations. If an inmate has some problems with the material, he can rely on a support network by

contacting a tutor at FIM or another inmate (a peer learner) participating in the course via email (which will be delivered one day later). Meetings between all the participating inmates and the tutors will be held physically on a regular basis to guarantee a direct feedback.

Every four weeks, a questionnaire will capture the personal development and learning success of each inmate.

HERO Curriculum & Schedule		Course I	February – July 2002
Date	Package	Chapter	Title
11th February	1	HERO Initial meeting, SothA Erlangen COMT/0 TOP/0	Guidelines for the PC Guidelines for learning with TOP
18th February	2	HERO Consultation hour, SothA Erlangen COMT/1 TOP/1	First steps with the PC Successful learning Glossary & Icons
25th February		HERO Consultation hour, SothA Erlangen	
04th March	3	HERO Consultation hour, SothA Erlangen COMT/2	WINDOWS 2000 for beginners
18th March	4	HERO Consultation hour, SothA Erlangen COMT/3	Communication with the PC I
25th March	5	HERO Consultation hour, SothA Erlangen COMT/4	Communication with the PC II
08th April	6	HERO Consultation hour, SothA Erlangen TOP/2 TOP/3	Self-management Learning & working in teams
22nd April		HERO Consultation hour, SothA Erlangen	
06th May	7	HERO Consultation hour, SothA Erlangen COMT/5	WORD 2000 for beginners
13th May	8	COMT/6 TOP/4	Advanced WINDOWS 2000 Learning and working in teams
27th May		HERO Consultation hour, SothA Erlangen	
03rd June	9	COMT/7	Advanced WORD 2000
10th June	10	TOP/5 TOP/6	Professional and private orientation I Professional and private orientation II
24th June		HERO Consultation hour, SothA Erlangen	
01st July	11	COMT/8	EXCEL 2000 for beginners
08th July	12	HERO Consultation hour, SothA Erlangen TOP/7 TOP/8	Professional and private orientation III Job application training
29th July		HERO Consultation hour, SothA Erlangen	

Preliminary results

Evaluation and monitoring of the course will be realised via questionnaires (every four weeks) and direct feedback during the face-to-face-sessions. Preliminary experiences can be summarised as follows:

- a) inmates participating in the course
 - mostly high motivation to continue the course
 - wide range concerning knowledge and weekly time spent for the course
 - participation as privilege (“they chose ME for the course”) and “status symbol”
 - disappointment about the restrictions concerning internet and email
- b) prison personnel
 - fear of negative publicity
 - high concerns in security
 - suspicious of the added value for them
 - huge efforts needed to keep the personnel in a good temper
- c) technology
 - even more restrictions than expected (e.g. disabling of the soundcard necessary)
 - many detail problems
 - many strengths of ICTs had to be cut off

Further and more detailed results are expected to be extracted from the on-going evaluation activities.

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INTEGRATING NEW EXPERTISE: EXPERIENCE FROM A SWEDISH INDUSTRIAL COMPANY

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Introduction

One of the central issues in lifelong learning is the impact of investments in personnel training. Personnel training efforts seldom lead to the anticipated, optimal results, i.e. that the new expertise is incorporated in operations thereby increasing its quality and productivity as well as the individual's usefulness in the workplace. An official government report (SOU 1996:56) indicated that the exploitation of expertise needed to be increased. Unutilised expertise risks being lost since skills that are not used gradually diminish. In other words, knowledge tends to disappear. Available studies show that different forms of undertakings to develop expertise often appear to be short-term, ad hoc and reactive rather than directed by conscious considerations based on an explicit policy linked to more long-term goals and strategies [5]. Sweden is at the lowest end of the scale when it concerns written policies for personnel training and development. According to Statistics Sweden only one-third of respondents state that they usually follow up the effects of personnel training. Only 54 % of the respondents replied that a written action plan exists and this is by far the worst figure among comparable countries. In Great Britain 83% stated that there is a written policy.

This article is the result of a study within the project "Heightened integration of new expertise" conducted at the National Swedish Centre for Flexible Learning (CFL) in Norrköping during 2001. The aim of the study is to analyse opportunities for heightened integration of the new expertise an employee introduces in the workplace following training.

Information research for literature plus interviews

Billerud's paper mill at Skärblacka, outside Norrköping, was selected for study of the issue of expertise integration in working life. Skärblacka is a smaller community dominated by production at the paper mill. Since 1998 CFL has been conducting a study workshop at the company using a model that supports flexible learning. The courses have aimed to prepare the participants for studies at the secondary level or have been secondary level courses. During the spring and early summer of 2001 six pilot interviews were conducted with employees working in papermaking and the chemistry laboratories who had taken a preparatory course to qualify for secondary level education. The interviewees selected were of varying ages and men and women were equally represented.

The following three phases [16] constitute the framework for the interview questions and form the basis for discussion and recommendations:

Preparatory Phase: To build up the individuals' self-esteem, motivation for the course and faith in their ability to learn new things.

Execution Phase: To continue reinforcing individual self-esteem and motivation through, e.g. the instructor's attitude and behaviour plus time for dialog, reflection and social interplay between the participants.

Integration Phase: To integrate the new knowledge into operations and to counteract territorial problems.

Focus on adaptation or development-based learning

In his article in the book *Livslångt lärande* Ellström [5] writes about learning as adaptation or development, the individual's interplay with and relationships to the surroundings (context) where learning takes place is an important aspect of the learning process. A focus on adaptation in learning means that the individual learns something with the starting point in established goals, tasks or circumstances.

The higher form of learning means instead that the individual personally assumes responsibility for formulating the problem i.e. personally must identify and define the demands of the situation. This is known as development-based learning. The prerequisites for this type of learning are that the individual learns to push boundaries and use the freedom available, the autonomy that exists in the situation. In other words, development-based learning presumes considerable freedom in the work situation as well as the opportunity to control and influence the surrounding world.

Significance of Working Organisation

The size and degree of decentralisation in an organisation is presumed to play a decisive role in learning and development as well as for company productivity. Vertical and horizontal distribution of labour is also presumed to be an important factor. Osterman [11] emphasises the importance of the transition from a traditional system with strict division of labour to a system that stresses group-oriented organisation of work. Rubenowitz [13] maintains that members of a group-oriented organisational form have greater opportunities to develop social contacts and alternate working tasks which can benefit productivity.

Conditions for development-based learning

Research on the effects of training undertakings in companies, including on-the-job training, plus job enrichment and work rotation indicates in a number of studies that training only leads to limited learning in terms of knowledge. Personnel adapt to or cope with a given task or situation. The training can however entail more extensive learning when the opportunity is provided for change, reflection and problem-solving in the work situation. To create the conditions for such extensive learning it seems decisive that the training efforts are of a long-term nature and are linked to a change in the work content and/or the organisation of work. The following has been shown to be of significance:

- a change in work duties, that entails that the employees get more challenging, more advanced duties and/or
- a far-reaching change in the structure of the working organisation towards a group-oriented organisation of work with long-term job rotation.

In accordance with the above it is likely that decentralisation of decision-making also influences whether development-based learning arises or not [10].

To promote individual learning and expertise development also demands, e.g. a high degree of complexity and independence [2]. Furthermore, to promote learning and development, the job should be able to provide the staff with the opportunity to make use of their aptitudes, circumstances and knowledge as well as, within certain parameters, the power to steer the working speed and the way the job is performed [13].

Modern organisational forms

In a traditional hierarchic organisation of work with its division of labour, specialisation and communication from the top down there is a striving to retain and accentuate the internal “pecking order”. Compared with earlier times the labour force today is often regarded as the decisive production factor. Newer types of work organisation include teamwork, co-operation and a more extensive flow of information in different directions. A learning [4] as well as a flexible [14] working organisation can serve as a starting point to support development-based learning.

Interview results

The information gained from the interviews cannot be generalised and applied to other people who have studied parts of the equivalent courses at CFL. The conclusions are however of value for continued studies and indicate a great range of potential measures for improvement within a variety of fields.

The roles of the education provider and the company prior to training

- Preparatory tests
In the interviews it came to light that there was a need for more extensive to ascertain, beyond fundamental knowledge, information on the study situation the employee/student is accustomed to. In CFL's case this means identifying an appropriate way of adapting the course(s) so that the demands made can be carried over to the situation of the students.

- Level grouping
One of the purposes of the preparatory tests has been for CFL to be able to group students at levels. Within some groups this grouping has still been insufficient since after a time students have reached different levels in the courses and then felt that this was an obstacle for continued study. This phenomenon has appeared in different groups but should be able to be addressed by changing group levels periodically at the company.

"Many people dropped out of maths because they thought the pace was too fast. They said at the start that it was supposed to be individual but it didn't turn out that way when the groups became so big. The levels were uneven in the groups..."

- Group co-operation
For most participants the group co-operation group co-operation was an important factor for study success, not least of all in terms of social cohesion and reinforcement. *"We had coffee breaks together and when the teacher came I put the coffee on and went up to the restaurant for some buns...It worked really well."* In many of the cases where students stopped studying they have continued to have a need for an "internal network" consisting of other students. It was seen as advantageous to be part of such a network at the same time as being a member of the study group itself. This is presumably a means to prevent people from dropping out of their studies. *"There are a lot of shift workers here and if you don't have a co-worker taking the course at the same time it can be pretty tough."*
- Studies & Work Duties
Action must be taken to clarify the value of new expertise in daily tasks at work. This undertaking can be shared by the company and CFL. A similar form of co-operation is required to meet the demand for customised courses. The degree of customisation is considerable significance. Course content that cannot be applied to one's own work duties is not regarded as relevant.

Several of the interviewees would have preferred other courses with a deeper and/or sharper focus on their own frame of reference. A portion of the students would have liked to gain broader knowledge of the company in order to understand the internal processes. *"We just get our test material and do the analysis, but I'm curious about..."*

The need for education related to the individuals' working situation, e.g. computer skills and English, became apparent during the interviews. *"... the computer takes care of most of the work but it would be interesting to understand how they work..."* To be useful the courses offered within these fields must be related to the work being done and, at the same time, development-based learning must be in focus in order to promote the development of new expertise in the longer term. *"We suggested that there should be some form of internal English course, a little internal course where we could sit and write down a rough description of a machine and how it works... in English - it's a question of learning and the more I talk about it the more confidence I get and then you can move on from there... right now I'm just too unsure of myself."* This indicates a need for preparatory work aiming to provide greater insight into the company and its dependence upon the surrounding world plus the consequences for work content. If not, there is a danger that students will remain in an adaptation style of learning even in the longer term.

- Miscellaneous
It was generally more difficult for women to complete the training due to a greater, overall workload. In other words, completing the training had a higher personal cost than among men. Of the participants who were asked to estimate the degree of pressure during the training women stated a greater degree of pressure than men. On the whole, women expressed uncertainty in their professional role that was not expressed by the men.

Organisation of work

For the students who completed the training it was apparent that the greatest obstacle to integration of new skills was the organisation of work. This applied regardless of whether the course was more specialised or of a more general, basic character. In both cases the level of hidden expertise increased and subsequently students expressed a desire to apply their broadened skills. In the short-term this can involve duties where new content is added. In the long-term it can mean a restructuring of the entire organisation to more effectively exploit expertise.

Requirement survey channels

Annual development interviews are the means currently used to determine requirements. The question of how to continue working with this method remains, ...*they could check what people in the lab want to learn. There is so much around here. Why that foul odour today? They shouldn't just ask the management but also us!*"

Follow-up interviews after concluded training would appear to provide the company with the opportunity to get an early understanding of the training needs in the organisation and what is necessary for the efforts to succeed.

Training follow-up

A task for CFL, which became apparent during the interviews, is the systematic follow-up of training via the closest manager. This would generate positive effects both with respect to how training should be developed (see above) and facilitate the preparation for new skills and integration into the company. One measure to strengthen the impact of an educational undertaking would be, together with CFL, following up the course with an interview with the employee directly after the conclusion of the course. *"This would mean my boss would sort of get a bit from school so that I don't have to explain everything and he would have a little background on what I've studied"*.

"You could take with your employer about the complete training package and tell them what you think. The company can say what it thinks and maybe suggest something. We haven't had that kind of dialog ..., felt like it just slipped away..."

Backing and support from the company and CFL

A majority of those interviewed did not sense any direct support from the employer except from one person who systematically encouraged the students. Support from the instructors has varied considerably.

"The longer the course was underway the less the company cared. At the start everyone was involved, bosses and everything, and there was information... but later, it somehow felt wrong, there was no interest from above. I would imagine that this influenced those who dropped out."

"...I guess it was as time passed and more dropped out that others thought that those of us who continued were silly. That's the feeling I had..."

"They (employer, managers) could have been more curious; how are the studies going? Are you doing well? More communication with them so that the training does not just flow past."

Discussion and recommendations

Both individual and structural measures are required if new skills are to become useful. This can involve changes in the organisation of work as well as management. The elimination of obstacles to expertise development is one of the personnel department's primary tasks according to Puick [12]. One of the most firmly established effects of adult education is that it leads to heightened motivation and greater self-confidence [6, 9]. By extension this means that when preparing training CFL, together with the company and employees, assume responsibility for integration of the new expertise and thereby contribute to actual expertise development.

This study has shown that CFL's role needs to be strengthened in relation to the company and so that the training has the desired effect. This applies *before, during and after* the training. Common for these three phases is that CFL needs to have a good understanding of the circumstances that exist in the workplace for the training to give the desired effect. A few examples of development areas are presented below.

- Demands and expectations from CFL and the employees concerning, e.g. course structure, needs to be studied. New procedures for collaboration between CFL and the company are essential. New procedures in connection with training efforts can generate benefits in the form of increased motivation for studies, an improved overall view of the company as well as the individual's role. A particular need that is apparent is the development of CFL's roll so that the course content contributes to development-based learning [5] among the students.

Ellström [5] also means that very little of what is learned in formal education, in the education system from primary school to university, can be transcribed and applied in daily life and at work. Knowledge has a function in that it belongs to a certain context. The practical situations where knowledge is to be useful are often not included in organised education [8].

- For the majority of students involved in this study it would have been desirable to have more information on the training's connection with the company's needs and their own work duties.
- The need for encouragement and support has been important, if not decisive, for employee success in their studies. Support from both CFL and the company can be significantly improved.

The question of how an organisation learns is topical because this study does not show the existence of any form of systematic follow-up of the training undertaking. There is a risk that the training will be without effect. Studies of companies that combine a high level of technical development with an organisation that provides the prerequisites for "learning-intensive" production show improved productivity and development [3, 11]. Sweden's technical attachés have in their book, "Knowledge Management Kunskapsarkivering eller Kunskapsaktivering [1]" also indicate how successful knowledge-based companies in the USA have effectively formed strategies for the dissemination of knowledge and motivate the employees to share their knowledge and reward ideas that benefit the company's development.

In the preparatory phase

Actions for follow-up should be planned from the start. This brings the issue to the fore when it is possible to actively influence the integration of new expertise by CFL, the employees and the company. One alternative would be to appoint someone as speaking partner and contact person with respect to how the integration of new expertise can be accomplished in practice.

In the execution phase

A dialog, initiated by CFL, concerning how the training can be integrated in operations can be conducted with the employees and parallel with the subject being studied.

Grouping the students by level can need to be reviewed during the course so that the difference in knowledge within the groups does not become an obstacle to learning.

One alternative would be to appoint a person from the company to be responsible for grouping the students and that an internal network of students studying different subjects is in place. Responsibility for this could be included in the role of the person acting as the contact person in the preparatory phase.

It has been difficult for the students to see the practical application of the studies since they have been conducted at a level that is too general. The majority of those interviewed have had a diffuse understanding of the training's significance for their own work duties. This is detrimental to motivation and therefore also the actual ability to learn. In other words, students can perceive that the gap between work duties and the focus of the course is so great that they do not see how the training can be applied in practise.

In the integration phase

A concrete form for following up a training course is a dialog between the employee and the most immediate manager concerning how the training has functioned and what measures are needed to

integrate the new expertise into operations. Here is necessary to collaborate with the contact person (as in the two previous phases). This dialog also provides an opportunity for the company to determine how training requirements develop. It can mean that instead of recruiting new personnel it will be possible to develop the expertise of existing employees, at least the scope for the latter alternative will increase. An exchange of information with CFL is also required in this context.

In the long-term the introduction of new expertise involves changes in the organisation of work such as a widening of, or more specialised, work duties. A heightened level of basic knowledge among employees will lead to expectations for more challenging work duties and not strictly within the employee's current department. Initially the one can expect that there will be a loosening of the boundaries between divisions in the working organisation where common processes already exist.

By allowing a relaxation of these boundaries it will be possible to make good use of the employees' overall expertise and development-based learning will be possible. At present, individual work duties and circumstances form the starting point for learning, which indicates that adaptive learning [5], dominates. Changes are required in both work content and/or organisation for training efforts to have a more long-term impact and broader skills development. In the USA trade unions have developed programs to adapt training to the needs of both the workplace and the employees. These programs distinguish themselves from traditional internal training in that they focus more on lifelong learning broader knowledge [7].

There is presumably great potential in the Swedish business community to better utilise expertise by adopting new organisational forms and thereby increase growth and well-being in Swedish society [1].

This study has shown that co-operation between actors in the labour market as well as between the company and education provider is a central factor for success in this context. Additional studies involving other companies have been required to be able to develop general procedures leading to greater integration of new expertise in a workplace. For this reason the development and interview work at CFL has been deepened and extended and will be applied to other companies. During the last six months, two further studies has been completed. Contact with potential partners and information on good examples in other European countries is of particular interest. CFL therefore welcomes companies and education providers with an interest in this subject area to make contact for an exchange of experiences.

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SUPPORTING ONLINE LEARNING AND TEACHING (SOLT): A TRANSNATIONAL PARTNERSHIP

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Introduction

The Supporting Online Learning and Teaching project (SOLT) is a trans-European research and development project partly funded by the European Leonardo da Vinci programme. The project is supported by a partnership of universities and other educational institutions and private consultancies across Europe: from Denmark, France, Germany, Hungary, Italy, Portugal, Slovakia, Spain and the United Kingdom. SOLT is one of twenty successful pilot projects out of the 250 applications submitted in the UK.

SOLT fits well into the Leonardo programme's aims: to support member states' policies on employability, lifelong learning and social inclusion. Transnational mobility and exchange of good practice and innovation are highlighted. The three main objectives of the programme are:

- To improve the skills and competencies of people in initial vocational training, through existing work-linked training programmes
- To improve the quality of, and access to, continuing vocational training and lifelong learning
- To promote innovation through training, to improve competitiveness, entrepreneurship, and to foster cooperation and partnership.

Online learning and the small business community

It is now widely accepted worldwide that a revolution in learning technology is underway. The knowledge economy in Europe has become the key to overall economic prosperity and competitiveness. Without good, reliable and fast access to information and knowledge most businesses will struggle to survive. There is increasing demand on even the more mundane work to underpin skills with continuous knowledge updates and flexible access to resources. Ability to communicate has become crucial both in the form of social skills and in the form of Information and Communication Technologies (ICTs).

By becoming the centre of gravity the knowledge economy has sown the seed corn of flexibility and dynamism into the wider economy and business communities, most of which are small businesses. Key to any successful small business is its flexible and competent workforce. Updating their skills and knowledge has become a major challenge for the EU and its member states. The learning technology revolution can help to address this challenge if only it could be made accessible not only technologically but also culturally.

Government initiatives are often linked to developing physical resources such as learning centres, laptop computers for teachers, developing national grids or developing other forms of infrastructure. However, the professional debate usually focuses on issues such as limited bandwidth, plugins, authoring tools, browsers and copyright. Advances in technology are not matched by advances in content development and innovative pedagogical approaches. There is a need to provide guidance on how to effectively produce online learning content and on which methodologies to employ.

Most online learning or e-learning is driven culturally and technologically by the corporate business experience. There may be some exceptions through Government driven initiatives such as the University for Industry in the UK, but the long term impact of these initiatives still needs to be evaluated. Learning taking place in small businesses and organizations, including voluntary organizations, is different in so far as it reflects the dynamic and flexible nature of the workplace. Informal, ad hoc and peer group learning are some of the key words here. As a dispersed group of learners this group is theoretically an ideal target

group for online learning, but the question is how to engage these learners. Often it is forgotten that the majority of these learners have very little knowledge of ICT let alone e-learning, and the same may hold for the trainers that work with these client groups. The pedagogical or learning methodology should be placed at the centre of the e-learning revolution:

The central issue is; do we know how to design high quality learning and support systems? Products are needed which not only motivate an adult to learn at home after a day's work but will engage and excite them, ultimately helping them to learn. ... The use of online learning approaches is very new, so experience is limited with considerable areas of uncertainty. We still have a great deal to learn about online communication, design and delivery, so it would seem to be sensible to at least employ or adapt what we already now is effective interactive learning design from other media. The focus should be on learning with the technology applied to meet learning requirements, not the learning adapted to suit the technology.

Dr Alan Clarke, National Institute for Adult Continuing Education (NIACE)

Within the European context the SOLT project addresses the need to support trainer development, particularly trainers working with small businesses. Rapid progress in the development of online learning technologies and learning platforms has provided new opportunities for small businesses to take up flexible training. Enhanced access to online learning technologies still however poses a difficulty for trainers and human resource managers, in determining approaches and content appropriate to the environment.

In the light of the above the project has brought together a range of European expertise to develop pedagogical guidance that will help trainers wishing to utilise online learning, particularly in the context of their small business clients. By doing so the project also hopes to play its part in narrowing the digital divide between the 'ICT haves and have-nots', and to underpin one of the main aims of lifelong learning: to engage and support difficult-to-reach learners. SOLT's results will contribute to the pedagogical empowerment of learners and trainers, advance innovation in the area of e-learning and find a better balance between the existing and potential needs of the learner.

The project

Innovative features of the SOLT project include:

- Developing a flexible trainer guidance and learning product that will involve both trainers and small businesses through joint focus groups
- Target not only trainers and human resource managers but also 'informal trainers' that take on this role in a collaborative learning situation, typical in a small business context
- Linking the training and guidance material to the small business context which demands a more flexible and learner orientated approach, and a greater mix of practical benefits and educational value.

By addressing the above themes the project will:

- Encourage, promote and facilitate the use of technology in teaching, learning and assessment
- Encourage research and publications on the use of technologies in teaching and learning
- Identify staff training needs and provide necessary and adequate training resources
- Extend and coordinate collaborative links between business and training providers
- Help trainers in choosing and evaluating learning materials
- Help trainers identify and provide training for staff
- Advise on how to integrate technology into a training programme
- Help trainers to evaluate its effectiveness
- Help trainers to be technology focused but led by pedagogy.

Project objectives are to develop a multimedia guidance handbook for online learning supported by case studies covering three areas of online learning:

- generic learning
- technical learning, and
- the management and administration of learning.

The product will be used as a pedagogical compendium (pädagogische Leitfäden) and a creative online course development tool allowing trainers to produce appropriate online learning materials and methodologies in a small business context.

Specific project outcomes will also feature:

- multimedia training and guidance materials paper based, on the Web and CD-ROM
- evaluation and review of standards on online learning materials and methodologies
- a project Website with relevant links and access to training material
- a transnational online learning trainer network with distinct small business collaboration.

The partnership

We commenced SOLT project development in January 2001 and will complete the work at the end of 2003. The project has a large supporting partnership with eleven partners from eight European countries. Project partners share their approaches and experience in online learning and teaching with training organisations and learners from small businesses. Each partner brings different expertise and experiences in online learning and course development, small business learning environments and professional development to the project as well as different cultural backgrounds. This provides the basis for a highly creative synergy within the partnership, which has chosen to collaborate via a virtual workspace. This collaborative platform facilitates the exchange of ideas and pooling of information by partners. Partners share responsibility for leading or coordinating activities within the ten work packages spanning the five phases of the project..

The project was developed and is led by e-Novate Consultancy Ltd who are based in a technology park in South East England. e-Novate is proud to have been able to bring together the following partners:

France: Bernard Dumont, Paris

International expert in the field of IT for education and training. Former full Professor of Educational Science at the University Paris VII, he is now an independent consultant working as an expert of the European Commission, the French Ministry of Education and for several private companies.

Portugal: Centro de Computação Gráfica (CCG)

Operates in the area of computer graphics and applications, promotes awareness and makes these available to local companies via INI-GraphicsNet. Fosters links between African and Latin-American countries, participates in R&TD and technology transfer projects in Portugal, Germany and the EU. CCG works towards adapting, translating and integrating cross-cultural developments in SMEs and networks.

Hungary: Chamber of Commerce and Industry Csongrád County

The Chamber organises, supervises and assesses its members' vocational training, marketing development and helps to locate foreign business partners. It has experience in developing learning environments for tracking training in businesses linked with professional qualifications. The Chamber supports the development of online learning and guidance materials; facilitates access to small businesses and higher education institutions; assists with evaluation and dissemination; provides technical ICT support and setting up a trainer/SME focus.

Italy: Consorzio Interaziendale per la Formazione (INFOR)

Provides improved information and access to 200 firms to training opportunities offered by the European Union. Infor trials and disseminate project training initiatives to member SMEs and supports the development of on line learning and guidance material.

Germany: Universität Gesamthochschule Essen

Education Department currently co-ordinates a SOCRATES project which aims to support online open and distance learning in teacher education in central Slovakia. Cross-cultural expertise and advice on the development of online learning materials and online learning

Germany: Institut für neue Lehr- und Lernmethoden VIRTUS e.V.

Members develop and apply new types of teaching methods. Expertise in: telecommunication and teleworking in SMEs; electrical engineering and electronics; telelearning; professional development for SME staff and the socially excluded.

Spain: Forum De Cultura Empresarial, S.L

Forum assume the role of a promoter organisation which disseminates information on Innovation Management Techniques, quality and excellence, companies' values and other related topics. It collaborates with other organisations and promotes companies in the economic and social sectors.

Spain: Universitat Oberta De Catalunya (OUC)

The Open University of Catalunya delivers under- and postgraduate degree courses to its region by combining latest technologies, personal computers and multimedia with a solid pedagogical foundation and continuous evaluation. It provides ICT based tutor support and access to university resources to a mainly non-traditional student population. UOC also provides in-company training, extension university courses and postgraduate courses.

Slovakia: Metodické Centrum Banská Bystrica

An independent agency of Ministry of Education, providing online professional development for school teachers, educational staff and students in Central Slovakia. It will evaluate SOLT in the context of Eastern Europe and teacher training; SOLT will support the centre's developing virtual ODL department.

Denmark: VUC (Voksen Uddannelses Center)

Denmark's largest provider of further and adult education, working with businesses, municipalities, public employment bureaus and professional organizations to design and plan courses. Develops virtual flexible teaching materials for the private sector including staff development, which focuses on aligning goals of individual with the enterprise. VUC will be ideally placed to manage a focus group and support the evaluation of learning materials

United Kingdom: The Marchmont Observatory, University of Exeter

Established under the European Union's ADAPT Programme in 1999, Marchmont's role is to stimulate and explore innovative practice in work based learning and workforce development, with an emphasis on SMEs. The approach aims to support more effective evidence based practice, and enables practitioners to identify, comprehend and build on models of what works and why.

United Kingdom: eNovate Consultancy, Kent

E-Novate provides expert advice and support in the development and delivery of training programmes, project development, management and evaluation and online learning environments in a small business context. It also provides advice on government and EU funding streams such as ESF, EQUAL and Leonardo supporting the development of appropriate learning environments for small businesses. E-Novate Consultancy has overall project responsibility and will also be responsible for the co-ordination of SOLT.

Project partners are currently engaged in implementing a needs analysis survey amongst trainers active in their home regions. Extensive partner collaboration resulted in a comprehensive and sophisticated questionnaire, designed to investigate training needs arising within a wide variety of learning contexts in the private and public sectors. The tool is presently being used in partner regions to assess and gain feedback from a range of trainers working with businesses, who is already utilising or wishing to utilise online learning. Results will help to inform the content and structure of the guidance to be developed in product form, which will then be piloted amongst participating organisations.

Our presentation will cover SOLT project progress to date, capture project partners' experience and present interim findings.

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PEDAGOGICAL INNOVATION ENGINEERING A POSSIBLE WAY TO EQUAL OPPORTUNITIES FOR WOMEN?

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The Pedagogical Innovation Engineering frame

For several years ISPFP Lugano has been standing out more and more as a body promoting, designing, implementing and researching on territorial development projects based on Pedagogical Innovation Engineering principles. One of this recently recognized discipline mainstay is that ICT, CmC and distance in the current sense of the term should run transversally in all educational and training projects aimed at the territory expected to answer in an adequate way to the many and complex needs of contemporary society. ISPFP know-how has been built both on field experiences (Poschiavo Project, Guinea Project, MovingAlps, Innovation and Stop Exclusion, Bregaglia Project) and on drawing from the project-related researches carried out on the Swiss National Scientific Research Foundation behalf. This spiral movement going from practice to research and back to practice has made ISPFP Lugano standing out as leading house in the field of ICT, CmC and e-learning at a national level besides Neuchâtel University. To carry out its projects and related research ISPFP refers to a wide net of national and international relations and cooperation with Universities, research institute and learning and e-learning Centres.

Though a public body ISPFP has been supported in the development of its projects by private sponsors interested both in its mission targeted to equally balance and boost opportunities linked to digital access in Switzerland or abroad, and/or in the perspective of widening the range of their potential customers.

In this paper we are going to talk about an ISPFP project aimed at establishing on the territory a net of people with a complex professional profile able to design and implement projects and routes creating and boosting opportunities for young girls (students and apprentices) and women in general.

The project has now reached a second delicate phase as the 9 sub-projects conceived in the first phase are about to being implemented on the territory. To explain the processes going on within the project it is very useful to turn to the metaphor often used to describe Pedagogical Innovation Engineering impact on the territory: the “pond effect”, where a stone is thrown into the middle of a pond and its fall triggers a chain of events that affect a larger and larger area of the pond in different ways.

We are therefore going to try to describe the complex process of setting up and carrying out a Pedagogical Innovation Engineering project and point out some of the related issues.

The Project: “Person of reference in equal opportunity” (RPO)

The project conceived in collaboration with CISEM (Centro innovazione e sperimentazione educativa Milano, Istituto di ricerca della Provincia di Milano e dell'Unione delle Province d'Italia) and Associazione IRENE (Iniziativa Ricerche Esperienza Nuova Europa - Milano) is meant to form people with a new professional profile, multiple competences and complex know-how. As we well know, a modern professional profile cannot anymore be defined by simply describing the task that should be carried out, but by a whole of different skills that intertwine, sum up and go as far as to include competences related to spheres that, up to some years ago, were considered as belonging to the person privately and not taken into account as assets or even required in professional life. We refer to the so called transversal competences indispensable tools in most current jobs.

The RPOs should be able to design and implement projects including ICT, CmC and e-learning targeted to rebalancing lack of equal opportunities linked to gender. These people come from and are going to

work transversally and in a widespread way in different working contexts as wished by the gender mainstreaming policy backed up not only by the European Community but also by the Swiss government.

The modular course (16 months, 12 hours a week presence/distance, 5 modules, to phases) backbone of the project should enable people to:

- Acquire the “Assessment of competences method” and the “Autobiographical approach” with professional purposes including when designing hypertexts and web pages.
- Acquire theoretical and practical disciplinary competences linked to gender (taken into consideration as a culture) and equal opportunities both for men and women.
- Be able to use ICT, CmC and e-learning in order to design and implement a project aimed at equal opportunities.
- Be able to set up a project in the virtual network centred on gender related themes.
- Be able to read their own working context from the gender point of view, to get and understand the needs, design and implement the best possible rebalancing routes or interventions including ICT, CmC and e-learning.
- Be able to manage, to tutor and evaluate the designed interventions.
- Work in a synergic virtual (and not) net of similar projects.

RPO, CmC, ICT, e-learning: some issues

Use of the website as a learning platform since the beginning of the course with the intent to boost autonomous learning regarding contents, ICT and CmC

Though the first part of the course is based on external interventions in presence, since the beginning the website has a crucial role, people refer to it for:

- Information about the modules, specific programmes.
- Getting all the material they need in order to follow the course.
- Getting to know the trainers.
- Making themselves known to the trainers.
- Co-operating in setting up the course.
- Contributing to the content of the modules with their own materials (e.g. hypertexts).
- Widening their opportunities of education and training both in gender matters and technologies using the webTV of the site and the Units made with streaming media.
- Setting up connections with existing bodies operating in the equal opportunity field.
- Carrying out relevant discussion and reflections through the forum of the site.
- Experimenting ways of approach to technology sensitive to gender issues.
- Using e-mail for communication with pairs, tutors, trainers.

Connected issues taken into consideration:

- The effectiveness of a pedagogical system based on the “learning by doing” principles as most of the people following the course did not have formal education and training in computer science.
- The effectiveness of the presence/distance tutoring system set up to facilitate people put in the condition of “learning by doing”.
- To what extent people actually refer to the platform to learn what they need.
- To what extent we can point out a difference in the approach to technologies linked to gender.
- Can this approach be considered a good model to be used to boost opportunities for women as far as ICT and CmC are concerned.

The functioning of the website as a learning platform has been checked up several times, though the results seem fairly encouraging they appear to vary a lot from individual to individual. More research about this point is being carried out by the researchers in charge of the external evaluation.

Designing sub-projects within RPO

As the ultimate aim of RPO is to implement in the territory good practices related to equal opportunity including a wide use of ICT, CmC and e-learning, people who wanted to follow the modular course RPO had to show, in addition to the required education, training and professional experience, that they worked in a background open to implementing such good practices.

20 people (17 female and 3 males) coming from different working backgrounds, ranging from schools to civil service to private bodies, were accepted and since the beginning they had transversal moments of presence/distance training and reflection work related to getting people to join in a project group, conceiving, designing and implementing a project reflecting Pedagogical Innovation Engineering principles.

At the end of the third module (dedicated to deepening issues connected with ICT, CmC, e-learning and gender) the trainees came up with 9 projects that were introduced via multimedia artefacts to a selected public of people in the trade.

Among the inalienable criteria for the sub-projects acceptance there were, of course, the ones linked to equal opportunities, CmC, ICT and e-learning.

A panel of interdisciplinary experts has assessed these products, assisted and tutored trainees in their remedial work leading to the projects that are about to be implemented.

The main issues taken into consideration:

- What is the level of transfer of Pedagogical Innovation Engineering principles into the trainees projects.
- To what extent Pedagogical Innovation Engineering projects can help to establish good practices in the equal opportunities field

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A MODEL OF THEORISING VIRTUAL MOBILITY

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Introduction

The section of home economics teacher education [<http://www.edu.helsinki.fi/kotil/english.htm>] at the University of Helsinki was eager to experiment with mobile studying in the context of practice teaching. It is characteristic for practice periods that student teachers and their supervisors are dispersed in several schools and university buildings which are located in different parts of the city of Helsinki. Another thing is that a lesson is a hectic event in which a lot of things happen in a short time. Happenings follow rapidly each other and a student teacher as well as his (the number of male home economics teachers is increasing in Finland) or her supervisor try to manage the hasty situation.

The University of Helsinki has investigated mobile teaching and studying for a couple of years. The first experiences were acquired at the school level (Sariola et al. 1998). After that we carried out two projects in connection with personnel training at the University of Helsinki (Kynäslahti 2001). A logical extension was to experiment with mobile technology with degree students.

Theory of mobility

The theoretical framework is based on the theory of mobility which we have elaborated under recent years. According this (emerging) theory there are three essential elements when we speak about mobility in the context of educational activities. We found out these elements when we asked why, when and where were mobile devices used for educational purposes and with what kind of content the use was associated. Another fundamental aspect of mobility, when compared to the use of information and communication technologies in general, is that we are speaking about a phenomenon in which someone or something is on the move.

Accordingly, why do we move when performing educational activities. There are two explanations. First, the reason for moving is irrelevant regarding to learning and teaching. A person just happens to be moving while conducting educational activities. It deals with **convenience**, **rational** time management and other such things. Second, we can assume that a person is on the move in some particular place or in places which is/are relevant regarding the subject that is being taught or that is being studied. We may call this the perspective of **expediency**. The third essential aspect of mobility is **immediacy**. We can perform an educational act immediately, even if it requires access to the Internet or a connection to other kinds of electronic environments (like the wap environment, for example), regardless of where we are.

There is also emerging a new aspect of mobility and here our thinking has been inspired by the researchers in Hypermedia Laboratory at the University of Tampere (Leino et al. 2002). They speak about the relationship between the use of mobile technology and quality of life. In other words, the use of mobile devices may provide opportunities to manage your everyday living (for example concerning management of time) in the way which can better the quality of life.

The Project

In the beginning of 2002, a group of 11 home economic teacher students and their four supervising teachers experimented with the use Nokia 9210 in the practice period of the home economic teacher studies. The idea was that mobile devices could enable a flexible way for guidance and discussions considering the students' practice period lessons.

Another element was digital pictures that were taken during the lessons. Either a supervising teacher or a fellow student took pictures, they were downloaded in the Communicator and sent to a special Wap-based

environment, called the UniWap environment. The pictures could then be used as a source to recall and analyse what pedagogically interesting things had occurred during a lesson. Originally, our intention as the researcher of the project was not to pay any great attention to these pictures. The role of this picture taking, however, became fundamental in the project and the amount of them among all the messages was big. Both the student teachers and their supervisors commented that taking of pictures was a basic part of the whole project. (Pictures are not a usual aiding tool for practice teaching in Finland. Tape recording and video recording, however, has been used.) It was a tool for feedback discussions and for self-evaluation of hasty lessons. According to the students this kind of picture taking would not be meaningful without the help of mobile technology. The pictures were usually sent to the UniWap environment during a lesson or immediately after it.

Testing the theoretical model

One of the aims of the project was to test the theoretical framework of mobility. In other words, were the notions of convenience/rationality, expediency, immediacy and quality of life appropriate for the mobility that existed in the project. Convenience and rationality were the most apparent features. The participants used (other use than making calls) their Communicator when it was convenient and usually this convenience associated with rational management of time. The most often reported situation for mobile use was related with public transport: sitting in a bus or in the metro, waiting for a bus or train to arrive and so on. Indeed, the participants really used this otherwise useless time for their own benefit. This aspect was also praised by the student teachers and the supervisors. This kind of convenience/rationality concerned home as well. For example one of the supervisors commented that when she has been preparing food and waited it to get ready, she has sometimes took her Communicator at a table and worked with it. At home the mobile device was used in different places, mostly in bed. In general, the participants worked with Communicator in a variety of places: cafes, university lunch rooms and other public places. Usually working with the device necessitated to sit down and have a table. Some students reported that they had used Communicator also standing in whatever place they happened to be. This use had mostly considered sending or reading e-mail messages, not writing.

The aspect of expediency was also crucial. The participants went to a certain place (a classroom) because it was there that they could find the knowledge they were searching. A supervisor's task is to find out how a student teacher teaches. This knowledge is to be found at a real life situation in a school, in a classroom. That is why they went to lessons making observations. The observations were written down in the Communicator and send to the student teachers e-mail address. This concerned fellow students as well. Also they wrote down observations during the lesson and took pictures and send them to the UniWap environment.

The aspect of immediacy concerned mostly picture taking. Actual happenings of lessons could be captured and sent to the data base of the UniWap environment. Some other minor issues, such as checking a phone number, also emerged. However, the participants haven't felt an instant need to access to the net when they were on the move.

The participants had also experienced some enhancement of quality of life. They commented, for example, that using of time rationally (e.g. doing their homework when sitting in a bus) provided more time for the family or hobbies. This feature was highly appreciated.

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TOWARDS E-LEARNING „CLUSTERS“ – DEVELOPMENT STRATEGIES OF „EFIT-AUSTRIA“

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Introduction

“The internet is perhaps the most transformative technology in history, reshaping business, media, entertainment, and society in astonishing ways. But for all power, it is just now being tapped to transform education”. This headline of the Kerrey-Report “The power of the Internet for Learning” (Kerrey, 2000) marked a first awareness of the Internet as a tool or environment in learning and teaching. The OECD published two reports in 2001: The rather conventional analysis “Learning to Change: ICT in Schools” (OECD, 2001a) with new features of the “digital learner” (radical curriculum change is needed in the Internet age; digital literacy is now a fundamental learning objective for all, ICT in schools requires an extended professional role for teachers) and the progressive new report “e-Learning, the Challenge Partnership” (OECD, 2001b), where the opportunities of e-Learning are demonstrated: dematerialization of time and space; mass education access to learning for everyone; input for task based learning (fast search, retrieval); peer-group learning/teaching through distance education.

Different workgroups of the EC and the initiative “e-Europe” have also provided a framework for targets in the member countries of the European Union.

A government initiative in Austria for the period 2001 to 2003 meets this challenge and has initiated a number of projects and perspectives for schools, colleges and universities. Branding “eFit-Austria” (Bundesministerium für Bildung, 2001), a support programme with a budget of about EUR 21 Million was established, where pupils, students, teachers and educational institutions as a whole can participate. Typical topics of this initiative are:

- The campaign “New Media in Teaching at Schools and Universities” with platforms and courses for e-learning and Internet skills for teachers and a project application procedure for university teachers and institutes;
- A support structure (funding, organisation, evaluation) for e-learning projects of educational institutions (also adult education) and student groups;
- An electronic learning portal www.bildung.at, where community building and content providing is managed;
- An approach to reshape the IT studies at Austrian universities was implemented (informatics bachelor, master and teacher-training studies at five universities form a computer-science-cluster; about ten new Fachhochschul-study courses were founded; two electronic new media centres in Graz and Innsbruck were established)
- The following examples of private-public-partnerships can be given: there is an intensive cooperation to provide internationally acknowledged IT-industry certificates like Network Academies, Networking Operation Systems, ERP-Software and Internet-script languages (JAVA, PHP, ASP,...) for students (even young students from age of 16).

However, this paper should focus on a specific topic where different “threats” of school development strategies shall come together to “bind” and design a clearly structured environment for further distance learning and e-education development.

Three ways of e-learning

To begin with, e-learning services can be defined as follows: e-learning services have to be provided by learning platforms or learning management systems and have to be created or adapted with authoring

systems and authoring tools (in both categories there are commercial and free standard software programs available with a wide range of features). A portal structure, licences for handling and spreading these specific standard software products, community services for teacher or user training and support services are the necessary requirements.

In the last two years centres at universities and academies in Austria, which have practical experience in handling electronic learning platforms and deal with different types of authoring tools for content collection and content creation, came into being. Last year these test-environments got about 50 clients at schools and educational institutions, mainly in the upper secondary school system and among the Fachhochschul-study-courses (Pauschenwein et al, 2001). Students of different disciplines and subjects could find ways to introduce and work on different content structures, e-learning programmes and offers to share ideas by using different community tools. In spring and summer 2001 an open selection procedure of about 200 products of e-learning platforms was organized, where about 15 products passed all tests and some of them will be licensed for Austrian education institutions (see www.virtual-learning.at, where the selection process is documented). Another result of this consultation process is the development of e-learning standards under technical (server-client-configuration, platforms..), organisational (communities, management of educational institutions) and didactical aspects (different e-learning approach in different subjects and disciplines). These standards can be a first step to make constructive legal decisions for schools and adult education and to provide criteria for funding.

In autumn 2000 about 30 upper secondary schools in Austria participated in a project named “e-learning classes with notebook-PCs for students”. Some of the schools have got experience in this field for some years, but most of them began a systematic work after joining the project. All students in these about 45 classes got the opportunity to buy or use a notebook-computer as a personal assistant for his/her own work at school and at home (one notebook-PC = two desktops at school and at home). Around this rather expensive equipment a school-development programme was developed, where all components of new learning environments had to be solved: hardware and networking management, packed software licences, new learning climate, changing role of teachers and students, new didactics and methods using these universal problem solving and communication devices. Since June 2002 66 schools with about 140 classes and 4000 students have joined the “notebook-PC”-project, gathering new experience in open classrooms and further steps in school management and development. A forum for the exchange of experience, examples of good practice and for tips and tricks in teaching and learning was established (<http://wbt.donau-uni.ac.at/notebook>) and teacher training courses and conferences (“eLearning at Schools”, Krems, 22.Nov.2001) were organized for the dissemination of studies and project results.

The third trace of development in structuring educational institutions is the initiative “Quality in schools”, where methods of quality assurance and management development in enterprises have been applied to schools and adult education (www.qis.at). The target of this initiative is the establishment of a school development plan or programme for every place, fixed by a frame decree of the Austrian school law (Schulgesetze, 1999). Up to now evaluation principles and evaluation tools for different situations in course-management, personal management, good practice of teaching or partnerships between schools and companies have been published (QIS see above) and schools participated in quality networks, using different methods for communicating and initiating new processes. Soon it has become apparent, that some main types of innovation form new targets in the upper secondary field: e-Learning courses, bilingual courses and the emphasis on some specific professional education (e.g. media, tourism, business, electronics, informatics, architecture).

Connecting initiatives: e-learning clusters

Now it is the right time to merge these three “strands” (e-learning services, e-learning classes and quality in schools which have started in different years) into a further development to reshape the first phase of getting experience and to meet the challenge of comprehensive concepts of educational development.

e-Learning clusters are regional networks of schools with similar profiles (most of them are upper secondary technical, business or tourism colleges, some are upper secondary schools for general education) and similar e-learning programmes, using common platforms and authoring tools. They arrange a specific cooperation, have similar technical and didactic approaches and organise common

teacher training seminars. Schools, university institutes (for giving advice) and firms work together in these clusters. Necessary IT services are bought through application service providing (ASP – server). After getting a lot of experience with their own electronic education services, these are sold to other firms or private education institutes on the free market. One cluster will consist of about 10 to 15 institutions.

In a small country like Austria 5 to 8 e-learning clusters will be constituted and media-development-competence centres will provide them with the necessary support. The establishment of such competence centres will be the next step to be taken in the development of the e-learning clusters. On the one hand, these competence centres are to serve the schools and, on the other hand, function as research centres in media and e-learning pedagogy.

Currently, at the beginning of the cluster constitution, school and classroom development are the main targets. The whole teaching staff must be seen as a co-operation partner in e-learning projects; all teachers must be involved in the process of creating a new learning culture and a new learning environment. In our point of view it is essential to involve the mainstreamers as the whole process needs a “critical mass” and will run by the targets of students and teachers themselves.

With e-learning features the choice of the learning style can be done more easily for all individuals. Learning materials and services can be customised, tracking and recording of the learning process can be individualised. Self-assessment and monitoring of the learning performance can be done more easily and the interactive communication between participants and teachers is possible nearly without time and place restrictions. We will also try gender sensitive approaches and offer different programmes for handicapped and gifted students without discrimination. Strictly speaking, constructivist principles will be integrated in our learning environments.

So to conclude, it should be emphasised that the main targets of the clusters are the collaborative development of teaching staff, learning environments and school management (“schools as learning organisations”) in a co-operation of about 10 to 15 institutions. The institutions will establish an e-learning programme including standards with respect to technical, organisational and didactic figures. Good practice in the education “business” and reflection about the work being done will be the main idea of working. In the process described electronically used content for nearly all subjects will be developed and different “learning arrangements” will be tested. Open and distance learning courses with different professional and vocational profiles should be offered by all cluster-schools.

Studies and forecast

In the “notebook-classes”, first studies of the class and working climate have already been made (10 schools were analysed by two university institutes and one self assessment approach was realised in spring and autumn 2001; Zentrum für Bildung und Medien, Donauuniversität Krems 2002). The results showed high satisfaction of the students with the new learning environments after a “hard beginning”, good acceptance of the new working style by the teachers and high agreement of teachers with the new situations. In general the students appreciate more skilled working experience, but there is also a broader gap between better and average performing students. Technical problems could be solved after the initial stage of half a year and the students made a considerable progress in organising learning processes themselves as well as in the handling of the electronic environments – even in “not technical” courses. On closer examination it can be said that up to now we have considered some lack of good content and the school organisation must cope with more individualized learning styles. On the whole, however, the climate and the acceptance of e-learning pilot-projects in the investigated schools was very positive.

The main track of the next two years of development is clearly scheduled: There will be a decision “e-learning classes as an offer for parents and students from grade 10 for all, but not compulsory” and “e-learning-schools with specific profiles and specific content” for some as a special offer or specialised training. A controversial and hot discussion among all partners at schools (teachers, parents, students) is expected to begin and the result of this discussion will have an impact on the legal framework of the learning culture until the end of 2003. More motivation concepts for the teaching staffs are needed and a broad e-learning-content development must begin. In the near future the regional clusters will transform to regional education centres (RECs) with e-learning offers for all citizens, not only for “their” students.

If this “master plan” can be developed in a self-organized way with high commitment of principals, staff and school partners, the public education system will have a chance to meet the challenges of the next years. Otherwise, private e-learning services will dominate a new and exclusive market.

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WEB-BASED COLLABORATIVE LEARNING, A TOOL FOR INTERNATIONALISATION IN ADULT EDUCATION

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Internationalisation in adult education

VOX is, through its participation in several international projects, exploring several methods to promote both flexibility and the use of Internet in adult education. Our projects always have a twofold objective; to encourage cultural understanding in adult learners as well as new basic skills as foreign languages, internationalisation, ICT skills and collaborative and social skills. These objectives are very much in accordance with the objectives for lifelong learning stated in the Communication from the Commission: “personal fulfilment, active citizenship, social inclusion and employability/adaptability”. Making the new basic skills available for adult learners are crucial not least because of the way in which knowledge and competences impact on citizens’ life opportunities in modern society.

The Norwegian institute for adult education has as its main purpose to initiate, coordinate and document research and development projects about all aspects of adult education, facilitate contact and collaboration among all national actors in the field, establish national and international networks for adult education, and spread knowledge about important developments in the field both at national and international level. The institute is also a central tool for the implementation of the newly launched Competence Reform in Norway.

The last years’ changes and development within technology, economy and social patterns will to a large degree influence the methods and organization of adult education in Europe. We can already identify a need for greater awareness of the adult learners’ specific pedagogical situation and the need for a more flexible approach to the organization of adult education services.

In Northern Europe we find a methodological approach to adult education based on the ideas of Grundtvig and other educators and ideologists. One main point behind these ideas is the recognition of the student as being in control of his or her own learning process, and consequently, the adult education institutions’ responsibility of creating a learning environment where the students’ needs and their active participation and independent learning strategies will be focused upon.

In order to meet the new challenges and technological developments it seems necessary to expand one’s national or regional focus and open up for new European ideas on adult education. We believe this goal can be reached by establishing networks between adult education institutions on various levels, with various aims and students, in areas all over Europe, in order to share experiences, develop new ideas, and investigate our similarities and dissimilarities in pedagogical approaches.

We believe that the following factors are important for international work in general:

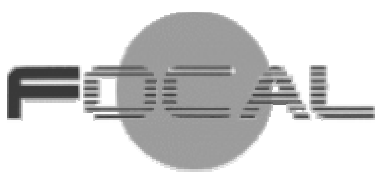
- motivation for international work
- social and intercultural interest and competence
- language skills
- broad topical interest
- awareness of the need for ICT
- interest and competence in adult education
- a willingness to work hard and with purpose
- courage and having the ability to look upon challenges as fun

Our institute's international profile is based on the following themes:

- International co-operation within Europe and beyond
- Our main source of funding is the European Commission and the Socrates Program
- Our typical partners range from universities via adult education institutions to NGOs, from the Nordic countries to the south of Europe, from the US to Japan
- ICT is crucial in all our projects as a tool for communication and learning
- Our main target group is adult learners. We pay special attention to groups who traditionally fall outside the scope of public and private initiatives: immigrants, people with reading and writing problems, people with problems with mathematics, the unemployed, the elderly, etc
- Open learning and the need to provide a flexible learning environment is a basic, underlying idea for VOX

We will here present some of our current projects as examples of how to promote these ideas and achieve the goals discussed above.

Some current projects and their contribution to the visions stated above



FOCAL—Exploring the Possibilities of the Flexible Open Classroom in Adult Learning

The FOCAL project is established to promote the ideas and methods necessary to create a more flexible approach towards the learning environment in adult education. The thematic area covered is to get information and share experiences concerning the flexible open classroom methodology in Europe. A network of nine partners will create their own national networks and participate in a discussion and share their expertise and experiences through the FOCAL web portal which will be specifically created for this project.

The main target groups are adult students who, due to a number of pedagogical, social and economic factors, are in need of a more flexible approach concerning the organization of the learning environment, and adult education providers who are interested in the development of the flexible open classroom. There are adult students who have been less advantaged in schools or they are early school leavers and thus at the risk of exclusion from the labour market as well as from social life and active citizenship. For this group the learning environment must consist of active social contact and support from fellow students as well as from tutors.

The outcomes of the network will be manifold: the awareness and dissemination of a flexible approach to adult education, the FOCAL portal (which will function as a communication and resource center), a handbook written for educators and libraries which would like to try out the methods, and presentations of the project ideas in written articles, talks at conferences, etc.

The partner countries are Norway (co-ordinator), Belgium, The Netherlands, Lithuania, Malta, Denmark, Spain, Sweden and Hungary.

www.statvoks.no/focal

SIGURD (The Socrates Initiative of Germanic Understanding and Recognition of Discourse)

SIGURD is a LINGUA project aimed at increasing the awareness of the linguistic similarities between the various Germanic languages in Europe.

The main target groups are students and teachers in secondary education, who have Germanic languages either as their mother tongue, or who learn a Germanic language.

The main activities of the project will be to collect texts in the form of common Germanic fairy-tales and other linguistic and historical texts, provide information on Germanic linguistics, and discuss methodology on how to help students become aware and positive towards the linguistic similarities between their mother tongues and other Germanic languages for ultimately to become aware of the possibility to expand one's linguistic capacities to include other Germanic languages.

The activities will take place by the use of the SIGURD web portal, which will function as a resource base as well as a discussion forum and a presentation of the project. The various texts will be hypertexted to show the translation into the various Germanic languages. These hypertextual features will help the students see the similarities between the languages.

The expected output will be a web-based guide (in the following languages: NO, NL, DE, SE and EN) which will provide suggestions on how to teach Germanic linguistics based on the experiences from the SIGURD project. The portal will continue being operative after the project is ended in order to disseminate the texts, information and experiences embedded in the resource base and communication area.

The partner countries are Norway (co-ordinator), Belgium, Germany, Sweden and the Netherlands
www.statvoks.no/sigurd

Ecole, Internet-based Collaborative Learning in Adult Education

ECOLE is a Grundtvig 1 that started in December 2001 and will be finished in the autumn 2003. The project is coordinated from Denmark, and the other participating countries are Sweden, Portugal, Lithuania, Norway and Germany as an external evaluator.

The project is based on student-based collaborative learning as a pedagogical approach and involves learning through group interaction and through discussions with fellow students.

The study field of the ecole project is two models called WebSiteStory and ACROSS.

The objectives of the project are to explore the potential of Internet-based collaborative learning:

- As a tool that will enable a holistic approach to adult education throughout Europe, by involving several subjects and disciplines in short duration activities at European level (the ACROSS model)
- As a tool that will motivate adults for creative writing, both in their mother tongue and in other European languages, thus lowering the threshold that provokes fear of performance (the WebSiteStory concept)

The innovative aspect in this project is that it involves collaborative learning and the use of ICT since the use of the web-based TELSI platform is very central in the project.

The models has been tried out in the spring of 2002, and will run a second time in the spring of 2003.

The WebSiteStory is a model for motivating creative writing and intercultural competence and consists of five scripts. Each will have a theme and in the spring of 2002 the themes were a Love Story, an autobiography, a Detective Story, a Soap Opera and a Travel Book. Each script was given a starter which could be a photo, a person gallery or a small text.

One group (in Country A) was presented with the initial sentence, the photo or the small text, and was asked to complete the first chapter. After a certain deadline, Country A was denied access to the document and a new group (in Country B) was asked to continue the "story". All the five stories started simultaneously and each country wrote one chapter in each story and each chapter was to be connected to the previous chapter.

The other model, ACROSS, is a model for cross-curricula problem solving activities. The students from each country were given a theme in the field of energy and participated in writing a report. Each country

gathered information about energy in Europe and each country wrote a report covering the situation in their particular field. E. g. Norway was to make a report on gas in European countries, not only in Norway. Therefore, the other countries had to report on gas in their countries to contribute to the report from Norway.

The two models started simultaneously and the project period was five weeks.

www.statvoks.no/ecole

NICOLE, Network for Internet Based Collaborative Learning

NICOLE is a Grundtvig 2 project coordinated from Norway. The other participating countries are Sweden, Spain and Germany. The background of the project is the fact that collaborative learning is rapidly gaining acceptance as a pedagogical approach. It has been demonstrated that most students learn more rapidly and better if placed in a position of positive interdependence with their peers which can encourage collaboration.

The main objectives are to :

- create the core group for an expanding network of educational institutions and study groups interested in the educational potential of Web-based collaborative learning
- spread information about good practice within each of the participating countries and to other countries in Europe
- collect validated materials from the partner institutions and present them through the project's Web-page, the NICOLE-page

The Web-page will exist during the lifetime of the project but also after the project is finished, as forum for discussion and a resource where those who are interested can find materials, information and contacts.

One example of collaborative learning as a pedagogical approach is the experiences from STUDIT – a Cross-curricular Flexible Course for Adult Learners run at VOX. STUDIT is not a transnational project as the students are solely Norwegian students. It is a distance education model which includes English, Norwegian, History, Mathematics, Natural Science and Social/Political Science. The idea behind the model was to make use of principles of collaborative learning in a long-term cross-curricular project. Another main idea behind the project was to make the learning process more realistic by connecting all the subjects and exercises to the life and activities of a fictive family.

For several reasons, the course ended up in being less cross-curricular than intended. In the beginning the tutors were very eager to make the students engage in discussions and chats and expected a high degree of collaboration. This very soon proved difficult and it became evident that the students preferred to work individually and communicate solely with the tutors. The reason the students gave themselves for this, was that collaborative learning was too demanding as they had responsibilities like families, jobs, etc. In addition, there were no regulations of the access to the tasks and progress in regard to the calendar. Flexibility had been estimated to be very important to adult learners and had thus been given a very high priority. The result was that they were not working with the same subjects and tasks simultaneously, a fact that made collaboration difficult.

Another experience, was that to achieve good results in a distance education course and to avoid drop-outs, the students have to be highly motivated from the beginning and they also have to possess a high degree of self discipline to be able to organise the studies and get the work done.

One last experience is that reunions between the students and the tutors on a regular basis are of great importance socially, as well as from the learning point of view, and thus contributes to avoid drop-outs.

www.statvoks.no/nicole

VOX will continue its participation in international projects in the future and thus contribute to the promotion of the ideas behind and the objectives for lifelong learning. As a consequence, we will always wish to find new partners and join international networks.

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DIGITAL NETWORKING AND THE ORGANIZATION OF TEACHING AND LEARNING BETWEEN SCHOOLS

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The urbanization of industrialized societies accompanied by rural out-migration has generated educational, sociological and policy issues in the provision of educational opportunities in small schools located beyond major centres of population. In the Canadian province of Newfoundland and Labrador the falling birth and fertility rates have combined to pose a threat to the ability of small rural schools to offer a high quality education program to the school-aged children they serve (Dibbon and Sheppard, 2001). As rural communities and schools decline in size educational policy makers often question their viability. In the Canadian province of Newfoundland and Labrador and in other areas of the world, new educational structures based on digital networking, using the Internet, are being developed for the delivery of education to rural schools (Stevens, 1999a).

The rapid growth and educational application of the Internet has led to a challenge to traditional ways of teaching and learning at a distance that have been based on paper and the postal system (Ben-Jacob et al, 2000; Collis, 1996; Keegan, 2000). TeleTeaching is Internet-based and does not require the degree of central control that distance educators have traditionally had. Teleteaching at the present time involves a search for appropriate pedagogy to enable teachers and learners to gain maximum advantage from the devolved, flexible and increasingly collaborative ways of organizing learning that are now possible between teachers and learners in multiple networks.

Collaborative networked educational structures in Atlantic Canada based on the Internet are known as School District Digital Networks. Within these electronic educational structures new teaching and learning processes are being explored within virtual classes (Stevens 2001).

Telelearning for Rural Students in Newfoundland and Labrador

Many communities in the Canadian province of Newfoundland and Labrador are characterized by geographic isolation, rural lifestyles and high rates of out-migration. Approximately two out of three schools are located in rural communities. Thirty one percent of schools in the province are designated “small rural schools” (N=122) and 75 of these have fewer than 100 students. Seventy of the small rural schools in this province are classified as “all-grade” (K –12), which means that they must offer a senior high school program. This presents educational administrators with significant challenges (Healey and Stevens, 2002).

The recent re-organization of Primary, Elementary and Secondary education in Newfoundland and Labrador into ten school districts provided an opportunity to develop the first digital Intranet in the province. In school district No. 8, (The Vista School District), there are 5165 students enrolled in 18 schools. The schools range in size from 650 students down to 40 students. In eight schools in this district there were senior students who wished to study “Advanced Placement” (AP) courses in four subjects: Biology, Chemistry, Mathematics and Physics. (Advanced Placement courses enable students in their final year of High School throughout North America to begin undergraduate degrees if these courses are passed at grade levels specified by the university of their choice). The challenge that this presented for the eight small rural schools in the Vista School District was to provide University-level instruction for small numbers of students.

The Challenge of Providing Advanced Placement Courses in Small Schools

Although AP courses are a well-established feature of senior secondary education in the United States and Canada, it is unusual for students to be able to enroll for instruction at this level in small schools in remote communities. In fact it is rare to find high school students in small and remote communities anywhere in the world who are provided with instruction in university-level studies. During the last

decade several countries have explored new ways of addressing the issue of extending educational opportunities to senior students in small schools. For example, in Iceland (Stefansdottir, 1993; Stevens 2002), New Zealand (Stevens, 1999b, 2000) Russia (Stevens et al, 1999b) and Finland (Stevens and Kynaslahti, 1996; Tella, 1995) there have been attempts to develop alternative models for the delivery of education to small and remote communities.

The Vista school district initiative in the Canadian province of Newfoundland and Labrador challenged the notion that senior students in small schools have to leave home to complete their education at larger schools in urban areas. The initiative accepted the challenge of providing university-level courses to students within their own community schools.

It was not possible for any individual school in the Vista school district to provide AP instruction in all four subjects at the AP level on its own and a new collaborative structure had to be developed. A three-stage process was followed to implement telelearning in this Newfoundland school district.

1. The Development of Advanced Placement Courses for the Internet

The development of AP Internet-based courses in Biology, Chemistry, Mathematics and Physics took place within a development team in each subject area. A lead science teacher in each discipline was paired with a recent graduate in each of the disciplines of Biology, Chemistry, Mathematics and Physics who possessed advanced computer skills including web page design, Java and HTML. The lead teacher and the graduate assistant were advised from time to time by Faculty of Education specialists at Memorial University of Newfoundland in each curriculum area and, where possible, scientists from the Faculty of Science. In most rural communities in this part of Canada, digital telecommunications infrastructures do not enable schools to have a high-speed up-link to the internet. All schools involved in the project had DirecPC satellite dishes installed to provide a high-speed down-link. Appropriate software had to be identified and evaluated for both the development of the resources and the delivery of instruction within the Intranet. Many software packages were evaluated and finally WebCT was selected. This package enabled the instructor to track student progress, it contained online testing and evaluation, private E-mail, a calendar feature, public bulletin board for use by both instructor and student, a link to lessons and chat rooms for communication between teacher and student. For real - time instruction, Meeting Point and Microsoft NetMeeting were selected. Students had to learn how to communicate with each other and with their instructor using these new technologies before classes could begin.

2. Teaching Advanced Placement Science to Rural Students Using the Internet

The electronic linking of eight sites (or schools) within the Vista School district to collaborate in the teaching of AP Biology, Chemistry, Mathematics and Physics created a series of open classes in this part of rural Newfoundland and Labrador. This new electronic structure became known as the Vista School District Digital Intranet. The School Board responsible for administering this district selected the lead teachers to teach each subject. The four AP teachers came from different schools in the district and were, in fact, the people who developed the AP courses for Internet delivery. Each of the four teachers had a tele-presence in each of the participating schools for that part of the school day during which classes were electronically connected, or on-line.

From the eight schools that together comprised the Vista School District Digital Intranet, 55 students initially enrolled in AP Biology, Chemistry, Mathematics and Physics courses. By participating in classes in real (synchronous) time using audio, video and electronic whiteboards over the Internet, combined with a measure of independent (asynchronous) learning, senior students were able to both interact with one another on-line as well as work off-line in their own community schools. From time to time social occasions were organized so that students could get to know their on-line AP teachers and the other students in their virtual classes personally.

A question facing teachers and school administrators in the initial stage of the Vista School District Digital Intranet was whether students who were not used to being unsupervised could cope with their new freedom and accept increased responsibility for their learning. At the conclusion of the school year the students were unanimous that, to be successful in an on-line AP course, it was necessary to be able to

learn independently, to be able to cope with a high volume of work and to be willing to ask teachers and other learners questions as they arose (Stevens et al, 1999).

The development of this new, electronic educational structure in rural Newfoundland was an attempt to use information and communication technologies to provide students with extended educational and vocational opportunities. Many students who were participants in the virtual classes learnt about the potential of information and communication technologies while completing their AP courses.

There are three features of the changing educational environment that influence the ways in which we both provide and access education at the present time in rural communities:

The inter-connectedness of schools

At a time when the economies of many countries are becoming inter-dependent, so individual schools as well as school systems are able to link with one another. Global economic changes of the last decade have shown that national economic systems cannot survive by sealing themselves off from one another, and neither can national school systems. Many schools today, particularly those in rural areas of countries like New Zealand, Australia, Finland, Iceland and Canada are changing by interfacing with one another electronically with profound effects on how they provide education for young people and their families.

The electronic basis of contemporary education

The question that many schools face today is not whether to develop electronic infrastructures to use new telecommunications technologies in classes, but how new web-based technologies are to be effectively used for improving teaching and learning.

Appropriate technologies for classrooms

Most of the computers that are used in schools were designed for businesses or researchers. There have been few attempts to design computers specifically for classroom use and teachers and students in schools have had to adapt hardware that has been designed for other purposes. With the changes that are taking place in education, the mass provision of appropriate technologies for schools – flexible, durable and inexpensive - will become increasingly urgent.

3. New Ways of Teaching and Learning

Students in the Vista School District Digital Intranet were frequently subject to scrutiny by their peers as they responded through chat-rooms, audio and video with their AP on-line teachers. The Digital Intranet provided students with access to multiple sites simultaneously as well as the opportunity to work independently of a teacher for part of the day. The need to prepare for classes before going on-line became increasingly apparent to both teachers and students if the open, synchronous, science classes were to succeed. The advent of the Digital Intranet had implications for students who had to interact with teachers and their peers in a variety of new ways. The teaching of each of the four AP Science subjects in the Vista Digital Intranet took place within classes that were open between participating sites. Many students experienced difficulty expressing themselves and, in particular, asking questions in open electronic classes when they did not know their peers from other small communities. However, as the students became more comfortable with one another, particularly after the first social occasion, inhibitions such as asking questions on-line were overcome.

For those students in the first Digital Intranet in Newfoundland and Labrador a new learning opportunity was provided. They were able to study advanced science subjects, at University level, as members of virtual classes without leaving their small, remote communities.

Challenges Facing the Teaching Profession

The development of new ways of providing education in rural Newfoundland and Labrador by bringing schools into collaborative relationships has generated four challenges:

Challenge One: What is an appropriate location for teleteachers - in schools or between schools?

Teachers are appointed *to* schools, but in Newfoundland and Labrador, a growing number of them are actually teaching *between* schools. Teleteachers electronically enter and leave a growing number of schools (sites) across rural Newfoundland and Labrador in the course of a school day. Is it now appropriate to recognize the emergence of a new educational professional - the lead teacher with subject expertise and responsibility across a network of schools? A relevant development for educational policy-makers to consider is the emergence of charter teachers in Scotland.

Challenge Two: Where should control be located in electronic teaching and learning structures?

Principals in rural Newfoundland and Labrador increasingly have teachers who appear electronically in their schools and who also disappear electronically. Where is control appropriately located when schools link electronically to share resources?

Challenge Three: What is appropriate pedagogy for integrating on-site and on-line learning?

Rural educators have made considerable advances in bringing on-line instruction to their senior classes and currently there are developments to extent this to other areas within schools in Newfoundland and Labrador. The pedagogical challenge facing educators, curriculum developers and administrators at present is the integration of on-site instruction with on-line learning to blend physical and virtual education.

Challenge Four: What is the future of the small school in Canada – physical or virtual?

How far can educational networking be extended? At present most networks are at the school district level. Is it possible to move beyond the structure of school district intranets to personal intranets?

Innovative solutions to these questions have direct implications for the teaching profession, for the funding of schools, for the scheduling of classes, for the organization of classrooms and for the delivery of the curriculum.

Restructured Schools and Post-Industrial Society in Newfoundland and Labrador

Students in rural communities in Newfoundland and Labrador are making increasing use of the Internet, learning in virtual classes within Digital Intranets and accessing an expanding range of web-based instruction. In the current school year there has been a doubling of the number of schools in rural Newfoundland and Labrador that use telelearning to expand educational opportunities in Intranet-linked classrooms.

Schools in rural Newfoundland and Labrador are increasingly integrating with one another both academically and administratively. As classrooms are extended in terms of time, space, organization and capacity, teachers are challenged to develop pedagogy for telelearning to facilitate the integration of physical and virtual instruction.

The emergence of new educational structures and processes portend a shift away from schools as we have known them as information and communication technologies facilitate new pathways for both teachers and learners (Information Highway Advisory Council, 1997). There are many implications in this development – educational, sociological, technological and political – to be considered. However, the extent to which the changes that are taking place in the delivery of education in rural communities in Atlantic Canada are appropriate for communities in other parts of the world, including Spanish-speaking communities, is not yet known.

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HELLENIC OPEN UNIVERSITY: THE NEW CHALLENGE IN 21ST CENTURY GREECE

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Introduction

The following paper is an attempt to approach the spirit of the Hellenic Open University (H.O.U.) and a comparative analysis of the “traditional” Higher Education Institutions (H.E.I.) of the country. Our intention is to trace those elements that render the Open University, not as a new distance learning foundation only, but rather as a multifunctional, polymorphic and flexible academic foundation for continuing and life long learning.

The new paths of knowledge

Education is a gargantuan life respiration procedure for a society. It inhales the past and exhales the future. Everyone agrees that universities form the most vital core in this education “lung” (Tassiou T.P., 1993).

Education, research and knowledge are substantial elements of the new competitive environment. Not educated manpower is not esteemed, but it will continue to struggle for survival in a time of knowledge and information.

Societies with a knowledge shortage and a subsequent implementation deficiency will struggle to develop and progress in a global economic environment that is changing rapidly.

Humans have the ability and the need to learn, and that is why they have come so far.

Higher education gives a chance to acquire scientific knowledge. The restrictions posed by the traditional educational institutions in our country, as regards admission and attendance of the academic courses, do not allow a large part of the population to cover its needs for training and education.

In the era of globalization, technological innovation and economic reforms, society faces profound changes. Mattheou D (2000) characteristically mentions that “within the logic of globalization, the national ideal forms merely closed, societies and negative attitudes that vainly, ineffectively and mostly dangerously for themselves raise barriers to reform and progress”. Education nowadays should not stop with the conclusion of the basic studies. In the new era of the “information society”, education rapidly become obsolete, having as a result the forming of a need for continuing and life long learning, training and improvement of dexterities, as well as obtaining specialization. Mere know-how somehow is not enough, continuous flexible knowledge and development of abilities is a must, in order to be able to follow a world that is changing all the time. We live during a period in which knowledge is part of the productive circle of a society, at least as long as the capital, labor and the need for a quality and mass education emerges as the main need of our times.

The new peak industries that are forming at the dawn of the 21st century are not the chain production industries of the 20th century. They accumulate and reproduce knowledge.

Bearing this in mind, we will attempt to trace and analyze the most important similarities and differences between an Academic Institution of open and distance learning as the H.O.U. and the traditional Hellenic Higher Education Institutions (H.E.I.).

Academic education institutions

The Greek State, according to the country's Constitution, is obliged to provide for academic education to every Greek citizen that wishes to get such education. Law sets the prerequisites.

The objectives of the Higher Education Institutions H.E.I.¹ are:

- To produce and transfer knowledge, research, teaching and to cultivate arts.
- To contribute to the creation of responsible citizens with scientific, social, cultural and political awareness and to provide for the necessary knowledge that will secure their perfect training for their scientific and professional careers.
- To contribute to facing the social, cultural and development needs of the country.

The Hellenic Open University (H.O.U.) is an independent and totally self - governed Higher Education Institution that functions as a Public Legal Entity²

Its objectives are:

- Distance undergraduate and postgraduate education and training, with the development and utilization of the proper educational material and teaching methods.
- The promotion of scientific research in the field of transmitting knowledge from a distance.

Similarities and differences between the traditional H.E.I. and the H.O.U.

Although the main aim of the two types of Universities is to provide academic education and therefore they have several similarities, their spirit and their way of function has several differences that will be thoroughly examined according to the following areas:

- Orientation and Philosophy
- Admission of those interested
- Structure, function and Degrees
- Teaching and Learning procedures
- Teaching personnel
- Teaching / Learning Material
- Administration and Organization
- Communication of tutors and learners
- Funding and Financial Management
- Research
- Evaluation

Orientation and philosophy

The traditional H.E.I. target a specific age group (18 –25) that attends a strict and rigid academic program. The method of lectures requires compulsory attendance on a regular basis, with a specific timetable and location of the lectures. Students live in the places the Institutions are located (campuses) and their main occupation is attending their courses.

¹ Law 1268/82 on A.E.I.

² Law 2083/92 and 2552/97 on H.O.U

These requirements, however, exclude the following groups from obtaining academic qualifications:

- Working people, either full or part time
- Citizens with increased family duties (e.g. mothers, one parent families)
- Disabled citizens, or people living under special circumstances (e.g. imprisoned)
- Citizens that live in the province or remote areas, far from urban centers with H.E.I.
- Financially weak that cannot keep up with the cost of living away from their permanent residence.
- Emigrants that live abroad or other people that temporarily reside abroad (e.g. diplomats)
- Citizens that belong to other age groups than that of 18-25 and that feel uncomfortable in a traditional H.E.I.

On the other hand the H.O.U. is aiming to the ideal of “open learning” (education is every mans right and they should be able to enjoy that during their entire lifetime) in combination with the method of “distance learning” (D. Vergidis, A. Lionarakis, A Lykouriotis, V. Makrakis, C. Matralis, 1998). The methodology of distance learning and the modular system that H.O.U. uses, gives the students a chance to chose, up to a point, the direction, the pace, the time, the location and the way of their study. With this method, students study with the help of a specially designed educational material and the frequent help from their tutor-counselor.

At first distance learning might give the impression that it collides with the traditional academic education, or that its aim is to replace it completely. However, its role is supplementary. Open universities are trying to deal with the restrictions, the injustice and to cover the gaps of the traditional system (Lionarakis A., 1995). The H.O.U.’s function is not competitive towards that of the traditional existing H.E.I., primarily when bearing in mind the targeted age groups.

Internationally today, more and more young people wish to continue their studies at the university, while at the same time the number of those that have completed their basic studies a long time ago and decide to get academic education is increasing as well. According to OECD’s last report, in many countries half of those that enter higher education are over 25 years old. In Greece the percentage of “adults” or “already working” students is just 6,5% and very few people over 35 decide to continue their studies on academic level.

Admission of those interested and the number of students

The admission of students in the traditional H.E.I. is based on a selective mechanism (exams for the admission of the “best»), immediately after Secondary School (Law 1566/85) or during Secondary School (Law 2525/97). Those examinations, despite the changes of their title (Pan-hellenic, Bundle, General etc) did not succeed in satisfying the needs of all those wishing to study. A large number of students (besides those admitted in prestigious departments) attend courses in departments they chose as their last resort. As a result, a large number of students drop out, delay or never complete their studies.

Admission in the H.O.U. is easier (Admission depends on choosing by lot) however high demand at the beginning made it necessary to exclude some candidates (*for example, in the case of “Business Administration” 6300 applications were received for just 510 places offered*)

At traditional H.E.I., the candidates are asked to prove beforehand that they are able to study the subject they are supposedly³ interested in. This competitive system of admission excludes persons that wish to study and they are also capable of doing so.

At conventional Universities the number of the students is de facto limited, depending on the number of buildings and available infrastructure (teaching rooms, laboratories, teaching staff, etc). There are no such limitations when it comes to the H.O.U.; Distance learning secure that the University remains open to all.

³ In the case of the H.O.U., the ones that wish to study does not need to prove in advance that they can conclude their studies

A traditional University with 34 years of function, such as the University of Patras has some 15.000 students, while the H.O.U. in its second year of function has some 5000 students. However, this number is not adequate to cover the increasing demand for Bachelor degrees due to the absence of open and distant learning education in Greece. On the other hand conventional universities were delayed in establishing and operating postgraduate studies, forcing the great majority of students to universities abroad.

Structure, function and degrees

The H.O.U. is operating under the supervision of Greek Ministry of Education exactly as the traditional H.E.I.s. It comprises four schools⁴ that offer program studies leading to degrees equivalent to those of traditional H.E.I.s. In contrast to the traditional H.E.I. there is no provision for departments. In the case of the latter, departments are the basic academic unit and they are the own awarding degrees except from very few cases of interdisciplinary postgraduate degrees.

Each school offers a fixed number of Subject Units / modules from which the student can choose freely (modular system) and create his or her own educational profile.. That is to say that the basic academic unit at the H.O.U. is the Subject Unit / module instead of the “Semester Subject “ of the traditional university. Each module aims to cover the knowledge field that it is about the same as three semester (six months) subjects of a traditional H.E.I., leading the student to gain in depth knowledge.

In the case of traditional H.E.I., students complete their studies after having attended a predetermined number of semester subjects that are taught at the Department in question, while students at the H.O.U. complete the studies after having successfully concluded a fixed number of modules.

Students are asked to complete 4-6 assignments during their study of each Study Unit / module. At the end they take an exam as in the case of traditional H.E.I..

The H.O.U. awards all degrees that H.E.I. award (Bachelors, Master’s and Ph.D). In addition it certifies attendance of other levels of education, such as training diplomas, postgraduate diplomas or even attendance certificates.

Teaching and learning procedure

In traditional H.E.I., one teacher usually teaches every semester subject. In the case of the H.O.U., this task is something the Team of Teaching Staff does (TTS). The TTS consists mainly of members of the Teaching and Research Staff / Academic full time Staff (TRS) as well as members of Collaborating Teaching Staff / Academic part time Tutors (CTS). A member of the TRS is responsible for every study program as Academic Supervisor and for every Subject Unit / Module a member of the TRS becomes a Coordinator.

In each Subject Unit / Module, a tutor supervises about 30 students. The student of the H.O.U. is more autonomous than the common student. He or she studies independently according to a specific schedule, using mainly the teaching material that is being sent at home. The students communicate regularly (by mail e-mail or telephone...) with their tutors; they are guided, having their questions answered. They complete papers or assignments and they are being graded. During tutorials, the students and their tutors create a personal relationship; they are being morally supported and keep their spirits high in order to continue their studies. The advisor sends analytical comments, justifies the grades awarded, proposes means and solutions to improve and develop the learning ability.

On the other hand, the traditional student is usually a passive receptor of ex cathedra knowledge that is taught to a large number of students. That student usually studies one book in order to be examined (excluding laboratory works or memos if there are any) at the end of the semester, so as to show if he or she has learnt the thing he was supposed to. Even the results will be announced with the faceless procedure of the Notice Board.

⁴ Human Studies, Social Sciences, Sciences and Technology, Applied Arts.

With the distance learning method the student is positioned in the center of attention. This way, interest to reach knowledge with one's personal effort is maintained (Hall R., 1993).

Teaching and research staff

Teaching and Research Staff / Academic full time Staff (TRS) is elected, promoted and working according to the same laws that apply for traditional H.E.I.

According to the law, initially there should be 2 members of TRS for each Subject Unit / Module and the rest of the teaching staff will be CTS / Academic part time Tutors. The CTS comes from other universities or new docents. This renders the H.O.U. very flexible when it comes to evaluation and choosing each year the best available tutor.

At the H.O.U., teachers work in close cooperation with each other under the direct supervision of the Subject Unit / Module's coordinator. This is a contributing factor to healthy competitive spirit that improves the quality of the offered education.

The role of the teacher in the H.O.U. is shaped differently, since it is not seen as a transmitter of knowledge, but rather like a close partner, mentor, evaluator and animating spirit of the student's effort. The teacher communicates substantially with the students and acts as a catalyst during learning procedure. The professor answers the questions the students might have during the whole period of the subject unit / Module. Through communication from a distance or tutorials, he or she helps the students face the difficulties they might encounter.

Teaching material

At traditional H.E.I. the teaching material is exhausted to one book that is usually written by the professor that teaches the subject. The orientation, reference to current developments in the relevant field, structure and contents totally depend on the writer's good will (Koustourakis G., Panagiotopoulos Ch., 1999).

The H.O.U. is equipped with an Educational Material and Methodology Laboratory. It was established in the spirit of recognizing that the development of appropriate material and methods together with evaluation form the essential factors for the success and quality of the new institution.

The choice of the contents and the development of the teaching material in the H.O.U. is a result of teamwork. The logic of the Subject Unit / Module is promoting interdisciplinary approach of a knowledge field. The teaching material is the fruit of collaboration among leading scientists of the subject unit's spectrum, specialists in distance learning and adults teaching, the coordinator of the Subject Unit / Module and the critical readers. Great emphasis is placed to the style and the structure of the material. Professors of traditional universities that have participated in the creation of such material used their experience to improve the books used in H.E.I..

For each Subject Unit / Module, students receive a package of teaching material that includes printed material (books, readers, parallel texts, guidance for essay writing, aid material) audiovisual and multimedia material (cassettes, videocassettes and cd-rom...) that have been carefully designed to fit the needs of distance learning students. The student is able to form a complete picture of every field of knowledge. That is also a result of many writers contributing to the material, so that the presentation of a subject immediately gains a global character and a composite spectrum of facts and views. We should also mention that the curriculum guide that comes with the teaching material is leading the students in that way that they can organize their time and effort. That way, through continuous study, self-evaluation tests and assignments they can achieve their aspiration, which is learning. In addition, the H.O.U. is equipped, as the traditional H.E.I., with a library.

Administration

The administration body of the H.O.U. is the Senate, as in traditional Universities (Deans and Rectors, Chancellors and Vice Chancellors). During the transitional period, the H.O.U. is administered by the Administration Committee, the President and the Vice president of the Administration Committee. The Senate is the supreme administration body of the H.O.U. and its field of competence coincides with that prescribed for the H.E.I. by the law, as well as that of the Deanery.

In the case of the H.O.U. there is no dean council, its tasks are performed by a small senate⁵, a novelty that renders the administration of the institution very flexible.

H.O.U. has the same administration services as the traditional H.E.I. However, it has a special organization that allows development, evaluation, production and management of the teaching material.

Financial management-funding

The same laws applying in the case of H.E.I. (Regular Budget Control, public investment, development program, property management, research programs, etc) determine the financial management of the H.O.U. In addition, the H.O.U. is funded by the compulsory participation of the students to the cost of their studies, which is the main difference with the traditional H.E.I.

The cost for the student

Attendance in traditional H.E.I. is free of charge. However, the majority of students have devoted important sums for preparatory courses or private tutoring in order to achieve admission. The cost of transport, establishment and living in a city away from their permanent residence is particularly high.

Following the courses of the H.O.U. requires the student to participate in the cost.⁶ This sum is significantly lower than the sums that are required from other open universities (e.g. the Open University of the United Kingdom) that exclude the financially weak. The H.O.U. can subsidize up to 10% of the students, so that poor or financially weak are able to study for free.

The cost for the state

The cost for providing education is a declining function of the cost to the number of receptors. The cost includes expenses for the development of the university, the cost of buildings and other fixed expenditure, function expenses, the cost of development, production and distribution of the teaching material, the cost of libraries and other media required etc.

Comparing the cost of studies per student between the H.E.I.s and the H.O.U. we observe that as the number of students increases, the cost of long distance education becomes significantly lower.

Research

Research and production of new knowledge is one of the principal aims of the H.E.I. In the case of the H.O.U., besides from research in various sciences (mathematics, physics, medicine, biology etc) as in the case of H.E.I., the research is focused in studying methods of improvement of the open and distance learning education and improving the offered special teaching material.

⁵ The Senate consists of the, the Rector, the Dean, the proctors and a member of the TRS of the H.O.U. from every School and the Head of the Educational Material and Methodology Laboratory.

⁶ Cost of 400 \$ per subject unit

Evaluation

In contrast to what happens at conventional universities where evaluation is taking place occasionally; in the case of the H.O.U. there is a provision for continuous evaluation procedures. That is the purpose for establishing the “Internal Evaluation Unit”. All H.O.U. activities, i.e. teaching, materials, administration etc are evaluated by the students themselves, the personnel and the administration in order to achieve continuous improvement of the offered services and the promotion of corrective movements.

Conclusions

The change of socio-economic conditions is leading to a change of education methods at universities and to the development of new ones, such as open and distance learning education that is mainly offered by Open Universities. With the Institution of the Hellenic Open University, the state is making an effort to cover the need to secure access to quality education and to provide for education chances to as many as possible, regardless of their social, financial or cultural characteristics.

The similarities between the H.O.U. and the traditional H.E.I. are mainly traced in their legal form, the equivalency of the degrees, providing information on offered course, the fact that there are administration services, the function of a library, the organized examinations, the awarding of degrees, etc.

Their main differences are visible when it comes to their philosophy and the method they apply; the way the students are admitted, communication between students and tutors, development and production of teaching material of various forms, evaluation of the material and of all procedures in general, the levels and the way of certifying attendance, the students bearing the cost and the possibility of forming the training profile of their graduates.

The H.O.U. in contrast with the traditional H.E.I. is an educational institution that functions according to the needs of the times and it reflects the social, economic and political demands for a better and more effective education. Flexibility in forming the curriculum is aiming at covering the needs and the interests of the student as well as those of the market. The organized creation of multifunctional and polymorphic material through a comprehensive procedure eventually results in having the means necessary for modern learning. The production of modern teaching material by the H.O.U. will lead through healthy competition and upgraded quality to the improvement of the material used in traditional H.E.I.

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DISTANCE EDUCATION IN BRAZILIAN PRIVATE UNIVERSITIES

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Abstract

The Electronics Revolution of the 1980s changed the nature of distance education, making it possible to groups as well as individuals at a distance in a pseudo face-to-face environment. In its infancy, distance learning did not provide the same level of credibility compared to traditional methods of education and training. However, the impact of telecommunications and information technology industries, joined by the arrival of the internet and World Wide Web combined with their popular usage, is a landmark from which there is no turning back. Nowadays training centers, business corporations and universities cannot ignore the distance learning channel. Despite the enormous potential of distance learning on the Web, the field of distance training is little known or understood.

The purpose of this paper is to give an overview and analysis of the sector known as distance education and training. The progress achieved in recent decades can be charted, and the way to the future planned from well-known principles. For this purpose data are assembled from open and distant universities in Brazil. To consolidate the data, we will examine six case studies, of distance education establishments providing insight into their characteristics and advantages. The case studies show the contrasting solutions to the challenge of developing systems for students studying at a distance.

Introduction

The development of new technology nowadays allows man to enjoy great developments in diverse areas. These technologies are transforming the means of carrying out business, the way people work and also making other learning sources possible. They open way for the development of new distance education alternatives, which have been researched and practiced in universities. Distance education techniques combine known educational sources with information and communication technology tools. Distance education points to a change in the methodology and in the curriculum, mainly because it increases the chances of a greater number of people having the opportunity to attend schools.

Some questions related to our modern society, such as the giving citizens new opportunities in the working market through professional qualification that is only given by education, added to the need of having to be updated and studying constantly, continuous education has urged in an astonishing way the spreading of distance learning courses offered, having more and more followers not only in companies but also among the academic realm.

The interest of increasing, in a short term, the opportunity for all Brazilians to attend school is related to factors such as globalization in the world's economy and having as a goal putting the country in a competitive level in the international and world market. Moreover, the economic decrease is strengthening the growth for the demand of distance education and training. In the next couple of years, business that involves online education wills US \$ 1 billion in Latin America, according to the projections of IDC Market Research (IDG! Now, Jun/2001), having one third being invested in Brazil.

According to UNESCO (2001), distance learning allows us to have a glimpse over a new democracy over information and knowledge. However, distance learning programs in Latin America, suffer in some countries from the lack of credibility, are not recognized in the same way as other courses, having their certificates not so recognized also, and, historically speaking, most countries have had experiences with low quality programs and institutions, giving distance education a poor reputation.

Higher Education in Brazil

For such a big country as Brazil, the use of new educational technologies will be determining so that it might overcome its current problems regarding education, in spite of some advances that have happened in the last couple of years. The increase of the percentage of children and people in Brazil enrolled in schools has also increased the population's educational level. The illiteracy percentage is of 13.3% in the population older than 15. The current panorama of the Brazilian educational system is summarized, according to *Revista Exame* (2002) as follows:

- 56 million Brazilians or one third of the population is attending schools; the access to education reaches 97% of children between 7 and 14 years old. About 3.3 million children have enrolled Elementary schools from 1994 to 2001;
- in 2001, 8.4 million enrollments were registered in high schools. Seven years ago, a little bit more than 900,000 students graduated from high school. In 2000, this number was close to 2 million;
- in 1985, there were 859 institutions of the higher education in Brazil. In 2000, there were 1,189, 60% private institutions. The number of majors offered by universities during this period has jumped to 170%.

We can see that higher education institutions have been feeling the need to open new seats to fill the need of high school graduates, which increased fastly. According to the *Ministério da Educação* (MEC), in 2004 there will be more than 3 million students enrolled in colleges and universities and, to fill the need for this number of estimated students, about 875 thousand new seats will have to be available. If we think, having as a base the size of Brazil's territory, the number of people that need education, available physical infrastructure and also the number of teachers with the ability of helping them with the building of them knowledge, we will easily get to the conclusion that distance education is a very viable solution.

In the last few years, distance education has been making a lot of progress in Brazil. In 1997, Brazil had only one *Licenciatura* course (a special course for students who have majors such as biology, physics, chemistry and want to teach in schools) approved by the *Ministério da Educação* (MEC), which was offered by Mato Grosso do Sul's Federal University. Nowadays, there are 15 accredited schools with the total of 40,000 students enrolled and 39,000 of them participated in teacher training courses. MEC's prediction is that until the end of the year of 2002, there will be 70,000 teachers enrolled in these courses.

Brazil has been using a varied system, different from those that are used by the mega-universities around the world, such as Open University in the United Kingdom or UNED in Spain. We are transforming the regular university into distance education courses, which requires an extra effort from universities so that they might be able to deal with the necessity of translating the contents of the courses into a dialogic language and, above all, give more potential the forms of communication amongst people involved.

Distance Learning Concepts

Many authors point out the basic characteristics of the distance learning process that, despite of the lack of equality, allow a clearer definition of the concept. According to Moore (1996), distance learning can be defined as a family of instructional methods where the actions of teachers are executed apart from the action of the students, including those continuous situations that can be done with the student present but the communication between the teacher and the student can be facilitated through printed, electronic, mechanical or other means. According to Keegan (1996), the central elements of the distance education concepts are: the physical separation between the teacher and the student, with distinguishes distance education from the class sessions; the influence of the educational organization (planning, systems, projects and strict organization) which differentiates it from a one-to-one education; the use of the technical means of communication, which are usually printed, to unify the teacher and the student and transmit the educational concepts; two-way communication, where the student can benefit from dialogue; the possibility of having occasional meetings with educational and social purposes; and the participation of a new industrialized form of education with a revolutionary potential.

This type of education/learning transforms the traditional classroom relation. The idea of the teacher's authority and his power over the learning process is transformed into shared learning. A new interface

between students and teachers appears, through computer technology such as the Internet. In this education model, instructors develop the role of facilitators rather than a specialist, for the courses are less structured and more personalized, giving the students the chance to control their own education. These ideas reinforce the idea that students will learn by actually doing things, not only by memorizing.

With the quick increase of technological changes, the educational system is challenged to broaden opportunities without increasing its budget. Many educational institutions are responding to this challenge by developing distance education programs. Basically, distance education occurs when the teacher and the student(s) is (are) separated by physical distance and technology, with voice technology, videos, data and media that is used as a bridge between them.

The development of flexible spaces for teaching/learning in which available resources and media can be used without the need for greater investments is the big challenge for universities that have been working as partners for a better improvement of the possibilities offered by distance education. In this educational proposal, responsibility, accessibility and opportunity quotas are distributed equally.

Research Methodology and Sources

When we choose a methodology we should always have in mind the instruments currently accepted for the field of study in which the project is being inserted. Mumford (1985) states that for researches in informational systems, a combination of methods usually produces a better result.

The basic questions in this research are the strategies of research used in this research were case studies with multiple analysis of cases in which each university interviewed was treated as one unit of analysis.

Which educational processes placed between information technologies (IT) are being used in distance education courses? Identify how and what is the range of use of IT, regarding the following questions: To what degree do students interact with teachers in the course? What are the forms and how often does communication between students and teachers occur? What are the educational technologies used? How is the material used, prepared and distributed? What evaluation criteria are being used?

The sample is composed of six private universities which were chosen because they are close to São Paulo and also because they have proven experience in distance learning courses. All chosen universities have already started a second or first group on their distance learning course and therefore already have some proven experience related to distance education and all interviews were done with specialists in the area who are responsible for the creation and keeping up the distance learning courses functioning well in private Brazilian universities.

Case Analysis

The information gathered in the universities that were visited was analyzed individually and were grouped later on due to their similarities. Through the analysis of the data gathered it is possible to trace the profile of teaching methodologies for these universities. We wanted to identify in the sample forms of interaction and support to similar students in the universities. The case was analyzed according to the answers obtained from the research protocols used in the interviews and also through contact made during the visit to the educational environments visited when the interviews took place, such as: technological environment, classrooms, printed or electronic material produced, among others.

Table1: Summarized Presentation of the Universities (1st part)

<i>Instituição</i>	<i>Courses Offered</i>	<i>Course</i>		<i>Learning Environment</i>		<i>Cost</i>	<i>Teaching</i>
<i>Code</i>	<i>Evaluation of the main course</i>	<i>Material use</i>	<i>Form of interaction student-professor</i>	<i>Professor</i>	<i>Tutor</i>	<i>For the student</i>	<i>Course structure</i>
A	<i>Especialização</i>	Available on the Internet	Class sections, Internet and telephone/fax	Yes	No	Free	Class sections
B	Continuing Education	Available on the Internet	Through the Internet, telephone and fax	Yes	No	R\$ 50,00	No class sections
C	<i>Especialização</i>	CD-ROM	Class sections, Internet and telephone/fax	No	Yes	R\$ 4.450,00	Class sections
D	Continuing Education	Available on the Internet and printed material	Through Internet, telephone and fax	No	Yes	R\$ 900,00	No class sections
E	Continuing Education	Available on the Internet	Through Internet, telephone and fax	No	Yes	R\$ 630,00	No class sections
F	Masters	Available on the Internet	Class sections, Through Internet, telephone and fax	Yes	No	R\$ 6.000,00	Class sections

In the universities that were analyzed, interaction between professor/tutors and students is always done through the Internet, phone or fax. What varies from one course to the other is the possibility of classroom interaction, through either meetings or classes, as shown in Figure 1.

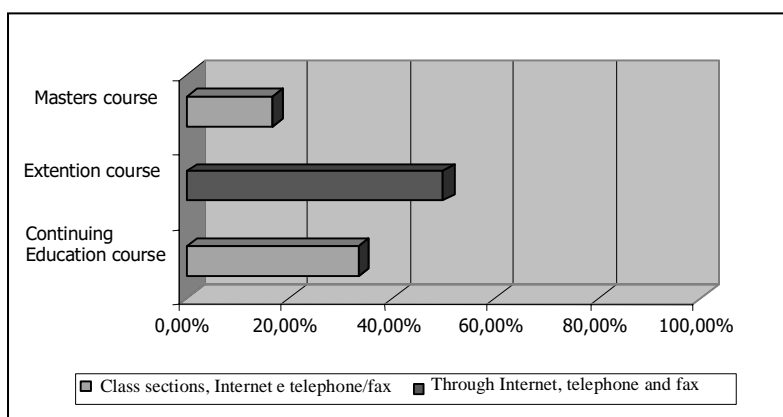


Figure 1 – Types of Interaction vs. types of course offered

We can see that in the longer courses, such as masters and continuing education courses, more class sections are offered in which students and professors/tutors interact in the classroom. On the other hand, shorter courses, such as extension courses, use tools from the Internet for interaction. The means used for communication between the teacher and the student vary and depending on the one that will be used, or on their combination, there might be a greater or lesser interaction between teachers and students.

In the analyzed sample, the percentage of professors is the same as of tutors. It is known that teaching is very expensive, for it requires from the professor a constant and active posture as someone who motivates and cheers up the group, and therefore, this demands many hours of work. Furthermore, a professor can look over a group of a maximum of 20 to 30 people. The more number of students enrolled in distance education courses, the higher the cost spent on teaching, but when teaching is carried out by the professor, the cost increases even more. In our research, we found, in one of the free courses, a professor acting not as a professor but as a tutor. The professor that tutors doesn't necessarily need to be a PhD. It might be a professor who earns a lower salary, but has a wide knowledge on the subject. The student's learning happens just the same, but costs will decrease.

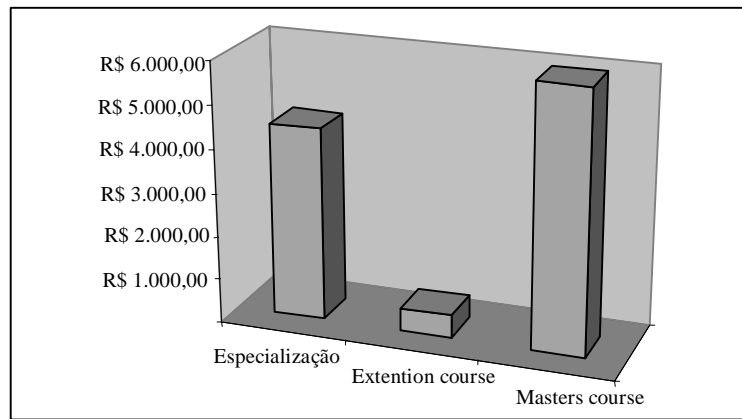


Figure 2 – Average Cost for each course

By looking at Figure 2 we can observe that the highest value is the one of the master's course. The Especialização courses are also expensive and cost an average of R\$4,425.00. The high costs of these courses can be explained due to the fact that they last longer, more than 360 hours, which demands a lot of hours not only for the development of the material but also for the teaching.

Table 2: Summarized Presentation of Universities (2nd part)

<i>Institution</i>	<i>Technology being used</i>	<i>Student Evaluation System</i>				<i>Course Management</i>
<i>Code</i>	<i>Type of platform being used</i>	<i>Finals-Class section Evaluation</i>	<i>Finals- No class section Evaluation</i>	<i>Final Participation Evaluation</i>	<i>Tests, participation and final project</i>	<i>Number of people involved</i>
A	Their own	Yes	No	No	Yes	5
B	Their own	No	No	Yes	No	15
G	WebCT	Yes	No	No	Yes	30
H	Learning Space	Yes	No	No	Yes	25
I	Learning Space	Yes	No	No	Yes	40
K	WebCT	No	No	No	Yes	13

Other characteristics that can be observed in Tables1 and 2 are the following:

- 83% of the universities have the course material available on the Internet; the rest have the material available on CD-ROM, having all classes that are transmitted through videoconferences and/or conference calls digitalized;
- shorter courses, between 20 to 60 hours, represent 50% of the sample; 50% of the courses have class, which means that they set up meetings between students and professors/tutors;
- 67% of the courses that have material available on the Internet use Learning Space platform. The rest uses an internally developed platform; the WebCT tool is used in the class and no class section courses. The WebCT is used by almost all universities that charge a higher price for their courses;
- Almost all universities (83.4%) have their own evaluation, but they are not carried out as a no class section evaluation but as a class section evaluation. A total of 17.3% evaluates the student for his/her participation during the course;
- All courses that have class section evaluations at the end of the course also calculate the students final average through a number of evaluations, which include tests, their participation in chats, discussion groups, exercises and class sections and also through the evaluation of their final project;
- The final project, in the masters and *especialização* courses, corresponds to the writing of their monographs.

Conclusion

The new information technology, added to the spread of interactive media, has put resources such as computers, the Internet and video available for education. The current trend is to join technology to education and, because of this new reality, its implementation of a new professor and student culture has become even more necessary in the educational institutions in our country. Distance education results in such an intense educational paradigm that it revolutionizes even the class sections and it presents a unique opportunity so that the institution and its professors might go over its educational methods once more.

One of the critical factors of a successful distance education is its focus directed to the student's needs and how they define the contents that fulfill all these needs. On the description of the presented cases, we can highlight some important aspects from the analyzed courses, such as the fact that students still prefer printed material rather than the electronic one, even if the online is or isn't available. We can also observe that the structure that supports the student, as well as the availability of teaching material, is converging gradually towards the Internet.

The study of various teaching models on the distance education courses used in the main Brazilian universities might stimulate the analysis of the professionals involved with distance education and, that in any way, might be facing some difficulties in choosing a methodology for best serving the students that can't or choose not to come to the university campus.

We might also highlight that one of the main challenges for the universities that are starting distance education courses is the search for the appropriate educational language that might be used in the learning process through all the different types of media available. The tutoring factor is an essential instrument, for it will determine whether the course will be successful or not. Control and accompanying of teachers, tutors trainees and the university's main office are all crucial for the student's interaction which might occur in a number of ways, and all of them are essential for a successful learning process. The structure of a specialized team, made up of people who understand the principles of technology and education and of hard work may guarantee a better learning performance from the student.

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OPEN DIMENSION IN EDUCATION INITIATIVES OF THE EUROPEAN COMMUNITIES THE POLISH EXPERIENCE

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Introduction

In the last ten years that have passed since the signing of the European Union Treaty in Maastricht, in the process of the European integration the role of co-operation in the field of education has been repeatedly emphasised. The "Europe of knowledge" - a common intellectual, social and cultural heritage has been defined as an unquestioned factor of progress throughout the Old World.

European higher education establishments have accepted the challenge: the Sorbone Declaration signed in May 1998 has stressed the significance of universities in the building of the common European cultural area; the Bologna Declaration signed in June 1999 by 29 countries, including Poland, is seen as a commitment to strengthen the European dimension of higher education and to promote the European higher education system world-wide.

The common strategy of the higher education system is related to the popularisation of comparable credit giving systems, introduction of the Diploma Supplement and the implementation of the two levels of academic education - the B.A. (B.Sc.) and the M.A. (M.Sc.) levels, accepting a common credit transfer system (like ECTS). Apart from that, it is strongly connected with the promotion of mobility among the academics, particularly in the context of enabling students to study abroad.

The Socrates programme - an educational initiative of the European Communities has spanned more than 30 countries and is realised Europe-wide. The programme activities aim at improving the quality of education, popularising knowledge and accepting the challenges of the 21st century by promoting lifelong learning, unlimited access to education, acquisition of new skills and qualifications and foreign language learning.

The Socrates programme is addressed to all active players of the educational market, including the adult education participants. For all target groups and in all educational activities undertaken the programme promotes respect for intercultural Europe, active citizenship, equal opportunities for men and women and for disadvantaged and least privileged social groups.

In all activities financed within the Socrates programme particular attention is paid to the use of modern information - communication technology (ICT) and the introduction of educational innovations. The supported activities and changes in European education result from the challenges delivered by the world of today, the contemporary era which is often referred to as the era of "the knowledge society", "the information society" or "the knowledge-based economy".

Knowledge and information and ability to use them in practice are considered key factors of progress, whereas in the society - the key role in terms of development is assigned to the so called "human resources" whose value is measured by the level and quality of education in particular.

Within the many programmes and activities of the European Communities which support the formation of the information society, two key initiatives play a particularly significant role: **e-Learning** and **Lifelong Learning**, published in the following European Commission documents: "**e-Learning - Designing tomorrow's education**" and "**Memorandum on Lifelong Learning**". They aim at creating a common European strategy of implementation of new technologies into education and promoting lifelong learning.

In the increasingly common and international area of education the transfer of ideas and best practice is possible through the use of modern technology which also makes it possible to place such achievements in the virtual web access to which becomes more and more unlimited.

Similarly to other European countries, Poland makes better and better use of these achievements and contributes more and more to the common educational area.

1. New possibilities and dimensions in tomorrow's education - European Communities initiatives

Numerous representatives of scholarly and artistic circles, widely appreciated thinkers and philosophers, politicians responsible for Europe's prosperous future take active part in the open debate on the role of education in realising the challenges of the 21st century. In the popular understanding the future of Europe - i.e. perspectives of further development, enhancing the standard of living, improving employment possibilities - in great part depends on the enhancing of scholarisation ratios and of the quality of education continent-wide, and on the popularisation of the use of modern information and communication technologies (ICT) in the life of the society.

The new technologies and the digital transmission of information have placed the modern man in the era of universal communication independent from time and location, and at the same time - have changed nearly all aspects of social life. On the one hand - we observe the broadening of possibilities of applying the technological progress to the benefit of mankind, in the context of cognitive and creative undertakings, on the other however - today's world of economic competition, increasingly complex social and political systems, rapidly changing patterns of social behaviour and labour market requirements, confronts the modern man with hitherto unknown challenges.

It is the role of education to equip everyone with instruments of cognition and valuation and with appropriate skills which will make it possible to cope with these challenges and to design one's life path according to the changing world's reality.

It is a fact that **education is a long-term and multidimensional process**. As a **social experience of a universal value** it should inspire and direct the development of individuals and social groups alike **on the basis of the value of the very process of learning "... in order to know, to act, to exist and to co-exist..."**

All over Europe measures are taken to create educational offers and environments which could enable people to both realise their development potential in a creative way, and to work effectively and to take active part in the shaping of social life in the rapidly changing social reality.

Furthermore, the aim is to make education a long-term process - in a lifelong perspective, and to make the need for learning an incentive for an active search for knowledge, acquisition of new skills and competencies. The most important suggestions put forward by the Council of Europe in relation to the policy and activities realised by the European Union concern wide popularisation of lifelong learning and implementation thereof in all educational contexts in the next couple of years.

The European Commission publication titled "A Memorandum on Lifelong Learning" contains a definition of objectives to be considered during the implementation of the concept of lifelong learning Europe-wide:

- Public and unlimited access to education - acquisition and renewal of skills necessary for the active participation in the information society;
- Enhancing the level of investments in human resources, making it a priority;
- Preparation of effective teaching and learning methods and of suitable conditions for the implementation of the concept of lifelong learning;
- Preparation and improvement of tools for evaluation of the results of the learning process, particularly outside of institutions (in the informal context);

- Easy access to information and advice concerning the educational possibilities at any stage of life;
- Lifelong learning possibilities in one's closest environment, within local communities, with the use of modern technology.

Two other European Commission publications, i.e.: "Designing Tomorrow's Education. Promoting Innovation with New Technologies" and "E-learning Initiative - Tomorrow's Education", contain proposals saying that the use of ICT should be part of a more general strategic plan calling for flexibility of action for educational establishments, proper staffing, and means necessary for the transition from the experimenting stage to the promotion stage and popularisation of innovations.

To achieve these goals it is necessary to clearly **define priority objectives of education** both in the national and the European context, and to **open the area of education to the technological progress, the rapidly changing social needs and the challenges of the 21st century.**

2. Popularisation of the information-communication technology (ICT) in education

Research activities and comparative analyses conducted by the European Communities and concerning the use of ICT in education in several European countries made it possible to define **favourable conditions for the popularisation of information and communication technology in education.**

The following points have been considered most important:

- The state authorities' **defining and adopting a strategy of the education sector development;**
- **Creation of a modern market of educational services;**
- **Organisation of teacher education and training activities.**

Apart from that, the creation of favourable conditions for the popularisation of ICT is related to the following issues:

- high quality of educational materials;
- preparation of methods and services through which these resources could be applied in an efficient and effective way.

In this context, a better access to information, introduction of a systematic structure of information, and creation of effective models of development of the multimedia educational software market, are equally important.

Another issue to which much attention has been paid is the question of evaluation of knowledge and skills and of issuing certificates and diplomas on the completion of the given level of education.

Expert literature dealing with the question of use of modern technology in education gives primary importance to the **proper training of teachers**, and in particular:

- **equipping teachers with tool managing and computer language skills;**
- **expanding the teachers' workshop with high quality teaching aids based on the ICT;**
- **altering the usual teaching practice - enabling students to "search" for knowledge and stimulating active group work.**

It is important to provide teachers who use ICT in their work with easy access to various multimedia resources, both at school and at home.

The European Commission publication titled "Designing Tomorrow's Education" which has a key importance in the context of promoting innovative teaching methods, contains the definition of **priority actions making it possible to effectively implement new technologies into education**, and of the necessary co-ordination of initiatives undertaken on various levels of education. The following issues were considered priority actions:

Continuos update of knowledge

It is necessary to improve research procedures and to introduce a "technological supervision" along with a systematic monitoring of practical actions and an evaluation of the influence of ICT on the learning process.

Furthermore, it is recommended to take actions to define paths of development and major trends that appear in relation to the application of ICT to education.

Promoting innovations

It is equally important to conduct pilot programmes in such a way, so that they could serve as a preparatory stage in introducing innovations in various types of schools and on different levels of education. Group work, interdisciplinary approach, starting co-operation with new partners and education market players were considered major issues as well.

It is recommended to promote high quality of educational services, to create a network of professional assistance and training centres, and to introduce innovations in a systematic way. Another important issue is to increase investments in infrastructure and in multimedia programmes and educational services accessible via the Internet. It is advisable to create a network of quick connections between educational establishments and research institutes, public centres and institutions such as libraries and museums, in order to facilitate the access to science and culture resources.

Particular attention is paid to actions which aim at removing barriers resulting from i.e. social diversity. In the realisation of comprehensive ICT implementation processes it is necessary to consider the needs of all those who have difficulties in getting access to educational services for social, geographical or other reasons.

Moreover, it is recommended to strengthen the intercultural dialogue, to enhance social skills and foreign language command - i.e. the factors which facilitate international co-operation and exchange of experience.

International co-operation

Since mid nineties in Europe there has been a significant increase in the number of international, national and local initiatives promoting the development of education through the use of modern information and communication technologies (ICT) and the implementation of the idea of lifelong learning which in itself is a recurrent motto in all of the Community educational programmes.

Multiple actions financed from the budgets of educational programmes such as Socrates, Youth, Leonardo da Vinci - international co-operation and creation of thematic networks; realisation of pilot projects and joint research activities; exchange of experience and promotion of mobility in the area of education; building of European data bases and innovative teaching programmes and methods - are the key elements of the process of implementation of the idea of lifelong learning, promotion of innovations and emphasising the European dimension in education.

3. Polish experience

Similarly to other European countries Poland has joined the process of realisation of common initiatives aiming at the expansion of possibilities and achievements in the area of education.

Throughout the 8 years of the realisation of the TEMPUS programme nearly 23,000 academic teachers and more than 11,500 students have visited foreign academic centres in the frames of the Joint European Projects and Individual Mobility Grants. Polish universities received more than 11,000 academic teachers from the EU countries who gave lectures, organised seminars, specialist courses and summer schools.

The intention to provide wide groups of users with education and training opportunities has been a reason for preparing joint initiatives aiming at the development of distance education.

Within the PHARE project titled "International Co-operation in Distance Education" and realised in 1995-1999, twenty Polish education institutions (i.e. 5 universities and 15 continuing education centres) have started the implementation of new technologies in distance education. The project made it possible to equip the centres with high quality computer and multimedia infrastructure, to train the staff in the use of ICT in education, and to prepare multimedia programmes facilitating the distance education mode.

Eight centres from Poland have been included in the European network of 40 distance education centres.

This "valuable starting capital" is being improved and multiplied through continuous transfer of knowledge and good practice from the European Union countries. The centres which realise this participate in further Community initiatives such as Socrates and Leonardo da Vinci.

In Poland actions have been undertaken nation-wide in order to equip schools with computer infrastructure which makes it possible to enrich and modernise the teaching / learning process e.g. through the Internet access.

The realisation of the project titled "An Internet Classroom in each municipality" made it possible to organise Internet access in classrooms in 2,500 Polish schools and to equip them with 25,000 computers. The aims of the project were as follows:

- To prepare the pupils to life in the global information society by enabling them to use information and communication technology in learning and problem solving;
- To facilitate communication within the education system.

The project included the following actions:

- in each municipality equipping one school classroom with 10 multimedia computer workstations connected by a local network;
- preparing a classroom with an Internet access from every workstation;
- providing each classroom with software enabling pupils to use the information technology (according to the programme assumptions of the reformed school);
- training of at least 3 teachers in each school spanned by the programme in the basics of information education strategy.

Another initiative aiming at the popularisation of the information and communication technology in Polish schools was the Interkl@sa programme.

The Interkl@sa programme aims at creating favourable conditions for the popularisation of information education in the Polish education system and at improving the information education quality through:

- preparation and implementation of programmes of teacher training in the use of information technology in teaching;
- preparation and propagation via the Internet of educational materials and resources in the Polish language within the creation and modernisation of a non-commercial and widely available Polish Educational Portal - Interkl@sa;
- promotion of the 'Quality Certificate for schools' programme and encouraging the educational circles to use computers and the Internet in the teaching process and to the benefit of local communities.

The Interkl@sa programme currently comprises 4,160 Polish schools, including 1,888 primary and 2,258 secondary schools.

It is expected that in the next 3 years all secondary and primary schools will be equipped with classrooms with Internet access (secondary schools - till the end of 2003, primary schools - till the end of 2005).

The impressive work of Polish educational institutions is being supported and continued through the subsequent international co-operation possibilities.

The realisation of the Socrates programme is highly important in the context of the development of the Polish education sector.

Socrates is a European Communities programme promoting and supporting international co-operation in the area of education, and its **main objective is to improve the quality of education on all levels and in various educational contexts**: from the basic kindergarten education programmes to highly specialised academic initiatives and the development of adult education services and offers.

As Poland joined the Socrates programme in 1998 there has been a **significant improvement of possibilities for students** to study abroad, and **for the academic staff to continue their scholarly career** through the co-operation with academic communities from all over Europe. **Educational establishments of all levels can participate in the realisation of international projects** in various thematic areas, there are possibilities of **pupil exchanges, foreign training courses for teachers, participation of education institutions managers in study visits abroad.**

In the frames of numerous Socrates programme components many international pilot projects are realised aiming at the preparation of new tools facilitating foreign language learning, preparation of innovative teacher training programmes, implementation of modern technology in education, improvement of adult education offers.

Socrates comprises 100 Polish universities; over 8,000 student have spent 6-month study periods abroad; more than 500 people representing managerial staff from various levels of education **have participated in study visits abroad; over 500 Polish schools co-operates with educational establishments from other countries in the realisation of European Educational Projects.** Nearly 900 Polish foreign language teachers had the opportunity to complete a training abroad.

This scale of impact of the Socrates programme onto the Polish education sector can be supported by the number of large projects - the International Co-operation Projects aiming at the promotion of open and distance learning and the use of new technologies in education, and the implementation of the idea of lifelong learning. **Polish universities, adult education centres and schools have participated in the realisation of 28 projects concerning the implementation of ICT in education, including continuing education.**

The multinational composition of project realisation groups, the diversity of topics, innovative approaches and teaching methods, and the diversity of users of educational offers prepared within the individual projects have been highly beneficial in the context of the experience gained by the Polish institutions which have participated in international projects.

Undoubtedly, such an impressive treasury of human experience and achievements is likely to create new possibilities and dimensions for the education system in Poland.

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HOLDING A BALANCE BETWEEN EXTENDED INCLUSIVE ACCESS AND THE EXPANSION OF EXCLUSIVE PROVISION IN DISTANCE HIGHER EDUCATION AND TRAINING: THE TECHNIKON SOUTH AFRICA CASE STUDY

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Abstract

The vision for the 21st century South African higher education system as presented by Kader Asmal (1999) has crystallised into two priorities for the state:

- a) Priority 7: we must create a vibrant further education and training system to equip youth and adults to meet the social and economic needs of the 21st century.
- b) Priority 8: we must implement a rational seamless higher education system that grasps the intellectual and professional challenges facing South Africans in the 21st century.

The institutionalisation of this vision in higher education has led to (1) the reconfiguration of management structures and learning programme; (2) setting up of alternative means of enabling access into higher education; (3) and in retrospect imposed new challenges in strategies and methodologies of providing higher education that respond to all forms of diversity that the extension of Access invites into teaching and learning. This paper is based on a case study depicting an analytic audit of Technikon Southern Africa of intervention programmes that seek to extend students' academic access (access from outside) to the provision learning programmes and learner support (access and success from within). These 'access from outside' equity programmes are used to benchmark the vision of the seamless higher education that grasps the intellectual and professional challenges facing South Africans in the 21st century. The latter refer to the 'access from within' development programme which are benchmarked against diversity quality assurance, and diversity in expanding exclusive provision as prescribed by the act of extending inclusive access. The study employs an action research model that presents a vision to balance equity and development. It analyses the context of teaching and learning in distance higher education and rigorously reflects on practice of the work in progress at Technikon SA based on diversifying and extending inclusive access as well as expanding exclusive provision and learner support in distance higher education in Southern Africa.

Introduction

Any attempt to present a critical reflection on issues of access into higher education and how this shapes academic success of those admitted into academic programmes cannot do so without presenting a sufficient reflecting on various forms of access in teaching and learning envisaged in South Africa today. There are various forms of access to teaching and learning; access to space; access to resources; access to knowledge (epistemological access) Jansen (2001); access to skills and competency; access to dialogue; access to workplace education; access to feedback, etc. These forms of access can be clustered into two broad categories, learner invitation (access, admission and placement) and learner hosting (academic provision, service and capacitation). Operating within the franchise of corporationalised and globalised education enterprises, physical access would translate itself to client-learners enticement while academic provision translates itself to product/service delivery by creating space and opportunity to enhance capabilities of clients (learners). Not withholding the significance of the critique that higher education institutions as business are not good for business (Singh, 2001) if their competitive advantage and niche focus is bias and phenomenally thinned to the production and utilisation of knowledge by business economies, one can still argue that individual learners accepted into learning programmes are entitled to academic provision that reflect value for money in the context of free education viewed non-existent.

The 'value for money' paradigm in teaching and learning does not merely find ratification of its common sense value within 'education as a business enterprise' discourse, but it also significantly permeates itself to the core of the 'education for public good' argument. In spite of whether the 'inclusive access' motive being commercial, civil or political, any systemic attempt to balance the inclusive access and exclusive provision equation in higher education planning and practice, is by its principle of accountability and responsibility an act of public good. While such a systemic attempt to balance access with provision is an economic 'demand and supply' phenomenon pillared on the discourse of the internationalisation and the subjecting of education to financial discipline (Ruth, 2001), it also serves the social purpose. This social purpose is the one of providing differentiated interventions rooted on South African constitutionalised democratic values and diverse cultural enterprise, a cultural brand of identity that makes the democratic order South Africa boast of itself as a rainbow nation. Opening access by relaxing recruitment and selection criteria, making it more invitational and inclusive, signifies by definition the creation of relative agility in teaching and learning systems in a manner that affords learners extended choice and control over learning itself (Race, 1994). Technikon South Africa has by making minimum admission requirements a grade twelve certificate with at least five higher grade, standard grade or the combination of the two, or any SAQA and Technikon SA Senate recognised equivalent certificate, or no grade twelve at all, extended access into academic programmes by creating these invitational conditions (Technikon SA, 2002).

The values of extending inclusive access to higher education and paralleling this with expanding exclusive provision are eloquently espoused in the National Plan for Higher Education (2001), as founded on the White Paper 3: A Programme for the Transformation of Higher Education (1997) which is based on the goals:

- to provide a full spectrum of advanced educational opportunities for an expanding range of the population irrespective of race, gender, age, creed or class or other forms of discrimination
- to promote equity of access and fair chances to all who are seeking to realise their potential through higher education while eradicating unfair discrimination.

Implications for Extending Inclusive Access

As argued above, balancing extended inclusive access with expanded exclusive provision has both economic and public good interest in a sense that it remains a moral, pedagogic, and business imperative in any public and private enterprise. Deviation from this norm owing to financial viability models that currently characterise South African higher education as part of its restructuring and reaction to globalisation and internationalisation of higher education corporate management models has been widely critiqued as failing to advance the social justice agenda through education and training. As observed by Singh (2001), the quality of provision has been placed in jeopardy as large numbers of diverse learners render educator student ratios significantly unmanageable as institutions revitalise from the verge of collapse through survival strategies in the face of fiscal austerity. This stance has been raised as a political concern in the National Plan for Higher Education (2001) where it is clearly stated that increased equity access should match success rates.

“The Ministry acknowledges that significant changes have occurred in both the race and the gender profile of the student body in the higher education system. However, these changes have not gone far enough. As the White Paper states, “equity of access must be complemented by a concern for equity of outcomes. Increased access must not lead to a ‘revolving door’ syndrome for students with high failure and drop-out rates” (White Paper: 2.29). Neither must the increased access of black students through distance education programmes and satellite campuses – students who are “neither seen nor heard”, be allowed to parade as a commitment to equity of access. In this regard, the Ministry would like to state emphatically that it is unacceptable that the student profile of some institutions continues to remain predominantly white. This cannot continue.”

Whether student numbers escalate as a repercussion of the execution of unresearched survival strategies or the articulation, prioritisation and realisation of social transformation initiatives, the agenda of quality assurance in higher education can hardly be deemed complete without paying significant attention to the following factors:

- an increase in levels of efficiency in process of academic provision
- an escalation in degrees of effectiveness of teaching and learning systems
- the alignment of individual learning processes with generic standards and expected outcomes
- realisation of academic obligations shaping individual contracts between learners and institutions
- an emphasis on student stakeholder feedback on learning experiences encountered with academic and administrative systems and processes put in place to shape teaching and learning
- putting in place of teaching and learning strategies, structures, systems and processes that improve meaningful participation of learners and enhance learning potential for all learners
- mentoring of balance between institutional accountability to cutting-edge academic provision, and learner responsibility to academic participation.

Making it possible for distance education institutions like Technikon South Africa to realise these quality assurance benchmarks, it is imperative to understand legal imperatives binding the nature of learning contracts concerned parties (learners and institutions) enter into during students registration. Students are financially liable as individuals; academically responsible as individuals; learning occurs in an individual mind; skills and competencies are individually internalised (in spite of the context of learning); and success and failure are conferred individually. If the learning contract from the perspective of the learner is this highly individualised, opening inclusive access should contractually be paralleled with exclusive provision that meets various levels of the needs of learners during teaching and learning. It is critical for provision to realise that individualised learning contracts bear various forms of diversity that make it necessary to have learning differentiation a significant symbol of agility in teaching and learning systems and processes, an imperative that makes business sense while remaining a public good gesture.

As characterised by Matentjie (2001), an effective access framework puts emphasis on diagnostic assessment and has to be anchored on effective learner support and academic development systems where learners at risk are identified and supported through appropriate academic and personal support interventions. As maintained by Matentjie the integration of academic development and support systems into mainstream programmes ensures that the under-prepared learners are allowed access, without compromising institutional academic standards, while on the other hand upholding quality assurance values in teaching and learning.

Barriers in Paralleling Diversity with Differentiation

There are various barriers and challenges that impinge on the construction of agile structures, flexible systems and responsive processes in South African distance education. These barriers are depicted on the April (2002) model provided below.

While factors depicted in the April model can be squarely attributed to the functioning of various organisations, some being non-academic, Technikon South Africa has over years realised the essence of putting systems and processes in place to ensure that through extended inclusive access, learners are not placed for failure, but success. Whether these systems and processes are adequate, fit for purpose, add value to teaching and learning, enhance learning and accelerate students success is another question that needs systematic evaluation, which owing to time, scope and latitude of the challenge to match extended access with differentiated exclusive provision, is hardly observed. Looking at high input and low output ratios in terms of student numbers, it remains safe to merely state that our current systems and processes are good in making students disappear. The questions to ponder are 'Why do they disappear?' 'Where do they disappear to?' and 'How can this situation be rescued?'

Why Exclusive Provision fails to match Inclusive Access?

Strategies	Structures	Systems	Processes	Policies	People	Culture
<ul style="list-style-type: none"> - No systemic strategies - Lack of shared vision - Lack of commitment to differentiation - Financial constraints - Isolationist intervention models that fragment systems and processes 	<ul style="list-style-type: none"> - Cumbersome hierarchies - Responsibility without authority - Top-down management models - Bloated staff functions - Communication discontinuity - Rigid structures backed and hardened by over rehearsal 	<ul style="list-style-type: none"> - Oppressive control - Lack of agility - Provider centred - Unabling evaluation and sumative feedback - Unresponsive practices 	<ul style="list-style-type: none"> - Lack of fitness for purpose - Provider convenient - Set to prove instead of improving - Parochial and bias - Expert bias perspective 	<ul style="list-style-type: none"> - Complex approval cycles - Extensive documentation - Over-reliance on set rules and procedures - Reliance on rigid frameworks 	<ul style="list-style-type: none"> - Resistance to change - Fear of failure - Turf protection - Complacency - Short-term focus - Lack of appropriate skills - Lack of willingness to go an extra mile 	<ul style="list-style-type: none"> - Rigid norms and tradition - Lack of consensus - Unshared values - Lack of fit - Strong cultures that fail to recognise need for change

Adapted from April 2002

The few systems and processes put in place reflect the willingness to differentiate admission criteria into programmes, while putting in place enabling mechanisms to recognise diverse levels of readiness to enter academic programmes and commence learning with success. These systems and processes recognise that every learner is similar and different from other learners on basis of age, marital status, work experience, social values and norms, gender identity, ethnicity, previous education, location and residence, motivation to study, language, socio-economic status, course enrolment, nationality, physical ability, intellectual capability, learning pace, ability to adapt to learning space, subject specialisation, dominant cultural identity, and attitudes (Cele, 1999). This fabric of diversity that informs the need to differentiate teaching and learning experiences of all learners by realising that all learners need to make their own sense out of every presented reality, has been incorporated into some structures, systems and processes at Technikon South Africa. In characterising Technikon South Africa strategies, systems and processes in place to extend inclusive learner access into programmes, Humphrey (2002) becomes blatant and explicit.

“Technikon SA has become known as an access institution and affords access to students who cannot gain entry to residential institutions through financial of academic exclusion. In addition students who reside far from residential institutions are able to enrol in Technikon SA’s distance education programmes. In fact Technikon SA provides an opportunity for students to study for first year courses while working and later transfer to residential institutions”

Support Systems and Processes on Admission, Placement and Provision

Technikon South Africa connotatively uses an Integrationist approach model to accelerate student success in retrospect of open access and differentiated student placement into academic programmes. With wide open access policy in place, Technikon South Africa has put in place two critical systems that enhance inclusive access into academic programmes and systematically accelerates levels of success, Recognition Prior Learning (RPL) and the Academic Development (ADP) Programme.

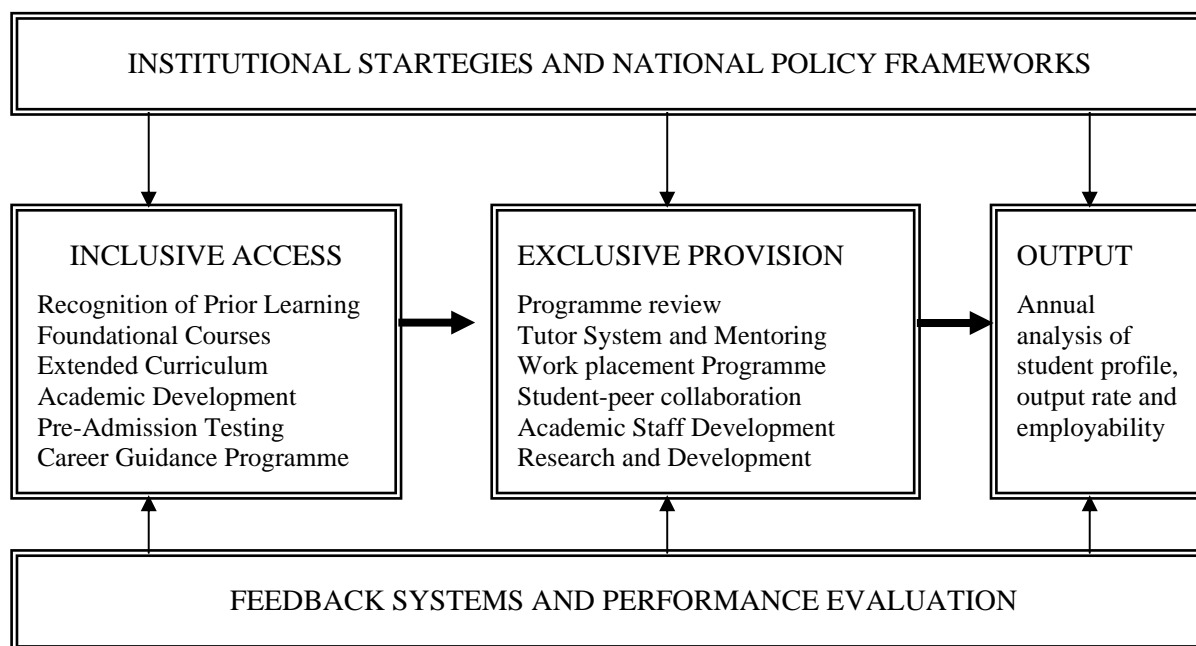


Figure 1: Integrationist Access and Provision Balance Model

National Policy Frameworks informing Open Access

There is a wide range of policy frameworks and legislation that govern operations of institutions and shape the development of internal policies, the corporation strategy, functional and operational strategies of Technikon South Africa. It is not the purpose of this paper to present an extensive analysis of these policy documents and frameworks. However, realising that a study of this nature cannot be concluded without the acknowledgement of these landmark policies in higher education, a list of reference will be drawn. Critical policy frameworks that inform and shape access and provision strategies in higher education are among others the following;

- National Education Policy Act No. 27 of 1996
- National Plan for Higher Education (February 2001)
- Education White Paper 3 (July 1997)
- Skills Development Act No. 97 of 1998
- Skills Development Levies Act No. 9 of 1999
- Official Languages and Promotion of Multilingualism Bill (2000)
- Norms and Standards for Educators (February 2000)
- Higher Education Act No. 101 of 1997
- South African Qualifications Authority (SAQA) Act No. 58 of 1995
- New Academic Policy for Programmes and Qualifications in Higher Education (January 2002)

These policy frameworks and pieces of legislation inform the attempt to redress and transform South African higher education. It is on this premise that holding a balance between extending inclusive access and expanding exclusive provision as argued in this paper, becomes a critical strategy and the political imperative in policy implementation phenomena.

Systems in place

(a) Recognition of Prior Learning (RPL)

Recognition of Prior Learning is a critical affirmative stance in teaching and learning that seeks to recognise skills and competencies acquired through work, training, reading, parenting, community work and travelling experiences as critical component of education and training. The recognition of these skills and competencies prevents the repetition of learning already acquired; accelerates career mobility; and widens access into learning programmes. In this context Technikon South Africa understands RPL to be the identification, assessment, and acknowledgement of skills, competencies, knowledge, and attitudes obtained through previous formal and non-formal learning, work, and life experiences (Smith, 2002). RPL in teaching and learning serves the following functions:

- *Establish systemic evidence of learning that transpired competencies and skills acquired*
- *Allow learners access into programmes*
- *Provides individual career profiles that inform career guidance*
- *Provides critical individual learner profile and suggest suitable teaching intervention*
- *Placement of learners on different levels in programmes*
- *Provides systemic skills and knowledge profiles as indicators of levels of learner readiness for the development of proper mix instructional design*
- *Establish the context of learning that suites learners most*
- *Allow providers to establish responsive intervention strategies that accelerate learning*

The Technikon SA RPL policy is the one that adheres to the international widely acclaimed and accepted standards Council for Adult and Experiential Learning (CAEL) based in Chicago USA. These benchmarking standards by virtue of being foreign and first world become detached from the historic context peculiar to South Africa. This on its own creates a particular genre of social redress policy conceit that while seeking to redress political injustices of the past by adhering to uncontextual frameworks, inevitably lands itself to the perpetuation of the status core. In this context the privileged enjoy more privileges and the disadvantaged endure wallowing in that abyss forever. The danger of that genre of policy making framework is that continues blaming the unprivileged for failing to comply with policy, without instituting a critical reflection on the context of policy implementation and learning from the realities of the South African context. It is this context that the TSA RPL policy needs to be critique and rewritten. However, working in close collaboration with academic programme groups, the RPL unit facilitates the use of various strategies and methods (interviews, portfolios, challenge tests, site visits, standardised tests, submission of assignments and projects, taking of short courses etc) to assess skills and competencies and fast-track learning. RPL processes have proven to provide the most successful assessment and placement strategies that have extended inclusive access to learners into. While very few students have taken advantage of this programme and some have been sidelined by policy itself, the success rate of cases handled is significant.

(b) Academic Development Programme

The Academic Development Centre hosts a number of learner support and students enablement academic programmes that include foundational courses, extended curriculum initiatives, pre-registration assessment, and guidance and counselling, placement in programmes, tracking, and evaluation of success rates.

(c) Foundational Courses

Various discipline based foundational courses are developed for different students who demonstrate lack of expected competence on study and learning skills, cognitive skills, problem solving, and critical thinking skills. These foundational courses are based on different divisional fields of study, which makes these courses differentiated according to discipline demands. These disciplines are Engineering and Natural Sciences; Applied Community Sciences; Management and Economic Sciences; and Public Safety and Criminal Justice (Machika and Fritz, 2001).

(d) Extended Curriculum

Upon analysis of individual student profiles during pre-registration assessment, certain students are recommended for the extended first year level curriculum. The extended curriculum is designed to place students into programmes for success, based on:

- subjects selected for foundation courses
- interventions extended where high drop-out rates are detected
- introductory modules offered for all courses
- foregrounding of academic literacy
- different mainstream subjects selected for student development

The extended curriculum maintains the balance between open and inclusive access and academic readiness for mainstream education. Maintaining this balance is a critical measure in ensuring that social redress, equity and open access policies of the Technikon are meaningfully successful and articulate with differentiation of academic provision.

(e) Pre-Registration Assessment

The pre-registration assessment programme is designed for first time learners at Technikon SA based on principles of establishing learners' basic numeracy, mathematics, language, and computer competencies. The Pre-Registration Assessment selects all students into programmes by establishing their level of readiness and responding with appropriate intervention strategies as envisaged in the conceptualisation of this programme. This process assists the materials development unit to respond efficiently with relevant learning materials, lecturers embarking on appropriate subject planning and employing relevant intervention strategies, and learners preparing for empowering learning experiences exclusive to their needs and competence levels. Student profiling through pre-registration assessment and responsive capacity building are linked to student academic development within mainstream programmes (Machika and Fritz, 2001).

(f) Tutor System, Mentoring and Job Placement

As a distance education provider, Technikon South Africa has its prime target market spread throughout South Africa and extended to the Southern Africa Developing Community (SADC) countries. At the forefront of teaching and learning is a critical core and cadre of specialists in various fields and experts in teaching and learning. Teaching and learning and interactive engagement between learners and tutors is decentralised to nine regional offices that facilitate learners support delivery, provision and delivery of quality learner-centred courseware. The decentralisation of the tutor system and placement of learners on industries enable the Technikon to reach multi-dimensional learner and respond to the diversity and needs of diverse learners. On the same token it has become obvious that TSA does not have a grant plan that speaks to innovative strategies for co-operative education. Owing to the high unemployment rate stance of the South Africa economy, many students remain without places for experiential learning and workplace education. This condition calls for the inserting of agility in the human capital management policy to respond with the staff profile imperatives and partnership modelling of co-operative education.

While the 'wide web' model of interaction is shaped and monitored by a central critical mass of educators, it also brings a multiperspectival dimension to teaching and learning and initiates dialogue between tutors and learners, tutors and tutors, learners and learners, and learners and prospective employer, learners and lecturers, and lecturers and employers. This multiperspectival approach ascertains that knowledge is not created by the few, disseminated for acquisition from educators to learners, and transmitted for application by tutors without critical thinking processes taking the lead. Debates, dialogues and web-structured communication secures space for the contextualisation of knowledge, personalisation of the internalisation processes and the localisation of skills and competencies acquisition. While this framework at a general critical stakeholder participation level makes it essential that education serves the fundamentals of public good, it also secures the acquisition of skills and competence for contextualised needs of societies. Knowledge, skills and competencies acquired through such a dynamic and multi-perspectival discourse, also balances the discrepancy often perceived between theory and practice, while ensuring that all these forms of knowing and coming to know, can be immediately translated into practical solutions in the real world.

(g) Academic Staff Development

The Institute for Staff Development (ISD) is positioned as a path to Technikon SA becoming an employer of choice by using training and development to invest on academic human capital. When Technikon SA realised that it needed to secure its "BUILDING YOUR CAREER WHEREVER YOU ARE" competitive advantage in teaching and learning, ISD was established as a critical component of the strategy to entice talent, enhance, retain and extend the academic potential of Technikon SA academic staff. The Institute for Staff Development offers long-term training programmes and short-term training workshops based on annual *Needs Assessment* and the GAP analysis on professional readiness of academic staff. These courses are provided on perceived critical areas of teaching and learning applied competencies which are foundational, practical and reflective as defined in the new roles of educators prescribed by the Norms and Standards for Educators (SA Government, 2000). These roles are:

- Mediation in learning
- Interpreting and designing of learning programmes and materials
- Administration, leadership and management
- Being a scholar, researcher and life-long learner
- Community, citizenship and pastoral role
- Assessor
- Specialist function in learning area, subject, discipline or phase

These short-courses linked to the Education Training and Development Practices (ETDP) Service Education and Training Authority (SETA) accreditation framework, seek to provide work-related training and development that is linked to credits-bearing workshop programmes. On completion of training, participants should receive credits-bearing SAQA recognised certificates for attending these training workshops.

(h) Research and Development

In a quest to retain Technikon SA and its academic staff on the competitive edge of the creation, acquisition and application of knowledge frontiers, the Research and Development Centre provides a combination of proactive and reactive research and consultation strategies and services to Technikon SA structures, systems, and processes, and to external clients as well. To elevate quality teaching, meaningful learning and community service, through Research and Development Centre, Technikon SA staff members are encouraged to critically research and reflect on their practices. Academic Staff are invited to become part of collaborative research groups committed to create more effective, efficient and equitable open and flexible learning environments, learning technologies and learning materials.

The Research and Development Centre also provides individual advice to staff members on reflective practice and learning which encourages conversations with peers and other interested parties on their own innovative practices in teaching, research and community outreach. These 'insiders' talk and reach out to their fellow staff members and concerned stakeholders to expose their discrepancies between their theory and practice, to illuminate their concerns, to explore what others think and to probe to find out what could or should be done to enhance the quality of teaching and realise learning potentials.

Output Analysis

An Integrationist approach like a 7's (shared vision, strategy, structures, staffing, skills, systems, styles of leadership) model in human resources management advocates a co-ordinated approach to systems analysis. If systems are conceived as organised bodies of interrelated things, events and processes, sets of relationships connecting different parts of a complex whole, and keeping that whole together, the analysis and feedback system on the existence and success of exclusive provision processes and systems in place can not be viewed from an isolationist perspective, but an Integrationist one. If student progress and success rates are enhanced, such success can not be attributed to a single variable, but to multidimensional variables. To be successful, this rather complex process that suggests the need for spiral

and longitudinal evaluation and feedback processes both vertical and horizontal in nature, at least micro evaluation and feedback systems have to be developed. The Academic Development Centre has conducted an intensive systems and processes analysis pilot study for their open access intervention and this is used to benchmark their institutionalisation of the open access admission framework. The Research and Development Centre tracks and guides research into open and distance education teaching and learning knowledge frontiers, and this is used to inform the system of best practices in teaching and learning. The Institute for Academic Staff Development conducts an annual Gap Analysis on learning facilitation competencies of the academic staff, and this is used to design responsive training and development programmes that are credible and related to felt and detected needs within the Technikon SA teaching and learning continuum.

However there is a need for the tutor programme to be annually reviewed, and the co-operation education for job-placement to be intensified with new strategies, staff development stakeholder driven and research development institutionally co-ordinated and integrated into all systems and processes. The Integrationist approach to the evaluation of these systems should see not only student enrolment increasing, but also the increase in the rate of pipeline students progress, and student output/pass rates improved. The most critical challenge to the Integrationist model used at Technikon SA is that systems change overtime. While this is good for learning organisations, such change needs to be aligned with the vision of the Technikon on teaching and learning, public good mission of inclusive open access, and the viability of investment on exclusive provision that responds to learners' diverse profiles.

Conclusion

This paper has presented an analysis of systems and processes in place at Technikon SA and how these inform the vision and practice of extending open inclusive access while maintaining exclusive academic provision that does not brand all learners with the same intervention. It is critical for provision systems and processes to realise that every learner is the same like any other and different from any other – no two learners are exactly the same. The challenge of the Integrationist paradigm on inclusive access and exclusive provision stands in the ability of TSA to enhance students' success and contribute to the National Skills Strategy of South Africa while equally contributing to the moral revitalisation of South Africa through such social curriculum. Learning interventions have to produce functional South African citizens who by all standards are eligible for global citizenship.

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OPEN AND DISTANCE LEARNING IN THE ROMANIAN TECHNICAL HIGHER EDUCATION

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The Romanian Technical Higher Education

The history of the technical higher education in Romania is to be looked back in 1920, when two institutions have been established through Royal decree: the Polytechnical Schools in Timisoara and Bucharest. The Technical Universities were at that time a continuation of some technical schools, taught, especially in Timisoara, in German and Hungarian. The development continued during the times, influenced but not completely determined by, even passing the years of the communisme regime in Romania. In the late '80s, the technical higher education enrolled the majority of Romanian students, being considered probably the highest academical level, the less politically influenced and the one giving the best career opportunities for the graduates. Specifically, the Politechnical Institute "Traian Vuia" of Timisoara (the continuator of the Polytechnical School, actually the "Politehnica" University) was considered one of the traditional higher education institutes in Eastern Europe, the diploma awarded being directly recognized by most countries in Europe and America.

A decline of the technical education has been noticed at the beginning of the '90s, after the change of regime in Central and Eastern Europe. The situation was normal, due to the economical problems encountered by Romania, as well as the other East European countries, and due to the reorientation of youngs towards economical, law, political and social studies.

Consequently, reforms have been started in the technical higher education, characterized by change of curricula, profile of specializations, number of students enrolled in different areas and enrollement criteria. At the end of the '90s, the situation became quite stable, with a number of 56 technical profiles approved by the Ministry of Education and the National Council for Academic Evaluation and Accreditation. At the same time, private higher education institutions appeared, enrolling more and more students each year. The private institutions were oriented more to law, economical and social sciences studies. Nowadays, in the technical education, most of the students are interested in modern specializations, such as information technology and communications. These profiles are at the same time the most efficient from the economical point of view.

The reform also attracted some changes in the way higher education is delivered, with more emphasis towards flexible learning, distance education, vocational training and continuing education. The present paper describes some achievements in providing technical higher education in high technology fields through distance education at the "Politehnica" University of Timisoara, by underlying the strengths and weakness of the system in Romania.

Open and Distance learning development

Despite its known attractions, open and distance learning had serious barriers to overcome. It didn't have a real background, but it was quickly implemented in private institutions. The most critical was the legacy of the correspondence education delivered by some higher education institutions. The academic standard of correspondence education was usually questionable, with a very low efficiency, which developed a certain reservation among professors and students to this form of education.

In Romania after 1990 the dramatical economical change demanded a change also in the labour force, in people's education and skills. This asked for expansion in the number of students, but under a continuing underfunding of the higher education, especially from the national budget. The increased poverty of the population asked for more and more young people to get a job before starting a university or trying to do

both at the same time. This demanded a new form of education and the solutions were the development of open and distance learning and of continuing education.

The main challenges that ODL addresses in Romania are:

- Old mentalities: it can be found also at institutional level, university professors and among population;
- Access: the full-time education is still weak in infrastructure and it is short in qualified personnel (in the last years a lot of the staff has left university for better paid jobs in private companies);
- Flexibility and adaptability: the system has difficulties to respond quickly to the rapid changes in the economy;
- Transfer of new technologies: in many of the Romanian universities the impact of new technologies is high (due mainly to European programmes), but in some is lacking, and the access of population to new technologies is still very low, mainly due to the high costs of the Internet and other modern communication links.

Around 1995, the higher education reacted to the new, challenging educational methods, especially due to the institutional reform and to some EU PHARE programmes. The European Union offered support through PHARE TEMPUS programmes (Trans European Mobility Program for Universities), PHARE Multi-country programme and more recently SOCRATES programmes.

Legal aspects of the development of ODL in Romania

The general legislative framework for the development of distance education in Romania is the Law on Education of 1995 and the Law of Accreditation of Higher Education Institutions and Diploma Recognition of 1993. The Law of Education defines forms of study as full-time, part-time and extra-mural. The latter can be undertaken through mail or distance education, as part of the permanent education system. The curricula are based on defined national standards. Open and distance learning can be developed with the consent of the Ministry of Education for adult training as well as for the attainment of specific objectives of the education system.

The president of the National Council for Academic Evaluation and Accreditation, professor Ioan Mihailescu [1] stated in 1996 that "Open and distance education is targeted at adult training and the support of the activities developed by the higher education institutions. The large universities have open and distance education centres, the main objective of which is permanent education of pre-academic teachers. At the national level, about 80,000 pre-academic teachers are included in continuing education programmes".

New legislation on distance education was promulgated in 1998. This includes the Statute of Open Distance Education in universities, an order regarding study centres of open distance education, an ordinance regarding continuous learning and the education system, and an order regarding the use of broadcasting and television in open distance education. The new legislation allows the systematic development of distance education in universities, non-profit organisations and others with appropriate status. A university can develop distance education courses only if it is in a speciality that has been accredited by the National Council for Academic Evaluation and Accreditation (NCAEA), or if it is a short course. The 1993 Law on the Accreditation of Higher Education Institutions and Diploma Recognition describes the role and responsibilities of institutions and the NCAEA with respect to evaluation and accreditation. The NCAEA is responsible to Parliament.

Distance education courses must be validated through University Senates. But before presenting a course, the university must establish a distance education centre and this (the trainers and its equipment) must be accredited by the Office of Open and Distance Education (which is part of the Ministry of Education). The OODE provides support and co-ordination of distance education and is responsible for the standards of the functioning and endowments of study centres. Once courses are validated and accredited, they are announced in the mass-media.

Further clarifications were given in the Government Decision of November 2000 (supplemented and modified in October 2001), regarding the organisation and functioning of the distance education in higher education. According to this decision, distance education programmes can offer full degrees in higher education (on short cycle or long cycle education), post-university degrees (master), vocational training, reconversion courses for continuing education. The decision also presents the minimum necessary equipment, administrative support and staff needed for accrediting a distance education study centre, as well as the specific training materials that should be offered to the students. One important step in the development of the distance education programs is that the decision states for the first time the recognition and transfer possibilities for the credit points obtained through distance education.

European projects' contribution towards development of ODL

Since 1992, the "Politehnica" University of Timisoara has been involved in different TEMPUS projects, which gave the support for educational reforms and for the creation of the structures for introducing modern and flexible learning. The most important for the scope presented in this paper were the programmes DÉCOR – Development of Colleges in Romania (S-JEP 04684/92), DRUM – Development of Romanian Universities Multimedia (S-JEP 09838/95) and TEMIS – Telematics and Multimedia within the Information Society (S-JEP 12086/97). These programmes, running between 1992 and 2001, involved partners from UK, France, Finland, Denmark, Belgium, the Netherlands and Greece.

As result of Tempus DRUM, in October 1996 was created the Open Access Multimedia Learning Centre, with a view to offer specialised courses in the field of multimedia and basic computer skills. The centre was also equipped to allow production of interactive materials for open, distance and on-line education. As a result of the needs on the labour market, a new speacialization in Audio-Video and Multimedia Technologies has been introduced at college level, students being familliarized with the production of radio, video, television and multimedia production.

As the need of new educational technologies has been realized, the Tempus TEMIS programme supported the establishment of a Centre for Learning Technologies, with the aim to promote and implement new technologies in education and training. The objectives of the centre were:

- promotion of modern technologies for developing a flexible education at all levels;
- implementation of modern technologies in training for active and inactive work force;
- creation of a videoconferencing center to support distance learning;
- development of courses for distance education and training on various supports: written material, books, video and audio tapes, interactive CD-ROM presentations, Internet;
- development of on-line (web-based) courses and other educational applications;
- development of new teaching methods in higher education, using modern interactive technologies.

The staff was trained for producing and tutoring based on training materials developed with the use of new technologies. As a result, a number of 18 distance education courses have been produced: Principles of Distance Education, Study Skills for Distance Education, Management of Distance Education Projects, Sound Techniques, Object Oriented Programming in Java, Digital and High Definition Television, Electromagnetic Compatibility, Radio Languages and Techniques, Development of Multimedia Applications, Computer Graphics and Virtual Reality, Electronic Equipment Testing, Using Asymetrix Toolbook for Multimedia Production, Multimedia Production Equipment, Image Processing, Television, Recording Techniques, Interactive Communication, Audio-Video Compression. Some of those courses are also available on-line at www.opendrum.utt.ro.

In parallel with Tempus TEMIS, during the years 1998-1999, the university was involved in the Phare Multi-Country programme for the development of distance education in Central and Eastern Europe. As a result of this project, one of the 40 distance education study centres in Eastern Europe has been established in the "Politehnica" University of Timisoara. The programme was extremely important for the introduction of an institutionalised and coherent view regarding distance education at regional level. The

Ministry of Education was persuaded to recognize and to create the legal framework for that type of higher education. The project established 7 distance education centres in Romania, as well as the earlier mentioned Office of Open and Distance Education (OODE). All centres have been provided with the necessary infrastructure (equipment and know-how), with the possibility to develop some pilot courses and to operate in a network environment able to facilitate course interchange. Train of trainers has also been provided by allowing staff from all centres to follow the course "Learning about Open Learning (LOLA)", provided by Scottish Development Overseas and Scottish Knowledge, using Web-Based Learning Environment and course materials designed by the Institute for Computer Based Learning at Heriot-Watt University.

The creation of those centres in the university allowed development of distance education learning materials, staff development and participation to other international projects, such as Leonardo and Socrates Minerva.

Introduction of open distance education specializations

Based on the Statute of Open Distance Education promulgated in 1998, the Timisoara Regional Open and Distance Education Study Centre in our university introduced in October 1999 two specialisations at college level (short-cycle higher education) through open and distance education: Applied Informatics and Audio-Video and Multimedia Technologies. The curricula and the diploma awarded are similar to the ones offered for full-time students.

Most of the work in introducing these specialisations was in producing the teaching materials. Happily, some of the courses only had to be reviewed and up-dated, as they were developed through the previous Tempus projects. Even that some of the courses are available on-line, it has been quickly seen that it is difficult to rely on the Internet for providing open and distance education in Romania. It is mainly due to the still limited availability of the high quality access to the Internet and to the prohibitive costs (that are increasing constantly). This is why the decision has been taken to give access to the web site for the students that can afford this, but not to limit training materials to this. All courses are available and distributed to the students in paper based format (developed according to distance education standards) and accompanied by relevant exercises and examples on CD-ROM or diskettes.

The tutors are usually the same professors that are teaching the same courses for full-time students. One of the reasons of choosing those specialisations for starting distance education was the fact that the teaching staff involved is relatively young and more dynamic due to the training periods spent abroad as part of Tempus staff mobilities. Usually three face-to-face meetings with students are planned during a semester for each course, in order to provide practical laboratory training and seminarization. The contact with the tutors during the semester is done, according to students' possibilities via email, telephone or mail. Students are asked to send at least three homeworks, reports or projects for each course during a semester. Examination is done at the end of the semester based on the reports submitted by the students, their activity during the face-to-face meetings and on a final written examination. Usually, the percentage of student evaluation is around 70% for the activity during the semester and 30% for the final examination.

From the administrative point of view, the students are registered by the faculties that are running the respective specialisations, which are keeping records of students' progress and are making all the general announcements to the students, via email or telephone. The distance education study centre is responsible for the quality of the teaching materials, of the tutoring activity and for the quality assessment of the whole process. The teaching language is Romanian.

According to the experience until today, it seems that about 95% of the students enrolled through distance education are working full-time or part-time in a company, in about 70% of the cases in the same field or in connected areas. They are usually older than the full-time students. The most frequent age category is between 25 and 30 (about 60%). Just 5% of them are in the age category of 18-20 (normal age for full-time students). Most of the students are male (about 80%). They are coming from different locations around Romania, and due to the position of Timisoara near the Hungarian border, also from Hungary.

Anyway, it is worth noticing that the percentage of female students is however a little higher in distance education than in full-time studies.

A problem faced is the quite high drop-out percentage (about 25%). It seems that the reason is mainly the time schedule that involves face-to-face meetings at about three weeks time, during the weekend, and the sustainable activity asked during the whole semester. Probably a solution to this problem might be found by reducing the number of face-to-face meeting to only two for each course unit, but this will be easier done if the access to modern communication channels will improve.

Advantages and disadvantages

The main advantages noticed when introducing the distance education specialisations are clearly the flexibility of the time schedule and the other general recognized advantages of the ODL.

The problems encountered are coming mainly from the old mentality of some of the teachers, that are still not confident in distance education, and consequently are not able to give the best during the tutoring activity. There are still teachers that are asking students to come personally for submitting the reports (instead of sending them by email, or mail for instance) or are asking for more meetings for laboratory works (instead of using modern simulation programs for part of the practical training). On the other hand, there are still students waiting for the tutor to ask them step by step about their progress, instead of contacting them directly any time they encounter problems.

An important disadvantage is the economical one, as the number of students enrolled each year is about 30. It is well known that costs are becoming reasonable for a greater number of students. The courses would certainly need better marketing and promotion, that has not been done properly until now.

A further obstacle recently encountered is coming from the announced intention of the National Council for Academic Evaluation and Accreditation not to give accreditation for distance education in the technical specialisations, including the ones discussed in this paper. At the same time, seems that other technical specialisations are considered by NCAEA as more appropriate for being delivered through distance education than the ones addressing direct the new technologies used in ODL. It is a subject unclear at this moment, that would certainly need further clarification.

Perspectives

The projects taken into consideration by the Timisoara Regional Open and Distance Education Centre for the perspective can be summarized as follows:

- increasing the quality of existing courses;
- acting for further legal clarifications regarding the status of distance education in technical fields;
- increasing the number of students enrolled each year;
- participation to other international projects in ODL (such as Socrates, Leonardo);
- introduction of Master studies in the field of Multimedia;
- creation of a Virtual Polytechnic through co-operation with the other technical institutions in Romania and other institutions abroad (especially from Finland, which is advanced with a similar project).

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LEARNING THROUGH COMENIUS PROGRAMMES IN GREECE. THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

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1. Introduction. Information and Communication Technology at school

Information and Communication Technology (ICT) has caused profound changes in society. A generation of children is emerging already immersed in a multimedia “data storm” (Moshell, 1995). Their understanding of the world and their expectations are mediated through their experiences in multimedia and ICT and these differ substantially from those of preceding generations nourished on linear technologies (Crawford, 1999).

The widespread proliferation of computers in schools is based on the assumption that ICT has a significant role to play in education and its applications will result in the improvement and advancement of schools’ quality (Cox & Rhodes, 1990). The nature and the importance of the role that the computer plays in the classroom have been justified through the embrace of different sets of reasons, principles and beliefs.

The classic role of computers at school is their use either as tools that help the educational procedure or as basic means for teaching Information Technology, a subject introduced in schools’ curriculum of many countries. This role of computers in education and pedagogy is a well-trodden path and a lot of research has been done on it. Yet, other aspects of computer usage at school, perhaps of less importance at first sight, affect school life and produce unexpected results in the formulation of schools’ profile as well as in implementing some essential functions.

Among such supplementary usages, it is worth mentioning the support that ICT provides in schools’ administration as well as its contribution in opening schools to the world. These roles seem somehow neglected in the relevant literature, although historically the first computers at school have been installed in the directors’ office to help with their administrative duties.

Computers at schools’ administration not only upgrade and improve the quality of schools’ operation but also allow interaction between schools and the local, national and world society. Within such a context it may be assumed that those schools that have computers and an access to the Internet can get benefit from opportunities for cooperation with other institutions as well as for participation in projects that promote not only educational, but also cultural, environmental and other targets. Talking about such projects in Greece, one has in mind programmes of the European Union (EU) available in the field of education that along with the new ideas that they promise to develop and the innovative activities that they try to incorporate, they also bring a breath of fresh air into schools.

This “breath” signals the schools’ adaptability to modern needs. Bringing in mind the profile of a future European citizen, it may be assumed that the 21st century’s European school should be characterised not only by its educational quality but also by flexibility in communication, readiness to accept new ideas and new methodologies and ability to cooperate with schools from other cultures and other countries.

Within this context, the access of schools to European programmes is of particular importance and if ICT facilitates this access, then we have an additional argument in favour of computers at school. Accordingly a whole series of questions need to be investigated: The most essential one is to what extent ICT is a necessary condition for a school to participate in such programmes. If the answer is positive, then it is worth knowing whether ICT in its administrative role is adequate to ensure the school’s active participation or alternatively whether other ICT applications are also necessary. The sort of ICT applications that help in the successful implementation of the programmes should be known together with the users’ attitudes and opinions.

In order to bring evidence on these issues, a survey was undertaken on Greek schools of primary and secondary education that have participated in such European projects, namely the Comenius projects. The survey focused on the examination of various parameters of ICT in schools, along the questions mentioned above, concerning mainly the usage of computers in general and specifically in relation to the Comenius projects as well as the attitudes of the school directors about the ICT usefulness.

2. European Cooperation: The Comenius Project

Comenius is part of the European Community's Socrates Programme in the field of education. Socrates was first launched in 1995, and its second phase began in 2000. One of Socrates' goals is to promote co-operation, mobility and interaction in the field of education. It targets the whole spectrum of education and it does so through eight different actions, of which Comenius is one.

The aim of Comenius is to enhance quality of teaching, strengthen the European dimension in education and promote learning in a multi-cultural and diversified environment, which is the cornerstone of European citizenship. There is also emphasis on certain important issues such as supporting disadvantaged groups, countering under-achievement at school and preventing exclusion. Comenius funded projects are based on partnerships consisting of schools from countries that participate in the Socrates Programme, i.e. from EU members and countries that have applied for membership.

The Comenius action focuses on pre-primary, primary and secondary education. It provides projects that (a) enable schools of different countries to work on themes of common interest (b) focus on the learning of a foreign language and (c) encourage schools as institutions to share experiences and compare teaching methods, management techniques, approaches for integrating pupils from different social and cultural environments, preventing violence etc.

Out of Europe's 340,000 schools, 10,000 took part from 1995 to 1999 in the first phase of Comenius. The aim from 2000 on is to considerably increase this figure.

Apart from schools as entities, teachers and students seem to benefit from the program. More specifically Comenius provides opportunities for teachers to develop new skills or practice old ones when planning and managing a project. Teachers are motivated to organise and chair meetings, negotiate with their partners and manage a project budget. Meetings with colleagues from different European countries provide an insight into different educational systems and teaching methods, which may inspire innovation in teaching. Furthermore, with Comenius, students acquire new skills useful in their personal and professional life. These skills refer mainly to the development of creativity as well as of the ability of communicating, presenting works in public, decision-making, problem-solving and managing conflicts.

3. Applied methodology

The survey basically concerns an evaluation of the role of ICT in motivating schools to participate in European projects and to cooperate with other schools. For this, a questionnaire was developed, addressed to the directors of Greek primary and secondary schools that had participated in Comenius projects seeking answers in the following issues:

- Availability of ICT at schools (Hardware acquired and Software used),
- Integration of computer activities into Comenius projects,
- Application of communication between participating schools using ICT.

An effort was made to concentrate to close-ended questions so that the researchers retrieved quantitative data. The data obtained as answers to the key- questions contained not only descriptive details concerning the hardware and software used but also opinions and attitudes.

The national agency of the Comenius Programme in Greece provided the data of 299 schools that have been funded for various Comenius project for the academic year 2001-2002. The data contained the names, addresses, telephone and fax numbers of the schools.

The questionnaire was sent to 212 schools and 128 responded, of which 54 were primary and 74 secondary schools. The main findings from these responses are reported below.

4. Results

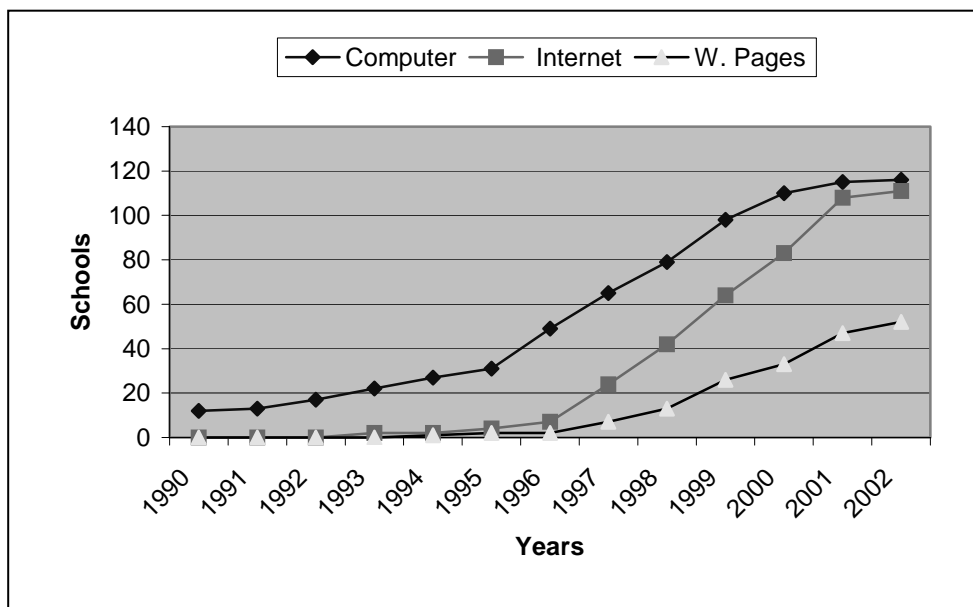
The results of this study are presented under three groupings: (a.) Availability of ICT, (b) Integration of computer use into the Comenius projects and (c) Communication of participating schools. In most of the cases the results are based on total answers. However, since in Greece ICT is officially taught in secondary while not in primary schools, it is considered helpful in some cases to separate the responses of primary schools from those of secondary schools.

a. Availability of ICT

The results show that 100% of those participating schools that had answered this question (116 schools) reported that they have ICT facilities and that their staff and students have access to computers. In the overwhelming majority of them (70,9%) the Webmaster was a member of the school staff both for the primary and the secondary schools.

In addition to this straightforward result, that supports the assumption that ICT is a necessary condition for participation in the Comenius projects, the answers give also an insight concerning how ICT infrastructure has evolved in these schools.

Diagram 1. ICT infrastructure in schools involved in Comenius projects



As seen in Diagram 1, less than 20 schools had any equipment in the early nineties and none had either an access to the Internet or any web pages at that time. The situation changes radically from 1996 and, since then, there is a high rate of increase in the number of schools with computers and an even higher rate of increase in the number of schools that have an access to the Internet. It is interesting to see that in 2002, the number of schools with computers coincide with those with access to the Internet, giving evidence that nowadays the Internet is an indispensable service provided to computer users.

Increasing, though at a lower rate, is the number of schools that have developed their own web pages. Secondary schools seem to be proceeding in this application, followed by primary schools in which only 47,3% managed to build their own site. The majority of them mentioned that their URL was ready in 2001.

A local area network is common in secondary schools, with 82,4% giving a positive answer whilst in contrast to primary schools where the answers were positive only by 42,6%.

The frequencies of software uses are reported in Table 1. Undoubtedly, the most common application of a personal computer is Word Processing. Excel seems to follow relatively close. Teachers use Excel mainly

for producing diagrams and simple databases. Videoconference, though an easy and cheap application, is almost unknown to schools.

As expected, the performance of secondary schools with respect to ICT is better than that of primary schools. This is due to the fact that secondary schools are more familiar with Information Technology and among the staff there is somebody with expertise in computers who, not only does he teach but also inspires his colleagues and undertakes the task of helping with projects such as Comenius. In primary schools everything relies on the enthusiasm of the keen individual.

Table 1: Frequencies & percentages of software use

	Word	Excel	Power Point	Internet	E-mail	Photoshop	Sound	Games	Painting	Music	Videoconference	Web design	Educ. CD
PS	49	39	26	44	41	22	11	24	27	16	3	6	31
PS %	90,7	72,2	48,1	81,5	75,9	40,7	20,4	44,4	50,0	29,6	5,6	11,1	57,4
SS	72	68	55	68	64	48	25	29	46	27	9	33	49
SS %	97,3	91,9	74,3	91,9	86,5	64,9	33,8	39,2	62,2	36,5	12,2	44,6	66,2

PS: Primary Schools – SS: Secondary schools

b. Integration of computer use into Comenius projects

Some interesting results concern the attitudes of the participating schools towards the Internet. Specifically with respect to the question “Do you find the use of Internet useful to retrieve information about Comenius”, 125 out of 126 answered positively.

Table 2. Use of Internet

Q: Do you find the use of Internet useful to retrieve information about Comenius?		
	Yes	No
Prim.	52	1
Second.	73	0

This unanimous response confirms the obvious and well-established notion about the use of Internet. It is interesting that it is all very well clear in the minds of the teachers.

Another very important question concerns the interdependence between Comenius’ implementation and ITC. The results from the relevant question show that this dependence is very strong (Table 3).

Table 3. ICT and Comenius

Q: Would you apply for Comenius project if you did not have ICT available at your school?		
	Yes	No
Prim.	30 (55,6%)	22 (40,7%)
Second.	40 (54,1%)	34 (45,9%)

Computers seem to be a very useful tool for the programme itself, as the majority of both primary and secondary schools (93,8%) gave a positive answer at the specific question. Computers were proved to be useful during all stages of the process (82% of the received answers) and almost all school principals (97,7%) believe that Internet is useful for getting relevant information about Comenius programmes.

Another question referred to schools readiness to participate in other programmes apart from Comenius. The relevant answer show that the majority of secondary schools (65%) have participated at least in another programme while the majority of primary schools (87%) did not. Such a difference could be attributed to the fact that secondary schools have better ICT infrastructure and know- how than primary schools.

Table 4. Participation in other Programs

Did you participate in other programmes such as COMENIUS?		
	Yes	No
Prim. (54)	7 (13 %)	47 (87 %)
Second (74)	47 (65 %)	35 (35 %)

Comenius is one of the very few known programs that primary schools can join.

Secondary schools have more opportunities to participate in programs.

c. Communication of participating schools

The success of any type of Comenius programme depends a lot on communication. The results show that there is a strong preference of e-mail and the Fax as means of communicating. More conventional means, such as post and telephone, are not favoured.

Table 5. Preferred ways of Communication

e-mail	699
Fax	608
Telephone	599
Post	444
Visit	383
Chat	82
Video Conference	35

A basic characteristic of any project involving cooperation is communication between the partners. When asked about the type of communication they prefer, both primary and secondary school principals responded as in the Table 4. Principals marked their preferences from 1 to 7 for each medium. The figures that appear in the table 5 are the sum of these marks.

E-mail and fax are on the top of the table presumably since they are cheap means and they don't require the use of a foreign language in real time. Noticeable is that some other research (Tsolakidis), among same language speakers brought telephone to the top of such a list. Visits, even, if they are considered the main attraction of such a project, did not receive as much operational value. Chat and videoconference are not used as much since they are synchronous techniques and the communication could be difficult. The lack of know-how in videoconferencing is a forbidding factor.

With respect to the contents of e-mail communication the results are as follows (Table 6):

Table 6. Contents of e-mail

Text	108
Text Files	71
Image Files	72
Clip Art	15
Sound Files	12
Video Files	7

The contents of e-mail which is the most popular and dynamic tool for communications indicates the technological expertise of the teachers in the schools participating in the Comenius projects

5. Comments – Conclusions

A straightforward conclusion derived from the above analysis is that schools participating in Comenius projects have a substantial computer infrastructure, an access to the Internet and some dedicated teachers who teach, inspire, support the ICT system and provide help for the implementation of such projects. Although the analysis of the results does not imply necessarily a cause and effect relationship, it is derived that, without ICT infrastructure, it is difficult to participate in a project like the Comenius that depends heavily on partnership and communication.

In general, the use of ICT in education helps European cooperation in many ways. Not only it enables the opening of horizons for schools to cooperate and get information on other educational systems and teaching methods. Equally important it gives teachers a tool for their own professional development. Applying distance education techniques, they can cooperate with colleagues in other institutions and other countries and they can get involved in a reflective dialogue, which will increase their knowledge and enrich their methodology utilising other peoples' experience.

Comparing the performance of primary and secondary schools in the Comenius' projects the main feeling is that the latter have benefited more than the former. This may be partly attributed to the fact that Information Technology is officially introduced in the curriculum of the lower secondary schools since 1995 and later in that of the upper secondary schools while there is no such a provision for ICT in primary education. In spite of that, one should mention that, although Information Technology is not taught in primary education, one could identify active and caring teachers that could be the spirit and heart for implementing a European project.

Related to the above, if it is accepted that European Programmes are useful and beneficial for schools, and that ICT is a necessary tool for such programmes, then we are in front of a new argument in favour of introducing ICT in primary schools. Furthermore the combination of Comenius Programme as a general framework and ICT are of specific importance for small and remote areas where actions that decrease educational isolation improve quality and act as factors decisive for the school's continuation of operation.

ICT has an effect on our life in many ways and so does on school life. Some aspects of such an influence have been analysed and scrutinised intensively and some others are left, being less important or less visible to the worrying educators. What one should keep in mind is that in education a new man-machine-centred culture, a "technological culture" or an "ICT culture", should be developed. Such an ICT culture is related to acquaintance with technology, familiarisation with it, training and investigation of its potential. This new technological culture is not about knowing what to do in any problem and the way to go about solving it. It is about cooperating and looking for solution using other people and other colleagues' experiences just as the teachers did cooperating in the Comenius projects.

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HOW CAN DISTANCE EDUCATION HELP TO COUNTERBALANCE THE COMING SHORTAGE OF COMPETENT STAFF?

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Introduction

We will soon witness a shortage of competent people at work if we do not do something. A large number of people is getting older and will quit the labour market within shortly. At the same time, the number of children being born is decreasing. Fewer will have to replace a larger number of people at work. In times of increasing awareness of a shortage of competent staff, in many countries in Europe we look for quick solutions. Even if we can replace man labour with machines to a greater extent, there will be jobs and situations where man can not be replaced.

One way to try is re-service training or training to a higher skilled profession for adults. Among grown-ups who are tied to home and work in their neighbourhood, it has shown to be a good strategy to offer easy access to and advantageous conditions for adult studies.

The choice of subject, method, study rate and studying conditions depends on the individual. What is best for one person will differ from what suits the other. The individual needs and wishes must be regarded as well as the labour markets both locally and regionally. One person wants to study mathematics, the other electronics in theory and practice. One will choose studies at secondary level, the other at college or university level. While one person has the possibility to study full-time the other stays at his/her work full-time or part-time besides studying on free time. Can all these expectations be fulfilled?

The infrastructure of local study centres in Sweden to support adult education

The infrastructure for an active support of adult education via inservice-training, re-education, widening of the competence etc already exists in many places. In Sweden over 150 municipalities have created public study centres to give access to and support education on various levels. These municipalities have given priority to the establishment of one or several public study centres. The access to these study centres is free of charge for participants in courses offered through the public education systems.

Most of the Swedish local study centres offer courses and study programmes on various levels to adult students. By offering adult education from basic to secondary level as well as university education through different forms of distance education, the study centres to a large extent reach professionally active adults. Reports done at different public study centres show that a great part of the students have a full-time or part-time job on the side. For these persons, distance education is a prerequisite for their possibilities to combine work with studies.

The public study centres function as a place for study and a meeting-place for project work, discussions, seminars etc during the period of studies. Tutors and other support staff provide students with guidance, advice and support. The local study centres have at their disposal suitable premises, a reference library, a combination of media for distance communication, for example videoconferences, computers and access to the Internet. At the centres there is a staff that provides students with administrative and technical service. The students have access to the premises in the daytime, evenings and at weekends.

Various educational institutions are involved and give courses to the study centres through different forms of distance education. Gradually more educational institutions have come to participate. The number of single subject courses and educational programmes has increased, and today cover several disciplines. By co-operating with most of the universities in Sweden and using modern technique the municipalities in

the NITUS (see below) association can present a wide range of university courses free of charge for students all over Sweden.

Most courses at the study centres are part-time – half or quarter – in the daytime or in the evening, although also full-time educational programmes are offered. The education offered at study centres is due to perceived needs among individuals as well as business and industry. The staff at the study centres estimates on a regular basis the educational needs in their municipality. The public study centres are also involved in local marketing of and recruitment to the courses offered, and offer different kinds of information and study guidance.

The local study centres give people far from desired schools and universities the chance to take part in a Life Long Learning. The courses can be transmitted by techniques such as fax, Internet and videoconference. The technique will interact with the social support of a study group even if the teacher is not physically present in the study centre. These courses can be adapted to the subjects and to the levels to suit those adults. That can mean an agreement with one or several educational institutions who wish to change profession to one higher skilled and more demanded on the market.

Study centres are often collaborating with each other in collecting and bringing forward demands for different courses and programmes. NITUS (Nätveksgruppen för IT-baserad utbildning via lokala studiecentra/lärcentra, The Network group for ICT-based education via local study centres) was established in June 1996 to support and develop local study centres and to foster cooperation and exchange of experience in higher education through distance learning between the member municipalities of the organisation. Today the association is made up of over 100 municipalities mainly in Sweden, but to some extent also in Osterbotnia, Finland.

Regional development and local study centres

Sweden is a large country with both similarities and dissimilarities. The demands this makes on policy are considerable. The general conditions that are decisive in providing development opportunities in every region include municipality finances, infrastructure and, not least, education. In the Swedish Governments proposal for a new regional development policy, which was passed by the Parliament in December 2001, the role of distance education is a matter of importance.

The new policy states that equal opportunities in accessing higher education in all parts of the country is an essential prerequisite for a successful regional development. Local study centres are one important way of distributing higher education to people in the countryside as well as in the cities. Therefore the Parliament has made an extra grant for the further development of such study centres.

The Government has also instructed The Swedish National Rural Development Agency to describe the situation of local study centres on a national level. In this study the Agency will focus on where the study centres are located, the kind of education distributed through them and what kind of students that attend the centres. The description will also view how the local study centres interact with universities and others. Finally the Agency will try to describe how the local study centres are organised and financed. The coming report from the Agency will contain proposals to the Government about how the future policy on local study centres can be formed.

One method of getting information about the study centres that is used in this study is a questionnaire that is sent to all Swedish municipalities. Other methods are interviews, conferences and the review of different documents. At this date more than 80 percent of the municipalities in Sweden have answered the questionnaire. Hopefully we therefore will be able to present some preliminary results of this project at the EDEN-conference in Granada.

Recent trends in the Swedish educational system

The Swedish government has decided to establish higher vocational education in the Swedish educational system. The signal is clear - both trade and industry as well as individuals express strong desire of more

qualified vocational training. It is up to the educational institutions to transform that into forms that suit also people who can not attend in regular school districts.

The state institutions have assured another 20 million Swedish kronor to support the creation of more study centres in the country. Even though more than 150 municipalities have established public study centres, there are many local authorities that will take the chance to get national financial support.

A national Swedish Net University was established in March 2002 to help distributing university education to a wider range of people. The combination of the Net University and of local study centres creates great hopes of increasing the number of participants in higher education. Another big investment in higher education is 120 million Swedish kronor to projects with the aim of widening social and gender-related recruitment. The national support also includes 50 million Swedish kronor for three years to stimulate regional co-operation between universities and local authorities.

One conclusion one can come to is that the Swedish government wants to stimulate professionally active adults to study, and also actively tries to encourage different institutions to cooperate. Cooperation between different educational through local study centres and organisations and companies is a powerful instrument for regional development.

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'EVERY WHICH WAY?': E-MODERATING IN INTERNATIONAL CONTEXT - OFFERING A PROFESSIONAL DEVELOPMENT PROGRAMME ENTIRELY ONLINE

Gilly Salmon, Open University and Francisco Gonzalez, Open University, UK

This paper explores the experience of offering large scale online courses (lasting 6 weeks and starting on the 1st of each month) to train educators to become e-moderators on a global scale. It explains the original intentions and drivers, the underlying e-learning model and the design principles of the course.

It introduces the concept of “E-tivities” with examples.

Conceptual Background

This paper explores the ideas around online group activities – the processes we call e-tivities and the reasons for using them for online learning. It shows a global example of a course based (almost) entirely on e-tivities.

For us, computers are a mediating device between people and are not an instructional tool in their own right (however sophisticated the software and system). The focus needs to be on working together and on real-world activities.

An e-tivity involves *at least two people* working together in some way. The WWW or other resources are probably involved but usually to provide information rather than as the focus of the activity. E-tivities can apply to any discipline. As they are online they do not depend on learners being physically together.

Many of us are influenced strongly by the way we ourselves were taught. Most of us have not grown up learning to take part in remotely located activity therefore we need guidance on how to take part in e-tivities and how to develop them. Students need support to develop the skills of working together this way, and they need careful pacing and leadership (e-moderating).

Ideas on e-tivities derive from a number of frameworks, theories and notions about learning. Making learning personally meaningful comes from the constructivist perspective, which emphasises collaborations between peers and teachers within a supportive context (in this case, the online learning environment) (Jonassen, Davidson et al. 1995). Situated learning suggests the importance of relevant and authentic tasks, that can be applied to the participants’ every day learning, working and cognitive life (Lave and Wenger 1991). Experiential and self-directed learning, derives from theories of the way adults learn (Rogers 1993). From engagement theory, comes the key idea that students *must* be engaged with other learners and meaningful tasks, in order for successful learning activities to take place, (Kearsley and Shneiderman 1998). Kearsley and Shneiderman also emphasise the importance of teams working on stretching projects that have application outside the learning time itself. This simply means that the activities are authentic – a little harder to achieve when the learning interaction takes place virtually.

Research and work on computer mediated conferencing and online discussion groups spans many years and predates the growth of the Internet. Some key examples are from Rosanne Hiltz from the New Jersey Institute of Technology and Robin Mason and many colleagues in the Institute of Educational Technology at the OU (Mason and Bacsich 1998); (Harasim, Hiltz et al. 1995).

The Drivers for the Course

Following the publication of my book (Gilly Salmon) “E-moderating” in May 2000, many educators asked me how they could experience online teaching and learning for themselves, start to develop their skills and explore the ideas in the book. These requests came from all over the world. People also wished

to have the opportunity to work with others from their own disciplines but in other countries, university lecturers wanted to understand more about e-learning approaches in corporate training, schools teachers wanted to get involved too. A critical issue is that very few teachers, at any level of education, have taken part in online courses for their own professional and personal development. Late in 2000, Centrinity Inc, a Canadian based company agreed to work with me to provide a fully online course to meet this audience and requirements.

The course was developed in FirstClass software and hosted by Embanet. Details can be found at <http://www.centrinity.com/e-moderating>. The first course went live on 1st March 2001 and monthly starts are now offered. Each course attracts between 6 and 25 participants and each is a mix of university lecturers, corporate developers, college lecturers, and school teachers. The course has attracted participants from every continent in the world. Even in our cynical global society, this brings interest and excitement to the participants. As one, a participant in the 3rd E-moderating course said, referring to its global reach. "So! This is what online learning looks like from space!"

The Model & the Design

A model was used to provide an overall framework and scaffold for the course, based on 5 stages. At stage one, individual access and the ability of participants to use online learning are essential prerequisites. Stage two involves individual participants establishing their online identities and then finding others with whom to interact. At stage three, participants give information relevant to the course to each other. Up to and including stage three, a form of co-operation occurs, i.e. support for each person's goals. At stage four, course-related group discussions occur and the interaction becomes more collaborative. The communication depends on the establishment of common understandings. At stage five, participants look for more benefits from the system to help them achieve personal goals, explore how to integrate online experiences into other forms of learning and reflect on the learning processes. See <http://oubs.open.ac.uk/e-moderating>

We plan for a wide range of prior knowledge and/or experience of online learning and training among the participants. Each has his or her own 'map' of the topic and differing needs. The online course also helps participants to explore their attitudes to online learning and its meaning for their own teaching.

We took a number of decisions at this stage about our own approach to online training. The course is designed to create a series of 'microworlds' in which the participants interact with each other, with the e-moderators of the course (who we call e-convenors) and with the software, before progressing to the next stage. We hope that our trainees will gradually build up their knowledge and software skills. We make them aware of the goals all the way through the training. They are advised of appropriate ways of undertaking the tasks but can also construct their own approach. We try to enable them to use the software as a matter of routine whilst we raise their awareness of the teaching and learning aspects. The importance ascribed in constructivism to the building of relationships between new and existing knowledge leads us to a careful choice of icons and titles for messages and stages, and the use of familiar metaphors for explaining aspects of e-moderating.

For the global E-moderating course, we took some specific design decisions:

- The course is based on the 5 stage model, with links between each stage,
- Each individual message provides an "e-tivity" in itself and includes a small amount of instructional information, then a request for the participant to take some action,
- There is no course material except for supply of the E-moderating book as a back-up resource,
- The course is paced. We will allow one week at each stage of the model, (and a little more for levels 4 and 5) asking participants to take part around 5 hours per week, at any time that suits them,
- The FirstClass client software is provided, but access is also possible through the Web,
- Each stage includes highly relevant and authentic e-moderating skills, *FirstClass* features and enjoyable exercises and a reflection conference,

- Group working is encouraged from the beginning,
- It used a competence framework on (p40 Table 3.1 Salmon 2000),
- The e-convenor (trainer of the trainers) models the skills taught in the course.

Example from the Course

The course consists of 20 e-tivities, each arranged in sessions requiring around one week's elapsed time and up to 5 hours participation time. The principle of an e-tivity message is as follows:

1. Illustrative title
2. Everything required for the e-tivity to take place contained in ONE message. The message is presented in a way that is easily printed or copied into participant's word processor if required.
3. Basic piece of stimulus material or content (e.g. few lines in message, web site etc)
4. Description of e-tivity itself including purpose and task to be undertaken and *actioned* by the participant.
5. Brief note of further reference material if participants require it.

The following is an e-tivity from session 2 of the global course based on one message. The message was entitled: "Principles of online communication"

Message:

Here are some principles to hold at the front of your mind when e-moderating

[5 short principles listed...each 1-2 sentences in length]

Purpose: responding encouragingly.

Task: Look at these short messages and prepare a response to each.

a) It's taken me two hours to get into this &*\$£"!! conference!

Sajid

b) Hello! Have you got this message?

Monica

c) I think this environment is absolutely brilliant. I've been online since 1991 and I'm still amazed at what can be done. My dog's got her own website...Everyone should have free access...(and so on and on for 4 screenfuls). Is there anyone there? Yours B.

Send a single message to the 'Course Conference' suggesting your response.

Dip into the Resources for practitioners 5 in 'E-Moderating. e.g. 125-6

E convenor

In the course that started on July 1st 2001, 13 participants responded to this message. This simple exercise resulted in 28 further discussion messages and a summary by the e-convenor some 10 days later. We believe that simple "e-tivities" such as this mobilising learning through the online environment.

Interculturalisation

Cultural and intercultural aspects of learning together became apparent from the first log-ons of the participants. From the time they introduced themselves and began the process of exploring and establishing their online identities, many were fascinated with the experience of other teachers, some of them in other countries and continents. The very fact of engaging with a global-yet-local interface was conducive to a journey of intercultural discoveries, each participant benefiting from exploring the views of others as they worked together through the e-tivities.

Certain aspects of the course seemed to be more appealing to some of the participants than to others. Typically, participants from Latin backgrounds tended to emphasise the socialisation dynamics of the course and contributed a unique flavour to the eLearning experience of the group. Not surprisingly, when some Brazilian participants were asked in the questionnaire at the end of the course what else would they have liked to include in the course, their response was 'More Chats'. The global nature of this course

provides a rich context for identifying cultural differences that should inform the design of future versions. More attention needs to be given to understanding the significance and exploring such differences among participants, especially in their own learning histories. Intercultural and interlinguistic environments present new academic challenges to course designers and e-moderators alike (Gonzalez 2002; Goodfellow, Lea, Gonzalez and Mason 2001) if the online learning experience is going to be both meaningful and relevant to each of the participants involved.

Conclusions

Early conclusions are that developing individuals and groups through the e-tivity and 5-step approach offers a positive experience in the *medium itself* for potential e-moderators and exceptional exposure to the benefits of a global approach to networking with and learning from other online teachers.

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COMPETITION OR COLLABORATION: CONFLICTING PARADIGMS OF TEACHING-LEARNING, ASSESSMENT AND INSTITUTIONAL DEVELOPMENT?

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Introduction

Over time, each culture has developed norms and expectations for teaching and learning that are passed along from one generation to next. Since these norms and expectations are so widely shared and familiar, they become nearly invisible to members within a culture. When we observe classroom practices in other countries, these accepted and unquestioned cultural models are revealed.

Kawanaka et al (1999, p. 86)

The background context for this paper is the International Masters programme in E-Learning Multimedia and Consultancy that was developed from the TRIPLE M (*Multimedia Education and Consulting*) Advanced Curriculum Development (CDA) Project supported by the European Commission under the SOCRATES programme (1998-2001). The programme has involved an active partnership between Arnhem-Nijmegen University of Professional Education (HAN) in the Netherlands, the University of Oulu in Finland and Sheffield Hallam University in the UK. In parallel with this development research has been carried out with the aim of exploring the conditions for the development of online learning communities (Hudson et al, 2001; 2002).

During the early phase of this research issues around aspects of culture and in particular of cultural differences have been illuminated. As Jager and Collis (2000) have pointed out in providing guidelines for designers of cross-cultural Web-based learning environments we need to be aware of cultural differences in terms of how people teach and to what extent they accept reactions from different people. For example they note that "in some cultures, it is normal to criticise others ..., in other cultures it is not." Our experiences suggest that it is not a simple dichotomy, but rather is as much about social norms and quite subtle nuances. However differences do not relate simply to ways of behaving but also to history/histories and social and cultural traditions. Furthermore it is not simply a matter of what we learn about or from others but even more significantly what we learn about ourselves as highlighted by Kawanaka et al (1999) in the quote at the head of this paper.

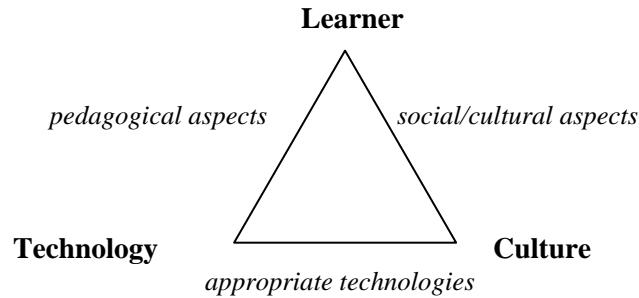
Accordingly some of the early findings from this research are discussed and differences in relation to assessment practices are explored in particular. The discussion is subsequently widened to consider different traditions in relation to teaching-learning. Finally some common themes are highlighted and questions raised in terms of their potential relevance not only for teachers and learners but also for institutional development in general.

Background context

The programme is made up of six units/modules that together make up 90 European Credits (ECTS):

- Open and Flexible Learning Environments (10 ECTS)
- Digital Media Applications (10 ECTS)
- Communication Consultancy and Change (10 ECTS)
- Research Methodologies (15 ECTS)
- Project Studies (15 ECTS)
- Dissertation (30 ECTS)

The major aim of the programme is to develop the profile of the ‘problem solver’/team co-ordinator at the interface of pedagogical, technological and cultural dimensions of development.



Programme design

The theoretical framework brought to this project informs both the programme design and also the approach to related research. This is underpinned by an emphasis on the social aspects of computer mediated learning as discussed in Hudson (2000). Furthermore it is informed by a perspective on teaching-learning that recognises this as an inherently complex (and reflective) social practice that is essentially about a search for meaning (Hudson, 2002).

In designing and planning the programme considerable emphasis has been placed on enabling collaborative activity in multinational teams. In relation to this aspect the programme development has been guided by the general perspective offered and the crucial distinction between co-operation and collaboration made by Lehtinen et al. (1999). They highlight the way in which recent research on the role of collaboration in learning has searched for more meaningful theoretical frameworks that could better guide the development of technology-aided learning environments. They also highlight the distinction between co-operation and collaboration based on different ideas of the role and participation of individual members in the activity. Co-operative work is seen to be accomplished by the division of labour among participants, whereas collaboration involves the mutual engagement of participants in a co-ordinated effort to solve the problem together. In relation to this, a key role of the technology is seen as potentially *affording* new opportunities for collaborative learning and for supporting it in the development of knowledge building learning communities i.e *effects with* rather than simply the *effects of* the engagement in computer supported collaborative learning environments (Salomon and Perkins, 1998). However in our experience the keys to unlocking this potential are just as dependent on a range of other factors as they are on the particular technology. Amongst the characteristics that we are seeking to achieve is the purposeful engagement of autonomous and independent learners combined with *well-orchestrated interdependence*. By this is meant collaboration based upon genuine interdependence involving a shared sense of purpose, a division of labour and joint activity that is open to examination, elaboration and change by all within the peer group. Furthermore the achievement of this is seen as involving the whole curriculum design, the selection of appropriate tasks and activities and pedagogical approaches.

A project and team based approach towards learning underpins each module of the programme which involves a gradually shifting balance from more supported and directed to more independent learning through the course of each unit (see Figure 1).

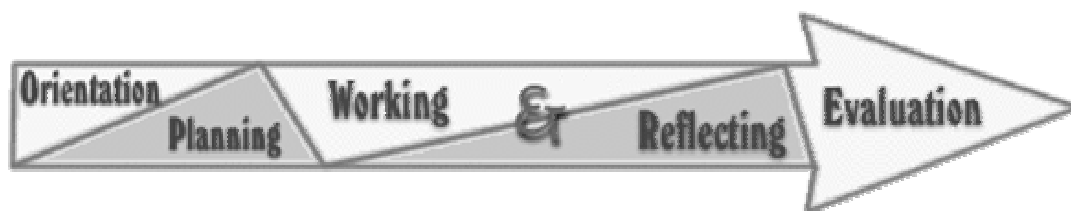


Figure 1: Project based work process

The programme as a whole is framed within a Virtual Learning Environment (VLE). At this time two VLEs are being used - firstly *Learning Community Profiler* developed at the University of Oulu in Finland and secondly the more widely known *Blackboard*. The programme design aims to integrate three aspects of the study process as follows:

Online learning (the e-learning component)

- Project and team based on-line learning; online materials and discussion (available through the VLE); whole group activities and discussion; use of video and audio conferencing

Local Studies (the face to face component)

- Local group activities and discussion through seminars, workshops and tutorials etc.

Independent study (the individual knowledge acquisition component)

- Individual research, reading, writing and reflection etc.

These options (e.g. workshops, tutor-led input, mentoring, student support groups, including Internet supported activities and other support through e-mail, face to face tutorials and computer/video conferencing) are offered in various combinations as appropriate to students' circumstances and preferences as well as in response to the availability of resources. The exact mix of activities for each student group is decided through tutor negotiation and collaboration across the different study centres.

Pedagogical approach

The programme team is sensitized to the fact as highlighted by Salomon (1992) that the promotion of collaboration amongst students is both complex and challenging and that one of the conditions of successful group work is that it is well structured and goal-orientated (Salomon, 1996). As Slavin (1990) notes traditional group work, in which students are encouraged to work together but are given little structure, has been repeatedly found to have small or non-existent effects on student learning. This is echoed by Kirkpatrick (2001) who advocates that group work "does not occur serendipitously" and argues that it needs to be structured. As Lowyck (2002) notes, and also illuminated by Hudson (1996), this highlights the danger of mere communication activities, in which participants are simply "free-wheeling" during their interaction. Accordingly emphasis has been given to the need for well-defined group tasks (Salomon, 1996). For the potential added value of collaborative learning to be achieved it is expected to involve challenging and intensive interaction between participants. Furthermore this view is supported by Lowyck (2002) who advocates that this means that the task has to be:

- *multi-faceted, allowing each partner to contribute to the common task,*
- *sufficiently complex which let the group show more expertise than isolated individuals,*
- *oriented towards social goals in order to stimulate social activities and attitudes, and*
- *unambiguous as to elicit co-ordinated interaction.*

Lowyck (2002, 9-10)

The specific context for the research: the DMA unit

This unit aims to enable students to develop an overview and a critical appreciation of the development process and the potential and limitations of Digital Media Applications (DMA). It focuses on developing up to date understanding and knowledge in the area of DMA. The study includes relevant developments in hardware and software, the design, development and evaluation of DMA products plus an appreciation of the application areas in which DMA products are used. It enables the students to gain a critical appreciation of the development process and also a better understanding of the potential and limitations of Digital Media Applications through the development of practical skills and critical analysis and evaluation.

The unit involved working in international project teams to produce a DMA prototype. This was used as the basis for evaluation, the outcomes from which were compiled into a digital portfolio. There were ten students working together based at two local study centres in Nijmegen and Sheffield during the second semester of 2000-01. The unit leader was based in Sheffield and directed the unit together with a local tutor in each location.

Research methodology and methods of data collection

An eclectic approach towards research methodology and methods of data collection has been adopted drawing on the idea of "constructive method synthesis" (Klafki, 1998) and discussed more fully in Hudson (2003). A starting point has been the standard approach towards unit evaluation through means such as end of unit questionnaires to both staff and students. In addition an ethnographic approach has been used with the aim of exploring emergent issues as they arise naturally through the process of enquiry. In relation to this aspect the approach of responsive evaluation as outlined by Stake (1973) has been found to be particularly relevant. This approach aims to be responsive to the concerns and issues of the "stakeholders" involved in the evaluation.

As part of the DMA unit requirements students have kept an ongoing diary in the open learning environment. The diary is seen as one technique for accumulating data as part of an action learning approach. It is intended as aid for systematic reflection and as a tool for linking theory with practice. Having agreed a statement of research ethics at outset of the project, these diaries have been used as a source of data collection with the aim of carrying out follow-up interviews based around *emergent themes* in seeking to achieve a genuinely responsive mode of enquiry.

Discussion

As a result of the analysis of the diaries a number of themes have emerged which have crystallised as a series of questions around the theme of collaboration. A particular catalyst for focussing attention on this aspect came from one student in particular who argued that collaboration in any environment is about needing each other and the notion of *orchestrated interdependence*.

To open a discussion, to publish work or ask a question, in short to let people know where you are in knowledge, thinking and questions is the only way to learn and get the support you need. The feedback and comments are essential to learning ... I am wondering in what way more collaboration is going to develop in coming units, as is suggested. Is collaboration a result of building a community or is a community built on the need of collaboration? The need to be each other's teachers and learners? And where does this need of collaboration come from? Collaboration in any environment is about needing each other, or as Salomon (1999) says: "collaborative learning requires much and well orchestrated interdependence". How interdependent are we? How are we going to investigate this interdependence? And how are we going to orchestrate this interdependence?

In considering approaches to assessment practices quite distinct differences in terms of emphasis are revealed. However these are not restricted to particular national boundaries but are also the product of differing policy emphases, some of which are relatively recent. In our emphasis on the importance of ongoing peer and formative assessment through the programme design, and in foregrounding attention to the notion of *orchestrated interdependence*, we (as a programme team) are implicitly emphasising the notion of assessment *for* learning in contrast to simply the assessment *of* learning. Furthermore we increasingly see this is a key to the building of online learning communities. This is a central cornerstone of our practice and is based on core professional beliefs about teaching-learning and also on traditional conceptions of professional autonomy as teachers in Higher Education. This distinction (between assessment *of* and assessment *for* learning) is also highlighted by Lowyck (2002) through the parallel comparison between "the instructional agent as *assessor*" and "the instructional agent as *coach*". He notes that this distinction is already well established in some countries.

However in recent years "quality assurance" has become a highly centralised, standardised and regulated mechanism within an instrumentalist culture of "managerialism" in the English education system. On this aspect Broadfoot (1999) focuses on English assessment policy as a driver of education policy itself over recent decades and notes that this may come to be seen as the "defining principle of English education policy in the late twentieth century". She highlights the "pervasive climate" of "quality assurance" which is characterised by a whole culture of target-setting, performance indicators and league tables which can now be observed at the very heart of Higher Education. Furthermore she highlights the situation in which a range of powerful assumptions have become so dominant in relation to current policy making that their validity has become unquestioned. Amongst these are "that decisions concerning curriculum (inputs),

pedagogy (process) and assessment (outcomes) should be centralised; that there are standards of 'quality' that can be objectively measured; that it is necessary and desirable to assess institutional quality according to externally-defined 'performance indicators'; that the punitive use of league tables and other publicly-shaming devices will help to drive up educational performance and that assessment is a 'neutral' measuring instrument which only requires further technical developments to make it more effective." Broadfoot (ibid)

In considering such assessment practices, it can be seen how these have their roots in fundamental assumptions about teaching and learning. As highlighted in Hudson (2002) the dominant idea the US curriculum tradition is *organizational*. This involves an emphasis on the tasks associated with the building of *systems* of schools. These systems have a curriculum-as-manual as a central part of their overall organizational framework. This curriculum contains the templates for coverage and methods that are seen as guiding, directing, or controlling the routine classroom work of a school, or of an entire school system. Such an approach results in a view of the role of the teacher as an employee of the school system, who is concerned with implementing the system's curricula in a relatively mechanical fashion. On the other hand, within the German tradition the state curriculum, i.e. *Lehrplan*, has not been seen as something, which could or should explicitly direct a teacher's work. Although a *Lehrplan* does outline prescribed content for teaching, this is seen to be an authoritative selection from cultural traditions that can only become educative as it is interpreted and given life by teachers. Within this tradition there is an emphasis on teachers' relative professional autonomy and on their freedom to teach without control by a curriculum in the US sense.

In contrasting the performative and managerial competitive with the professional and interpretative collaborative culture it can be seen how the former emphasises the *individual* and external forms of incentive and control. The individual may be an individual learner who is seen to be motivated by ever more external assessments, the individual teacher "incentivised" by performance related pay or even the individual institution aiming to achieve higher rankings in the league tables and hence attract ever more students. The increasing competitive drive is reinforced by notions of institutions of higher education as "knowledge businesses", with an increasing focus on commercialisation of intellectual property.

In viewing the EU within a global economy as one of the major trading region comprising the EU, ASEAN and NAFTA might the incentive towards collaboration at an institutional level be illuminated? Moreover the rich traditions within Europe might then be seen as distinguishing characteristics to be preserved and celebrated within a culturally rich and diverse global system. The benefits of collaboration are undoubted as our experience in recent years bears testimony to. There is no doubt that the collective achievements of those institutions involved in this Masters programme are far greater than could have been achieved by any one institution acting in isolation. One of the challenges of the future in the EU is to build on this diversity and in seeking harmonisation to avoid instrumental approaches which are the rocks on which creativity and innovation will founder.

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LEARNING HOW TO WORK IN TRANSNATIONAL ONLINE TEAMS

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Introduction

The Open University Business School (OUBS) provides supported distance education worldwide, with nearly 56,000 qualifications having been awarded by 2001. The learning model enables students to continue their study when travelling, working on different shifts or operating in different time zones.

The OUBS offers a Certificate in Management Programme for students who are in a first line management position or who aspire to become managers. This can also be used, combined with the Diploma programme, as an entry route into the OUBS MBA. The course comprises four discrete modules, each with an exam, and there is also compulsory attendance at a residential school consisting of 21 hours of learning about how to work in groups, usually spread over a weekend. Each module is supported by two face-to-face tutorial sessions and online conferencing, however those students who cannot, or prefer not, to attend these can opt for complete online support with online tutorials. There is a similar alternative for the residential school, where students can 'attend' an equivalent online event learning about online group working, spread over 19 days; this is called the Online Management Challenge (OMC). The pedagogy was designed using an inductive approach, with students learning by discovery. This is more appropriate for learning how to apply knowledge and also to develop proficiency as an independent learner (Scheull 1992). The OMC was produced by a team which had a strong team culture (Parer 1993) and the fact that an on-line event on group working had been produced by a highly integrated team, lent strength to the pedagogic approach.

This paper describes how students from around the world get together to work in virtual teams to learn about the process of online team working as part of the OMC. Virtual teams, as defined by Lipnack and Stamps (2000), are 'teams with a common purpose that use technology to cross time zones, distance, and the boundaries of organisations with three facets; purpose, people and links'.

The Online Management Challenge (OMC)

The OMC has been running every three months from November 2001. An average of around 50 students take part divided into eight tutor groups, each with its own tutor. The students work through a series of activities designed to familiarise themselves with online group working theory and to give them a variety of group working experiences to reflect on and learn from.

The OMC is run completely online via a website. The website contains learning resources, tutor group information and support details; access to various parts of the website is determined by status (student, tutor, administrator) which is activated via the password needed to log in to the site. The resources for the event are also only accessible by students at certain times, that is they are 'revealed' to students on a timed basis (just before the activity they relate to).

Students have their own web page and also have their own online space where they maintain a learning diary. The latter is used by them to reflect individually on events as they happen and it can then be used to aid their input to the group reflection (days later) at the end of an activity; tutors encourage a group discussion after each activity to enable students to share their experiences and reflections, and develop their own learning (Laurillard 1993).

There is also a tutor group area where only the tutor and the associated students can 'meet'. Discussions take place here using a web-enabled version of First Class conferencing software. Students also have their own 'break out' areas where they can go for sub-group discussions if they are split up into smaller groups to undertake some of the activities. Students are therefore encouraged to look in both their group area and their sub group area when they log in to the website. There is also a 'chat' area where students can carry out a real time discussion, and a student Cafe where students can make contributions that are not related to their coursework.

The event is structured through the use of a timetable; each day the students know what activities should be going on, and at the end of each activity they understand that they have to make a contribution to the group discussion in the group conference and reflect on their activity in their own learning diary. (This forms part of their 'attendance record', so is necessary for them to pass the course; the Course Director is responsible for checking individual student diaries and the logs kept on line by tutors to ensure that a student has satisfactorily completed the activities.) The activities themselves are less structured to encourage situated construction of knowledge (Bonk & Cunningham, 1998). As pre-course work the students have to complete some self-assessments on their learning styles and the roles they take in groups. These can then be used for reflection after activities, in order to assess how appropriate or useful the theory is in practice.

The event begins with an introductory message from each tutor to their group, welcoming them, explaining about how the school will run, and encouraging them to get started on the first activity.

For the first exercise the students are put into pairs where they then have to work together over two days to produce a brief introductory web page (using input forms) on each other; this includes information on their learning styles and group roles. After this the students discuss the activity in their tutor group, for example reflecting on how they tackled the activity and whether this reflects their own approach to learning (learning style).

The subsequent tasks become repeatedly more complex and lengthy, building up to a five-day group project to produce a business plan for a fictitious company. At the very end the group make an overall review of their learning over the school, both at an individual level and a group level.

Findings

The Online Management challenge has not been running for long, so our findings are still at an early stage, however some useful observations can be made. These are based on four sources of information: the student discussion areas, the student learning diaries, the tutor logs and feedback forms completed by the students at the end of the event. The effect of early 'teething problems' in the form of technical difficulties is not included here.

Student profiles

The majority of students chose to do this event online as they were unable to get to a residential school. This was usually because they had other commitments at the time or could not easily get to one. A number of them were also interested in learning more about working in online groups.

A high proportion of students were resident outside the UK. Many of these were not British and had English as a second or third language.

Over half the students access mainly from home, where the majority had only a modem connection. They all had to use the conference area for communication, but just under half also sent personal emails, and around a quarter also used the telephone.

Less than half the students had taken the online version of the course, and although each of the modules has an online collaboration activity this is not compulsory and only a very small percentage of any of the students felt that they had had much previous experience of working in online groups.

The role of the tutor

Tutors had a large input at the start of the OMC where they first had to encourage students to come on line and then take part in a collaborative 'ice breaking' activity. This represented assistance in overcoming the two main barriers to on line discussions - technical and collaborative (Salmon, Allan & Giles 2000). After the groups had been 'kick started' in this way the tutor's role was one of monitoring and encouraging. Tutors kept a log to record students' progress throughout the OMC.

Time, synchronous/asynchronous communication

By far the biggest issue for students was time. Many students were either working in another country with a different time zone, or they were on shift-work that meant they could not access the conferences at the same time as other students. The result was that although at some stages groups wanted to work simultaneously many just could not physically achieve this; however others did manage to engage in successful, synchronous online discussions. Problems with time also manifested themselves in other ways.

The effect of logging into the website only once every one or two days is described below in Silences; some students failed to appreciate the effect caused by not having much of a 'presence' in their group area. Unfortunately often it was unavoidable that a student could not access the website for a day or two, due to work pressures, unexpected technical difficulties, family commitments (particularly at the weekend), or the fact that they could only access the school via one particular PC which limited their availability. To be fair to students, most of them quickly established a sense of 'belonging' to their groups, and felt guilty when they could not take part (even if this was not their fault)!

Some students complained that there was not enough time to do the activity, they could not ask enough questions or consult fully, however they were reminded by other students that this was like real life so they should 'just get on with it'. An interesting adjunct to this was that the time pressure can contribute to the group development of 'swift trust' (Maverson & Weick 1996) thus assisting with their working as a team.

One positive side of the time issue was that it enabled students who prefer to reflect on things far more time to take on new ideas. They greatly appreciated this aspect of the online school, which was indeed constructed in the style of other OUBS courses that incorporate the 'reflective practitioner' approach (Schon 1982) where students reflect on their learning and its impact on their work environment.

A further benefit was the reduction of cultural and language problems compared with face-to-face versions of the OMC. Both authors have considerable experience of face to face groups where language problems and cultural differences can hinder group integration and interaction. The ability of students to reflect before making a contribution appeared to minimise cultural and language difficulties, which were not apparent in any of the student groups.

Silences

Students encountered difficulties with the lack of spontaneity and disjointed communications that occurred in their groups. Sometimes this was unavoidable (see Time above), but often it was through a lack of understanding about online communications where, because of the greater uncertainty than face-to-face communications, there can be an 'intense need for response' (Hawisher & Moran 1993). This misunderstanding resulted in frustration as often students failed to receive any acknowledgement of their input and there could be a sense that others were not making a fair contribution as people appeared to 'sit back' and avoid making decisions. These assumptions and misinterpretations were exacerbated by the isolation of the students from one another (Kezbon 1999).

It is possible that there is an issue about a 'critical mass' needing to be reached before smooth group work can take place: where there are enough students to keep the discussion flowing even if there are unexpected absences. The number required depends on the needs of the conference (Salmon & Giles 1998) although Jarvenpaa and Leidner (1999) considered that a group size of 'between four and six members was 'large sized'.

Lack of visual clues

Some students found that they were more confident when they did not meet face-to-face; they had time to reflect on their contributions and were not put off by verbal or visual signals from other group members. However others found that they were happier if they could at least 'put a voice to a face' resulting in nearly a third using the telephone on one OMC.

It may be that the lack of visual clues also affected the group forming process as there was little apparent 'storming' (Tuckman 1965) as groups started to form. This could also have been hampered by too much attention to 'netiquette' (Cox et. al. 2000) where students found themselves being so busy trying to stick to

the polite rules of 'netiquette' that they did not behave as they would in a face to face situation (for example some students recognised that they were not telling people what they thought of their ideas as they would in a normal face-to-face encounter).

Online processes

Groups found that it was necessary to allocate tasks early on and that this was best achieved if they had a nominated co-ordinator; '...the manager of a virtual team [needs to establish] a clear definition of responsibilities, as lack of clarity may lead to confusion, frustration and disincentive.' (Jarvenpaa & Leidner 1998).

Progress was made far quicker if tasks were allocated early on and carried out concurrently. Making decisions sequentially using group consultation soon slowed groups down to almost a standstill, at which point the students usually recognised that they would need to allocate tasks in order to get anything done in the time scale; full consultation on everything was not practicable. This problem was exacerbated by the fact that some students were in different time zones or on shift work.

It should be noted that the role of coordinator in a group is an onerous one, so even if someone was good at it they could not be expected to sustain the effort for more than one activity.

Student attitudes

Although groups working online are less inclined to express excitement and support (Rice & Love 1987) than groups working face to face, when they do express enthusiasm it 'increases the attraction to the group, tendency for agreement and cooperation' (Fulk, 1993) and these students seem to gain more from the experience. Overall it is seen as beneficial if members can respond to contributions, 'explicitly verbalis[ing] their commitment, excitement and optimism' (Jarvenpaa & Leidner 1998).

The commitment to the group itself appeared to be similar to that of students in the face-to-face experience, with students managing to contribute despite personal problems at home or at work, and often feeling 'guilty' if they didn't.

Group forming

The students on the OMC had not worked together before, but they did have a shared history (having all studied at least part of the Certificate Programme), a shared experience of distance learning (and thus how best to learn from it) and a shared language (management terminology). These shared factors and experiences may well have assisted the groups in developing trust (Meyer et. al. 1995), and thus aided the swift formation of working groups. The social content of the conferences has not yet been analysed.

Conclusions

Running an online learning event can be a successful alternative to a face-to-face event, particularly if student availability is not consistent over a 24-hour period. In this case, activities designed to be carried out asynchronously, with reflection afterwards, seem to work well.

On the whole students were positive and saw the experience as a learning opportunity. The lessons for future online groups are given below.

Recommendations

Tutors need to devote a lot of time and effort at the start of such collaborative conferences to ensure that all the students are on line, motivated and understand the tasks by the time the first days activities are required. In order for the groups to work together successfully they need to undertake a number of activities including:

- To identify the coordinator for each activity early on
- To establish a sense of 'presence' through rapid response to input from others
- To establish 'norms' quickly like 'give feedback – don't be silent'
- To work hard at forming/storming – avoid being 'too nice'
- To agree on a revolving coordinator role so that the burden is shared

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A SEA OF LEARNERS OR: HOW TO HUMANIZE E-LEARNING ENVIRONMENTS

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This paper includes four aspects of humanizing learning environments through metaphors:

1. Case study: “the sea” as a metaphor in a train-the-trainer course “teaching and learning online”
2. Meaning of metaphors in learning communities
3. Using metaphors: is there a toolkit for course developers and instructors?
4. A metaphorical vision: “cross-cultural cruising” or: making international courses work

1. Case study: “the sea” as a metaphor in a train-the-trainer course “teaching and learning online”

Using the sea as a metaphor in a train-the-trainer course

“eleon” – is a blended course on teaching and learning online, which focuses on collaborative learning and teaching methods (<http://www.eleon.at>). The following description is the key to understand our idea of humanizing learning environments – which brings new life to eLearning in adult education.

In the f2f start up workshop of the course we used “the sea” as a metaphor for eLearning as such. We started off using powerful pictures of the sea, some waves, satellite perspective on water and shore and of a beach café.

These pictures were intended to stand for different perspectives which one can take within eLearning – imagined as a grown system – such as the sea.

Further the students (that means: the trainers) were asked to find themselves an element to both – introduce themselves to the group and describe their position in their organizational environment.

The Intention

So far things could have developed a very different way than we intended them to grow. As a course developer I wasn’t sure if the students would be hesitating to pick up the metaphor because they might find it ridiculous to work with pictures in an adult training program.

But things worked out extraordinary well: The picture and all its implications reached far beyond what we expected. To better visualize the huge amount of community engagement we’ve experienced through the metaphor, I will give an outline of what happened in online group dynamics.

Example: The Beach Cafe

We called our informal discussion board the “beach cafe”, where people as a first task in the online course had to post a greeting to everybody by telling that “they made it” to the platform. The following part describes how we invited them, by picking up the metaphor from the f2f workshop – referring to the most “easygoing” pictures we showed: the beach cafe.

“Welcome to the beach cafe! Fine, that you’ve found your way. Did you already had time to do some exploration on the platform? This learning island isn’t that hilly to climb to as it looks like on the first day of landing. Enjoy the view on the sea and the shore together with others. By the way: What would you like to drink?”

Answer from a student:

“Hi Captains! I already did some navigation – that’s why I’ll have a glass of red wine to relax and keep in touch with the beach under my feet. Just in case, sea sickness will approach me some day....☺ ahoi to everybody on board!”

Community Building

A whole range of community building aspects were put together in using this metaphor, without students thinking about it as a seminar method.

First of all people

- liked the picture
- associated positive thoughts with it
- could hold on to first hand experiences (even though most of the participants live in Austria)

The criteria to make pictures work:

The aspect of closeness to one’s experiences is most important if metaphors should work. To use those which evoke positive meanings for the students does not just speed up the community building process, but also gives possibilities to the make in-depth group experiences in a virtual group.

Example: Boat hire business

Collaborative eLearning depends on a well established learning community, where working in groups can effectively be done. But working in groups online is a big challenge – for both: the students and the instructors.

In our course we focused on a “close” relation that people had to be thinking of groups combined with the sea and found out that paddling boats would possibly refer to that experience.

The task of finding group members online was wrapped around an assignment to find people to “paddle with”. What we offered was the picture of a boat hire business (as a discussion board), where usually two people should engage in paddling and others could meanwhile enjoy the sun on the back platform (on a canvas chair for instance).

The result of building groups through this picture was that within a very short time – 4 days – 20 students made themselves comfortable in their own little boats (and groups) and started thinking about proper names for their vehicles.

From this point on 6 groups of three or four students worked intensively on different tasks through the whole course, which lasted for 4 months.

2. Meaning of metaphors in learning communities

The meaning of metaphors relates to a variety of core aspects in community building:

- The creation of closeness and distance of the students to the topic and the course goals
- The creation of closeness and distance in the community itself and within the groups (group dynamics between small groups and the group as a whole)
→ this is crucial for establishing “trust”
- The definition of roles of students, tutors, instructors and course developers
- The change and development of roles within ongoing courses

3. Using metaphors – is there a toolkit for course developers?

Successful use of metaphors depends on several aspects, where “culture / learning culture” comes in as a crucial factor.

Which kind of metaphors are actually used in learning communities, depends on

- how “close” one can get to people’s experiences with this picture
- if all (or at least most) of the students can relate to this metaphor (culturally)

There has to be a learning needs analyses to find out, if people can work with it or if the metaphor does serve in one culture but isn’t compatible to another. In international courses this is a challenge, but it forces us as course developers to have a closer look of what kind of pictures can work in learning communities and how we can establish them carefully. The aspect of trust which a metaphor – in national, as in international courses – intentionally has to promote can be varied throughout a course; for instance can parts of metaphors be adopted to provoke discussion (for example: a storm) or to give impulses to group dynamics.

“Living” pictures with the possibilities for (more or less) spontaneous change is what we need.

Focusing on what students contribute to these pictures will help the instructors to keep the visualizing of learning environments alive and to renew the inspirational side of it.

4. A metaphorical vision: “cross-cultural cruising” or: making international courses work

“Visualizing” is crucial, when people in learning communities are supposed to connect to each other and to (more easily) reach their course goals. This is what nationally as well as internationally works well.

International course expertise

“Training Program for Teaching Online” – is another course given by the CSI that is similar to the above described train-the-trainer course. It is situated in the “Distance Learning Courses in Science and Engineering Using Online Case Studies” financed through the MINERVA-program of the European Commission.

It brings Slovenian and Scottish trainers and teachers together to do intensive exchange on all topics regarding ODL.

Using metaphors is necessary in this case to build a community which didn’t meet in real life. There is distance geographically speaking but also difference in dealing with online learning and teaching as such. The culturally determined aspects of learning can be coped by dealing with “cross cultural” working pictures – which is again, the sea. Students who have never met in real life usually need more advice from online teachers to handle tasks in groups or to organize reasonable communication between them. Leading students along pictures is one way to bring them together and encourage them through “written advice” that focuses on visualizing rather than on “to do’s” without a “humanized touch”.

Knowing that ODL consists of text for most of the time, we can help ourselves by bringing all neglected senses into a learning environment, by describing them. Fantasy of people will do the rest: which means – will bring enormous amounts of motivation to the eLearning light.

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ANALYZING THE ASYNCHRONOUS ONLINE COMMUNICATION THE DEVELOPMENT OF A QUALITATIVE INSTRUMENT

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Introduction

Web-Based Education is growing in the entire world. A growing increment is observed from the training opportunities to distance education adapted to the long life learning necessities of the professionals and students. But at the same time that the use of the Web-Based Training is enlarged, new research problems arise for people concerned with knowing more about the learning processes. The Web-Based Training offers new learning opportunities and we need to know more about how and in what circumstances we can improve the possibilities of learning of the Web-Based Training (Marcelo et al, 2002).

One of the area of interest to investigate has to do with synchronous and asynchronous electronic communication. Our research group is trying to learn more about the content and process of discourse that is generated in electronic situations in Web-Based Training. The analysis of the discourse is an area of research that is a very multidisciplinary one. In the excellent book edited by Van Dijk (2000: 23), he says about the discourse that *"people use the language to communicate ideas or beliefs and they make it as more complex social events."* The analysis of the discourse necessarily incorporates a study of the utilized language, of the beliefs that communicate and of the interaction in situations of social nature. Therefore we consider that the electronic communication situations are also natural situations. For Davis and Brewer, *"electronic discourse is one form of interactive electronic communication... we reserve the term for the two-directional texts in which one person using a keyboard writes language that appears on the sender's monitor and is transmitted to the monitor of a recipient, who respond by keyboard"* (1997:1). For these authors, the electronic discourse is centered in the form like people use the language to exchange ideas and not so much in the means that they use for it.

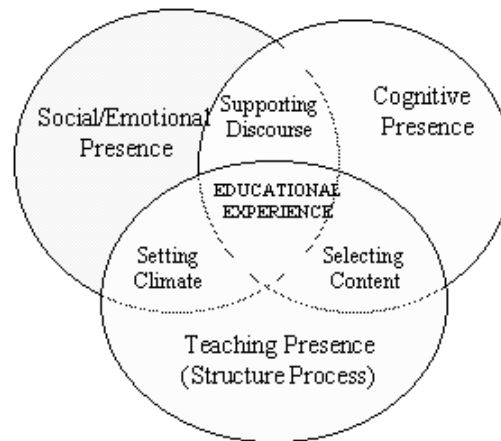
For the analysis of CMC, Blanton, Moorman and Try (1998) made a proposal to organize the messages among convergent and divergent situations, depending on the interpretations of the users. Starting from this work, Shotsberger (2001) applied different categories for the analysis of synchronous dialogues through chats. These were: statement, beliefs, concerns, practice, desire, intention, asks and result.

The analysis of the processes of CMC has had different perspectives. Henry (1991) proposed that the electronic communication could be analyzed through five dimensions: participative, social, interactive, cognitive and metacognitive. Henry's contribution, together with the works developed by Garrison, Anderson, Archer and Rourke in the University of Alberta (Canada) have guided our construction of a system of categories for the analysis of the asynchronous communication in the forums of web-based training courses.

The Model for the analysis of asynchronous communication

Garrison, Anderson, Archer and Rourke (see the references at the end of the paper) developed a theoretical model to explain the process of electronic communication in asynchronous forums. This is the model in which we have based on analyzing the interactions in the processes of asynchronous communication. This model, like one can observe in the following figure includes three main analysis dimensions: Social, Cognitive and Didactics.

COMMUNITY OF INQUIRY



From Garrison, Anderson and Archer

Social dimension in electronic discourse

The social dimension comes to include all those declarations of the students or tutors where the creation of a dynamic group is promoted. It includes social relationships, expressions of emotions, and messages where the group of students is affirmed as such. In the social dimension gratefulness are included, jokes, greetings, etc. In our system of categories, the social dimension includes the following elements:

- **AFFECTIVE:** We include in this category, those declarations that has to do with the expression of emotions, jokes, greetings, irony, as well as critics.
- **INTERACTIVE:** This category has to do with interaction: the main reason about this dimension tells that the members of the group make about declarations or statements carried out by other members.
- **COHESION:** Regarding declarations where the students tell explicitly how feel themself into the group. The identity's group appears reflected by means of expressions like: us, we, colleagues, group, etc. Also includes greetings, farewells, formal ways in the communication.
- **LEISURE:** In this category we include those aspects of the group communication that don't have to do with the content of the course: comments on a book, a movie, etc.

Teaching dimension in electronic discourse

The asynchronous forums represent an opportunity to direct the learning of the students. In the virtual forums, the same as in the real classrooms, teachers and students interact, formulate questions, they expose ideas, answer questions, etc. For this reason we need a dimension that analyzes these processes from a didactic point of view. Following the proposal from Garrison et al., but enlarging some of the categories, we have ended up establishing the following categories:

- **DESIGN INSTRUCTIONAL AND MANAGEMENT:** In this subdivision we have included a relationship of categories that make reference to statements where well the tutor or the students, make reference to aspects related to the dynamics of the course: the development of the program, of the contents, timetable, the methodology, the means and materials to use, as well as the rules and norms.
- **DIRECT TEACHING:** This subdivision includes a series of categories that make reference to the processes common of interaction in the virtual classroom: to formulate questions, to introduce new ideas, to answer questions, reactions to interventions of other members of the group, to share additional information, to summarize, etc.

- **FACILITATE THE DISCOURSE:** This third subdivision makes reference to the tutor's or students interventions with the idea of promoting participation, to identify agreement areas or disagreement or to value the effectiveness of the own training process.
- **TASKS:** This fourth subdivision includes elements related to the tasks that the students have to do along the course. These tasks can be individual or in groups. In the e-forums the students sometimes request explanation regarding the content of the task (what it is expected from them), or they look for answering for their activities.

Cognitive dimension

The cognitive dimension seeks to analyze in what measure the students go understanding and building meanings and elaborating a critical thought. As Duffy et al. (1998) outline, “*electronic conferencing systems allow the instructors to (a) observe students’ contributions to the discussion, (b) include transcripts of the discussions in a portfolio for feedback or grading, (c) participate in the discussion to model critical-thinking skills, (d) interject questions and comments to coach critical thinking, and (e) provide expertise in a topic area when such input is required*” (53). For the analysis of the processes of meaning construction we have used some categories that organize the thought just as a process of resolution of problems with the following phases:

- **INITIATION:** In this category the problem must be identified. In relation to this problem, there is a need to consider the constraints around the problem, new meanings that might arise from the problem. Theremore, in a situation of online learning any member of the group can begin this phase.
- **EXPLORATION:** In this category, the participants exchange ideas, it is required that they recognize the nature of the problem, and that they obtain the outstanding information. At the end of this phase the students begin to be selective with regard to what is and is not outstanding. It is a phase of contributing ideas, to formulate questions and exchange of information.
- **INTEGRATION:** It is characterized by the construction of knowledge starting from the ideas generated in the exploration phase. Integration of ideas and meaning construction should come from the debate in the community.
- **RESOLUTION** of the dilemma or of problem: hypothesis and treatments are contrasted from a critical perspective.

Contrast of the reliability among codifiers

The elaboration of the system of categories that previously we have described it has been laborious. The research team has gone generating different approaches of systems of categories and applying to an example of texts coming from a web-based course (see <http://www.webformacion.net>). The research team, composed by the three authors of this paper coded in an independent way the same texts. After each code, the team met to compare the codes carried out by each one of the members based on the same texts. The debate and discussion on the tuneless elements usually arrive to modifications of the system of categories.

The analyzed data. Analysis of international courses

At the present time, we are in the process of coding the messages generated from five web-based courses that we have already developed. The student in these courses come from six different countries: Spain, Chile, Argentina, Colombia, Republic Dominican and Mexico These web based courses are varied in their contents, although all have used the forum like interaction vehicle among the students. The total of messages got in the five forums is of 3417. These messages have been coded using the system of categories and at the moment we are in the analysis phase.

The code unit

The code unit, that we have chosen, has been the complete message. We find that the message has unit in itself and it generally represents an idea that is approached on the part of the speaker. Each message can be coded in one, two or three of the dimensions that we have used in the system of categories. This way, a message can contain social information for example, only. Other messages can be coded in a multiple way.

The analysis of data

The analysis of data is carrying out using the computer program AQUAD-5. This program facilitates the process of recovery of coded text and of hypothesis contrast and this process is integrated inside the tradition of qualitative analysis.

Conclusions

This paper is based on the process of elaboration of a system of categories that allows us to analyze the computer-mediated asynchronous communications (CMC). The created instrument comes from a ratified process through its application to forums of several courses of Web-based Training with different purposes. This instrument has been subjected to a mixed process of deductive and inductive coding, it has gone by different moments of readjustments and continuous transformations in its construction. Our effort has been centered in reaching a good grade of exclusivity among categories, and of clarification and delimitation of its codes.

The system is finally constituted by three general dimensions: cognitive, social and didactics. Each one of these general dimensions have different categories and indicators that define them. The system has been applied to 3417 messages. With this it finishes the first phase of the research. Now we are in the process of analyzing the data coded with it. In the final presentation we will inform about the results related with:

- The role of the different tutors in the communication process in the courses of Web-based Training.
- To identify students' profiles and their learning styles in Web-based Training.
- To identify the thematics in the forum which help to a bigger participation and other that offer resistance.
- To find discourse that can conceptualize the learning.
- To analyze the forum like space for the thought and collective construction of the knowledge.
- To analyze the forum like space that facilitates the significant learning and in group way.

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APPLYING CASE-BASED REASONING IN ONLINE COURSES TO IMPROVE THE COLLABORATIVE PROCESS

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Abstract

This paper describes an application of Case-Based Reasoning in Online Courses. It aims at developing a computational tool to improve the student-teacher interaction, the evaluation process, and the feedback of student evaluation. The purpose is to reduce the time spent by the teacher answering the students' questions through their redirection to other available didactical resources, and also the learning evaluation process, so that more students can take part in an Online Course with good results. To achieve this, the proposed tool has to keep a knowledge base, where past experiences can help teachers and students regarding to their doubts, and establishing tasks and evaluations to be performed.

1. Introduction

Information and knowledge technologies are providing new possibilities to transform the teaching-learning process. New ways of producing, maintaining, and distributing knowledge can lead to performance improvements, breaking some of the traditional teaching barriers. In this process, the use of Artificial Intelligence (AI) techniques is quickly spreading.

Case-Based Reasoning (CBR), an AI field, uses past experiences as a guide to the solution or interpretation of new problems and situations. We consider that it has great potential in Online Education.

A computational tool that uses CBR can aid teachers and students in their interaction and evaluation processes in Online Courses. As an example, the knowledge base containing relevant past experiences of past courses can be used to solve the students' common questions, without the teacher's interference.

Similarly, past experiences can also be used as a guide to the evaluation process, also identifying the specific topics to be reviewed.

This work initially presents CBR as a support mechanism in Online Courses. Then, a teaching model will be proposed, as well as the structure of the Intelligent Case Based System (ICBS) that implements this model. Finally, we will present some concluding remarks.

2. Current Models

Current experiments applying Collaborative Learning Environments in distance courses indicate that this technology can be inappropriate for some kinds of teaching needs, specially in poor countries. Among the several advantages, distance learning can deal with high students demands, besides reaching far away areas. On the other hand, online courses with more than 20 students for each teacher can be pedagogically ineffective.

This way, such courses do not have much attention and investment in such countries, since traditional courses may have 50 to 60 students for each teacher, in average. So, the effectiveness of this model includes the reduction of teachers needed, specially in more technical areas, and the facilitation in the students-teachers interactions.

3. The Use of Artificial Intelligence – Case Based Reasoning

There are two major research areas in AI. The first is scientific, and aims at understanding intelligence nature and human thinking. The second is technological, and aims at creating intelligent artifacts [6].

In the scientific area, researchers examine human cognitive behavior, including memorization, learning, planning, and any kind of problem solving. In the technological area, researchers try to develop intelligent technologies to help in relevant tasks. Case Based Reasoning is an Artificial Intelligence paradigm that involves both areas.

This way, CBR can be considered to be a psychological theory of human knowledge that supports new technologies in intelligent computational systems to solve problems and adapt them to new situations. It is based on the assumption that past experiences knowledge, called cases, can guide human behavior [1]. Thus, CBR uses past experiences to understand and solve new problems.

CBR makes systems more flexible than rule-based systems, and the implementation of learning features can make them more useful and time-lasting [2].

As a learning theory, CBR is similar to constructivism [7], since both of them believe that an individual build his knowledge from his experiences. Besides, both of them see learning as an active process, where students decide what to learn, and through which activities.

CBR is also similar to constructionism [4], since both of them valorize learning through concrete experiences and their interpretations. But CBR extrapolates theses two educational theories. It defines a cognitive model with processes and knowledge structures, that can behave as aid and prediction mechanisms, being simulated computationally as a test of ideas. This way, CBR deals with memory, learning and reasoning interaction.

In the educational area, CBR has specially influenced learning tools in their cases library creation. A cases library permits learning from other experiences, and also learning by experiences sharing.

4. The Proposed Teaching Model

In a distance learning course, each concept may have a particular way of evaluation, and its particular media and didactic materials. The computational system has to provide these features to the teacher. A simplified model of the content of each concept is depicted in Figure 1. It presents a resumed view of how the system's inferences kernel guides the evaluation process for each studied concept. The figure shows the Concept composed by three basic parts: Pedagogical Proposal, Pedagogical Contents, and Media and Questions for Learning Monitoring.

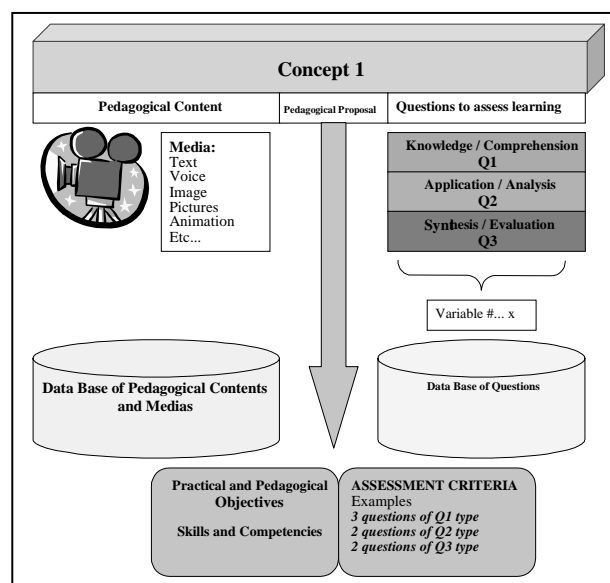


Figure 1: Pedagogical Concepts and Questions about each Concept

The contents are stored in Knowledge Bases for easiness of maintenance and recovery. CBR techniques are used for the information retrieval, which is based on the student profile. This strategy makes easy the symmetric migration among concepts for a given learning problem.

For the automatic evaluation process, the teacher has to identify the most desired criteria for each particular content. If there is a compatibility between the questions base and the evaluation criteria, the system will automatically produce the content evaluation.

Figure 2 identifies the programmed instruction module implementing the proposed technique, in a more general online course context.

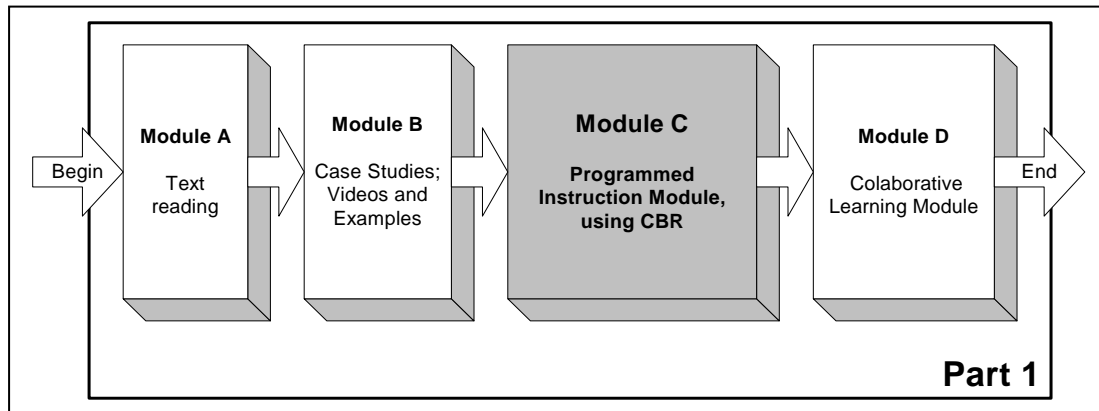


Figure 2: Programmed Instruction Module identification in an online course

Figure 3 illustrates the relationship between the proposed Intelligent Case Based System, called AUXILIAR, and the Programmed Instruction Module, as well as the students-teacher interactions. The students begin Module C at level 1, developing concept 1.

After the concept development, an assessment concerning its main points is performed, based on validation criteria, depicted in Figure 1.

If the student is not approved, he or she will be redirected to level 2, containing the same concept, more detailed. Thus, level 1 represents the student's starting point, and the above levels represent the same concept, each time more detailed.

During this process, AUXILIAR will keep all information regarding to the path and responses produced by the student. These records will be part of the student's profile, and will be used by modules DS (Doubts Solving) and NT (New Topic).

These modules will search an adequate stored past case based on the determined profile. If there is such case, it will be retrieved, and the student will be submitted to a new assessment. If he or she is approved, the next concept will be presented, at level 1.

Otherwise, the teacher (tutor) will intervene in the process. This intervention will also be recorded for the creation of a new Pedagogical Case for the specific profile. After this process ends, the student will be presented to the next concept, at level 1. If there is not a stored case, the process is the same.

The system will try to conduct the student so that he concludes Module C using the closest path as possible.

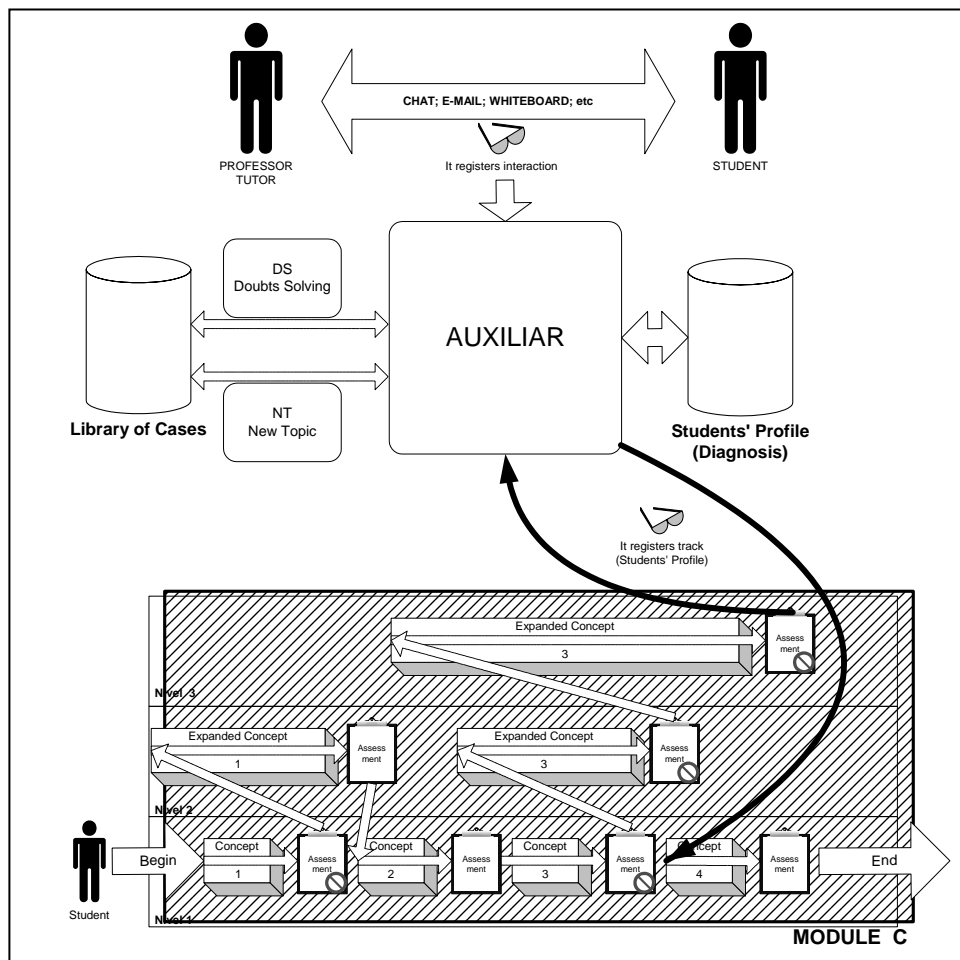


Figure 3: Relationship among the Course, the Cases Library, and the Teacher

5. The Proposed System

The system, named AUXILIAR, is responsible not only for supporting in doubts solving (DS), but also in verifying the student profile, through an analysis of the correctness of his responses to proposed questions, and his path through the didactic material. After defined the student profile, AUXILIAR will propose a new topic (NT) to be explored, as illustrated by Figure 4. It is important to note that this system is part of a major project, that proposes a Learning Methodology for Online Courses [5].

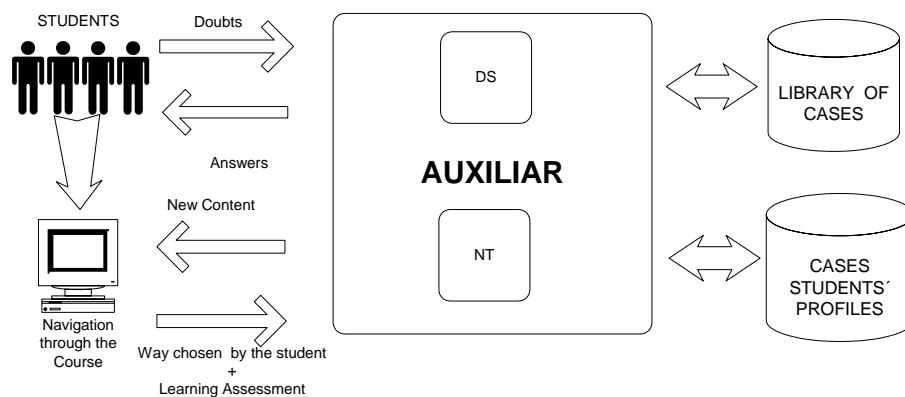


Figure 4: General Structure of AUXILIAR

The DS module keeps a Case Base composed by past doubts and solutions. The index structure will follow the Discrimination Network structure. In this structure, each internal module is represented by a question, which divides the stored cases in a lower hierarchy. The lower level nodes represent the different responses for the upper level question. Cases with identical responses are also grouped. It works similarly to Help systems in nowadays operating systems, where questions guide users to the desired response.

The NT module keeps a Case Base composed by profiles of already tested students. Since the evaluation process is composed by categories of questions, NT indexes its cases using a Plan Memory structure. In this kind of structure, the cases are stored sequentially in a list, being retrieved by a matching function which is based on the student's performance in each questions category. Thus, the system will define the student's profile after evaluating him. This process is repeated until the student is approved in all topics.

The use of an ICBS will make it even easier to develop Online Courses with pedagogical contents able to sustain their own evaluative process. The teacher will be needed only in cases the system identify as unusual, out of the previously established conditions.

This will allow more pedagogical flexibility and the creation of social interests courses for knowledge dissemination, due to the association between specific contents generation based on the student's profile also present in current systems, and the proposed methodology.

6. Concluding Remarks

This paper presented a general view of an Intelligent Case Based System for Online Courses. The ICBS aims at liberating the teacher of repetitive tasks, so that he may be concentrated on more important questions and processes. Nowadays, the system helps students in their doubts without the teacher's interference, proposing new studying topics, based on the student's profile and the detected deficiencies. This way, the system intends to contribute for the solution of one of the current issues of knowledge dissemination, so that the efforts can make students effectively learn the available contents.

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COLLABORATION IN TRAINING AND STAFF DEVELOPMENT ACROSS INSTITUTIONAL AND NATIONAL BOUNDARIES

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Introduction

This paper argues that the staff development of tutors in distance education is becoming increasingly important and that by working collaboratively in the field of staff development, institutions can provide a more effective service to their students. While it is very easy to assume that one's own way of doing things is the best, ideas from outside the institution can be very effective in stimulating thinking and change. Of course the context and culture can be very different between institutions, but we believe there are sufficient similarities between distance teaching institutions in Europe to make it possible to exchange ideas and methodologies in a practical and helpful way. In particular, many distance education institutions rely, as part of their system, on numbers of part-time tutors. The training and support of these staff together with the *training of the trainers* is a common issue facing us all. For many years distance educators have shared ideas and approaches through a number of media. Conferences, both face-to-face and on-line, are one way as are articles in journals such as *Open Learning* and *Open Praxis*. But on the whole contributors are mainly managers, organisers and course support staff and rarely those who are directly involved in helping students to learn. This paper proposes a way of addressing this issue.

Current issues

Why is staff development, particularly of those in direct contact with students, important now? Recent student surveys in the OU UK indicate that students see the course materials and their tutor as *the university*. This suggests that the development of tutors is vitally important. There is also increasing recognition that generic teaching skills are important and can be developed: Professor Graham Gibbs has demonstrated that “On **every** measure of 'skill', trained teachers got better, untrained teachers stayed the same or got worse. Trained Teachers become more 'Student focussed' while untrained teachers became more 'Teacher Focussed'” (Gibbs 2001 [1]). There are other reasons why we should think more about the needs of our tutors:

1. Tutor support now has a higher priority and a higher political profile, at least within the UK where the new University for Industry is placing a great deal of emphasis on training the 3,000 tutors it has recruited to be effective on-line. The OU UK has embarked on a major re-training programme for its 8,000 part-time tutors who will all be expected to be available to their students online by 2004 and it has developed a toolkit for on-line tutoring [2]. Other Universities in the UK are rapidly developing training programmes for tutoring at a distance, for example the University of Leicester has a three day residential training programme for its distance tutors on its MA Programme in Museum Studies.
2. Tutors need new forms of support because of the rapid growth in on-line developments.
3. Collaboration is possible by concentrating on the teaching process, rather than teaching content which may be specific to Institutions or countries.
4. Collaboration in the past has been of great benefit especially in areas of student support: there is great potential for future collaboration in the area of tutor support.
5. Systems supporting tutors on-line bring opportunities for cross national activity.

Staff development: political agenda

Several current changes are foregrounding the issue of staff development. In the 1990s staff development was ‘still largely seen by organisations as a cost, not an investment’ (Robinson 1998 [3]) and its champions justified the use of resources on the grounds of practical use: “for development to be seen as

worthwhile, for it to establish credibility in terms of the 'market' (the practitioners for whom it is intended), development has needed to prove its essential immediate practicality" (Webb 1992 [4]). Thus staff development, where it existed, tended to be practical and pragmatic: a particular need was identified and then met within current practice so that the focus was circumscribed by immediate concerns often related to specific issues. Professor Badri Koul (1998 [5]) comments that 'pressures of time, funds and size force the institution to develop staff development models which tend to be prescriptive, and can degenerate into being restrictive. Consequently the trained personnel are less innovative and more dependent. Only a minority can provide the necessary creative energy.... The solution may therefore lie in collaboration'.

In recent years staff development has expanded within the UK for a number of reasons. One is the increasing emphasis on teaching and educational development following the 1997 Dearing Report on the future of Higher Education and the establishment in 2000 of the Institute of Learning and Teaching and the Learning and Teaching Support Network [6]. 'There has been an explosion of interest in education development as pressure on staff has grown to cope with innovation and technology and to improve teaching quality, according to David Gosling who convenes the Heads of Educational Development Group. This group's membership rose from 15 HEIs in 1995 to more than 84 in late 2000. It now stands at 100' [7].

Tutor support: online developments

The introduction of on line teaching and student support places different demands on tutors and can create the potential for different teaching roles and styles: Stephenson [8] argues that 'the challenge facing teachers is not *whether* to give their online students responsibility for their own learning, but *how much* responsibility they are going to *deny* or *facilitate* and *how* they are going to do it'. Online teaching can take a great deal of effort and online tutors may need more support than their face-to-face colleagues. The irony of learner centred online learning is that it requires enormous input from tutor – online learning more than other modes, according to Alexander and Boud [9] 'focuses us strongly on what the teacher/educational designer is doing to enable learning' which 'may be seen to be contrary to current rhetoric surrounding student-centred learning which focuses on what students do to the exclusion of what the teacher is doing'.

Tutor support: the process of teaching and student support

Experience within the OU UK indicates a great deal to be learned within our own institution by sharing experience across faculties. Collaborating across faculties leads to a focus on developing the process of teaching, rather than the content of a particular discipline. In the East of England we now offer a general programme of staff development for all our part time tutors covering issues of common interest such as supporting students by telephone, delivering inclusive tutorials for diverse groups and issues in electronic student support. One multi-faceted example from this programme is the study of one of our own short courses 'Learning Online' by a group of tutors. In nine months, over 70 tutors (c 10% of our total) have volunteered to study this course which has a range of outcomes: cognitive, in the learning and practise of various online skills, such as web design and html; collaborative, in the work with colleagues and a tutor who draws out the teaching implications of the course; and experiential, through the process of becoming a student again. One tutor wrote of the course: '*I carry very vivid memories of what it feels like to struggle with something which does not come naturally, and with which I am getting nowhere despite hours of effort. This is something I shall hold on to when I am trying to help students who are struggling*' (Warren and Gaskell 2002 [10]). One of the further benefits noted by many tutors is that they gain different perspectives from colleagues in different Faculties.

The potential for collaboration

Over the last few years there has been a significant amount of sharing of expertise in the organisation of distance education. In the early 1980s the Open University in the East of England was organising visits and joint staff development activity with the Fernuniversitat and the Open Universiteit. Such activities

included the sharing of good practice and the joint organisation of staff development activity. Most of this was undertaken face-to-face and was funded by the Erasmus programme. McWilliams and Mugridge (1998 [11]) argue that early initiatives by the Commonwealth of Learning, for instance the Rajiv Gandhi Fellowship scheme, demonstrate that there is enormous potential for international and inter-institutional collaboration in providing staff development and training.

In the past the major possibilities for joint work have been the exchange of training materials and the organisation of visits. Now the possibilities afforded by ICT means that colleagues working in different distance education institutions can communicate with each other via a computer conference or the web. The Commonwealth of Learning [12] has for a number of years now run successful virtual staff development conferences from its headquarters in Vancouver. The latest series includes six separate conferences, with up to 100 participants on each, from across the entire commonwealth. The current conference *The Future of Technology for Developing Countries* has attracted over 250 participants. Other conference later in the year include *Quality assurance in open and distance education* and *Open and distance learning for community and social development*.

In April 2002 the OU in the East of England and the University of Oldenburg have arranged a joint programme of activity for part-time tutors. The project involves an exchange of practices between on-line tutors in the UK and Germany. Four OU tutors will pair with four tutors from the University of Oldenburg. The aim is to identify mutual insights into the experience of teaching on-line and to tell stories about this experience. The process will involve initial face-to-face meetings to enable colleagues to get to know each other before spending some months accessing each others' computer conferences and sharing experience on-line.

A proposal

There is a long tradition of sharing ideas on student support and learning through journals and conferences and materials. We suggest that the European Distance Education Network (EDEN) is an organisation which could stimulate the inter-institutional and trans-national sharing of good practice in tutor development for the future, along the lines of the Commonwealth of Learning (unless such an organisation already exists). The Open University in the East of England is prepared to organise such conferences in association with one or two other institutions but, as ever, our constraints are that, as our language skills are so much weaker than our European partners, the language of the conference would need to be English. Expressions of interest from other institutions are most welcome. It is proposed that the first two conferences should be organised between October and December 2002 and subject to a full evaluation which would be undertaken using expertise from outside the participating institutions.

What should be the topics of the first two conferences?

Those attending this session will have an opportunity to make an input to the decision-making here, but we suggest that the following might be of interest to a range of colleagues.

1. Issues of tutoring online

How does the relationship with students differ? What are the issues arising from on-line tuition? What are the advantages and disadvantages?

One very successful exercise within our own staff development programme was to ask tutors to describe their favourite face-to-face icebreaker within an electronic conference. They were then asked if it would be possible to transfer this to an electronic environment and if not, why not? This exercise had both a practical and a theoretical outcome: tutors gained a collection of excellent icebreakers and discussion raised a number of issues about similarities and differences between online and conventional learning. This could be used across institutions and national boundaries.

2. Re-thinking student support

What are the implications of less face-to-face contact between students and tutors. Can we use the Web to improve our advice and guidance services to students?

Finally, we suggest that these computer conferences should run over three weeks and have a moderator who will co-ordinate the activity.

Conclusion

Our tutors are the most important people for distance education students and we need to support, develop and extend their teaching skills in the most effective ways possible. We look forward to discussing with colleagues some of the issues raised in this paper and to exploring ways of taking forward these ideas.

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THE ONLINE MASTER OF DISTANCE EDUCATION - AN INTERNATIONAL PROGRAM FOR QUALIFICATION AND DEVELOPMENT OF PROFESSIONALS

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Some facts about the online Master of Distance Education program

The MDE program began in January, 2000. It is a joint collaborative program between Carl von Ossietzky University of Oldenburg in Germany and University of Maryland University College (UMUC) in Maryland, USA. At the beginning of its third year, the MDE has surpassed its 1000th course enrollment from approximately 300 active students in the program (enrolled in a course within the last 3 terms).

The Master of Distance Education degree program has formal approval by the Maryland Higher Education Commission. The first Certificate graduates were awarded in March, 2001 and the first Master's degree earned in December, 2001.

There are 15 active faculty members and 8 distinguished guest faculty members actually teaching the various online courses. International faculty and visiting experts come from Canada, Germany, Great Britain, Israel, Mexico, Sweden, and the U.S. (Florida, Maine, Maryland, Pennsylvania and Virginia).

The Master of Distance Education is designed to qualify the present and future managers of distance education. Given that distance education – and e-learning – have expanded so radically in the past few years, in both the public and private education, as well as training sectors, the program needs to train a multitude of new managers and future leaders required in this field. These managers, in particular, need to be trained as leaders, since they will be required to be active advocates for distance education and training in their organizations and will need to manage significant change processes that will affect the entire organization.

The transition from the Virtual Seminar to the online Master of Distance Education program

The development of the Master of Distance Education (MDE) program began in 1995, when the author and Eugene Rubin, at that time Director of the Office for Instructional Design at the University of Maryland University College/USA conceptualized a virtual seminar for professional development in distance education to address two critical needs:

- The need for faculty and administrator training programs in which new distance education faculty and administrators can develop a broader perspective of the general foundations of distance education and can learn critical knowledge and skills in the field.
- The need for a global perspective among distance education faculty and administrators so that they can benefit from the knowledge of how other institutions approach distance education and solve problems, particularly in cross-cultural contexts.

The Virtual Seminar was offered in 1997 as a successful experiment, and in 1998 two further Virtual Seminars were run on a self-supporting basis. The three Virtual Seminars attracted 127 faculty and distance education administrators from 24 different countries. Faculty, as well as most of the participants, experienced for their first time a virtual seminar, organized as an asynchronous communication process in an online learning environment. (Bernath & Rubin 1999a, 1999b, and 2001; Fritsch 1998) The most remarkable experiences bear noting:

- *Team-teaching across time-zones*
The online learning environment and the asynchronous mode of communication in the Virtual Seminar allowed team-teaching of the two seminar leaders across time zones. The seminar leaders planned and executed the seminar from their respective home universities across the Atlantic. This, in fact, turned out to be one of the hidden objectives of the seminar; to test whether this kind of Internet collaboration was feasible.
- *Knowledge building communities*
The Virtual Seminars featured a "visiting expert" model, a unique opportunity to interact with distinguished scholars and practitioners like Börje Holmberg (Lund/Sweden), Otto Peters (Hagen/Germany), Gary Miller (University Park/USA), and Tony Bates (Vancouver/Canada) for life interaction with the participants during an assigned period of time within the syllabus of the Virtual Seminar.
Otto Peters observed that the seminar appeared to be a virtual knowledge building community (Peters 1998). While this is not a new concept in the literature about computer-mediated communication, Peters' observation summed up quite well the experience of most of the participants involved in the seminars. Each seminar was a community in that the participants met, talked, agreed, sometime strongly disagreed, sympathized, empathized, and formed relationships (several of which have lasted beyond the end of the seminars). And like other types of communities, each seminar was different from the others. Each had its own "feel", its own pace, group dynamics and its own emphasizes on content matters.
- *The cross-cultural dialogue*
Another goal of the Virtual Seminar was to enable a cross-cultural sharing of experiences, ideas and opinions from participants from all over the world. This was deemed to be a potential positive outcome because
 - a. distance education occurred in some manner in almost all countries of the world and in a wide variety of ways, and using a variety of levels of technology;
 - b. distance education was increasingly becoming a world-wide enterprise in that courses became capable of being delivered almost anywhere in the world; and
 - c. the cultural and regional bias that each participant brought to the discussion would result in a broader and deeper learning.
 With participants from 24 countries of origin the three seminar experiences definitely supported the above supposition that the cross-cultural aspects of the seminar would result in positive outcomes. By being globally accessible via the Internet, the content and interaction allowed participants to differentiate and generalize across cultural borders and among the diverse practices within the field of distance education. It gave depth to the learning and forced the participants to think beyond their own cultural and environmental constraints. Not only was a broad variety of opinion expressed, but often these opinions prompted discussion that reflected a more comprehensive analysis and understanding of critical issues.
- *New interpretations of "activity" in a virtual seminar*
In many respects the communication processes in the Virtual Seminars appeared to be new and unknown for most of the participants at that time. From various points of view the "activity" of participants in a virtual seminar became a matter of initial research.
The notion of "witness learning" was introduced by the external evaluator (Fritsch 1998) to interpret positive evaluation results of participants with low or no visible activity levels and lead to further studies on the "invisible learner" (Beaudoin in: Bernath & Rubin 2002) to better understand learner activities that remain behind the screen.
The notion of the "ripple effect" (Bernath) was introduced to better understand a specific characteristic of asynchronous communication, in which postings seem to be much like throwing a stone into the water (the incoming messages) and seeing ripples expand outward in each recipients head (pondering on the content of the message). In asynchronous seminar discussions one can „work“ on the answer to be given. This pondering allows to react whenever you feel ready for and while doing so to go in-depth and to raise new ideas and notions in the seminar. (Bernath & Rubin 2001)

- *The volume of interaction*

By almost any standard, all participants of the three Virtual Seminars experienced that the sheer volume of the interaction in the Virtual Seminars was formidable. The data from the first seminar showed that the average length of a comment posted by a participant to the discussions during the weeks with a "visiting expert" was 187 words (with a range of 76 to 477 words), which fills half of a typical single spaced typewritten page that holds about 350 words. Although each participant contributed only an average of one comment in each of the ten weeks, which at a glance seems to represent only a very small amount of activity, yet these modest amounts of postings, when multiplied by 43 participants with their visible activity in ten weeks, resulted in over 66,000 words and an equivalent of more than 160 typewritten pages. The empirical data clearly show how online activity can be overwhelming to both the teacher and the student.

Consequently, all participants in an asynchronous virtual seminar need to develop new ways and means to manage such an unknown flow and volume of written communication.

Also, our data certainly suggested that 40+ participants may be too many for the type of a virtual seminar with an emphasize on teacher-student and student-student interaction. To accomplish this on a large scale (thousands of participants) it would require a significant infrastructure.

Conclusions from the Virtual Seminar

Based on the overall positive and successful experience, one of the most important outcomes of the Virtual Seminar was the joint decision of the two seminar leaders and their respective institutions, the University of Maryland University College (UMUC) and Carl von Ossietzky University of Oldenburg, to pursue the design, development and delivery of a Master of Distance Education degree. The decision came directly from the original intent to develop means to train faculty and administrators in the area of distance education in the light of the new technologies, the emerging market and growing importance of distance education worldwide. (Bernath 1996)

We realized that the Virtual Seminar just barely touched upon many of the important issues in the field and did not cover much of the knowledge and skills necessary for a qualified practitioner. It was, in fact, a successful foundation for further studies. At this point – by the end of 1998 – we needed to make a decision. Do we leave it as it is and possibly continue to offer the Virtual Seminar or do we further invest our time and energies to expand the concept of a comprehensive professional training in distance education in light of the new technologies, the emerging market and growing importance of distance education worldwide?

The formalization of the partnership

The Virtual Seminar allowed a cooperation between directors of their institutions acting within their respective areas of responsibilities. Once the planning aimed at the MDE the relationship between the institutions needed to be addressed. Knowing that institutional agreements often are difficult and complicated, it was felt that a successful collaboration needed to be straightforward and to be built on a feeling of trust and in a win-win environment. Since the personal working relationship was already in existence as a result of the Virtual Seminar, what remained was the negotiation of a simple yet fair set of terms. It was agreed that UMUC would be the degree-granting institution with Oldenburg as a partner contributing a certificate and courses within this degree. Furthermore UMUC would be responsible for all of the student administration as well as for the learning management system/web-based delivery system. Each institution would develop its respective courses and would hire and manage its respective faculty. It was further agreed that course and faculty development would be a matter of shared responsibility.

The online Master of Distance Education (OMDE) program

In September of 1999 the online MDE (OMDE) program was officially launched, and in January 2000 the program has been started with the Foundations of Distance Education course, which is recommended as the first course a student should take in the MDE program. It was agreed that the pace of development would proceed according to the needs of the initial students. Since the program was aimed at a working adult population it was assumed that most students would not take more than two courses per term. This is based upon UMUC's experience in other graduate programs.

Course development

The content and the design of the Virtual Seminar became the basis for the initial Foundation of Distance Education course in the Master's program. We planned to continue the team teaching model and to continue to use a somewhat modified expert guided structure. However, the Foundations course needed some additional development in order to make it appropriate for inclusion into a graduate program. It was necessary to add assessments and to extend the content to fit a 15-week term. Furthermore the target population expanded, so that the program served a broader constituency including professionals who involved in the distance education enterprise within the educational business, government, and not-for profit sectors.

The development model for most of the courses of the MDE required a more up-front materials, activities and assessment development. This is for two reasons: 1. Since the program and disciplinary area is new lacking a pool of reliable, long-term adjunct faculty. 2. Because the potential pool of qualified faculty for this degree is spread out across the world. Because of the need for more intensive course development in this program, the costs of course development have been significant.

Goals and objectives of the program

Students, who successfully complete the Master's degree shall be able to:

- "Understand and critique the broader policy and social issues that arise from using distance education and technology-based learning.
- Plan and manage distance education and training courses, programs, departments and organizations.
- Design, develop and deliver high quality distance education and training in ways that reflect a variety of different approaches to teaching and learning.
- Select and use technologies on the basis of their differing educational and operational characteristics.
- Evaluate and conduct research on distance education and training issues, and disseminate the results.
- Collaborate and network with other distance education professionals around the world.
- Cost and budget distance education development and delivery systems.
- Understand, from a learner's perspective, what it means to engage in distance and technology-mediated learning." (MHEC Proposal 1999)

The courses of the MDE program

Core courses

OMDE 601 Foundations of Distance Education – The course has been developed by Ulrich Bernath (Germany) and Eugene Rubin (U.S.) in collaboration with Börje Holmberg (Sweden) and Otto Peters (Germany). It is now being taught in multiple sections by a team of faculty with Ulrich Bernath, Thomas Hülsmann, and Michael Beaudoin, and visiting experts Börje Holmberg, Otto Peters, and Michael Moore.

OMDE 602 Distance Education Systems – This course has been developed by Eugene Rubin. It will be taught in fall 2001 by Yolanda Gayol (U.S./Mexico).

OMDE 603 Technology in Distance Education – This course has been developed by Judy Roberts (Canada).

OMDE 604 The Management of Distance Education – This course has been developed by Eugene Rubin and Jim Gelatt (U.S.).

OMDE 605 New and Emerging Media in Distance Education – The course has been developed by Joachim Hasebrook (Germany) and is taught by Joachim Hasebrook and Michael Romeis.

OMDE 606 The Economics of Distance Education – This course has been developed by Thomas Hülsmann. It is taught by Thomas Hülsmann with visiting experts Greville Rumble (U.K.) and Tony Bates (Canada).

OMDE 607 Instructional Design and Course Development in Distance Education – This course has been developed by Eugene Rubin and Inez Giles (U.S.). It will also be taught from Fall 2002 by Som Naidu (Australia).

Elective courses (students choose four)

OMDE 611 Issues in the Delivery of Library Services to Distance Students – This course has been developed by Ilene Frank (U.S.).

OMDE 614 Intellectual Property and Copyright – This course has been developed by Kim Bonner (U.S.).

OMDE 621 Training at a Distance – This course has been developed by Greg Kearsley (U.S.).

OMDE 622 The Business of Distance Education – This course has been developed by Gene Rubin (U.S.).

OMDE 623 Web-Based Learning and Teaching and The Virtual University

OMDE 624 Student Support in Distance Education – This course has been developed by Jane Brindley (Canada) and Alan Tait (UK). It is taught by Jane Brindley.

OMDE 625 National and International Policies for Distance Education in Developing Countries – This course has been developed by Thomas Hülsmann in collaboration with Hilary Perraton (UK).

OMDE 626 Technologies for Distance Education in Developing Countries – The course is under development by Thomas Hülsmann (Germany)

OMDE 631 Advanced Technology in DE I: Synchronous Learning Systems – This course has been developed by Gila Kurtz (Israel).

OMDE 632 Advanced Technology in DE II: Asynchronous Learning Systems

Capstone (required)

OMDE 690 Distance Education Portfolio and Project – This course will be taught by Eugene Rubin and Ulrich Bernath.

Further course development

Additional courses are still under development. Syllabi for the MDE courses that have already been developed in the program are available at the following URL address: <http://www.info.umuc.edu/mde>.

Aspects of program success

As one of very few graduate programs of its type in the world, the MDE has provided unprecedented access to professionals who want to pursue graduate-level work in this field. The program has the added benefit of bridging the resources, faculty, and expertise of two partnering higher education institutions in an international context. Most graduate students do not have opportunities for exposure to broader perspectives provided through courses from two different universities from two different continents.

The asynchronous format of this program itself lends to the recruitment of a diverse student body in terms of geographic location, career field, academic background, and professional aspirations. MDE students work in sectors such as small businesses, corporations, government agencies, not-for-profit organizations, colleges and universities, K-12 schools, and the military. The program has proven to appeal to students in diverse fields and at different stages in their careers. While many students have had extensive experiences in the field of distance education, others are looking to move into this field. Many students are working in organizations that could be described as “virtual” in focus, while others are in ones that have begun to use technology more recently.

In light of the characteristics of the MDE student population, UMUC and Oldenburg have recognized the importance of providing opportunities for professional networking and career development. In November 2000, a well-attended get-together was held for MDE students and faculty at UMUC's campus in Adelphi, Maryland. For most students, this represented their first opportunity to meet their program colleagues and faculty members face-to-face. In March 2001, MDE students were invited and eight of them funded by Nokia to attend a Mobile Learning Workshop held at Oldenburg University. This event was part of pre-conference workshops to the 20th ICDE World Conference in Germany, where another workshop provided participants with the opportunity to review the first year of the MDE program.

Building on the model of the MDE, UMUC and Oldenburg have recently initiated several related outreach efforts in the field of distance education, including the following:

- From April through June 2001, Oldenburg's Center for Distance Education in collaboration with UMUC provided a seven-week online course titled "Essentials of Online Learning" for Nokia (Finland) HRD staff using WebTycho. Nokia's manager from the New Learning Solutions department has decided to continue offering this course for their HRD staff members. A second course has been offered in Fall 2001.
- The Central Chinese Radio and Television University (CCRTVU) has started negotiations to adapt the content and asynchronous delivery format of the Foundations of Distance Education certificate and Distance Education in Developing Countries certificate for their educational system.
- The Escola do Futuro of the University of Sao Paulo has approached the program directors of the MDE to jointly develop a Brazilian support system for the MDE to make the program available in Brazil.
- The World Bank Institute has negotiated with Oldenburg's Center for Distance Education to become a program partner for its Global Development Learning Network (GDLN) to deliver virtual seminars for professional development on "Distance Education in Developing Countries," which is closely connected with the content in OMDE 625 and OMDE 626 and also in other subject areas.

Preliminary conclusions

Both UMUC and Oldenburg have benefited substantially from the implementation of the Master of Distance Education. MDE students and faculty are making important contributions to the field by positioning the instructional, technological, societal, and management-oriented aspects of distance education into a broader international context for consideration. A publication with extensive reflections on first experiences in the MDE is under preparation. (Bernath & Rubin 2002)

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UNIVERSITY TEACHERS' CONCEPTIONS OF TEACHING IN THE CONTEXT OF THE USE OF ICT: A CRUCIAL ELEMENT FOR THE IMPLEMENTATION OF EDUCATIONAL TECHNOLOGY

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Introduction

The University of Helsinki is developing the use of information and communication technologies (ICT) in teaching and studying. This mirrors a wider social trend according to which universities should develop as a part of the information society. One step towards this goal was the establishment of the Educational Centre for ICT in the University of Helsinki.

The Educational Centre for ICT aims to increase the use of information and communication technologies and to support teachers in their efforts to develop their pedagogy in this field. It is question of implementation of innovation. Innovation, at this point, includes new technology, new uses of technology or new kinds of pedagogical thinking.

My task as a researcher is to evaluate the diffusion and the implementation of such innovation. The first stage of the research (2001) focused on the teachers' pedagogical thinking. It would be easier for me to approach my research task in a quantitative manner. In other words to investigate the increasing amount of equipment, the number of network-based courses, number of teachers of technically orientated in-service courses and so on. However, I have chosen another (more difficult, I assume) way. Niederhauser and Stoddart (2001) argue that several innovative projects concerning the implementation of technology in education have failed because teachers' conceptual understanding of educational phenomena (such as teaching) has not been investigated and taken into account. My approach echoes that of Niederhauser and Stoddart. When we are speaking about the use of technology in teaching we are, indeed, speaking about an educational phenomenon which, in this case, directly implicates teaching. In other words, we should investigate this phenomenon and the relationship between this phenomenon and technology. I have done so at a conceptual level. I have interrogated university teachers' conceptions of teaching, on the one hand, and how these conceptions associate with the use of information and communication technologies in teaching. The idea behind this kind of approach was that if teachers' understanding of teaching doesn't have any relation to the use of technology, successful implementation of information and communication technologies in university pedagogy would be very difficult.

(One of the aspects of my research is teachers' pedagogical thinking. I am interested in how university teachers define teaching and how information and communication technologies are associated, if at all, with that definition. In other words, is intensive use of ICTs in teaching such an constitutive element that it has some impact on how teachers understand teaching? On the other hand, it is interesting to discover the kinds of teachers' pedagogical views that are affecting the use of ICT in university teaching.)

I interviewed 37 teachers of the University of Helsinki. Common for all of them was that they used or were planning to use information and communication technology in their teaching. This does not mean that they were experts in the field. Some of them, actually, were but mostly they were just ordinary university teachers who were in some way associated with the educational use of ICT, for example by participating in in-service training in this field.

Conceptions of teaching

An interesting feature that emerged in the results was an transposition between different concepts of teaching. We can also treat them as opposite concepts. Teaching was characterised as **transmission of knowledge**. This is a typical way to understand teaching as several results indicate (e.g. Martin & Ballan 1991; Samuelowicz & Bain 1992; Trigwell et al. 1994). Another way to see teaching was an **approach**

which was **based on constructivism**. The teacher either presented views which mirrored the constructivist approach or they just stated to me that their understanding of teaching is constructivist. Between these two there emerged a category which I called **discussion between different approaches**. Teachers were eager to see teaching as something that we could characterise as a constructivist view (I simplify constructivism here. The field of constructivism is diffuse.) However, at the same time, they did not totally accept such a view. They thought that in their own discipline there was something which brings about a need for a certain amount of knowledge transmission, even if they considered this kind of view to be unconventional with regard to current educational trends. That is, perhaps, why they sort of apologized for heretical thinking. To sum up, some teachers were ping-ponging between different kinds of teaching concepts and we can regard a constructivist approach and transmission of knowledge as opposite ends of this ping-pong table. The other categories of a concept of teaching that rose from the data were: **goal-directedness**, **interaction** and **organisation of the instructional process**.

Teaching conception in the context of the use of information and communication technology

University teachers' conceptions of teaching has been investigated to some extent, as my reference in the previous paragraph indicate. However, I have not found any literature in which these conceptions have been investigated in the context of the use of information and communication technologies. Nowadays, when technologies are intensively used in education, the link between the conception of teaching, on the one hand, and information and communication technologies, on the other hand, is worth exploring. The categories I have found so far are:

Empowerment of one's pedagogical view. Teachers suggested that, by using information and communication technologies, they are better able to teach according to their own pedagogical views than without them. Technology can serve their pedagogical intentions. It is worth noticing that this category is not restricted to one particular pedagogical approach. Approaches which could be characterised as constructivist flourished side by side with those that had no association with constructivism.

Authority of knowledge. The context of information and communication technologies has an impact on the relationships between a teacher, the substance (knowledge) and a student. Authority over knowledge is shifting from the teacher to net-based resources, which students can reach independently, and from static resources (like books) to flexible resources (like the Web).

Technology as substance and a tool. This category concerns the technology itself. It may be the content of teaching. For example, university teachers teach their students to use groupware and statistic-analysis programmes. On the other hand, technology is treated as a tool, an agent in pedagogical activities.

Some specific perspectives. This category was somewhat of a surprise to me. Some teachers presented very sophisticated views of the relationship between the definition of teaching and information and communication technologies. It was based on their own theoretical elaboration.

Conclusion

In this article, I have reported the current results of my research concerning teaching concepts and the applicability of information and communication technologies regarding these conceptions. The research will continue and the categories I have found so far may alter in the progress of further analysis.

Discussion between different kinds of teaching concepts is going on in teachers' pedagogical thinking. Teaching is treated both as transmission of knowledge and as facilitation of construction of knowledge. The link between how teachers saw teaching and their attitude towards technology was (surprisingly) positive. They regarded the use of information and communication technology as an empowering element which was able to realise their intentions. Other issues which emerged at this occasion was a new relationship between teaching, studying and knowledge. I named this category, more or less appropriately, authority of knowledge.

With regard to the results, teachers' pedagogical thinking indicates the potential for the implementation of an innovation which, in this case, refers to the type of pedagogical changes that the use of information and communication technology may bring about for higher education.

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HOW DISTANCE AND OPEN LEARNING CAN ANSWER TO THE TEACHER TRAINING PROBLEMS?

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Preliminaries

The information and knowledge society of tomorrow will support the values of our societies only if our educational systems take up the challenge thrown by digital tools, virtual pictures, electronic networks. And in order to our educational systems take up this challenge, the training of teachers must be crossed by this axiology and must fall within a strategy of social cohesion. All of this suppose orientations which perhaps overtake national policies.

Distance learning, by allowing flexibilities, and by the control of the distance has a trump card to play, in so far as it really represents an educative way and I, so far as it does not confine itself to a simple formation and services teleportation way.

And if distance learning will offer this opportunity for a new deal of the teacher training?

1. To form the teacher of tomorrow

We could begin with the training of the today teacher... But, we have to talk, from this day, about the formation of the teacher of tomorrow. Because, we are still tomorrow...

What about the teacher of tomorrow?

Instead of opposing him to the today master (or to those of yesterday), I prefer integrate him into the continuity of his action and his functions, with, however inflexion points.

The true integration of digital technologies, necessary to a future master brings the first inflexion in the formation. Indeed, these technologies have became, in the teaching act, a fourth pole, transforming the usual didactic triangle in a tetrahedron, putting in tension the three other summits. To approach this tomorrow teacher, we can say that, as today, he will not be neither a simple dispenser of knowledge, nor a social worker, nor a socio-cultural organizer, nor a simple tutor, even if sometimes and in a sporadic way, he will carry out these functions.

Even more than today, **the teacher will be a professional**, a technician of the pedagogy. Second assertion we cannot contest: the teacher will have, more than even, a strong social function. We do not have to take up the old cause opposing the teacher to the parents, he does not has to substitute them but he must has to complete, to extend, and to compensate too the parental education. And this role is all the more so important and difficult as the certainties are becoming less marked and as the values are changing and in redefinition. This refer to an other old controversy, which even goes beyond school: do we have to protect or to harden? It seems to me that, perhaps more clearly than today, it is toward the second term of this alternative the tomorrow teacher has to tend. At last, and in the extension of that I have said before, the teacher is a citizen, and not only a citizen of his city, but beyond, and **a citizen who has to promote an active form of citizenship**, from the values he has to keep living in his professional act. These two last assertions refer to a humanistic view of education and to a constructivist view of trainings which are two preliminaries conditions we have not to lose sight.

From that time, we can better delimit the functions of this teacher (who will not be a virtual teacher).

First, naturally, functions we can describe as really for teaching. To sum up, it's a matter to endow the pupils with basic skills (to read, to know how to talk and write, to master operation mechanisms), to teach them a first command of knowledge tools (how to use computers and how to browse the internet). The

master must teach to the pupils how to learn while he has to teach them something, and also to teach how to manage the complex and give them an intellectual spine which help them in integrating all the outside contributions. To do this, he will have to work with others, in teams (with teachers, social workers, tutors, even politic managers of the city and parents) during and out of school time and perhaps sometimes outside of the school area.

The tomorrow teacher, and it is not to define a new secularism, will be **a regulator**. This function seems almost at odds with the actual situation, and it is forced by the new communication tools. Indeed, the pedagogic differentiation has been in the heart of the pedagogic thinking, at least of the last decade, differentiation at the level of the regions, where the councils try to put on devices for pupils in difficulty or on trouble; differentiation at the level of the school with the school project which had to take care of the context and whose drifts have result in establishing convincing scholar and social leads, and last but not least, differentiation at the level of the classroom which has brought to the fore all the hardness of teaching.

Of course, the teacher of tomorrow will have to take care of the local reality and of the specific characteristics of the neighbourhood, and he will have to practice differentiated pedagogy, but he will also have to bring some plain, some unicity in all these diversities and to bring a kind of adjustment, a kind of regulation.

At last, the teacher of tomorrow will have **to manage the tools and the values**. In other words, it is by really integrating digital tools in his pedagogical and professional act, which permit an active and distanced use of these tools by the pupils, and by a distinctive use of these tools, out of the school time and of the school area, but in an educative viewpoint that he will create a true dynamic at the level of the society, and that he will completely fill his social contract. Networks like internet or digital television allow some intellectual mobility, a shortening of distances and time, flexibility in the kinds of working, and in the ways of learning, and others kinds of pedagogic relations: as many assets to the tomorrow teacher to help him to promote in live a new form of citizenship in society larger than the city, and even than the country, assets he will have to use for fear of being supplanted in the essence of his work.

2. Distance learning to bring about a "new order" in the training of teachers

Distance education or rather distance education methods can play a large part in transforming the training of teachers in two important areas.

First of all, **via changes in training methods and training times**. Using distance education methods, bringing people together on a given site whether this is the training site or the site on which the activity will be carried out (with the dual aim of ensuring professionalization and reduced travel costs), is no longer necessarily a constraint. This approach is valid both for ongoing training and also for initial training. Training times and training methods are indissociable.

This well-known theory-practice and scientific learning-professional learning combination is more often than not completed by a succession of different periods without there being in most cases a transfer of acquired information and mutual contribution, nor the emergence of integration-promoting measures (not to mention the counter-training effects of the assessment procedures used in these cases). The practice of distance training as part of the training of teachers makes it possible to instil continuity in the training process, where, (regardless of the training time and location) the student, trainee or teacher-in-training has access to resources, training support and the potential to exchange information, ideas and experiences with other students and trainers. Working from this basis, the extension of training time can be carried out without any problems concerning the duration of the University study period with periods of contraction where gatherings and major events will be possible. An improved "anchor" with the University will be created with no detriment to professionalization. But this stronghold could be focusing toward another thing, and among others toward strong connections with a foreign training plan, or toward linguistic deepenings. In this kind of experience, the technology direction of the French ministry of research has just command an internet site "Primlangues" (first languages) where international exchanges are favoured to follow the teaching of foreign languages in primary schools.

This now brings us to the second contribution of distance education in the field of teacher training: **the creation of genuine training networks** guaranteeing the promotion of innovation, system mobility and training continuity. Most educational policy managers agree that high-quality teacher training must offer both a high level of university qualification and sound preparation for the job. However, a high level of university qualification presupposes contact with research and professional preparation with a sound “anchor” in the active environment. Over and above the intellectual compatibility of the two approaches, the question arises of the material and above all temporal feasibility of the two approaches. Contact with research does not necessarily mean carrying out research, but having intellectual proximity to discussions with a research group. From its side, the professional environment is often burdened by “baggage” (even if this is very noble baggage!) and can only receive a breath of fresh air and become dynamic again through attendance at training networks where researchers, educationalists and professionals meet unhindered. The support of networks of trainers facilitates the implementation of integration-promoting measures including a genuine combination of acquired theoretical bases and professional knowledge independent of the place of work. (In the frame of “French digital campus” operation, we – the CNED - try to make up something like this with all the IUFM toward the students-teachers who were in classrooms.)

The work of these networks can also make it possible (and this is no easy task) to help future teachers to get used to working with others. There too, everyone mentions the necessity and obligation of carrying out the profession of teacher in a less isolated manner, and many breakthroughs have been achieved in this field. We still have some progress to make though. We can suppose that electronic communications beyond simple local networks will add to this process of reflection and offer further support to teachers often enclosed within the constraints of their establishment.

Training falling within long-term processes, with more contracted periods (making it possible to build forms of transposition for carrying out the job), increased contact and a wider number of references, as well as team working outside local networks are all possible contributions of distance learning to teacher training, helping to overcome initial problems and putting in place a new approach for the future of this training.

3. And what about European citizenship?

Beyond the Euro, which evidently shows a civic will at the level of Europe, what about the overhangs toward an European citizenship?

Can its learning cut off from school? And, consequently, can the training of masters be all square with this approach? What is the situation today?

Now, we cannot really say something clear about educational systems, where some are nationals, other federals, where in some countries, the school is in the heart of the system, while others set the cursor of centralisation in one side or in the other, where the obligations in matter of curriculum, schedules, working hours, degree courses and areas of training differ from one country to another... To say nothing of the religion question, of the secularism, or above all of the status of the teachers.

In spite of important efforts which have been done in the last decade and in particular through European programs like Erasmus, Comenius, Socrates the compartmentalization of the systems, and even the ignorance of the uses of the neighbourhood countries is always the standard for the masters, and in a less degree for the managers and for the trainers. We can easily put forward some explanations from the history of the institutions to the language, to the skills of thinking and pedagogic referents.

But, beyond, back to the first question: how may we to an European citizenship in this context?

For a long time, the researchers have established international links. They were, among the first to use internet for scientific exchanges. Institutional plans are made to further students exchanges and training periods in an other country. Step by step, international standing, mainly by exchanges, symposiums, and studies travels, it's true, takes its place in the thinking of teaching specialists and in those of decision-makers. But can we say almost that something is increasing toward an European citizenship education?

The missing of true works exchanges and the missing of collaborative practices between the trainers and the practitioners don't allow actually to make up this gap. The growth of linguistic and professional exchanges, just as some experiences as European sections in second schools or at last the extension of the learning of a foreign language in primary schools and this in most of the European countries, are as much acts which are going to make up this problematic. But, it is from the training that the critical boost can be given.

Let us go back to some wished changes. In most of training schools, or institutions – it's mainly true in France with the IUFM - the formation "at the closest" of the ground realities, very near from where the teacher-student will work is hardly required. It is a good thing, but it will also be made "at the largest". **Adaptability** seems to be an important skill (quality) to be develop in this teacher in becoming (go back to the function of regulator). Even without geographic moving, he might be work in various situations, in a school or according to others forms. Moreover, it seems more and more evident that the practice of job in the same forms and the same ways, or in near frames during several decades is no more possible (all the statistic studies coming from various sources show this). This adaptability became a guarantee of efficiency not to say a guarantee of professional salubriousness. This dimension marks a break with the actual situation, at least in the collective subconscious of most of the trainee teachers wishing the same not-moving post for a long time in a familiar land, near his home ("to live and die where I was born..."). Distance and open learning, with a good use of networks, can allow exchanges works about the practices and thinking about job. This would make teachers more open to the European differences and above all this would make them more open to the common values.

At last, the tomorrow teacher will have more **exchanges with the others**, he will have a more important communication and go-between function. Making this more easily seems to be more than today in the teacher training purpose. Of course, there is all the problematic of working in teams, and of projects to do with the other teachers of the matter, of the class, of the school even of the district and so on. In the same way, we have to develop exchanges with the others actors of school: all the educative team members, parents, associative managers of the neighbourhood, local partners... But, and it is still now a gap constantly renewed (except even in the professional education) we have to make exchanges with the others members of the social body, and with the others professional bodies, all of them confronted with training problems and social values problems and not only in the national frame. School can be no more a simple sanctuary, neither an itself-closed-world, even if to learn, it is necessary to have some come back times to their own values. Through lack of taking enough this in account in teacher training, school, in its institutional meaning, might open itself up to anything and brake with its mission (and that happens sometimes...)

Conclusion

In the always changing society we know, the teacher takes a more and more central place. It is him who hands the two ends of the chain: the everyday management, and to learn how to use the tools, and the passing down, by acting, of the values needed by all democratic society.

He cannot do all this alone. He cannot do all this only with his peers. In a world wide society, the action and the reflection scale cannot be the same.

The needs of teachers and the needs of training are increasing while the potentialities are going down. The need of opening is going up but the constraints are increasing...

At least, distance and open learning seems to bring an answer.

PREPARING AND SUPPORTING E-TUTORS IN THE RUNNING OF AN INTERNATIONAL ON-LINE TEACHER TRAINING COURSE AN EXPERIENTIAL APPROACH

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Introduction

Cambridge International Examinations (CIE) is part of the University of Cambridge Local Examinations Syndicate (UCLES), a major provider of examinations both within the UK and internationally. The Interactive Technologies in Assessment and Learning (ITAL) unit is a research group tasked with investigating the use of internet-based technologies in UCLES' business.

CIE is committed to providing high quality support and training to teachers of its syllabuses and has an extensive programme of in-service training. As part of this commitment the Curriculum and Teacher Support Group (CTSG) within CIE and the Interactive Technologies in Assessment and Learning (ITAL) unit have been investigating ways of using web based technology to support teachers of CIE syllabuses.

CIE provides assessments for schools in more than 150 countries. Providing training at reasonable cost and useful intervals for a community so disparate and geographically widespread is a continuous challenge. One area of investigation has been the use of Internet-based technologies as a way of bringing together geographically isolated teachers.

In this paper we describe the development of a course designed to prepare e-tutors to deliver an on-line teacher training course. The tutors were to deliver the courses to teachers world-wide using e-mail and e-mail-based discussion lists. We will describe the training issues we identified, the training we provided, and how the lessons learnt have informed subsequent phases of the tutor training.

Context

Underpinning the design of the on-line teacher training courses and therefore of the tutor training itself was an experiential, collegiate and action research philosophy. Strands of recent thought about effective learning and professional development stress the primacy of peer interaction, continuing reflection, the importance of experience and the grounding of theory in practice (see, for example, Schön, 1987; Wenger, 1998 and Kolb, 1984).

The building of teacher networks or communities is increasingly seen as a way of fostering the conditions in which this type of development can take place, allowing teachers to share experience, information and good practice (Lieberman, 2000). One of us (Riding, 2001) has already shown how e-mail-based discussion list technology can be used to build lively, syllabus-focussed, on-line teacher communities and how these communities can contribute to effective teacher development. We therefore decided to use such lists as the technological basis of the course. We supplemented these lists with web-based repositories for documents and Frequently Asked Questions.

The facilitation of such communities demands new roles and skills of those charged with the task. Successful face-to-face teachers do not necessarily make successful on-line moderators. We took Gilly Salmon's warning to heart:

Any significant initiative aimed at changing teaching methods or the introduction of technology into teaching and learning should include effective e-moderator support and training, otherwise its outcomes are likely to be meagre and unsuccessful (Salmon, 2000 p. 55).

Our task was to devise a course that would convert good face-to-face teachers into good on-line moderators.

The experiential view of learning also informed the way we, as staff and potential moderators, designed and modified the course itself. We were relatively new to on-line learning and understood that however much we read in the literature and talked to practitioners, there could be no substitute for our own experience. We just needed to make sure that we provided ourselves with opportunities and time to reflect on the courses and the research and to allow that reflection and learning to feed into subsequent stages of course design.

The Case Study

The potential e-moderators were all experienced face-to-face teachers, but they had varying degrees of knowledge and experience of internet-based technologies and of on-line teaching and learning. All had reasonable keyboard skills and were comfortable with e-mail and web technologies.

The initial structure of the course to be prepared by the e-tutors consisted of three separate modules, each of two weeks, making a six-week course. Each module would consist of stimulus materials, reading materials and some research for participants to investigate. Finally, e-tutors would set an assignment that would receive formative assessment, including suggestions and ideas for improvement of the teaching assignment. The assignments all involved some aspect of teaching practice. This structure was open to revision and development based on our own and the e-tutors' experiences.

The e-tutors were to use person-to-person e-mail messages to communicate with individual participants and to give personal instructions, encouragement and feedback on assignments. Running in parallel to this was an e-mail discussion group that would enable the tutor and participants to discuss matters of common interest and concern, as a group. This communication system therefore reflected the classroom situation where the teacher can give instruction to the whole group collectively and to individuals. Students are able to speak to each other and to the teacher privately or publicly.

Course aims

We took Gilly Salmon's five-stage model of e-moderating as the basis of the course design (Salmon, 2000 p. 26). This model provided a useful 'scaffold' on which to base the first iteration of the moderator training course. It describes five levels of competence ranging from simple access to the technology, to autonomous learning and critical thinking.

Our aims mirror these five stages. We wanted to give the new e-tutors:

- an understanding of the technology to be used (Stage 1: Access and motivation);
- an understanding of the concepts surrounding the use of email discussion lists and how the different methods of communication would facilitate conversations person-to-person and person-to-group (Stage 2: Socialisation);
- the conceptual information necessary to set suitable on-line tasks, to enable them to write effective content materials and to produce useful formative assessment (Stage 3: Information exchange);
- an understanding of the issues arising from and the techniques required for the effective moderation of on-line discussion and the creation and fostering of on-line communities (Stage 4: Knowledge construction);
- opportunities to reflect on their on-line experiences and to begin to think about how they would approach their own teaching on-line (Stage 5: Development).

Iteration 1

This first e-tutor course was initiated by a face-to-face meeting with the four e-tutors. During this day-long meeting we demonstrated moderation of the discussion group messages, discussed issues surrounding the management of discussion groups and made decisions about the range of assignments to be set.

Following the face-to-face meeting the e-moderators remained in contact with each other and with the trainers through the medium of an email discussion list. This, we hoped, would allow them to continue discussion of issues raised during the day, and provide ongoing support during the running of their courses. By using the same technology as they would use to deliver their training, it also provided 'hands on' experience.

In addition to the feedback we received from the e-tutors during their training (either directly by telephone, face-to-face contact, or via the specific e-tutor discussion list), and during the time they were delivering their courses, e-tutors were asked to complete feedback questionnaires. These questionnaires were designed to allow the e-tutors to provide us with some quantitative data about the time they spent on various activities throughout the course itself, as well as allowing them to give us a more reflective view of their experience.

The first cohort of e-tutors were enthusiastic and guided most of their participants to a successful outcome in all but a handful of cases. All of them reported that they would be happy to be involved in future on-line training courses. All of them felt that they had been 'well' or 'very well' supported during the training and the delivery of the courses, and they all reported that they felt 'more confident' with the use of the technology after the training and after running their courses.

The amount of time they reported having spent in learning to use the technology varied from 20 hours in the case of the least experienced tutor to only 2.5 hours in the case of the most. This suggested that there was probably a need for more exposure to the technology.

We were disappointed with the lack of on-line discussion that occurred between the e-tutors during their training and it was obvious to us that we needed to be much more active in encouraging discussion and reflection.

It was clear that some tutors were much better at facilitating discussion and a sense of community among the participants. It was also clear that the amount of reflection that the tutors elicited from participants varied widely - on some courses the discussion was dominated by 'procedural' messages while on others the discussion was more about professional issues. This led us to conclude that we needed to work with the prospective tutors in alerting them to the techniques and skills needed to encourage such interaction.

When asked what would be the ideal preparation for e-tutors, given their own experience, they were unanimous in saying 'doing it!' This was as strong an endorsement of the experiential methodology as we could have hoped for!

There were therefore a number of issues that we would need to address before embarking on the second course. E-tutors will need:

- more 'hands on' experience of the technology and the on-line environment before starting their courses;
- more training in the moderation of discussion lists. If we are to engage teachers in on-line reflective discussion, the e-tutors need to be better at promoting and maintaining such discussion;
- e-tutors also needed help with dealing with the process of on-line 'classroom management' (e.g. dealing with 'difficult' or disruptive students).

We need to use e-moderating skills ourselves to create a more effective community of e-tutors who will support each other during the training and afterwards.

In order to address these issues we made a number of changes to the course structure.

Iteration 2

The main difference between the first and second course was that the second was conducted entirely on-line, with no face-to-face meeting. Apart from our feeling that the more experience the moderators got on-line the better, one of the trainees was based in Switzerland, and therefore unable to attend a face-to-face session.

For the first phase of the training, we had the new e-tutors 'lurk' (join and observe, but not actively participate) in the on-line courses run by the e-tutors from the first course. For half of this time we asked them to observe the process from the viewpoint of a participant, for the second half, as a tutor. From each half we asked them to identify two 'critical incidents' which illuminate the differences between face-to-face and on-line training.

The second phase was based around a two-week on-line discussion forum. During this phase the main focus was the critical incidents identified during the first phase. We aimed to use these as jumping off points for discussion. We wanted the e-tutors to relate them to their previous experiences as face-to-face teachers. We would highlight general principles and relate them to the literature and other people's experiences. We would provide various inputs - documents, website and book references, but we saw these as background reference and summary information and not essential to the course itself. We did not expect the new e-tutors to read them all. We expected them to spend a minimum of nine hours reading and responding to discussions over the two-week period.

We invited the experienced e-tutors who had already run on-line training courses to join the discussions.

We had no fixed content agenda for the discussion in phase two; we wanted to respond to the concerns and interests of the new e-tutors as much as possible. Having said that, we aimed to cover some if not all, of the following topics:

On-line teaching and learning:

- the technology;
- the vocabulary;
- advantages;
- disadvantages.

Roles of the on-line tutor:

- social - creating an on-line community;
- pedagogical - promoting effective learning, types of interaction, feedback;
- managerial - dealing with and managing on-line discussions, motivation, facilitation;
- technical - dealing with email discussion lists.

During the third phase, the on-line discussion facility would continue to be available after the course and into the time when e-tutors began to run their own courses, to provide continuing support from peers and from ourselves, and as a forum for continued reflection.

Being members of these two lists gave the tutors more experience of the on-line environment and the issues facing both them as e-tutors and those facing the on-line students.

In this way we hope to provide new e-tutors with examples of good practice (either on the observed courses or on the training course) and we will be able to concentrate on issues such as the creation and maintenance of an on-line community where discussion flows. We will also encourage group work on-line by setting the tutors a task that they will work on throughout the two-week course.

Conclusions

It is too early for us to draw final conclusions from the work carried out so far. However, we believe that two lines of research may prove profitable. Firstly, the investigation of the professional socialisation of the e-tutors into their new role, and how they make this transition. We also intend to investigate the pedagogical issues surrounding the teaching of courses on-line compared with teaching face to face.

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OPEN AND DISTANCE LEARNING IN ADULT EDUCATION "ELEARNING" IN PRACTICAL TEACHING

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Introduction and Background

The practical implementation of *eLearning* methods in (adult) education still appears to be a challenge although the term "*eLearning*" appears to be a priority issue in European educational politics. Obviously, universities as well as private educational providers, in particular those who offer tailor-made in-service training courses for companies, have quickly taken up the new opportunities offered by the rapid technological development in web-based training. Compared to the situation only four years ago a huge variety of electronic learning management systems is available on the market today and thus the challenge for all actors in the public school system has become even bigger.

This paper focuses on the practical implementation of *eLearning* methods and grassroots activities in adult education and reflects the experiences made in a European co-operation project with the title "AEN - Adult Education Network" (<http://www.aen.at>) which was realised and also funded by the European Commission in the SOCRATES / MINERVA Programme from 1999 to 2001. The international collaboration and exchange of experience in the project has had an impact on the design and development of further *eLearning* strategies.

International collaboration and perspectives across Europe: AEN - A SOCRATES / MINERVA Project

The Austrian Ministry for Education, Science and Culture applied for European funding and co-ordinated the AEN project. Twenty-two Partners in nine European countries co-operated in the project, which focused mainly on adult education on the upper secondary level and initiated and supported the introduction of "*eLearning*" methods on a very practical level in the participating institutions.

The following keywords can give an impression of the main types of activities carried out in the project:

- Testing and evaluation of electronic learning management systems, which finally led to the implementation of *eLearning* methods in all the participating institutions that work with adult learners.
- Development of example learning material to be integrated in the electronic learning management systems.
- Coaching of the adult learners to support them in the new way of teaching and learning.
- Establishment of networks of teachers and students across Europe to support the exchange of experience and materials.
- Improvement of the organisational structure of the courses based on the needs of the adult learners and the experience made in the project.
- Development of teacher training courses and their implementation.
- Contribution of the project to the *eLearning* initiatives on the national level.

Undoubtedly, the biggest advantage gained and the most important effect of the co-operate activities in the project is the exchange of experience, approaches and strategies which had a direct impact on the further development on the national levels.

However, the project partners also experienced the limitations of the call for a co-operation across borders in particular with regard to language barriers that cannot be neglected. On the one hand, this applies to the development of learning material as it is quite obvious, for example, that it does not make sense to develop electronic learning material in the subjects physics and chemistry for Portuguese adult learners in English or any other working language which is not the target group's native language. On the other hand, the lack of sufficient foreign language skills of a high percentage of teachers at the upper secondary level appears to be an obstacle for an efficient collaboration on a broader level.

Therefore, international co-operation within and *beyond* Europe, which is also scope of this conference, can be regarded as an ambitious approach on the university level, but still is a long-term goal for practitioners on the upper secondary level and is currently confined to the exchange of experience and examples of good practice.

Teacher training

A new approach in the initial and further training of teachers is the key to an effective introduction of eLearning. Based on the experience made in the AEN project, efforts in the development of standardised models and modules in teacher training have to be undertaken. The design of a teacher training course (concept, structure and curriculum) which can be implemented in any of the available electronic learning management systems has to be developed.

Most importantly, teachers in open and distance learning have to become distance learners themselves.

We propose the following steps in the development of a distance teacher training course model:

- Development of a concept, structure and curriculum of a distance learning course for teachers who work with adults in distance learning: Theoretical and practical input by internal and external experts (methodological and pedagogical input on and observation of the recent development in the fields of authoring tools, multimedia and online learning)
- Implementation of the teacher training course in an electronic learning management system in co-operation of teacher training institutions with adult education institutions as a co-operative activity across Europe.
- Design of tailor-made courses by teachers participating in the training courses for their target groups, i.e. adult learners in their institution.
- Implementation of the tailor-made distance learning courses at adult education institutions in order to integrate the practical level and to disseminate the products developed.
- Establishment of a network of DL teachers on a national level in an electronic workspace to discuss common problems and to exchange teaching materials.
- Continuous evaluation of the courses developed, exchange of activities, experience and examples of good practice across Europe.
- Dissemination on the national as well as European level - contribution to the eLearning initiatives in the partner countries.

Teachers and “Content Creation” with simple authoring tools

Many teachers try to fend off content creation with reference to the fact that the average teacher can not be expected to be author of a course-book. The term “eContent” is mostly associated with glossy, shiny multimedia CD-ROMs like Microsoft’s Encarta.

An animated presentation in MS Powerpoint however is already a form of “eContent” like a gap-fill exercise in Hot Potatoes linked to a soundfile for listening comprehension. The Powerpoint presentation is the modern form of the overhead-transparency and the interactive exercise edited in an authoring system is today’s worksheet including immediate feedback, sound, images and record-tracking. These forms of “eContent” are as far from the multimedia CD-ROM as the worksheet on paper from the course-

book, but the media and the possibilities have changed. The glossy and shiny products like a CD-ROM on the one hand are contrasted by the quick and dirty products on the other hand, edited with an authoring tool for the demands of everyday teaching. Writing interactive exercises in an authoring suite does not make much more effort than writing a worksheet in a word-processor, but it's different.

Tools like Wida-Authoring Suite (<http://www.wida.co.uk/>) or Hot Potatoes (<http://web.uvic.ca/hrd/halfbaked/>) offer gap-fill exercises, multiple-choice, crossword, matching exercises, text-reconstruction and many more. The adult distant learner appreciates these tailor-made exercises and quietly admits that one of the main reasons is the fact that he can do these exercises over and over again without making a fool of him/herself in front of the fellow-students. For the same reason the home-learners find Powerpoint-presentations very helpful as they can repeat the input of new content again and again.

The "early adopters" among the teachers don't need training for these tools really, rather information and valuable links. But the majority of teachers is slowly approaching computer-literacy. Familiarity with a word-processor is the standard one can expect in a teacher training seminar. After the first successfully edited interactive exercise the resistance against content-creation is usually fading away and teachers begin to see the possibilities of these authoring tools and how easy they are to handle. Macromedia's Authorware Attain is a much more powerful tool, however, the experience in the AEN-project showed that it is far too complex for the average teacher and too expensive for the average school. Beyond that a questionnaire at a secondary college for adults showed that 80% of the distant learners did not manage to install the web-player that is necessary to run the exercises on the students' computers! For this reason Hot Potatoes is an ideal authoring tool as it produces HTML-files for the students to work with. These files are very small and can be easily be attached to e-mail and distributed to the students. All the distant learner needs is a computer with a web-browser. As soon as he/she clicks at the file, the browser starts and the student can begin his work. No plug-Ins, no additional installation, no software-licence problem. Beyond that these files are easily implemented in an electronic learning platform like Blackboard (<http://www.blackboard.com>) or bscw (<http://bscw.gmd.de>). As HTML is open source more experienced teachers can enrich these exercises with additional image- and sound-files and extent interactivity if they can edit Java-script.

Language teachers can easily edit text-reconstruction exercises in the programmes "Sequitur" and "Rhubarb" which are available as "TexToys" at <http://www.cict.co.uk/texttoys.htm> at a very fair price.

At the same address you will find "Markin", a programme to mark textfiles on the screen. You can edit buttons for correction and feedback and load WORD-files in the "rich text format" into the programme. The corrected paper can be sent back to the student in HTML or RTF, including statistics and feedback.

All these programmes are easy to handle and after a two-day workshop teachers can work with them and produce content in electronic form, without much additional effort but with considerable added value for the learner at the distance.

International orientation is a must in the implementation of innovative approaches in learning and teaching

As it has already been indicated, networking and co-operation of educational institutions and policy makers in Europe are an absolute necessity to establish the possibilities of enabling the people to become digitally literate. A concentration on the practical work, which was one of the major assets of the AEN project, and strengthening the synergy of all players in the field of ICT is a further must to accelerate the development towards a digital culture in the knowledge society.

The divergence of the educational systems in Europe can therefore be regarded as a strength and not as a weakness - on the contrary, it is one of the outcomes of the AEN project that despite the different approaches there is a common will to deal with problems and to develop a common perspective towards more equality in the access to education and training.

Distance learning supported by "eLearning" methods can therefore be a pathway to lifelong learning and to an equality of opportunities for everyone in a democratic society across national borders.

The next steps

In the IT-business it seems very keen to predict developments more than two years ahead. The next steps for secondary colleges for adults seem pretty clear at the moment. Electronic learning platforms have to be implemented as an additional offer for the adult learner. Stocked with interactive content this will add to the media already available now. As Marc Eisenstadt and Tom Vincent from the Open University put it in their book “The Knowledge Web” (London 1998), the mere online course will be a misconception. It’s the mix of media that creates the ideal learning environment and interactive exercises in a learning platform will enhance the possibilities of the adult learner at the distance.

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DEVELOPMENT OF INTERACTIVE SYSTEM FOR FORMATION OF TEACHERS: A CONSTRUCTIVIST PERSPECTIVE IN DISTANCE EDUCATION

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The increasing complexity of today's societies as well as the speed of technological advances have made it almost impossible to educate through focusing on the need for improving mental and cognitive abilities, which enable the individual to deal with the new, resulting in the prospect of developing knowledge through self-management.

Our students need to know how to read what they see and also, produce, express themselves in both audio-visual and virtual world. They must become proficient readers; (Villardi, 1966), someone who regards himself as a critical reader, capable of appropriating what he reads and of establishing various connections with the object of reading, being in touch with the surrounding world.

Initially, a new approach to reading (Villard, 1997) was developed by our research group. This methodology was applied to works of literature for children and young adults, by devising specific didactic material firstly introduced traditionally – paper (Villardi, 1998) and then through educational software programs. (Villardi, 1999).

The results of this research have allowed us:

- To assess the contribution of the use of technological resources to the development of reading skills;
- To ascertain that the interchange of different media enables the elaboration of broader meanings in the face of the insertion in a culture in which writing alternates with image in the student's daily routine;
- To check the positive impact of the use of information technology resources on the students' involvement with reading;
- To observe some teachers' difficulties in working with students' linguistic development regarding reading and writing, especially the difficulty in developing abilities to read the meanings implied in the texts, which will reflect in the ability to "read the world";
- To identify the need for projects which would meet the demand for programs, courses and methodologies which enable the teacher to deal with the increasing levels of complexity imposed by the educational systems.

From the analysis of the problems in teaching language within the ambit of Primary and Junior high school (1st to 8th grade) in Rio de Janeiro, the object of this study is to seek new ways to improve the educational system effectively. Our previous investigations revealed the need for investment in the continuous teachers' academic formation so that they become able to work actively to develop their students' linguistic abilities concerning both writing and reading. Not only would the teacher be able to teach but they would also be able to contribute to the inclusion, overcoming social injustices and building up citizenship.

Since the access to educated language is provided by the acquisition of complex linguistic structures, which relies on the development of mental reading abilities, the school plays a major role in providing the student with conditions for this accomplishment. Once these skills are developed, the individual will be capable of reading any types of texts, therefore being able to read the "world" critically, thus allowing them to build up citizenship (Foucambert, 1999). By investigating the mechanisms which would lead up to this knowledge, we try to adapt the theoretical and methodological approach, which has been used by the research group, to the use of new technology in school environment in order to create a multiple

system in EAD, based on studies of “the Aesthetics of Reception”(Wolfgang Iser, 1996). In a country of continental dimensions like Brazil, the courses of continuous formation at distance, come as a concrete possibility of reaching the professionals of the education that are distant of the urban centers. It is fundamental to offer those professionals access to the necessary theoretical references for the materialization of a true transformation in pedagogic practice and, consequently, of the education as a whole.

We believe that such proposal can offer significant contributions to sustain the excellence of the Education at Distance in our country, which is not in the forefront, looking for roads and alternatives to offer systems that may guarantee a work of quality according to what is offered in international ambit.

Consequently, the continuous academic formation is presented as a possibility of access to modern technologies, using an approach of interactivity and communicability which will facilitate the cognitive and social development.

We have substituted the traditional EAD model which is characterized by remote education, in which information prevails over formation, for a new mode of remote education: flexible, open and interactive.

We focus on the development of abilities that will help students in the process of learning autonomously according to their rhythm. The interaction with their own material and with other users, allows what is generated by each one to return, circulate and make the generation of new ideas possible.

Throughout the process we search for clarity and understanding in order to minimize the dispersion of the sense attribution.

We have made use of a didactic-methodological-information technology-based system which would allow the development of cognitive abilities through the use of different language codes, outlining an interactive approach which would value the building of knowledge.

A prototype of a remote course in Mathematics was developed.

A mini-course on “The concept of Fraction and Children’s education” consisted of six modules:

- The first module evokes daily routine of children’s education with scenes which elicit some concepts from the students. According to Giordan and Vecchi, this is an inciting situation which arouses in the students ideas, which will later, in group work, cause representations to face and confront each other in chats and forums.
- The second module leads to an investigation into geometric space confronting new contexts, which allow, according to Giordan and Vecchi, to learn with and against their own previous concepts.
- The third module takes the student to a metric, topological, spatial and plane space as well as to relations of equivalence and playfulness, which allow the transformations of previous concepts as a result of the mental operations carried out in the forums.
- The fourth module is the space for transformations in which movements with geometric figures are analyzed and experienced.
- The fifth module focuses on interdisciplinary activities which involve the concept of fraction.
- The last module consists in the assessing process completion which focuses on two main points. Cognitive and interactive participation.

This proposal was trialed through this remote mini-course involved 31 teachers. The prototype was made available by the information technology laboratory in the Faculdade de Educação da UERJ installed in four machines. The students did the course as the modules were made available, following the pre-set chronogram. Those who had a home computer, received a CD-ROM with the mini-course so that they could do the course off-line at home. They were asked to follow it sequentially, so that everybody would be handling the same topic on the day of the forum. This decision was made by the group due to the technical problems which occurred because not all the teachers enrolled had access to the Internet and because of the difficult accessibility to the Net.

A Multidisciplinary team consisted 7 Pedagogy students on grants, 1 Mathematics teacher, 1 professor of BA in Languages, 3 Computer Science students on grant took part in the field research in a process of reflection-action which afforded them theoretical and practical knowledge through experiences rather than assumptions and suppositions.

The choice of the tools for interaction to be used in the course was based on the study of their applicability and practicality. After choosing the appropriate tools, we defined the forums as a place for exchanging experiences and for building knowledge in which discussions on a theme were conducted based on the questions proposed by the teacher who devised the course. The discussion lists promoted communication with all the group. The e-mails formed the channel of communication between the individual student and the tutor and the study room a free place for interaction with all participants. We tried to choose tools for interaction which would be easy for the students such as the forums and e-mails in Portuguese which were available free of charge on the Internet.

Those who did the course off-line used the net only to access the tools for interaction in the university laboratory. Six students on grant who are primary school teachers and Pedagogy students on grant took part in the process of the tutor academic formation. The procedure was divided into 3 steps. The first step was a theoretical and methodological study of the tutor role in EAD course, so that he/she could be defined as an educator rather than a trainer. The second step, which involved participation in the course as students, allowed a critical analysis of the process, creating demand for changes in the navigability and communicability of the course and eventually set the standards for procedures which insured interaction and communicability. This process underlined the role of the tutor as an educator, establishing mediation, interaction and stimulus strategies. The third step consisted in the actual participation of those students on grant as course tutors. The tutors academic formation took place during the board of teachers examination, the tutor being the first student in the course. The definition of tutorial academic formation, from this perspective, aimed at an attempt to identify, minimize and tackle potential problems as well as difficulties which might be encountered by the students at a later stage when the course was on the net. This procedure enabled us to re-formulate and re-dimension some of our proposals in the search for understanding and communicability. Owing to the experience with the group of tutor we could ascertain the need for a file containing general instructions on the access to the mini-course and the use of the tools for interaction proposed. This file was made available to the students on enrolment.

We believe in the importance of the tutor academic formation. The tutors must have experienced the process as students, they must have been through all the difficulties that the students might encounter in order to minimize them as much as possible before acting as educators. We devised a mechanism of administrative control so that the teacher and the tutor could follow the students' situation, from the moment they enroll to the end of the course. As a result, a reference file containing general information about the students was created so that they could be found and/or contacted in different ways in addition to the Internet, in order to check if they managed to access the course, perform and send the proposed activities. Finally, we built an evaluation and result analysis system which combines the teachers assessment, by means of the work received and the analysis of each student's participation in the interaction spaces- through self-evaluation and other students' evaluation.

The methodological procedures utilized are based on the principals of research-action. The focus of our research is on the process of developing a didactic- methodological-information technology-based system for continuous remote academic formation, thus all the work of the team, from its beginning; became relevant material to our analysis. Firstly, the course prepared was presented to the team, giving rise to discussions and producing studies on the standards used nowadays in various courses EAD via the Internet. Our studies showed that our proposal constituted a challenge as we realized that is not consistent with the EAD modes found, which were still subject to the standards of programmed instruction or training.

The team began to work in three fronts in order to accomplish the modes established by the research. The computer science students on grant started to elaborate the structure of the course by researching various programs seeking the most suitable for the demands of navigability, optimization of the length of permanence of the students on the net and also search for clarity and communicability. An interaction with the Pedagogy students on grant was necessary so that the pedagogic dimension could be understood since it needs to be linked to the technique serving our objective. The second work front was opened by the Pedagogy group who was responsible for establishing the parameters for the academic formation of

the course tutors, who were 6 students on grants from this field. Lastly, the members of the team who acted in the field of Language, dedicated to a deeper study which involves Language not only in our prototype but also in EAD in general. The analysis of the course in terms of language was made by using the theoretical references developed by the team in this field. We did not aim at a grammar revision of the rubrics and the proposals. Our intention was to verify the level of clarity and communicability which is involved in the communication process from the point of view of the one who receives the message, not only the one who generates it

The need for creating an interaction net within the team so that our proposal could be carried out, can be regarded as a preliminary result. Work within a multidisciplinary group with people from different areas: Education, Languages, and Computer Science, in which the various steps of the process were planned and trialed, resulted in a learning environment in which what was relevant was how much one learned from the other.

Our hypothesis regarding the necessity of interaction from the building of knowledge was confirmed at the beginning stages of the process. It was possible to verify, with the sample of this course, that the level of accessibility to the net is still below the expectations, as confirmed in the difficulties faced by all the participants of the course, including the tutors. Another datum obtained refers to the high rate of students evasion during the course, for several reasons, such as not having the minimum necessary knowledge of computer skills demanded by the course, despite claiming it on enrolment; difficulties related to the context of the course proposed; problems of access to or navigation on the net; time availability to meet the deadlines demanded by the course. It was also possible to observe that the role played by the tutor is fundamental and decisive along all the process. The trust and self-confidence that the tutors acquired during the process of academic formation to build support for their performance in the course and the possibility of intervention in the proposal represented a landmark in the process of the building of knowledge. Our investigations had noticed experiences related to the tutors' performance which were still linked to the models of programmed instruction. In our proposal of formation, we aim to ensure a performance that was fundamental both in the follow-up of the students and in the achievement of understanding and communicability through the process.

It is essential that the tutors are the first students of the course, participating as co-authors, experiencing the process of the construction of the prototype in order to act as mediators, creating an environment of interaction, understood as the process of mutual influence. In this multiple information technology-based system, we guarantee the success of the course proposed, with the collective construction of learning to those students who completed it. We are now analyzing the data obtained in order to draw up graphics and tables that will enable us to consolidate our hypotheses concerning the importance of the academic formation and performance of the tutor in remote information courses.

In the light of the data obtained, it can be stated that it is possible to offer remote education, with the use of technology, which is different from the proposals of remote programmed instruction and training. It was verified that it is possible to learn remotely in interaction with others, with autonomy regardless of the space-time relations. Such realization increases the possibilities of reaching the teachers of the public school system, regarding continuous academic formation, in the search of an efficacious pedagogic action, in the language area, which goes beyond the boundaries of the physical and methodological limitations of school.

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E-TRAINING TEACHERS AS REFLECTIVE PRACTITIONERS

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Introduction

Studies of information and communication technology uses in education and training very often stress how complex the integration of technology in educational practices is for teachers and trainers. Pressured to adopt information and communication technological (ICT) tools, they are also urged to develop more active methods and to adopt the dominant constructivist approach to learning. Even then, the difficulties that arise – from becoming fluent in digital literacy to persuading computer persons to attend to maintenance- prove to be quite a challenge to which conventional teacher training does not prepare. Rather than focussing on local solutions, which are necessary but insufficient, a more promising approach could emerge through the consolidating, at an international level, of significant advances in the understanding of what is changing in the way people interact with information and knowledge today.

We would like to argue here that, if teachers are to cope with the evolving educational, training and social environments and participate in the production of a new understanding, they need more than ever to become **reflective practitioners**. As Schön has pointed out already in 1987, one of the best preparation for reflection-in-action is an experience in the methods of normal science research in practice. Such an experience could become possible with the implementation of online learning environments accessible by teachers, and whose object, as for example the one presented here, is the training in the fundamentals of scientific research for human and social science students. In order to foster the higher level cognitive abilities and competences required, the training environment could also be a repository for resources brought together from different poles of excellence identified worldwide.

Open and Distance Learning: a gateway for the transformation of paradigms?

When investigating the development of ODL, it appears that this field not only encompasses very diverse situations but is also considered as a most promising solution for many problems faced today by societies. The global impetus to implement this type of educational infrastructure world wide is especially strong in developing countries confronted with a high percentage of their population lacking basic training. For these countries, unmet educational needs result in high levels of unemployment and low quality of living conditions. Integration of ICT in education carries the hope of a global solution through distance education.

Attending to huge demands in the training of a competent workforce are problems that also concern the training of teachers and trainers. In Brazil, for example, over sixty projects¹ labelled Distance Training were documented in the virtual libraries of the Ministry of Education and Research. Among these are national projects aiming at providing qualification to untrained teachers, already at work up to the far ends of the vast country that is Brazil. Other projects are focused on the integration of computers in elementary schools through distance training. At the university level, the main target is integration of IC technology as tools for specific distance training programmes. Most of these projects are based on a traditional teaching paradigm. ICT is taken into account at the technical level of providing access.

Two basic concepts underlie the convergence on distance education in Brazil: *overcome geographical distances*, by providing persons living far from urban modern centres permanent access educational resources, and *reach out to populations traditionally outside the educational system* and bring to them the basics of modern education. And in both cases, the quality and competence of the workforce, be it for industry or for education, is the central problem.

¹ Survey conducted in 2001 on official Brazilian government web sites by E. Rosado.

Integration of ICT in education and training is also bringing about an important change by bringing into centre stage much more the learning than the teaching processes. Aspiring to democratise knowledge and learning, teachers willing to cope with ICT are focussing less on the didactic unravelling of curriculum contents and much more on learner centred activities, trying to bring about a new conception of self-learning and self-training. Trying to instil a “**learning to learn**” approach, already present in the '80, teachers see more and more the student as the master of the learning process. Training becomes successful inasmuch as students acquire a deep awareness of the psychological processes that regulate their relationship to learning and knowledge. Self regulation, emotional maturity, organisational autonomy are now identified as basic requisites, not to mention the mastery of technological tools. Far from disappearing the teaching process is also expected to adapt and perform in compliance with the new requirements of distant and instrumented learning.

However attention to the evolutions and changes in the way education is being delivered does not enfranchise from the obligation to observe and try to understand at a much deeper level what is happening in the way people relate to information and knowledge in an information society. Information production, storage and access is developing faster than users can cope with. Multimedia puts on the same bandwidth pictures, music and words. Speaking two or three languages is becoming common, attending to multiple representations and viewpoints is expected from educated people, information, judgements and assessments are assumed as being basically ongoing and permanently evolving. In such an emerging information society, the goals of teaching and learning need to be redefined and repositioned. Yet there is no definite official or scientific discernment on what is going to come out of the ongoing informational changes. The information tools are not only technological, but conceptual and issue-oriented. Digital literacy (Gilster, 1997), “the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers and networks” is about mastering ideas, and not only cables and chips. In 1994, David Olson, in his book, *The world on paper*, brought out an historical essay on the conceptual and cognitive implications of writing and reading. Today, it is the conceptual and cognitive implications of the “world online” that begs for understanding.

Teachers are therefore at the forefront, resolving the problems that integration of technology entails, establishing ODL services and at the same time trying to understand why this is happening and what exactly is happening. Going through recent studies in France where teachers give accounts of the use they make of information and communication technology, of the difficulties encountered and of the enhancements they experienced, one is struck by the strong adherence of the pioneers and the reluctance of the greater majority of teaching staffs to endorse this technological choice. Teachers that have endorsed the ICT option are operating within the discourse of marketing prophets and looking for the promised transformations and improvements that ICT is suppose to bring about. Clearly teachers need to have access to deeper insights, to be able to better grasp what they are bringing about through ICT, and to develop a specific awareness of the new conditions of teaching and learning in an information society.

Reflection in practice

Donald Schön (1983) pointed almost twenty years ago that the training of practitioners (in this instance, teachers) only allowed them to apply techniques based on specific acquired abilities that closed off their pedagogical practice and left them unable to take into account a larger context. He argued for the practice of reflection on pedagogical action as a condition for a genuine evolution of the profession. Later, in 1987, he proposed as one of the best preparation for reflection in action an experience of scientific research methods. He analysed that the professional practice of a teacher was filled with “zones of uncertainty” that the positivist paradigm underlying traditional teacher training (applying problem solving strategies to well defined problems) did not prepare them to face. These zones of uncertainty can be identified as “problems” (violence, refusal to learn, questioning of authorities, meaning of school, etc) that teachers face without knowing how to cope with. Integrating ICT in such difficult situations only makes the task more complex inasmuch as, to the uncertainty, is added the deep and necessary transformations in the values and the personal and professional competence of teachers (and of students) that ICT entails.

We have taken up Schön’s proposal, not in terms of training teachers as researchers, but in having them acquire through a hands-on experience of scientific research, a transdisciplinary and transcultural

awareness and understanding. What is at stake is developing in teachers meta-competences allowing them to better position themselves in their work context and in the information society, which is bringing about profound changes and addressing to the educational system demands that have considerably evolved from those that present after World War II. (Tardif, M. 2001). Such a training need not be local but could benefit from an international pooling of competences and know-how on coping with learning processes in an information society.

« How to do research in Human and Social Sciences »: Web Training Environment Proposal

Research training gives teachers access to those competences that are needed to cope with uncertainty: how to identify and formulate a problem, how to situate oneself in theoretical settings that can allow valid interpretations of reality (that go beyond naive theories of novice functioning or motivating role of ICT in learning), how to set up gathering of pertinent data (criteria for evaluation of role of ICT in learning), how to analyse data (going beyond description and quantification), how to produce conclusions. Without a thorough reflection on pedagogical processes and also without these meta-competences, it is doubtful that teachers will develop the enlightened practices that are expected of them.

Hence the objective of setting up a training environment online on the theme of *Training for scientific research in human and social sciences*. The training modules comprise units dealing with the different steps of research work: choosing a research question, defining the problematics and the theoretical background, setting up a methodological framework, defining variables and criterias, collecting and analysing data, interpreting organised materials, producing conclusions. The training objective is not only to introduce into the various stages and steps of researching, but also to constantly apply the reflection to pedagogical situations in order to bring about growing awareness of pedagogical paradigms, training strategies, articulation between distant and face to face activities, and a better understanding of teaching and learning processes when instrumented with ICT.

This site is presently being developed within a collaboration between the Department of clinical psychology and educational and school psychology of the Pontificia Universidade Catolica de Campinas and the Research Unit LIRE of the National Scientific Research Centre in Lyon, and the Department of Psychology of the University Lumière Lyon 2. A prototype module will be operational on the site of the University Lumière in French and in Portuguese by October 2002 and will be tested by university students in Lyon and in Campinas but also in different distant locations

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ODL AND TEACHER PROFESSIONALISATION AN INTERACTIVE RELATIONSHIP

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Introduction

When we started teaching ODL courses on upper secondary level, many students welcomed it.

They wanted to be able to study without going to school on certain days at certain hours. Among teachers there was a lot of suspicion. They asked us: “Why do work with ODL?”, “Are you sure it will be working out well?” and “How can anyone learn a foreign language by the means of ODL?”.

Since the demand of ODL courses increased, we soon found ourselves in a position where we needed ODL colleagues. Hence the reason why we started teacher training courses some years ago. We have added experience to theory, and we prefer to talk about *relating* to ODL rather treating it as a method of teaching. In the courses we offer, teachers learn to choose a pedagogical idea and to relate to it. Today we offer courses for both university teachers and upper secondary teachers.

A general change in education today is goal direction. A consequence for teachers is that they have more freedom to choose how to teach. On the other hand, they should be able to give reasons for their practice. This change contributes to the process of teacher professionalisation. In this paper we want to point to the contribution of ODL in this process. It is our belief that in order to be able to make didactic decisions you need to be able to relate to both content (*what* to teach) and context (*how* to teach). Being a professional teacher you also give reasons to support your practise (*why*).

In this paper we will discuss three aspects of professionalisation:

1. choosing and pursuing a professional object
2. relating to pedagogical problems
3. developing a professional language

What is the professional object?

“The professional object of teachers is learning, i.e. supporting the development of different abilities and competence in students” (Carlgren/Marton 2000, p 26, our translation).

We argue that the main interest and main focus of the teacher should be the process of learning.

The teacher is supposed to know about different ways of learning, be familiar with the concept of learning styles and be able to adjust to different individuals in different ways. What we call the professional object is how the teacher supports the learning process of the students. Both teachers and students are familiar with how this is managed on campus. Traditionally you could almost say that merely being in the same room as a teacher meant learning from the point of view of the students. ODL on the other hand often means that the student does not meet her the teacher or fellow students at all. Indeed a way of defining ODL is that learning is independent of time and place within the framework of the course. How is it possible to hang on to the professional object under such circumstances? In fact there are many tools.

Didactic conversations

It is of great importance to have a didactic conversation. In our opinion the main tool is *the study guide*. It is the medium where the teacher gives information about the course, instructions and introductions to new subjects. When writing a study guide the teacher should always think of the student as the reader, not

other teachers or her own old professor. She must write with great care, so the student feels noticed and spoken to. The student must feel that she is the most important person in her studies, the subject of her studies. In our opinion the best compliment a study guide can get is when the student says that it feels as if the teacher is present in the room, talking through the text.

In this way contact is made, although the student and the teacher have not actually met.

Through information and communication technology (ICT) there are many possibilities to create meetings. If we emphasise the freedom of choosing time for individual studies, *asynchronical communication* is one way. Using an appropriate platform you can conduct group work, discussions and individual tasks using the computer. In our courses we use First Class and WebCT which both have advantages and disadvantages. We will not develop this issue here. What we want to point out is that choosing a platform is also part of designing an ODL course.

Synchronical communication can very well mean face-to-face interaction. In our practice we always have students who want to and are able to come to meetings. We think that such meetings should not offer mini lectures or tests but meetings where you discuss current issues connected to the course. Face-to-face interaction can also be important for the student's sense of belonging and enhance the willingness to participate in virtual meetings on the net. We think that chat groups can be very useful, but they need a bit of planning. Spontaneous chat groups are an alternative, of course, but a didactic chat group needs a moderator.

In our courses we use these tools to create a meaningful interaction between students-students and students-teachers. Our purpose is to establish quality contact. To us this means a feeling of mutual trust and support. It is our experience that this enhances the learning process of the students.

Why presenting a pedagogical idea?

“It is important to specify what students must know, what they should know, and what they might find useful to know; to define this, as far as possible, in terms of what they will be expected to be able to do and under what circumstances they will be expected to perform.” (Holmberg, 1995, s 56)

It is indeed important for the student to know what is being asked of her. How is she supposed to be successful if the rules are not spelt out? In traditional teaching and teacher training, the student gets to know her teacher in many ways. They see each other a certain number of times every week. They speak and they act and interact in different ways. What is important is expressed in more ways than merely by words. The fact that verbal communication is only one aspect of student-teacher communication is of vital importance when we discuss the situation of the campus student in relation to that of an ODL student.

Presenting your pedagogical idea of the course in writing, is an efficient way of making sure that the student knows what will be asked of her. Is collaboration with other students important? Is asking questions important? Are references important? These are examples of student questions that will be answered when the teacher presents her pedagogical idea.

There is always a pedagogical idea behind any kind of pedagogical activity, but it is not always directly expressed. ODL can contribute in enhancing an explicit pedagogical idea, since ODL teachers do not regard face-to-face as the natural approach. In this respect, ODL presents new options in teaching and teacher training.

Learning to learn is today a well-known concept. Different people learn in different ways. There is no one best way of learning. The student herself needs to find out about her learning style. This is often the first step in the process of becoming a self-directed learner. To support the student to reflect upon her way of studying, finding information and processing it, ODL is an efficient tool. Since there is no classroom to go to or a teacher telling you exactly what to do, it is easier for the student to realise that she herself must take charge of her studies. The pedagogical idea presented by her teacher gives the framework of the course and within this framework the student can direct her studies herself. If this student experience is mirrored in future teaching we can also look upon it as a way of enhancing professionalisation in teacher training.

How do we develop a professional language?

“You do not become aware of your actions until they are obvious to you, i.e. when they are perceived by your senses and processed in your mind. If your actions can be defined and expressed verbally variations concerning the contents and the consequences of your actions can appear more clearly. To be aware means to become attentive to the meaning of your actions. “ (Madsen, ed, 1994, p 168-169)

One of the criteria of a profession is that it has a professional language. Our experience both in our own careers as teachers and in our teacher training courses is that there is no such professional language for teachers. When teachers talk about what they do and why, it is often possible to interpret what is being said in alternative ways. What specific meaning that is connected to words is generally not explicit. In fact, teachers often agree on what is being said when actually they do not agree at all.

One way of establishing a professional language would be to use academic terminology. Teachers often meet this with frustration. Some teachers consider academic terminology too theoretical to be able to apply to teaching. Others are of the opinion that there is no point in using a special terminology. It is our experience that this attitude is more common among campus teachers. ODL teachers, on the other hand, often have a great need to discuss pedagogical aspects in connection to their ODL courses. With ODL as the framework for discussions, it emphasises the use of verbal language.

We think it is of great importance that words are noticed and discussed in order to develop the awareness of the meaning of words. A possible first step towards a professional language would be to develop a terminology within the course for the situation at hand. One of our courses is called Flexibelt lärande med distansinslag (“Flexible Learning with elements of Distance Education”).

In this course, we started a discussion with our teacher students about terms. We focused on what words to use, and why or why not. “Why ODL?” “Why not flexible teaching? Or flexible education? Why not FLD?” The point we want to make is: Within distance education there are many different varieties. Progress and changes are an integral part of designing ODL courses. One effect of this is that we cannot take for granted that a word like “flexible” means the same to different people, even if all are teachers. A further consequence of this, is that it puts a focus on the need of a professional language.

Most of the research on teaching/learning and distance education is done in English-speaking countries. Translating is a common way of approaching foreign literature. Most of the time it is an efficient way of transferring new information from one language to another. But there is always a problem connected to translation. All words do not translate easily. In Swedish, there is only one word for “to learn” and “to teach”. You use the same word “lära” whether you learn something yourself or you teach someone.

Another aspect of the problem of translation is to decide what word to use when there are several words that mean about the same. When Swedish teachers talk about a person who studies, they can talk about a “pupil” or a “student” or a “course participant”. These words have quite different connotations. A “course participant” is a mature person who has decided to attend a course to widen her horizon. A “pupil” is an irresponsible child who has to be taught and checked and who basically wants to go out to play instead of spending time in a dusty school room. A student is a young intellectual with great interest in her studies. When a teacher talks about her “pupils” it gives a certain idea of how she relates to the people who are taking her course. What we do not know, is whether she is thinking about them as “irresponsible children” or not.

Conclusion

When we started learning about distance education and ODL, it was often described in terms of attending methodology courses. But once we got into the matter, we realised that methodology did not present a general solution. We found that distance education and ODL present a great challenge to all teachers and teachers-to-be, because it puts focus on what it means, and can mean, to be a teacher.

Teaching has a long tradition, and one of its foundations is that students and teacher meet regularly and during these meetings, often called lessons, the students are supposed to learn from the teacher. Using information and communication technology, we can look upon time and place from another perspective.

Meeting, in the sense of having contact, is still at the heart of teaching, but it takes place in a different way. Student and teacher “talk” to each other using e-mail, students discuss in discussion groups on the net, chat rooms are open 24 hours a day, to mention some examples. In this context the teacher needs to design and conduct the course, rather than teach it in a traditional sense. In doing so, the teacher develops her professionalism.

In this paper we have discussed the professionalisation of teachers and how ODL can contribute to it in terms of identifying a professional object, relating to pedagogical problems, the need for and the development of a professional language. The concept of distance education implies a distance, in a geographical sense. It is our experience that not being in the same “physical” room as our students has enhanced our attentiveness. In ODL it is hard to take anything for granted. We listen more to our students and to each other. We are more professional in our way of relating to teaching.

A flexible approach to time and place within the framework of the course creates new demands on dealing with communication. In this process we have learnt to develop our use of both information and communication technology as well as verbal language. The need to make didactic decisions in advance, to present the framework of the course to the students in writing and relating to different design models have put focus on the contribution of ODL in the process of teacher professionalism. And of course, in the training of teachers!

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MASTER DEGREE PROGRAM OF FLEXIBLE LEARNING IN-SERVICE TRAINING COURSE FOR TEACHERS, 60 ECTS-CREDITS

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Introduction

Swedish society is dependent on changes in Europe and other parts of the world. EU, European co-operation from a variety of areas, cultures of immigrants, media and technological development, and environmental problems, influences Sweden. The teacher education has to show ability to adapt to the needs of the compulsory, non-compulsory school, universities, industries and commerce and create possibilities to affect them. The teacher education in Sweden is blamed for slow change and not being in phase with the changes in the society. At the Department of Teacher Training we try to develop teacher education programmes that fit the needs of the society. We encourage the students to take on the responsibility for and affect their own studies, to develop the ability to co-operate, to work problem-oriented and be prepared for continues changes. We have found distance education as a way of achieving the aims mentioned and this form of distribution of education is rapidly expanding. This development tendency also points out the need of a program for education of teachers in distance education/flexible learning.

In Sweden a new Master degree program is introduced from autumn 2002 and our department offers a program of flexible learning aimed for teachers and employees in industry and commerce. A few months earlier in March 2002, the Swedish Net University was established. We will try to get the new Master degree program accepted in the Net University. If we succeed we can reach teachers and others all over the country and create an education program for flexible learning. The program is presented below.

In-service training course, 60 ECTS-credits

Target groups

The course is aimed for teachers in secondary and upper secondary school, folk high school, universities, university colleges and personnel responsible for educational programs in the national school system, industry and commerce.

Requirements for admission

To be accepted to the course the applicant needs to have 180 ECTS-credits and has a teacher education or employment as a teacher or employment as organizer of educational programs in the national school system, industry or commerce.

Aim

The student of the programme will achieve broader and deeper knowledge in behavioural sciences, flexible learning planning, teaching and evaluation in perspective of community requirements and from pedagogical and didactic perspectives. The student will also get a better understanding of information and communication technology (ICT) and develop skills in using ICT in education. Studies will end with a degree project where the students acquired knowledge, skills and experiences are used in a scientific research project on didactic basis.

Content

The course consists of two units, 30 ECTS-credits each.

Flexible learning 1, 30 ECTS-credits

- Behavioural sciences 1 7,5 ECTS-credits
- Teacher in distance education/flexible learning 7,5 ECTS-credits
- Two of the following courses, 2x7,5 15 ECTS-credits
 - Pedagogical/didactic advanced course, 7,5
 - ICT and media, 7,5
 - Evaluation, 7,5

Total

30 ECTS-credits

Flexible learning 2, 30 ECTS-credits

- Behavioural sciences 2 7,5 ECTS-credits
- Degree project 15 ECTS-credits
- The remaining of the above three described elective courses 7,5 ECTS-credits

Total

30 ECTS-credits

Flexible learning, materials and technology

Study-guides are available on Internet for each separate course, giving suggestions on relevant literature, individual tasks, group work and examinations. Detailed explanations are found in these guidebooks, covering relevant literature, examinations, objectives and ways to achieve a successful training. The students are asked to use word processing when working with the problems/tasks. A First-Class conference system will facilitate a closer contact between teacher and students and between students. Mail, telephone and video communication will also be used.

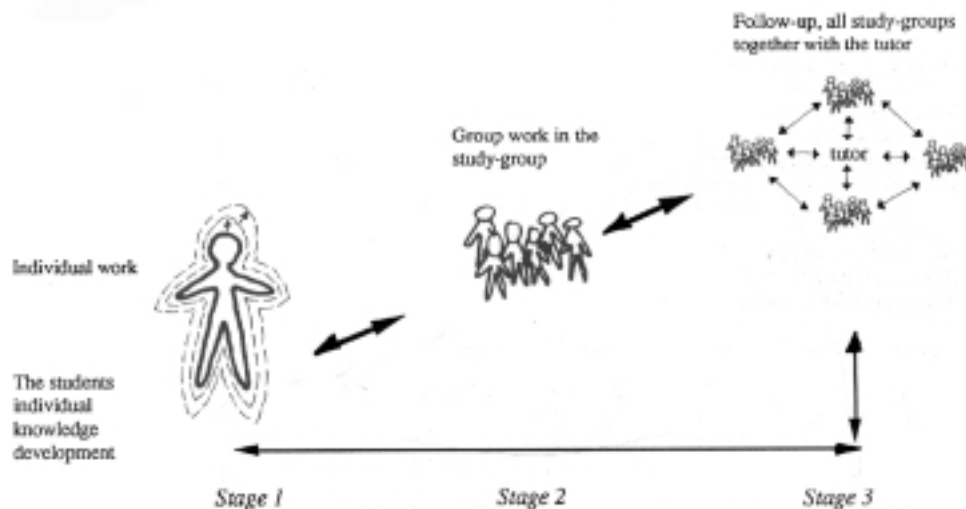
Teaching methods – Group studies

From the start of the first course the students are trained in group-study methods. The teachers make sure that the group is functioning in an appropriate way before the students leave the university for home studies.

The number of students, five or six, is suitable as the group gets enough competence to deal with the tasks and every member has a possibility to communicate with everyone in the group. The students belong to the same study group during the whole study period. The duration of each course is too short to create new groups.

Every group has access to a resource-tutor, who can answer questions and discuss with individual students as well as a group of students. He/she takes part in the students group meetings in accordance with the students own wishes and can assist if problems arise in the group. It is important not to split the group and the tutors and the teachers try to help the students to be aware of their situation, analyse it and find solutions to problems that may arise. The tutors' and teachers' tasks are also to make sure that every individual student becomes aware of his/her own behaviour and attitudes however the teacher should not act as a therapist.

The figure below is a model for group studies and will illustrate the ways students and tutors/teachers work.



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Figure. Working in groups

The aim of the teaching is also to encourage students to think of their training as a developing process in three phases.

1. initially, he/she studies on his/her own or within the group
2. secondly, he/she works within the group or on his/her own
3. finally, he/she has acquired enough knowledge for discussions with experts at the Department in Uppsala.

Examination and evaluation

Examination of the students will be based on their performances in individual and group assignments, in virtual seminars and projects. The examination degrees will be Pass with distinction, Pass and Fail.

The internal evaluation of the courses will be formative and implemented in the communication system, which makes it possible to develop the on-going course. Summative evaluation will be performed in the end of the course using questionnaires. Syllabi and the degree system are the natural basis for development of the instruments.

The Department will use the information obtained from these evaluations to reorganise programmes, develop syllabi, change forms for examination etc.

Externally the Swedish Net University Agency is responsible for the quality of courses presented in the Net University.

International Perspectives

A Master degree program of flexible learning would no doubt give status to flexible learning as a way of organizing education and also to teachers involved. Flexible learning is still unknown for many organizers of education and for teachers in Sweden. A Master degree program would be more attractive than different in-service training courses not leading to a Master degree.

Master degree programs may vary in many ways for example in aims and content, amount of ECTS points, and didactic viewpoints. There is certainly a need for different teacher training programs in flexible learning not just one program. Master degree programs are already been developed at other universities than at Uppsala University. I believe that it is a good idea to exchange experiences and create

one or more programs according to the needs expressed by students and people responsible for education programs and courses in European and other international universities and schools. If the programs are presented and taught in English students will have several programs to choose from among. There would be cross-border virtual communities of learners, which could present many ideas and viewpoints regarding flexible learning. Using ICT, for example a communication system, could facilitate the everyday communication. Videoconferences and other techniques would be used for special purposes where the technique is suitable. In England Open University, for example, represents a single mode organization of flexible learning with a lot of deep and broad experiences. At Uppsala University we use a double mode organization.

With several universities involved in the development of programs the base for research would be widened and more students, more teachers and researchers would participate. It is important for a small country like Sweden to learn from other countries how to develop and teach teacher courses in flexible learning. I have in this paper described our plans at Uppsala University for development of a Master degree program of flexible learning.

If I summarize I would like to discuss the following questions.

Is there an interest in

- International co-operation regarding a Master degree program of flexible learning?
- International co-operation in design and development of a Master degree program of flexible learning?
- Creating cross-border virtual communities of learners in a Master degree program of flexible learning?
- Academic co-operation and joint research in a Master degree program of flexible learning?
- Creating a network for exchange of existing experience, practice and evaluations of education of distance/flexible learning teachers?

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MODELLING OF EDUCATION IN THE ENVIRONMENTS OF TYPE “VIRTUAL UNIVERSITY”

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Introduction

Environments of type “*virtual university*” using the new information and communication *technologies* give easily accessible friendly *interface*, different *methods* for online access to the necessary resources and services, and *communication* between the subjects in different medias (text, audio and video) [Somova, 2000]. These environments have to satisfy the different and contradictory requirements of the users: for the *learner* – the generated course have to vary dynamically (*dynamic model of education*) on the base of learner’s progress (*individualized model of education*) passing over each learning phase; for the *author* – he/she has to be able to publish and republish distantly his/her own materials; for the *teacher* – to have means for tutoring and communication with learners, automatically generation and verification of tests in order to evaluate learners, etc.

One of the first models for planning of education are proposed in [Pashin, 1985; Saveliev, 1986; Zaiceva, 1989], which are mainly theoretical. They are formalized on the grounds of the model of the learner and the model of learning materials built on the basis of studying concepts.

[Grandbastien, 1994] proposes formal model for description of learning materials on the base of concepts and system ECSA, using this model. The evaluation of the learner’s ability and the representation of the pedagogical objectives are realized through respective tokens for each concept. Other models using the representation of the pedagogical objectives in the terms of concepts are presented in [Lesgold, 1988; Merrill, 1990].

The classical model for planning [Chien] is based on the initial and the final state of the problem and the operators for transformation of one state into another. The Chien model can not represent multiple used educational environment, where learners are interested in optimizing the path for passing over learning materials, not only from the point of view of the length of the path, but also depending on the time for passing over, price, level of difficulty, etc.

The classical model is expanded in [Koehler 1998, Rintanen 1999, Milani 2001] by adding resources (level, time, price, etc.). The disadvantage of the exiting models with resources is that they do not consider the structure and content of learning materials, the studied concepts and their representation (introduction, definition, example, classification, comparison, application, etc.). These representations we will call *layers*.

This work proposes a *model for planning of education based on resources and layers*. Each learning material or concept is determined by certain characteristics: layer and list of resources and resource values.

Plan of education

Subject domain (SD) [Doneva, 1994] is logically linked system of knowledge for particular processes, concepts, problems, solving methods and relationships between them.

Definition 1: Model of SD M_{sd} is oriented graph $G_{sd} = (V_{sd}, E_{sd})$, where the set V_{sd} consists of nodes, introducing concepts of SD, and the set E_{sd} consists of arcs, determining the relationships between concepts of the type *predecessor_of*.

Definition 2: Model of learning course M_{lc} in SD M_{sd} is oriented graph $G_{lc} = (V_{lc}, E_{lc})$, where $V_{lc} = V_{cc} \cup B$ and the set of nodes $V_{cc} (\subset V_{sd})$, introduces the concepts, studied in M_{lc} , the set B consists of 3 node types – **and**, **or** and **not**, through which the process of education is modelled, and the set of arcs E_{lc} introduces the relationships between the concepts.

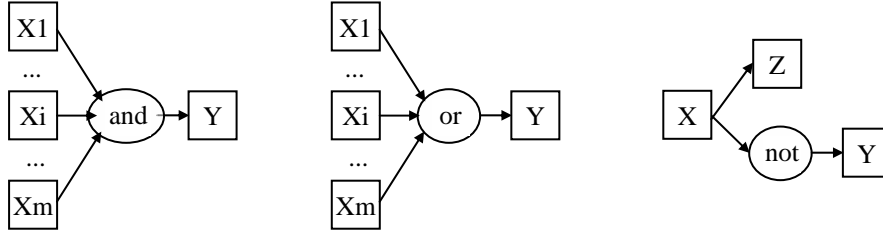


Figure 1. And-, or- and not-nodes

If $\{X_i, i = \overline{1, m}\}$ are predecessors of the *and*-node or the *or*-node (Figure 1), in order to reach the node Y it is respectively necessary to pass over all $X_i, i = \overline{1, m}$ or to pass over one of them. If X is a predecessor of Z and *not*-node, in order to reach the node Y it is necessary to pass over the node X with failure, otherwise the node Z is reached.

Introducing nodes of type *and*, *or* and *not* gives during the learning process the opportunity to set respectively parallel actions (without order of passing over) with compulsory learning materials; variety of education (the learner himself can choose the learning materials through which to pass over) with noncompulsory learning materials; and additional supporting materials (to prevent students from failure).

The learning materials can be either **learning units** (text, multimedia, etc.) or **verification units** (tasks or tests for verification or self-assessment). Every learning material regards one or several concepts. The full representation and verification of a concept in the common case can be made in some learning and verification units.

Definition 3: Model of the learner M_s^t is determined by the triple (V_i, V_t, R_t) , where V_i is the beginning set of known concepts, V_t – current set of learned concepts ($V_i \subseteq V_t \subset V_{lc}$) and R_t – current list of resource and value, specifying the characteristics of the learner.

M_s^i and M_s^f are the models of the initial and final (target) state of the learner respectively determined by the triples (V_i, V_i, R_i) and (V_i, V_f, R_f) , where V_f is the final set of the learned concepts, and R_i and R_f – the initial and the final set of learner's characteristics.

Definition 4: Plan of education is determined by the couple (G_{ep}, F) , where $G_{ep} = (V_{ep}, E_{ep})$ is oriented graph with the sets of nodes $V_{ep} \subseteq V_{lc}$ and arcs $E_{ep} \subseteq E_{lc}$, and $F : V_{ep} \cap V_{cc} \rightarrow [\text{list of learning materials}]$ is a function.

The plan of education of a particular learner depends on M_s^i and M_s^f . For a certain learner, while searching for appropriate learning materials for one concept, there could be found (Figure 2): just one learning material (for example for *a*); several not connected learning materials (for example for *b*); and there could not be found materials, illustrating the concept (for example for *c*).

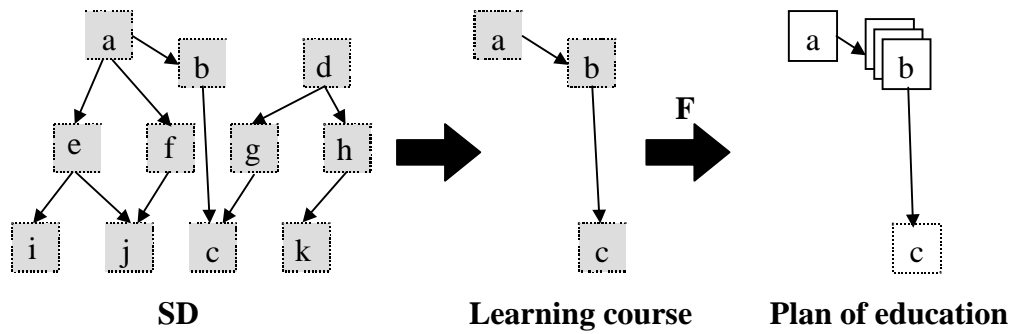


Figure 2. Relationship between SD, learning course and plan of education

Predicates from Table 1 are used for the description of the introduced models.

Table 1. Predicates and examples for representing models

Model	Predicates/ Examples
M_{sd}	<p><i>predecessor_of</i> (concept, concept)</p> <p><i>concept</i> (material, concept, list of layers, resource, value)</p> <p><i>material</i> (material, list of layers, resource, value)</p> <p><i>assignment</i> (assignment, concept, resource, value)</p> <p><i>concept</i> (the concept number system, number system, [definition], level, 3) – in the material the concept number system is described the concept number system with layer definition and resource level with value 3</p> <p><i>material</i> (transformation from one number system into another, [all], price, 10) – the material transformation from one number system into another describes its concepts with all layers and resource price with value 20</p> <p><i>assignment</i> (What is number system?, number system, time, 5) – the assignment What is number system? evaluates the concept number system with resource time = 5 minutes</p>
M_{lc}	<p><i>predecessor_of</i> (concept/ and/ or/ not, concept/ and/ or/ not)</p> <p><i>predecessor_of</i> (algorithm, subalgorithm) – the concept algorithm has to precede the concept subalgorithm</p>
M_s^t	<p><i>resource</i> (resource, list of possible values/ interval)</p> <p><i>initial_concept</i> (concept)</p> <p><i>seen</i> (concept/material, list of layers, resource, value)</p> <p><i>learned</i> (concept/material, list of layers, resource, value)</p> <p><i>resource</i> (level, [2, 3]) – knowledge level from 2 to 3</p> <p><i>initial_concept</i> (number) – know initial concept number</p> <p><i>seen</i> (number system, [definition, classification], level, 3) – the material about the concept number system with layers definition and classification and resource level with value 3 has been read</p> <p><i>learned</i> (number system, [definition], level, 3) – the concept number system with layer definition and resource level with value 3 has been learned</p>
P	<p><i>predecessor_of</i> (material, material)</p> <p><i>predecessor_of</i> (the concept number system, classification of the number systems) – the material the concept number system is a predecessor of the material classification of the number systems</p>

<i>F</i>	<i>author_of_material</i> (author)
	<i>resource</i> (resource, list of possible values/ interval)
	<i>layers</i> (list of layers)
	<i>layers</i> ([<i>introduction, definition, classification, example, assignment</i>]) – layers, that have to regard for the concepts are pointed and ordered in the given list
	<i>author_of_material</i> (<i>Totkov</i>) – materials from the author <i>Totkov</i>

Actions, which are caused by learning and verification unit, are respectively learning and verification action. The **learning action** is realized when the material(s) are offered to the learner and it is supposed that the knowledge of the learner is changed (increased). The **verification action** is realized when the material(s) are offered to the learner and they interact with the learner in order to evaluate learner's knowledge and skills. Predicates *seen* determine the effect of the verification action, *learned* – of the learning action. The predicate *seen* points out, that the learning material has reached the student, but not that his/her knowledge and skills are improved, this is determined by the predicate *learned*.

Strategies for carrying out education

The plan of education is a sequence of learning and verification actions, and is generated **statically** (it is represented in a file with organized learning materials, in accordance with the initial state of a particular group of learners) and **dynamically** (for learners with different knowledge and skills), both they are built on the base of graph of concepts or materials. The education can be carried out **statically** (through the static plan), **algorithmically** (through passing over a given plan in depth, in width or in some other algorithm) and **freely** (dynamic or author's plan).

recommended path for passing over the materials. The student has freedom to choose the order of learning in the presence of parallel actions and to miss some branches of the graph in the presence of *or*-. The author can propose a plan of education (**author's plan**) by his/her own learning materials, i.e. a nodes (Figure 3). This path is accepted to be the best and is used by the dynamic plan for giving some recommendations about the choice between several nodes from the graph.

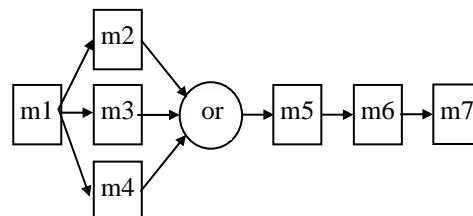


Figure 3. Author's plan of education

For a certain concept all materials, which are responding to the resource and layer restrictions are obtained with **dynamically generated plan** of a course based on of the graph of concepts. The found learning materials, explaining/verifying extra concepts (besides the searched concepts) which are not in the learning course, are recommended for additional learning/solving. It is recommended to search for a material in conventional bearers or a help from the teacher for concepts, for which materials are not found. During the educational process learning materials are proposed only for concepts, for which predecessor concepts are passed over with their respective materials.

On the base of the author's plan of education one of materials is always recommended as the best-fitting one. The learner himself/herself has the opportunity to choose the next material.

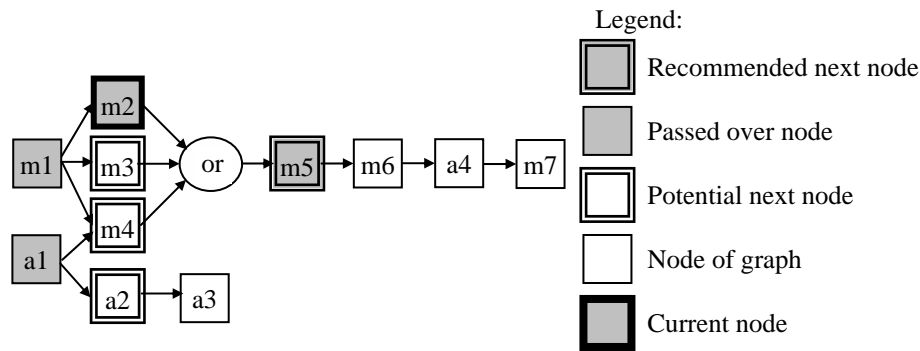


Figure 4. Choice of learning material in the dynamic plan of education

On Figure 4 is represented exemplary graph of learning materials in a particular moment of learning. $M_0 = \{m_1, m_2, m_3, m_4, m_5, m_6, m_7, a_1, a_2, a_3, a_4\}$ is the set of learning materials of a given course, $M_1 = \{m_1, m_2, a_1\}$ – the passed over learning materials, $M_2 = \{m_3, m_4, m_5, a_2\}$ – the potential next learning materials, for which all preceding materials are passed over, $M_3 = \{m_6, m_7, a_3, a_4\}$ – non-passed over materials. The exemplary author's course (Figure 3) includes the set of learning materials $M_{ac} = \{m_1, m_2, m_3, m_4, m_5, m_6, m_7\}$. A set of additional materials – $M_a = \{a_1, a_2, a_3, a_4\}$, is found. If m_2 is the current learning material, then m_5 is recommended to be the next learning material, because it is the first non-learned material from the recommended author's sequence.

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SELF-DIRECTED DISTANCE LEARNING SYSTEMS: A EUROPEAN-LEVEL COOPERATION INITIATIVE

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Introduction

With the current trends driven by advances in information technology lifelong learning is an essential challenge for shaping the future of our societies; it is a necessity rather than a possibility or a luxury to be considered. The significance of computer-based learning is growing in all kinds of learning scenarios. eLearning generally is seen as the chance to innovate learning. Learning can take place anywhere, at the moment when it is needed. It can be individualized concerning time, place, duration, and learning style. Learning can be taken out of classrooms and formal educational institutions. It must be integrated into working and private life. Even if critical opinions exist and empirical verifications of success stories are rare, still most experts agree that eLearning promises to innovate ways of learning. For instance, the eEurope initiative claims that *“the possibilities which interactive networking brings can be exploited to develop a whole new approach to learning and training – eEducation – where students access a host of academic and research material and facilities online. ... what is needed is both a network capable of supporting end-to-end multimedia communications with guaranteed quality and the development of innovative content, practices and tools to demonstrate usage of virtual campuses and virtual institutes.”*

It is our opinion that currently the first part, the technological issue, is far better developed than the second aspect of a new pedagogy for online learning. The remaining challenge consists of understanding, exploring, and supporting new learning paradigms such as self-directed learning, learning on demand, informal learning, and collaborative learning. At the moment, the development of innovative content and learning scenarios are rare, singular, and are not well documented and systemized. This is why eLearning scenarios are hardly transferred to different learning contexts. One proposal to tackle this problem by utilizing formal computer science methods adapted to the process of systematically specifying and formalizing didactic arrangements is described in [1]. In this paper we concentrate on the organizational issue of an European, transnational cooperation across different kinds of universities in order to develop innovative pedagogical processes which can be fostered by existing eLearning technology.

The challenge: Self-directed learning

Most of the current designs in learning systems implicitly presuppose a self-directed learning scenario, when they try to fulfill some of the main promises of computer-mediated learning, namely time and space independent, individualized learning in working or private life situations. These aspects determine that students can choose their own pace, duration, style, and sequence of the learning. Thus, in general students learn stand-alone. In some cases communication can be integrated at certain points (e.g. during breakdowns, when learners get stuck), but in most cases learners must control their learning themselves. This kind of self-directed learning is a whole new paradigm of learning.

Most authors of learning content do not take into account that this requires new competences from learners. Many of the current approaches to online learning have the same problem: namely, the adoption of traditional instructional models, the view of learning as an information delivery process coupled with practice of procedures. This discrepancy becomes even worse, because online learning requires more competences from learners: organizing and controlling the learning process. These tasks are traditionally performed by teachers. Most of the learning system designs start from traditional teaching paradigm and thus do not offer any help in performing these new learning tasks.

One of the challenges of lifelong learning is to support new paradigms of learning. The problem with this new paradigm is that teachers and students have no experience in how learning works in this self-directed setting. We all learned in traditional schools with classroom settings and teacher-centered approaches. We are used to learn passively, reproductive and oriented towards formal certification. Self-directed learning on the other hand must be active, constructive and self-rewarding. Let us analyze which new tasks a learner has to perform when learning self-directed, tasks which are performed by teachers in a traditional learning scenario (educational process):

- defining learning objectives (on different levels of granularity);
- collecting and evaluating material, choosing the relevant parts and structuring the material;
- deciding on adequate forms of presentation of the material depending on the target group and learning objectives for this group;
- presenting the content;
- evaluating the learning process, giving feedback and adapting the flow and presentation of content;
- assessing and certifying the learning success;
- keeping up the motivation for learning.

When students have to take the responsibility for educational decisions, they should be supported by the learning platform. The learning system should provide for tools supporting the choice of content, the sequence of actions and give feedback after (self-)evaluations.

The starting point: A pedagogical framework for building courses

Implementations of effective educational platforms need to carefully take into account the requirements identified in the previous sections. At Politecnico di Torino we designed an educational-oriented authoring tool capable of producing on-line courses with a structure and organization of the contents already defined according to a previously selected educational methodology [2, 3]. The application framework allows teachers with no specific computer science skills to easily create courses that may contain different content formats: simple text and pictures, but also audio/video streams, Java applets or animations. The main characteristic of the tool is flexibility, in the sense that contents are presented to the students in different ways, depending on their previous knowledge, on their learning goals, on the kind of hardware used to access the content, and on some preferences of the user (due to special educational needs, for example).

In order to acquire new knowledge, students are supposed to study, to practice new concepts, to solve problems and, very importantly, to assess their knowledge level with self-evaluation mechanisms. Each course is considered as a collection of modules, part of a homogenous structure; each module has clearly stated pre-requisites for the fruition and well defined learning objectives. Entrance and exit levels of knowledge associated to each module together with the graph of dependencies between modules permit the dynamical building of the educational path according to the student profile. Furthermore, each module allows different views of the content, since it consists mainly of a collection of sub-modules offering different presentation formats.

One of the main advantages of hypermedia with respect to traditional educational aids is the possibility of interactive learning, self-assessment and self-evaluation. The self-evaluation mechanism allows the student to test his or her level of knowledge and understanding of the concepts, permitting as well the dynamical building of the educational paths among the modules of the courses. Two types of tests are possible: a preliminary optional test, used for determining the student's level of knowledge when she is making the first contact with the course, and a final test for each module, used to determine whether or not the student has acquired the required exit level of knowledge for the module, and to choose the level of presentation of the following module. According to the results of the final test for each module, the profile of the student is modified, and the student's choice of the next module is reduced to those for which she has acquired the pre-requisite knowledge. The main idea is that the better the student performs, the less content she needs. In an extreme situation, the student that did not acquire the desired level of

knowledge could be forced to study once more the same module, in order to acquire the minimum level of knowledge required to proceed to another module. A course structure like this has two degrees of flexibility in building the educational paths: on one hand it allows the combination of different modules in different orders, and on the other the amount and the type of information presented in each module vary.

The developed application uses XML (Extensible Markup Language) [4] for the organization of the contents, assuring a simple way to modify the presentation of the modules. One DTD (Document Type Definition) grammar [5] is defined for the general structure of all the courses. The grammar lists the rules the course should satisfy, that is the division in different modules and the different views of each module (the sub-modules described above). For each sub-module it defines the possible contents and the minimum information that should be present. The contents can be created either by using a simple text editor, or by using an XML editor. The XML standard, which uses text files to maintain database-alike content, was the key for obtaining the desired flexibility.

It is important to state that we identified and implemented one of the possible content organizations that meet specific educational requirements, but the framework has been designed more general, and can easily be adapted to other structures. One of the main goals of the framework, in fact, is to be a flexible tool for experimenting educational methodologies applied to specific courseware.

At this point, we would like to add new meta-cognitive functionalities to the framework, in order to implement a more effective educational model. So far, the existing tools allow for the integration of self-assessment. But the results of self-evaluation can only be used to compute a learning path which was previously determined by a teacher at design time. The next step would have students take complete responsibility for their learning. One of the main aspects of learner-centered instruction is trust. While the teacher is always available to help, he or she trusts the students to take responsibility for their own learning process and success. Thus students need to be asked of setting their own learning objectives by choosing from the objectives presented from the system. They should also choose the level of knowledge and the time they are ready to invest in learning. Students must be supported by tools for explicitly planning their way of learning and for choosing a learning strategy (e.g. reading theoretical chapters vs. practicing vs. exploring by verifying or falsifying self-made hypotheses etc.). The system should monitor the learning progress, the chosen modules and so on: instead of computing the next module to be taken the system should confront students with differences in the original plan and the actually taken educational path.

Cooperation issues

We evaluated this XML-based educational framework at Politecnico di Torino by building and testing a courseware on database systems and applications, and on SQL language in particular. The system proved to be effective for the test population, i.e. students of the last year of a BS degree in computer science engineering, and we are implementing new courses within this framework.

However, since our research aims at experimenting effective educational strategies more than at implementing a tool for course design, for which many commercial educational exist, a lot of further aspects have to be integrated, for which cooperation at a European level can be of invaluable help. We started a cooperation with the Pädagogische Hochschule Ludwigsburg, whose competencies in educational strategies are complementary to the technical competences of Politecnico di Torino. The university of education in Ludwigsburg is currently using the XML-based framework for implementing new courses in the field of teachers education. Most of research in universities about using information and communication technologies in education, in fact, is oriented to building courseware about computer science topics, due to obvious reasons such as the competence of authors and availability of developers. Testing the tool in different settings (university, students, course typology, ...) at a transnational level will help understand the effectiveness of educational framework in a more general situation. Methodology for building self-evaluation interactive mechanisms, for example, can be very different if applied to a scientific context, in which quizzes or simulations can be suitable, or to social sciences, in which learning often comes from case studies analysis and best practice applications.

Besides this first cooperation level, that is the necessary starting step to evaluate the strong and the weak points of the framework and of the implemented educational strategies, we aim at further experimenting educational methodologies applied to courseware design, applicable in a European-wide context and in a general setting. We intend in particular to add functionalities to the framework, in order to better support self-directed learning scenarios. These modules comprises tools for the planning, controlling and adjusting of the learning process steered by the learner.

The next step: Integrating support for self-directed learning

So far the framework has been successfully used for classes in database systems in addition to face to face sessions. Students, most of all, liked the interactive features of the self-evaluation tests, which allowed them to practice SQL queries and have them compared to the correct answers obtained through a SQL server real query submission. On the other hand they considered the system a little bit too “rigid”, since the educational path forced them always to follow a pre-defined route they were not allowed to change (and sometimes they felt as if the path was somehow “mysteriously” created). These learning scenarios, can be classified as mostly instructional, which is not always suitable for university learning. In the following, we investigate how the framework can be utilized, to also support the new paradigm of self-directed learning. In order to follow the current trends in constructionist [6], and situated learning theories [7] it is important to activate the learner and have her or him take responsibility for the learning success.

Some of the most important problems of implementing self-directed learning are the learning experiences of learners and teachers. Learners traditionally recognize learning as a passive, reproductive process, which is carried out in dependency of a directing person (teacher or tutor). Learners normally are not used to reflect upon learning objectives or diverse strategies of learning. Also measuring and controlling the learning progress is not very common. All these functions are traditionally carried out by teachers. As a consequence, learners feel lost, when being “left alone”. Many times, they do not know how to start, or when to stop learning. Another problem is how to classify newly acquired knowledge, and how can achievements be compared to former achievements. While we can not solve all these problems, in the following we will sketch how the existing framework can be utilized to support the learner by some (auto-)didactic decisions. The activities of self-directed learning can be differentiated into five functions of a good teacher [8] based on Gagné’s instructional design principles [9] which we have adopted to self-directed learning [10]:

- preparation of the learning arrangement for the self-directed learning;
- carrying out learning activities;
- supervising and steering of the own learning activities;
- self-assessment of the learning progress and reflection about achievements;
- keeping up motivation and concentration.

The framework so far offers tools for authors to specify entry (previous knowledge) level and exit (acquired additional knowledge) level attached to modules. It also has a monitoring component to keep track of knowledge developments documented by self-assessments (tests). These monitoring results are stored in learner profiles together with some other user’s preferences, like access possibilities and general presentation preferences. All this information forms a good basis of information to let the learner actively take part in the learning process, if the information is made available in an adequate form. In order to improve the framework from a meta-cognitive point of view, further tools have to be added for the learner to explicitly control the learning process:

- Tools for setting learning objectives and differentiate them according to cognitive educational objectives, e.g. defined by Bloom’s taxonomy [11]. With this specification, the system should support the learner in composing the modules (or sub-modules) fitting best to her or his goals. But rather than computing and presenting the completely compiled module, it would be preferable to let the user take responsibility for decisions and also argue for or against certain proposed modules/sub-modules.

- Tools for choosing a learning strategy, e.g. reading the theory and then practicing the procedures vs. starting with a problem and trying to solve until a breakdown occurs and then search for the theory behind etc.
- Tools for selecting the time to invest and when to schedule each module, and the duration for exercises or other actions.

All these points together form the learning plan. The system can help compiling the plan by visualizing dependency graphs, variants to choose from, presenting information about expected duration, style of learning and so on. But it is important to let the student decide herself what she prefers. Then learning should take place according to this plan and interactive decisions on the way. While carrying out the learning the system again can help by offering the modules which were chosen originally. It might even control the time and make the student aware of differences with respect to the original plan. But it is preferable to always let the learner decide whether she wants to stick with the original plan or change it on the way, e.g. to visit another module which was not planned, which was not in the chosen path at all or at another position. The learner should also be allowed to jump on and off the educational path. The monitoring should keep track of differences in the plan and the carrying out of learning activities only to let the learner reflect about these differences, e.g. after self-assessment of learning success, so that learning strategy and learning success can be related. This way students learn also about the learning process itself (meta-learning [12]).

Some of the existing commercial applications have implemented tools able to show statistics about the user behavior (such as how much time each student spent in each module, how many time he or she failed a test, and so on). These tools, however, are always oriented towards the teacher, the tutor or the system administrator, and are not designed for self-directed learning purposes. At the University of Darmstadt we have implemented a basic prototype of such a system in 1996 (diploma thesis: [10]), where the ideas for the planning component were present, but the authoring and monitoring modules were not implemented. For this purpose, the XML-based framework can be a good starting point for adding these new self-directed learning components.

First of all, the learner's profile will be enhanced in order to add information about learner's strategies and decisions. The profile will comprehend the student's plan, that the system asked him or her to introduce as a preliminary stage, after giving a general introduction to the course. Filling the plan will consist in building a table (then stored in the user profile) with an ordered list of the selected sub-modules, the amount of time that the student supposes to dedicate to each of them, the amount of time that he or she foresees to spend on practicing that topic, and so on. This information is stored and never overwritten: the new versions of the plan, generated every time the learner makes some changes on it, are appended to the original one, in order to allow comparisons and feedback.

The system allows the learner to make two kinds of changes to the current plan: explicit changes and implicit, sometimes unintentional ones. The first one happens when the user selects the option "change plan", and modifies it in a similar way he or she did at the beginning of the course; this is useful when the learner understands that she or he will not be able to match the previous decisions, and realizes that a change in the learning strategy is necessary. The second one happens when the learner follows a different path from the pre-compiled, planned one or takes more or less time for exercises etc.; in this case the system allows her to do that, but also makes her aware of the shift from the previous plan. This notice can either be made immediately or after self-assessment in order to initiate reflection of the learning process.

With respect to the previous version, the system's main task still consists in building the educational path according to the user profile in terms of sub-modules (deriving from the learner's plan) and views (according to user's preferences, special educational needs, performance and so on). However, in this case the educational path is not strictly mandatory any more, and the navigation options outside the selected path are not disabled any more. This opportunity gives the learner a more direct control over his or her learning process, transferring part of the responsibilities from the teacher-author to the learner-user.

The feedback module, finally, is not transparent to the user any more. Previously, in fact, its role was almost coincident with the decision module, and consisted in evaluating the test results and updating the proposed (and compulsory) educational path. In the new version, the decision module is still the one that build the (non-compulsory) educational path using the self-evaluation test and the learner's plan

information, but the feedback module has the basic role of making the students aware of the differences between the planned and the actually performed actions, giving them useful suggestions and advice. The XML-based architecture allows the required flexibility for implementing the described changes in the framework, designed expressly for experimenting new educational methodology. The grammar of the course, and the user profile specifications need to be modified, but the general architecture of the system still remains the same.

As described here, the system does not only support self-directed learning, it also provides tools for meta-learning. Since learners were not born as educational experts, they must learn some of this expertise while using the system, making the right decisions at the right moment. As a first step the learning process must be explicitly recognized (meta-cognition). This is why a self-directed learning system must challenge learners with decisions: it must make the learning explicit as a systematic process which is goal-oriented. Then, when a learner is asked to control the success of learning, the system should not only provide feedback on domain specific achievements, but also relate success or failure and differences between original plan and actual carrying out of learning to the results of the assessment. This will lead to the reflection about learning strategies and will enhance self-directed learning competences.

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PROFESSIONALISATION OF MODULE DEVELOPMENT IN OPEN AND DISTANCE LEARNING

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Abstract

This paper outlines a design methodology for the creation of online learning materials to facilitate the transition from traditional classroom approaches to tutoring online. The material presented is derived from ad hoc qualitative knowledge rather than quantitative, evaluated research.

Introduction

When creating classroom lecture material there is a natural focus on content – creation of slides and other materials which the lecturer can then expand upon in front of the students, gauging their responses and understanding of the material as it is delivered and hence tailoring it in situ.

Experience shows that transferring this approach to online materials creates very dry material that tends to be a distillation of the bare facts. It then becomes very difficult to encourage the students to take a ‘constructivist’ [1] approach to the material, discussing and questioning the main concepts behind the content. Also tutors tend to take a passive, reactive approach to the learning experience, waiting for the students to post questions to the discussion lists, when invariably the students cannot conceptualise questions as they are not able to abstract to the higher theories behind the content.

This document details the Open and Distance Learning unit at Queen Mary, University of London’s approach to creating systemised, concept led materials that also facilitate the transition from traditional lecturer to online tutor.

Background

The ODL unit at Queen Mary is the result of an innovative collaboration between Queen Mary, the Communication Workers Union (CWU) and British Telecom (BT) to provide BT staff the opportunity to study for a Bachelors degree in Computer Science, part time at a distance utilising a Virtual Learning Environment (VLE).

The students are taken from BT’s general workforce and so application is based upon experience rather than qualifications and hence the students are generally very inexperienced with regard to study skills at higher levels – most having not studied for a considerable time.

The unit has been running for 3 years and has a student population of 175 UK students (rising to 450 in 2003/2004) which is going to be supplemented by an influx of 120 students based in Hong Kong this autumn.

The success of the unit has seen the numbers of staff expand from 4 full time to 8 full time staff and a further 8 staff to be shared with the department of Computer Science at Queen Mary.

The unit also employs over 20 student mentors who are taken from the undergraduate and post graduate student population in the department of Computer Science. Their responsibilities are to help the students understanding of the material, research into relevant topics and with presentation of findings in courseworks.

Motivation

The main foci of attention resulting from the initiatives detailed above:

- New staff have to be able to develop high quality learning resources focused on concepts rather than content with very little opportunity for extensive training. They are also then required to tutor these modules online.
- Reduction in disenfranchisement in an open learning environment for students used to the 'training' approach taken by BT to teach employees new skills.
- The Hong Kong students will also have some face to face tutorial sessions which will be done in line with the standard modules.
- The mentors have to be able to make an active contribution to the learning experience of the students without necessarily being an expert in the particular area.

These have highlighted the necessity to create professional standards of practice in the development and tutoring of online modules. This will help with development and training of new staff and quality of provision standards.

Current Module Development and Tutoring Practise

Figure 1 below gives an overview of the components of an online course delivered via a VLE as previously delivered within the unit.

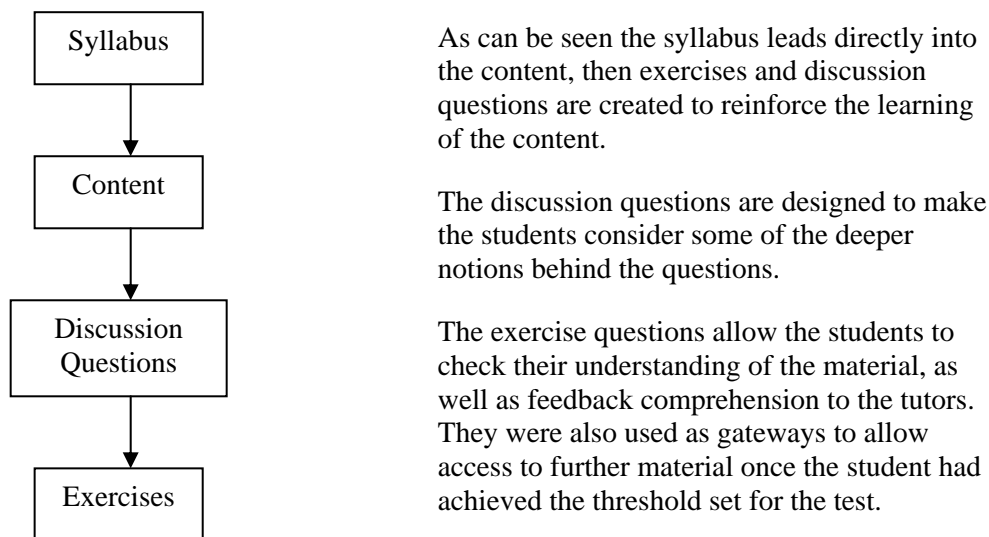


Figure 1 – Development Framework

The modules were developed as a partnership between the module tutor who provided the content expertise and the module development staff who organised the material (chunking it into logically related, short sections) and extra content such as graphics into a cohesive online course.

These modules were then delivered in an entirely open manner – the students were not directed in any way allowing them to undertake the material in their own way.

This approach lead to several problems:

- Management of development was very difficult – timescales are hard to create and adhere to for a whole module or even sections.
- Discussion questions were largely ignored. With students working asynchronously through the material it is difficult to generate useful discussion in a particular area.

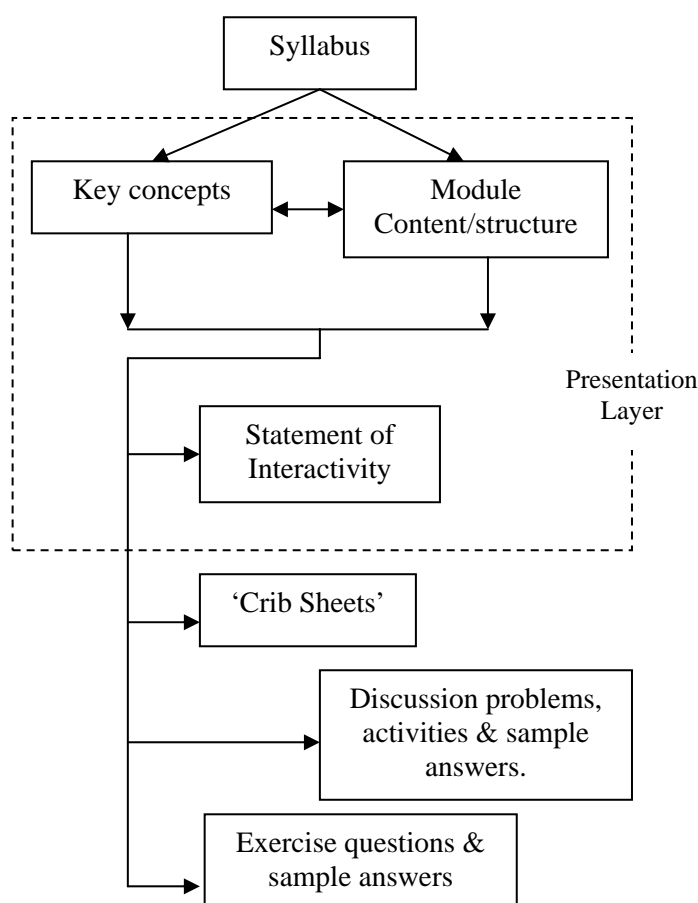
- Students took a very passive approach to the material – simply reading the content and feeling they had ‘learnt’. Rather than being encouraged into a ‘constructivist’ method to personalise the material.
- The mentors found it very difficult to help the students as the focus was at content level at which they were not experts. Although the students did appreciate the thought that there were people ‘on their side’ - this was more of a security blanket than a useful addition to the learning experience.
- It was very difficult for the tutors to try and direct the students by drip feeding in ideas for discussion and contemplation.

A Standardised Methodology

To try and address these issues a new ‘concept lead’ approach to module development has been proposed, this will have input from all stakeholders and focus on the teaching of the material – how to encourage reflective, deep learning from the students at a higher level than simply trying to understand the material enough to reproduce it in courseworks and exams.

With this, the openness of the programme has also been reduced within the modules – replaced with a directed learning paradigm so that the students and tutors can concentrate on certain areas together affording more opportunity for constructive interaction between the stakeholders.

The first thing that should be noted is the introduction of a *presentation layer* which encapsulates how the material is best delivered to the students (text, images, video, interactive demo and so on...)



The Syllabus leads directly to the *key concepts*, these are definitive statements of the motivation for studying the material, why it is important in this area and how it intertwines with other topics where applicable. The syllabus and key concepts then feed into the actual *content and structure* documents of the module.

The *statement of interactivity* is a detailed account of how and in what ways discussion and interaction can be encouraged and facilitated between all parties for each section of the course and should align to the crib sheets. Expected outcomes from these interactions should also be documented (not simply ‘students will have learned x’). Again this should help mentors and tutors alike to engender deep learning approaches to the core material by students and recognise when the learning has not been effective.

Figure 2 – a new paradigm for module development

The *crib sheets* are primarily for the Mentors but also act as a point of focus for the module tutor. The *crib sheet* should contain concrete examples of the concepts the students are expected to learn, common misconceptions, any useful hints/techniques/other resources that will help *novice* mentors facilitate the learning of the students.

Discussion problems/activities should reinforce the *statement of interactivity* and entirely reflect its contents. It is not necessary for both types to be used to back up a concept, sometimes only one of them will be appropriate. The discussion questions/activities themselves can either be integrated into the course text, or they can be used as ‘carrots’ by the mentors feeding them directly into the discussion lists at appropriate times in the course. Both types of task should invoke reflective and investigative thinking in the students.

For Queen Mary ODL these tasks can also feed directly into the Hong Kong ‘lab’ sessions that their staff will provide locally for students face to face. Focusing those sessions to these topics, ideologies and interactions styles, helps reinforce the move away from simple drill and practice learning to reflective, critical evaluation of material – a primary goal for HK students.

Exercise questions should be used to reinforce and demonstrate learning of the module content to both the tutoring team and the students themselves. If at the end of a module section, students cannot demonstrate that they have learned and understood the key concepts for that section, then it has failed to achieve its objectives.

The Development Process

These areas form the basis of ‘legal’ documents that have to be signed off during the creation of a module, the created documents could also feed directly into the course material in the form of overviews of sections, indices.

This approach allows for better management of development time and resources, and engenders a more professional, formalised partnership between the tutor and the module development team. There is also a framework on which to base staff training - each stage of development can be explained and examples given showing why this approach is taken and what the end result for the students is.

It is hoped in the future to develop tool support for the creation of this framework to offset the extra development time required by this methodology.

As sections are completed they should be evaluated by a separate group drawn from all stakeholders - tutoring staff, mentors, module development and students (this also counts towards peer review and Quality of Service [QoS]). This evaluation should be a critical assessment of:

- Achievement of aims and objectives set out in the key concepts document.
- Opportunities for interaction/discussion in line with statement of interactivity.
- Alignment with the crib sheet so mentors can have an impact on the interaction.
- Opportunities for remedial action/supplementary guidance to back up main materials.

The primary concern of all these people is to create a top down, concept lead view of the subject and in what ways it is best presented to the students and interactivity encouraged.

Directed Learning

This methodology now feeds directly into an activity/interactivity based tutoring approach. Each week a different concept can be engaged in via discussion and research. By this it is intended that rather than allowing the students to roam through the material and hence not really actively engage any area, work is focused on a week by week basis with a major concept to be covered each week. The concept will be

presented as a problem/discussion item and students will work in small teams, pairs or individually (as appropriate) to discuss the issues presented and suggest solutions. These can then be mailed to the tutor or a default mentor account where they can be collated and summarised by the mentor/tutor and a summary of what was covered made available to the students.

The student submissions should not be posted onto the discussion board as once some students have answered discussion questions the others have nothing of perceived (by themselves) value to add and hence do not contribute.

This model allows for direct intervention by the mentors in collation and summarising student submissions giving them more direction as well. Also as they are at the 'concept' level rather than low level detailed comprehension even a novice mentor can help the students in formulating and arguing their ideas, thus allowing for greater flexibility in employing non expert mentors to a subject.

Advantages

- By providing students with the lower levels present in Blooms Taxonomy [2] and setting in place the mechanisms to approach the higher levels, the framework for achieving learning is already in place in the module.
- Consideration for mentors is built into the development.
- Answering discussion questions, engaging in research and working on tasks becomes a routine for the students, engendering good working practices for approaching new material and for research in general.
- Students will be required to take a deeper more interactive approach to the material.
- Tutors will not be 'cast adrift' when the module runs – it will already be a cohesive interactive environment involving all stakeholders to the maximum amount. They will also have more direct tutoring support from the other stakeholders.
- Feeds directly into training of new staff.

Perceived Problems

- Module development time increased by a significant amount.
- New staff adapting to this methodology – requires an enthusiast who wants to adapt to teaching in a new manner online.
- 'Second guessing' how discussion and activities will develop between students outside of a classroom (and hence less directed) requires staff with a large amount of teaching experience in the topic.
- Possible perception of loss of control of the module by tutoring staff.
- Possible disenfranchisement of students who miss a weeks tasks and hence feel there are behind other students.

Summary

In scientific subjects, following well founded standards and methodologies for research, investigation, experimentation and application are cornerstones of the disciplines – without rigour no useful conclusions can be drawn. The processes and methodology set out in this document are intended as a first step towards applying this rigour to teaching on line.

Although this approach is untested – it does provide a framework whereby investigation and standardisation can begin to take place and thus move towards accepted professional standards in teaching and development of ODL materials.

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E-LEARNING STANDARDS BASIS FOR INTERNATIONAL CO-OPERATION

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1. Introduction

Enormous development of the eLearning activities in the last few years has the positive impact on the acceptance of self-learning methods for the broader use. Distance education as the resource for self-learning methodology gives the chance, that eLearning applications will be successful. Distance education has developed during its life-cycle a lot of tools and rules, how to make study easy and well managed. DE organisational structure, motivation plans, internal evaluation plans, tutors training, course author methodology and others have helped to the unification of the DE standards and made DE available across the borders. Using of Internet connection for training activities makes from eLearning international tool without any discussion. Unfortunately is eLearning so attractive, that many institutions and individuals started to do it without good recognition of self-training methodology and distance education organisation. They mostly use as the starting point their personal experience from the school period. There is also wide influence of IT experts, who are prepared ever to programme a lot of facilities for training, which are sometimes not necessary and makes the study confusing. Less could be sometimes more and unification of rules and standards could be useful. This is it, what this article is about.

2. Quality management of eLearning files

To prepare quality teaching material for self-study is not easy. The mistakes, which are made generally are:

1. From the content point of view

To offer ever more, that is necessary for the change of trainee competence. It is up coming from the experience from conventional first touch schools, because their task is to offer general knowledge. Clear definition of starting knowledge and measurable change of competence must be clear first of all of the course authors. In the eLearning courses is also possible expected, that the tuitions could be in other hands, that course preparatory. Also tutors need to know, what objectives the course author has implemented to the study programme. Tuition based on course authors can mislead to the higher study load, because authors are happy to disseminate all their knowledge.

2. From the methodology point of view

To underestimate the role of motivation and practical measures for keeping student stimulated. Clear definition of study objective, descriptive conclusions which make sure, what competence was developed, enough of self-tests for self-verification of study progress and clear and sophisticated study way are usually missing. Student has many options instead visible and user friendly study way. Basic mistake is made in including many optional study ways and in many decisions making processes, which are made directly by lonely student. Decision making is not easy process and if the offer of different options is too big, the lonely student has not enough information to do it. The support by tutor is only in explanation of possibilities (and partly advisory), but he cannot productively substitute the decision of student. There are situation, that student is not able to imagine, what is hidden belong any options. In fact, the course author wants to prepare the study easy and interesting, but the final result is just opposite.

Standardisation in eLearning course methodology could help to the broader use and internationalisation of courses. Of course different types of eLearning courses have different shape and size. Quality standards have to respect these diversities and differentiate for example between the information short term courses and courses for graduate studies.

3. Quality management of virtual classroom

Management of virtual classroom is the most problematic of eLearning programmes. There doesn't exist any systematic training standards for virtual classroom organisers. Everybody, who is able to operate with the training platform and who has (sometimes who has not) experience from the conventional teaching is sure, that will be able to manage the training on distance. Tuition during the cognitive study process from the screen is different, namely if we start to compare it with the face to face teaching/learning processes. That's why it is really surprising, that there are sometimes trainees, who are able to finish the course. The problematic areas, which would be necessary to standardise for possible quality measurement are following:

1. establishment of virtual classroom must follow standardised rules. Only virtual classroom cannot substitute the weak training performance. Virtual classroom makes study more agreeable, but the direct influence of learning process is not so high as expected. Tutors in eLearning programmes overestimate the role of virtual classroom creation and a lot of things (mailing pictures, communication to the organisation of study) lead only to wasting time and does not help to the trainee. There is necessary to set up the standards for eLearning tuition. There are substantial motivation damages coming from the individualism of the management of virtual classroom, however the goodwill of potential tutors is expected.
2. to develop the profession teacher in the virtual classroom, which could standardised the competences of such professional.
3. to prepare the standards for communication models in eLearning.

Quality aspects for assessment of eLearning platform

There is existing many commercial and many company teaching platforms for eLearning. The learning environment is more or less agreeable and users friendly, but the potential student must first of all to study, how to operate with each individual platform. Some of platforms offer the pre-course to learn students how the move in eEnvironment and how to use different tools and services. Unification of quality aspects for eLearning platforms could make eLearning more easy and more, to filter from the eLearning platforms the confusing services and overloading of students by enormous communication. What measures could be useful to insert to quality aspects of eLearning platforms:

1. to standardise the feedbacks – many feedbacks created in eLearning platforms have in fact zero value (i.e. number of students contact with the platform and time spent by “study”)
2. to set up the areas of evaluation rules to avoid individualisation in assessment of students outcomes and results
3. to describe minimal and maximal size (shape) of eLearning platform services from the pedagogic point of view
4. to prepare standards for obligatory communication and facultative communication in framework of eLearning
5. to close eLearning platforms for insertion of texts and hypertexts as a ground learning media. The role of text can be used for exercises, glossary, case studies etc, but not for learning processes, where the high pedagogical aspects and competences are strongly requested.

Conclusions

The presented contribution would like to support the professionalisation of eLearning methods. The individual approaches, influence of technically projected eLearning platforms and openness of eLearning platforms for each teacher/contributor makes from the electronic study exclusive mean for well educated learners, which are well trained in self-training and have a good discipline. The proportion and success rate between successful and unsuccessful students in eLearning are alarming and supporting the idea of professionalisation.

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A STUDY-PROCESS BASED E-LEARNING SOLUTION: COURSE ICT MANAGEMENT IMPLEMENTED IN A SECOND GENERATION E-LEARNING PLATFORM

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Introduction

In learning we see the evolution from a content driven learning, to a learning driven by learning objectives. The instructor is organising a study process. It is based on one or more predetermined learning objectives and is composed of activities and supporting content.

E-learning is not just providing info on the net or digitising the conventional courses. It is no longer technology driven but it will become more and more education driven by creating an e-study-process.

Our new way of integrated learning or blended learning is a mix of conventional face-to-face learning activities and self study activities.

Our advanced 2nd generation e-learning platform consists of a student portal, an instructor portal and a central warehouse of learning content.

The e-study-process can be structured in it and all activities and learning content can be delivered by it.

Challenges on point of the adaptation of new learning models will result in a 3rd generation e-learning platform.

1. The evolution to a 2nd generation e-learning platform

In the original definition of e-learning, the course or part of the course was organised as a self instruction. Instructors and students could have web-based access to the learning system. The facilities of learning content creation and storage and access were built in the system. Some virtual classroom activities of Q&A, assignments, discussions and testing facilities were made available as integrated in the system.

An evolution to a more flexible use of ICT/e-learning facilities in the learning process resulted in a learning portal delivering access to several ICT systems.

The requirement of re-usability of the content forced to evolve to an e-learning platform solution in which the content is organised and stored independent from the learning process track itself.

This 2nd generation e-learning platform consists of a content management system from the one side and an e-learning platform/frame in which the learning process is structured and the activities and the learning materials are linked via their URL.

Especially in lifelong learning this organisation of blended learning can be enhanced by integrating some life virtual classroom sessions.

Learning/e-learning	ICT	e-learning platform
(part of) the course organised as selfinstruction with 1. animation (picture, hypertext links,...) 2. interaction (quize-question, Q&A, case examples, exercises, assignments, selftest, e-mail, ...) 3. team collaboration (virtual class, discussion)		<i>1st generation e-learning system:</i> 1. webinterface(for instructor and) for students 2. integration of facilities: <ul style="list-style-type: none"> • learning content editor • learning content DB • content HTMLpages • testsystem • discussion forum • assignments delivery system • e-mail
e-learning supporting all kind of learning activities. Focus can be on one or more individual applications		Integration of applications in an e-learning platform: student learning portal with links to the application systems
Need of re-usablity of the content	Independent organisation of content (document) management	<i>2nd generation e-learning system:</i> 1. Content management system: warehouse of learning materials 2. e-learning platform: a frame in which the learning process is structured and the activities and the learning materials are linked via their URL
		<i>An advanced e-learning system:</i> <ul style="list-style-type: none"> • a browser based interface for the instructor and the instructor which allows for efficient document/info transfer • a warehouse of learning documents • a powerful search facility • a flexible DB connection allowing for easy adaptation to different learning applications • a flexible DB connection allowing linkages with the administrative DB (student and instructor id data) • (XML) authoring tools for the development of e-learning materials
<i>NOW: new advanced learning models and enhanced e-learning platform</i>		
1. Learning organised as a learning process: learning path based on the learning objectives and no longer on a content structure (textbook) 2. blended learning with integration of a life session		LearningSpace5 course : “ICT management”
<i>CHALLENGES: new advanced learning models and enhanced e-learning platform</i>		
1. interchangeability of learning materials 2. intelligent document search: personalised (customised) learning 3. dynamic personalised learning path 4. integration of applications of business simulation	Standard document format (XML) Mobile learning?	<i>3th generation e-learning system</i>

2. Implementation of the course ICT management

2.1. Study process and organisation of the “study process” in the e-learning platform LearningSpace 5
(figure on next two pages)

2.2. Real time session on distance in the ICT management course

The following life-session or realtime meeting has been organised:

- In the discussion template, three propositions (on topics) are formulated in advance by the instructor.
- The session starts with the input of one comment by each user on at least two of those propositions.
- One student team is responsible to bring one proposition and the summary of the comments on the white board.
- In a chat session all users will discuss about this topic. The instructor concludes the topic on the whiteboard.

2.3. Evolution

New standards for learning content

We postulate that a course, as implemented in an e-learning context, must fulfil some basic requirements such as reusability, interactivity, and personalization in the near future. Ongoing research points in the direction of standard XML file format to store the learning materials. XML provides a standard way to structure, store and send information. XML is a cross-platform, software and hardware independent tool for transmitting information.

Evolution to a dynamic implementation of the study process

When a high level self-paced learning is set forward, the study-process has to be dynamic on point of delivery of activities and of learning content.

The course must be differentiated and must be adaptable to the group of students. Even within the activities themselves, it must be adaptable to the type and the knowledge of the individual student, taking into account the characteristics of the student (learning capacity, learning style, etc).

On top of the e-learning platform a meta layer have to be constructed that is in charge of process flow management. The process flow follows a number of branches that of the generic flow, constructed in a tree structure. This happens dependent of the real values of a number of variables, which are stored in the XML scheme and the accompanying metadata tables.

Learning objectives	Learning activities		Learning content/info docs	Organisation of “study process” in e-learning platform LS5
	activities	Info/instruction/guidance		
	<ul style="list-style-type: none"> Student has to pass a m.c. selftest: does the student fulfil the requirements on point of knowledge level as specified If not passed: a preliminary reading of the introductory course: “ICT application” 	<ul style="list-style-type: none"> User manual LS5 User manual LS5 	<ul style="list-style-type: none"> LS 5 course “ICT applications” 	<i>Preliminary knowledge testing</i> <ul style="list-style-type: none"> self test web LS5 course “ICT application”
1 learning of the theoret. concepts of “ICT mgmt”	<ul style="list-style-type: none"> Lecture: an overview of the ICT function in the organisation and of the mgmt task self study of the introductory text lectures each topic will be round off with a team task: OR a search for supplementary knowledge and report about it, OR a discussion=evaluation 	<ul style="list-style-type: none"> user manual LS 5 assignment & instruct. 	<ul style="list-style-type: none"> PowerPoint presentation LS5 course “ICT management” Textbook McNurlin & Sprague: ISM in practise (Prentice Hall) ICT knowledge documents 	<i>Theoretical concepts of ICT management</i> <ul style="list-style-type: none"> ppt of introductory lecture web LS 5 course “ICT management”: self study introductory text: warehouse ICT: ICT knowledge documents ppt of introductory lecture chapter 1 discussion template: team task 1 ppt of introductory lecture chapter 2 discussion template: team task 2
2 ICT management in real practice	<ul style="list-style-type: none"> a real time online discussion session between students (in a meeting room) and ICT managers (in their companies) 	<ul style="list-style-type: none"> user manual LS5 	<ul style="list-style-type: none"> LS5 course “ICT management” 	<i>ICT management in real practise</i> <ul style="list-style-type: none"> life session in LS5 (synchronous) 5 student teams (5 users), 3 professional ICT managers and 1 instructor/leader are working together in a virtual meeting. They are using the discussion, the whiteboard and the chat application
3 learning the theor. concepts of “computer integrated business”	<ul style="list-style-type: none"> lecture: introduction to ICT management challenge of integrating the administrative and the manufacturing IS 		<ul style="list-style-type: none"> PowerPoint presentation LS 5 course “CIM” 	<i>Theoretical concepts of CIM</i> <ul style="list-style-type: none"> web LS 5 course “CIM”: introductory lecture

4 CIM in real practise	<ul style="list-style-type: none"> • guest lecture: CIM situation in a business organization 		<ul style="list-style-type: none"> • PowerPoint presentation 	<ul style="list-style-type: none"> • <i>CIM in practise:</i> • PowerPoint presentation
5 study in depth of topic Data Warehouse Management	<ul style="list-style-type: none"> • lecture: introduction DWH • self study of the introductory text • practical computer session in dimensional modelling 		<ul style="list-style-type: none"> • LS 5 course “DWH theoretical concepts” • LS 5 course “DWH dimensional model.” 	<i>Study in depth of DWH management</i> <ul style="list-style-type: none"> • webLS5 course: “theor.conc. DWH” • discussion template: evaluation • webLS5 course “dimensional modelling”
6 DWH applic. in practise: DWH project participation	<ul style="list-style-type: none"> • All teams are responsible to carry out one phase of the project life cycle plan 	<ul style="list-style-type: none"> • Planning document • Team - members and contact e-mail addresses 	<ul style="list-style-type: none"> • Life cycle project plan • blockbook UM 	<i>DWH project</i> <ul style="list-style-type: none"> • project information • lifecycle project plan • team reports
				This “study process” plan and the instruction guidance information will be implemented as a “Blockbook”: html pages The user manual: html pages

3. Conclusions

The way we are working in this course is a good example of blended learning. Especially the organisation of life sessions can be improved. We have to develop several new models of implementation such realtime meetings.

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THE ROLE OF SELF-ASSESSMENT IN AULAWEB E-LEARNING SYSTEM

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Introduction

This paper describes the self-assessment module of *AulaWeb* system and its implementation experience for assisting to learn basic concepts of computer programming. *AulaWeb* is an e-learning system with interactive training and self-assessment and has been used by more than one thousand of students at the Universidad Politécnica of Madrid for the last three years. The whole system interactivity, based on a client-server architecture, is carried out by means of a web server and a computer connected to Internet with a web browser.

System description

AulaWeb is a WWW-based interactive e-learning system which assists students/teachers to learn/teach subjects [1, 2, 3, 4]. In the one hand, the system facilitates students to learn the subject contents, to deliver practices and to do self-assessment exercises. In the other hand, the application provides teachers with the possibility of publishing contents, creating and configuring exercises and tracking student learning progress. Students and teachers only need a computer connected to Internet and a WWW browser to take advantage of all the application functions.

The system architecture, the graphic user interface design and an on-line help system make easy the user interaction with it. The system includes a password authentication (for students, teachers and general administrator) and four modules:

- Subject information database: syllabus, theoretical contents, documentation, references, external links, related software, timetable, calendar, previous exams and problems and solutions
- Communication tools: news system, frequently asked questions board, chat room, forums and user on-line questionnaire
- WWW-based collect and deliver module of practices, homeworks and exercises
- Self-assessment module with multimedia questions and several types of answers: true/false, single or multiple choice, numerical, string or programming code.

This courseware has been used as a didactic support to a computer programming subject taught in the first term by the Computer Science Department at the Escuela Técnica Superior de Ingenieros Industriales of the Universidad Politécnica de Madrid [5]. In this particular case, the self-assessment module for the students performance progress tracking is the most interesting system functionality because of the type of questions that can be configured and the large number of students (more than 500 each year since 1999).

The self-assessment module

The self-assessment modules are based on a question database with a friendly and easy-to-use interface for providing teachers to add, update, delete, print and activate/deactivate questions. Once the questions have been created, the students can configure an exercise (*customized exercises*) depending on the number and difficulty level of questions and the subject syllabus in order to verify their knowledge of the course contents. The teachers can also configure exercises (*programmed exercises* to be saved in the student history) for a student or a group of students depending on:

- Number of questions (1..N)
- Random or predetermined questions
- Units or chapters (depending on the syllabus)
- Type of answer (true/false, single or multiple choice, numerical, string or Pascal code)
- Question difficulty level (five theoretical and experimental levels)
- Type of penalty for wrong answers
- Timing (limited or unlimited)
- Deadline (limited or until the end of the term)

Fig. 1 shows an example of the graphic user interface when a student is doing an exercise of the AulaWeb self-assessment module

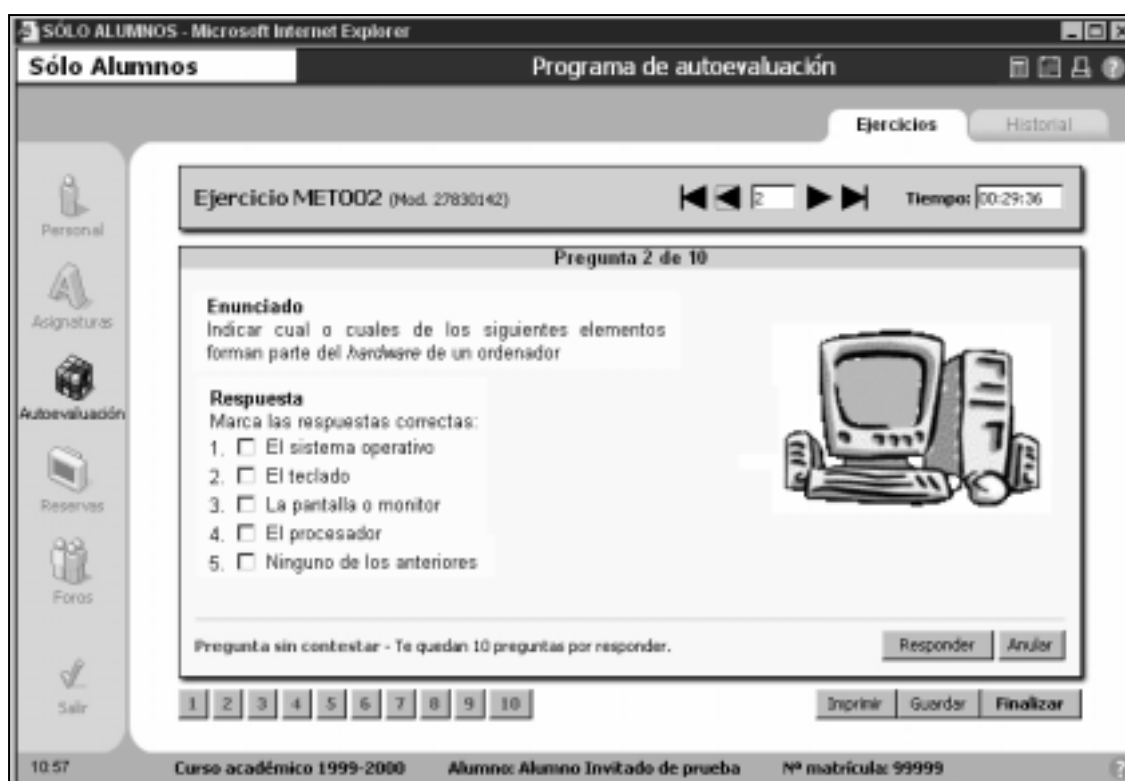


Fig. 1 A self-assessment test interface example

During the fulfilment of the exercise, the student can interrupt, save the exercises and postpone its end in any moment, in order to revise the acquired knowledge. After that, the student can reload and carry on with the exercise. When concluding it, the system generates and immediate grade and allows the student the possibility to check his/her exercise and to compare his/her answers with the correct solutions (Fig. 2). If the student answer correctly to a question, he or she will get one point, otherwise the student scores zero or a negative mark depending on the exercise configuration.

Resultados del ejercicio

A continuación se muestran los resultados del ejercicio que acabas de realizar. Si deseas obtener una copia impresa del ejercicio y la corrección de cada pregunta, pulsa sobre el botón *Detalles*.

Ejercicio: personalizado (Mod. 38583010)

Tiempo: 00:01:25

Corrección

1. Incorrecta 2. Correcta 3. Correcta 4. Correcta 5. Correcta
6. Correcta 7. Correcta 8. Incorrecta 9. Incorrecta 10. Correcta

Resultados totales

Contestadas: 10 de 10 Acertadas: 7 Puntuación: 7

Detalles

Ejercicio nuevo...

Fig. 2. A test results interface example

The resolution of the test provides the student's grade in that moment and updates the values of the student history. The evaluation of the exercise is, therefore, automatic, and both the student and the teacher can access the results of the exercises history (Fig. 3).

Ejercicios programados realizados									
Nº	Código	Variante	Fecha	Tiempo	Nº Preg.	Bien	Mal	S/C	NOTA
1	INF001	63535708	18/10/01	5	10	10	0	0	10
2	INF002	76629274	19/10/01	6	10	10	0	0	10
3	INF003	68452089	30/10/01	5	10	8	2	0	8
4	INF004	26755923	7/11/01	16	10	8	2	0	8
5	INF005	52567690	21/11/01	15	10	8	2	0	8
6	INF006	54281252	5/12/01	24	10	9	1	0	9
7	INF007	71310061	26/12/01	30	10	9	1	0	9
8	INF008	73321169	8/1/02	1	6	6	0	0	10
9	INF009	49390810	11/1/02	16	10	9	1	0	9
10	INF010	41819399	22/1/02	24	10	9	1	0	9
Índice total de aciertos					96	86	10	0	8,96
Nota media (sobre 10 ejercicios realizados)					.....				8,96

Fig. 3. Student exercises history example

So, the system allows the teacher to track the student progress during the academic period. Moreover, the system provides some statistical tools to determine the global progress of a group of students and to compare the theoretical and experimental difficulty level of the questions and to revise the first ones.

Self-assessment implementation experience

AulaWeb has been used by the students registered in the computer programming course, *Informática*, of the first term (from October 2001 to February 2002) of *Ingeniería Industrial* career. It is worthy of consider that students have no obligation to do the exercises although depending on the grade they obtained in the self-assessment history, the course final grade can be increased one point over ten.

A set of 750 questions structured in 10 didactic units was developed for this courseware with five different difficulty level and different types of answer. As the exercises are randomly composed by questions from the database, students may be asked to complete a Pascal routine or program which solves a particular problem. When a program code question is involved, the student can insert the answer and

click the option of compiling and/or executing in the web browser by means of a Java applet which emulates a Borland Pascal programming environment (Fig. 4). The applet checks the answer and replies suitably: *Compile successful/compiler error* or *Execution successful/Execution error*. This type of question is specially adequated to assess and self-assess students who are learning how to program: teachers do not need to correct programming exercises and students do not need to install a Pascal environment in their computers for training and practicing.

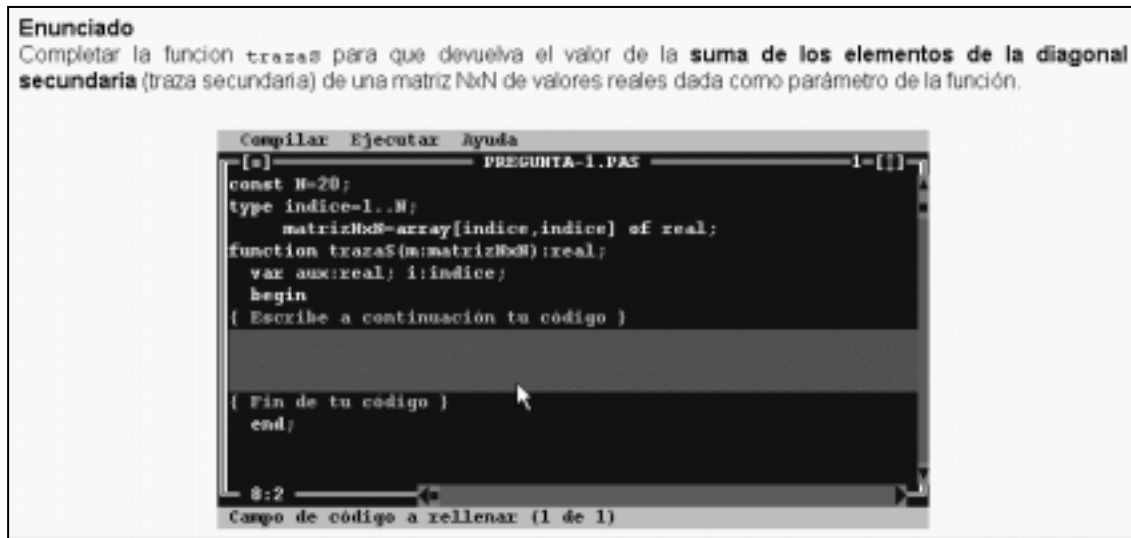


Fig. 4. Programming question example

A group of ten exercises were configured by the teachers as the term advanced. All the exercises were characterized with a deadline (two or three weeks since the publication date) in order to encourage students to study regularly and write programs during the term and avoid a massive connection at the end of academic period. Students can do each exercise as many times as they want. The final grade of a exercises is the average grade of all the attempts. This possibility lets a student to improve his/her grade if the first time he/she does the exercise has not a very good mark. Characteristics of the programmed exercises are summarized in Table 1. The number of students who did the exercises was reducing gradually in the course of time, although 624 of the 665 students did at least one exercise.

Table 1. Exercises programming and number of student

Nº	Unit / exercise title	Nº of questions	Publicación date	Deadline	Nº of students
1	Fundamentos	10	9/10/01	27/10/01	532
2	Estructura de un Programa	10	18/10/01	1/11/01	497
3	Tipos de Datos	10	26/10/01	16/11/01	569
4	Expresiones y Operadores	10	2/11/01	22/11/01	556
5	Sentencias de Control	10	12/11/01	4/12/01	541
6	Funciones y Procedimientos	10	27/11/01	20/12/01	505
7	Archivos	10	14/12/01	11/01/02	492
8	Unidades	6	21/12/01	16/01/02	490
9	Punteros	10	21/12/01	24/01/02	478
10	Listas	10	8/01/02	01/02/02	443

Evaluation experience

The evaluation goal was to assess the system and to collect information and suggestions in order to achieve an improved version in the future. At the end of the term students were asked by e-mail to fill in the on-line questionnaire about the system utility. The questionnaire was organized in two parts: a set of closed questions and three open questions to draw opinions about the best, the worst and suggested improvements for the system. The answers to the closed questions could range from 1 (lowest degree of agreement) to 5 (highest degree of agreement). The results of the closed questions are summarized in Table 2.

Table 2. Summary of the closed questions answers

Question	Total	1	2	3	4	5	Average
I have used a programming language before the beginning of the term	105	62	16	13	8	6	1,8
AulaWeb is easy to learn and use	105	0	2	9	45	49	4,32
The way of presenting information is clear and consistent	105	1	5	18	47	34	4,01
I find the organization of the system clear	105	1	9	20	49	26	3,84
AulaWeb has been easy to use for me	105	0	4	4	48	49	4,3
I liked to use this tool	105	2	5	8	50	40	4,08
Theoretical contents and resources module is useful	105	1	9	25	45	25	3,72
Self-assessment module is useful	105	1	3	6	30	65	4,44
AulaWeb has improved my comprehension of the course topics	105	2	5	14	42	42	4,06
In general, AulaWeb is useful	105	0	5	8	40	52	4,29

From the group of 665 students, 105 participated in this final questionnaire. The main results from this questionnaire are the following:

- A large majority of students had never used a programming language before the beginning of the term.
- The majority of users found the system easy to learn and use and the interface design clear and consistent.
- The majority of students found AulaWeb, and especially the self-assessment module, very useful.
- The best (open question): the majority of students pointed out the *self-assessment module* (61%) and the *facility* and *utility* of the system (18%).
- The worst (open question): most students indicated the *connection failures* from outside-campus computers (37%) and the *slowness* of some pages *downloads* (24%).
- Suggestions/modifications (open question): some students suggested that *other departments/subjects should make the most of the system* (19%) and the need for having explicitly the *solution of the self-assessment exercises* (15%).

Conclusions

AulaWeb has been used at the ETSII-UPM since 1999 as a didactic support to a computer programming course taught in the Computer Science Department. During the last term more than 600 students did more than 7000 self-assessment programmed exercises. The system have helped computer programming non-expert students to train and practice with programming questions. AulaWeb has also assisted the professors to evaluate the students and to know exactly the level of the students and adapt their subjects to the students group they had to deal with. The results drawn from the experience indicates that students found it easy to use and very useful learning tool.

With the adequate contents, AulaWeb can be implemented for any subject to be taught: the system is also being used in other courses and subjects in the Universidad Politécnica de Madrid.

For a full demo of Aulaweb system, please visit the URL: <http://aulawebdemo.dii.etsii.upm.es>

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Looking for partners

We are looking for partners in Europe and Central/South America to exchange our experiences and collaborate in e-learning R+D projects.

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THE WELEARN DISTANCE TEACHING FRAMEWORK

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Introduction

The field of Distance Teaching/Learning (DTL) has attracted considerable attention within the past three or four years and currently it seems that nearly all distinguished educational institutions are active in that field. At the same time there is a trend to move from passive and uninvolved, “stand alone” courses, towards tutored yet collaborative and self-organized approaches. The anticipated advantages that drive this trend include (but are by no means limited to) a more active and participatory learning process, improvement in soft skills while preserving independence in time and place. Hence a quite high level of acceptance of DTL approaches can be observed and this in turn fuels further developments of related tools and technologies.

Unfortunately the positive climate that surrounds the field has also given rise to a tendency to oversee some important aspects of the emerging educational infrastructures. Attention often focuses either solely on learners (pupils, students, etc), or on tutors, or on the quality of the provided learning material that is judged without taking any context into account. In other words aspects such as the acceptance of the learning / teaching environment and appropriate evaluation methods are not always on top of the priority list.

Based on the above observations, we have identified a number of principles to guide the design and development of WeLearn, a new application framework, so that it serves as both a flexible and scalable learning and teaching platform, and as an open and easily extensible base for further development (see: open software).

The WeLearn System

Design Principles

Platform and Tools: Keep them simple

At present, there exist several software platforms for DTL, with wide-ranging differences in the functionalities they support, their pricing, performance, etc. Furthermore, it seems that people are often inclined to deem a rich set of functionalities as a panacea to the challenges encountered by the tutors and the developers of educational content in general. Seldom are the required (human and other) resources, quality factors such as usability, or costs related to training, maintenance, etc., considered. To evaluate, or assess a platform, at least two categories of criteria should be taken into account: *technical requirements* and *objective requirements*.

Technical requirements: There is consensus that DTL platforms have to satisfy a set of minimal requirements, such as sufficient network connectivity, easy installation on the learner’s side (ideally requiring only standard, pre-installed software, such as a browser) and, last but not least, support for reusability of the learning material, and adaptation of the learning material to the bandwidth available to the learner.

Objective requirements: The platform should offer learners sufficient support for common learning and communication activities (including, e.g., a personal workspace, discussion forums, etc.) At the same time, the platform should feature an easy to learn and use, uncluttered interface, which is non-intimidating to novice users, and enables more advanced ones to focus on the learning tasks at hand.

The platform must also provide sufficient support for tutors in their role as course administrators. Specifically, it is vital that course setup and management be flexible to accommodate for different course delivery models, but flexibility should not result in excessive complexity on the side of the tutor/administrator.

Race condition: Undoubtedly, fulfilling all of the above requirements is cost intensive. Usually, when migrating from conventional teaching methods towards DTL, the budget is limited. Thus, a gap emerges that needs to be bridged: Should one opt to invest in the acquisition / development of an appropriate platform, or should the development of content be favoured as a cost priority. The usual way out of this dilemma is to arrive at a compromise, somewhere between the two ends of the spectrum. Which brings us to our second principle for WeLearn.

Adopt, Adapt, Improve

Adopt: To start with, the development of a comprehensive DTL solution (including the infrastructure, course delivery models, actual course material, etc.) from scratch, is, in all but the most trivial cases, economically prohibitive, mainly due to (human) resource- and budgetary limitations. A first step towards a viable solution in this respect would be to “adopt” an existing DTL platform, making sure that it both offers the desired degrees of freedom for both learners and tutors, and satisfies the already identified technical and objective requirements.

Reusability, a concept very well understood (although not always perfectly practiced) in software development, is also essential in the area of education. However, reusability assumes that one has already developed a tool or concept and would like to make further use of it, in identical or modified form. This is the basic premise of “adaptation” in the context of the present discussion, and the second step towards a solution to the problem of economic feasibility of DTL solutions. In principle, one could identify two possibilities of adaptation in this respect: *adaptation of course material to the platform*; and, *adaptation of the platform to the course material*.

Adapting the course material to the platform: Whatever technical facilities for course material adaptation may be provided, a platform that only supports proprietary formats for the representation of content is, essentially, insufficient. The adaptation of existing material typically represents a very significant resource expenditure, which is practically nullified by the use of proprietary formats, as the latter present hurdles to the further evolution of the course material, or even to its reuse in a different context.

Specifically, although tutors may find existing course material attractive, in order to make use of it they will typically need to transform it (by, e.g., removing parts, merging it with other material, and so on) to make it appropriate for different teaching aims, different audiences, etc. Consider, as an example, the case of academic courses: It is good practice to base one’s courses / lectures on existing material from several sources (books, scientific publications, etc.), manifest one’s own emphasis on the subject matter through the selection process, and complete the material with personal knowledge and experience.

Such forms of adaptation and reuse would be severely compromised if material from different sources followed a proprietary format, specific to that source. It is a logical consequence that tutors (or content authors more generally) will be unwilling to expend the effort required for the adaptation of the material, if the prospects of further adaptation / reuse from there onwards are minimal. Even the (unlikely) decision never again diverge from the use of a particular format would not solve this problem, because it would most likely lead to the formation of “islands” of knowledge, each expressed in its own format, but without the possibility for exchange or cross-fertilisation.

An argument that is often voiced against this line of thinking is that adaptation of this form is not necessary, since, in any case, new material should be developed in the context of DTL. Nonetheless, the migration from conventional course delivery to DTL is, in most cases, a stepwise process, in which most phases involve the adoption of hybrid teaching models (i.e., part of the teaching is done through conventional means and some through DTL methods and technologies). A further fallacy in the aforementioned argument is that existing material is to be entirely discarded, or, in the best case, merely consulted. However, DTL signifies a departure in the way knowledge is delivered and assimilated, and, therefore, poses no requirement for massively revisiting available material, other than making it appropriate for the novel teaching / learning approach(-es).

Adapting the platform to the course material: From a different point of view, an ideal solution would be to be able to “adapt” the platform to the available course material, because there is only one platform, but there are multiple course materials and many different users. There are two important aspects:

- **Scalability:** A platform used solely in a small electronic classroom and one used in a large company-wide intranet, or at a university campus, are faced with enormously differing requirements with respect to simplicity, supported functionality, acceptable levels of performance, etc. Thus, scalability is a very important factor for any platform that aspires to be used in several different contexts, meeting the requirements of each of them. Additionally, platforms would ideally scale while in use – it is often the case that once a DTL platform has been instated, interest in it rises and the number of users (both tutors and learners) increases substantially over time. To cope with an environment characterised by such dynamically increasing demands, a platform would need to scale “smoothly” and, equally importantly, without requiring major management / upgrading / (re-)configuration tasks that could cause lengthy interruptions in its operation (or, even worse, loss of material, configuration settings, etc.)
- **Adaptability towards scenarios or working environments:** The employment of DTL approaches can take several forms: Courseware may be provided in the context of regular physical meetings of all involved parties; or, physical meetings may be sparse; or, physical meetings may be eliminated altogether and tutoring be done solely via the platform; or, even, there may exist learning arrangements based on self-organisation, where the tutor assumes mainly the role of a coach. A very pragmatic requirement for a platform is, then, that it should be adaptable to the prevalent teaching model.

Many commercial platforms tout for their customisation facilities. But when one takes a closer look, the truth is that most of these platforms are parameterisable, but neither scalable nor adaptable as outlined above. This is naturally a major disadvantage, as the capability of realising radically different configurations of a platform is not a luxury, it is a necessity.

Improve: In addition to supporting course adaptation, a platform should also enable and facilitate improvement and evolution of the courseware on the one hand and the learning environment on the other hand. The experience gained during the learning process influences the proceeding process. Specific demands may arise and the platform must provide the flexibility to deal with those change requests, e.g. creating shared folders ‘on the fly’.

Treat the platform as a framework

In today’s world of informatics software application frameworks are quite common. These matured and became popular within object-oriented programming and are now an indispensable tool in the hands of software developers. An application framework usually provides direct support for a number of typical software configurations (sometimes specific to a given application domain), while it also allows for its own expansion and extension through well-specified mechanisms.

It is our claim that treating a DTL platform as a framework dedicated to a specific yet broad and diversified application domain, bears several advantages across a number of dimensions. Such a platform can go far beyond simple customisation like changing colours or arranging the entries of a menu bar. With the help of the framework the entire system can be redesigned. Entire modules can be swapped in and out to cater for different requirements of different contexts, while modifications are also easy at a lower level of granularity.

The framework can be used by individual organisations as the basis for their own specialised development needs. Organisations that have adopted the framework can more easily benefit from each other’s work on developing/modifying/extending it, through the exchange of technical know-how, specialised modules, targeted configurations, or experiences from its everyday use in real-world settings.

The WeLearn – Distance Learning and Coaching Framework

WeLearn stands for Web Environment for Learning and it is much more than a simple learning platform. WeLearn is a framework that provides the possibility to create a specialized platform, which lives up to the expectations and needs of the course providers and learners.

WeLearn consists of the following three parts: the platform itself, the settings and the course materials.

The platform

WeLearn is a free and open learning environment (GNU-philosophy), which is easily and universally applicable. Because of its implementation as a framework, it provides the possibility for adapting and scaling it. This construction kit philosophy is the reason why WeLearn can offer not only suiting but tailored settings for specific usage sites and can respond to changing learning situations.

The technical design: Within the WeLearn-system everything is treated as an object: persons, folders, documents, forums and so on. All these WeLearn-objects realize the modular conception of the WeLearn-framework. Therefore a WeLearn-system is the arrangement of selected objects within a highly dynamic system structure. This structure is continuously modified through the addition and removal of objects, occurring as the result of activities such as uploading a document, creating a folder, or setting up a user.

It could be useful to understand the concept of WeLearn, if it is not considered as a simple web application, but as a program with HTML-interface. WeLearn was implemented in Java. This design decision makes it independent from platforms and guarantees extensibility. All developed modules respectively WeLearn-objects have to follow the specified interfaces to classes (API). The created components can be added to existing WeLearn-systems at runtime.

Functionality: As each configuration of a WeLearn-system can differ in functionality, this section focuses on the description of such functions that are typically needed for eLearning. Overall each eLearning-scenario will comprise at least the following points, maybe with varying focus: administration, presentation of courseware and support of the learning process.

WeLearn offers the administration of users (learners, instructors, coaches, system administrator,...) and the possibility of forming groups. The administration includes the configuration of the system, the management of the course materials and the administration of the courses themselves. WeLearn also is content independent or in other words courseware in each data format can be used with WeLearn.

On the basis of our experiences in eLearning we have seen that any communication among the learners and collaborative work encourage the learning process and the sustainability of acquired knowledge. WeLearn provides discussion groups and chat as communication tools that can be used in various ways and at any desired place within the system.

As WeLearn offers a virtual filesystem, each user has its own home directory, where any documents or files can be uploaded and shared with other users. Because of the implementation as a web application, the system in general and the personal workspace with the users data can be accessed from all over the world simply by using a web browser. For setting up courses the instrument of shared folders can be utilized to realize collaborative work among the learners.

WeLearn is both user-centered and course-centered. Courses (containing various documents, shared folders, discussion groups, etc.) play a decisive role within the platform. But not less important are the users of the system. WeLearn can be personalized to satisfy the special needs of each user and to show him/her only those parts of the system, which he/she actually needs. This comes along with the design aim: Keep it simple! WeLearn offers a great amount of functionality but only those parts of the system that are really necessary are presented to the user. As an example a student needs not or should not see the functions for course administration. The personalization is also possible for courses and courseware, therefore it is possible to show only attended courses to the student. WeLearn provides a strong right-system, which manages the access to all objects like documents, folders, forums,

Appearance: The look and feel of WeLearn can be experienced at <http://welearn.fim.uni-linz.ac.at>.

The Settings

As no eLearning-environment is similar to each other the chance to scale and adapt the platform is a big advantage. In further terms we call the adjustment / customisation of the platform “setting”. A setting in our context is specific to the usage site, e.g. a setting for a school differs from a setting for university purpose. In more detail a setting can also be different depending on the target group, the kind of course or even because of different didactical concepts. In addition eLearning is more than the presentation of electronic content with the aid of a platform. A developed setting for a special eLearning-environment must provide different ways for communication and collaborative work.

On the basis of our experiences we developed such settings for selected learning scenarios. These settings are part of WeLearn as ready-made configurations, which can be used as they are or can be adapted at will. In the following example settings, one for a secondary school and one for university use, are described.

School: The administrator of a school network will establish the WeLearn-system. A typical setting for a secondary school includes a library containing content interesting for the whole school. Additionally each pupil has his or her own working space (home directory) for personal use. As courses in school primarily match with classes, the WeLearn-system is divided into sections corresponding to each class. Within such a part of the system, the class teachers have the right to administrate these levels.

A useful structure for each class may be to set up folders for each subject. On this level each teacher has the possibility to form his/her own course using shared documents and folders, discussion groups, chat or whatever he or she wants. A prefabricated setting for a secondary school realizes the described learning environment by implementing typical classes, subjects and courses.

University: A setting for university purpose provides a library containing general accessible content and a section with important web links for students. But the main part of the WeLearn-system for universities consists of courses, which are divided into lectures, practical courses and seminars.

The settings for those different kinds of courses are also different. The main teaching aid holding lectures are courseware and discussion groups. Exercise courses and practical courses demand, by definition, interaction of the students. Mostly the result of an exercise has to be presented to the instructor. For that purpose delivery folders can be established where each student has access only to his or her specific subfolder, for depositing the material to be reviewed.

In addition, seminars have the characteristic that teams of students generate the presentation of a topic. In this context there is a need for team folders to share any documents among the group members. A ready-made setting for university purpose offers templates for typical lectures, exercise courses and seminars.

The course material

As mentioned before WeLearn basically doesn't set restrictions to the course materials. Any data format can be used within the platform. The documents will be embedded in the WeLearn system, if the web browser used by the client supports embedding which is true for most cases. For not being online the whole time while learning, the documents can also be downloaded.

To develop reusable, distributable courseware we decided to support the Content Packaging Specification of the IMS Global Learning Consortium. The hierarchical structure of the course is described in XML and meanwhile this specification is used by various applications. WeLearn offers an export function for courses in CPS-format to produce offline versions of the course.

Case Studies

The WeLearn framework has been and is being used in various pilot studies, which are organized and performed by FIM in cooperation with the Austrian Centre of Distance Learning. These case studies address very different learning and teaching situations that demand a different setting for each individual case. Due to lack of space, we will focus on:

Teaching Operating Systems Principles: The course on Operating Systems (part of the curriculum of CS at J. K. University of Linz) that was held in the past in the traditional way (in a lecture theatre) with 180 students enrolled. This course is now provided as DTL course. The setting and the use of the WeLearn-platform/framework are adopted to its requirements:

The subject is subdivided into a sequence of self contained chapters, each of them is made available in time. Students are supposed to go through the various electronic teaching material (consisting of slides (ppt, html), text (pdf), self-assessment (html) and additional references.

In parallel, the instructor meets the students periodically in the lecture theatre in order to give a preview of the incoming chapter that the students are supposed to study.

In order to master the complexity provoked by the number of participating students, they are subdivided into n virtual learning groups G_1, G_2, \dots, G_n . A discussion forum and up-/download folders associated with each group G_i . Any member of G_i has r/w access to all objects (forums, folders, ...) belonging to G_i , but has no access at all to objects belonging to $G_j, j \neq i$. Each group G_i is tutored by a tutor T_i , who has r/w rights to all G_i -objects, but he/she is granted read-right to G_j objects, $j \neq i$. The tutors T_i own up/download folders and a forum, both are dedicated for internal communication between the tutors themselves and the main instructor.

Finally there is a general “news-board” and a global forum for all. The main instructor owns the blackboard and it is up to him/her to whom he/she provides access rights. The forum is available to everybody who either belongs to the group teachers/ instructors or is enrolled officially as student in one of the groups G_i , that we have mentioned already.

It is worth mentioning that a special team from the department of Psychology/Pedagogic follows the progress of the case study. Members of this team are granted read right to all objects.

Conclusions

One of the specific advantages of WeLearn is that at any time the course instructors and/or the development team are able to adapt the system quickly as soon as specific demands (e.g: proposed by the students or tutors) arise. The set of prefabricated objects is growing each time we are faced with a different teaching/learning environment that demands a different or modified setting and assembly of objects. This precisely is the reason why we regard the WeLearn system rather as a teaching/learning framework that provides flexibility in order to accommodate specific needs. WeLearn is made available to the public following the GNU-philosophy.

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NOT SURFING BUT DROWNING: THE QUALITY OF WEB-BASED RESOURCES

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Introduction

This paper starts by reviewing the potential of the Internet for facilitating resource-based learning. It then outlines the barriers and obstacles involved in utilising the Web for online programmes, reflecting on issues of quality, quantity as well as technical instability. The paper emphasises that to ensure successful outcomes, course designers must provide robust maps and navigation tools to enable students to steer a course through the overwhelming amount of information in cyberspace. The paper concludes with an example of a pedagogical approach developed in the context of an EU funded project designed to test the potential of resource-based learning in developing higher-order skills in an undergraduate distance education psychology module.

The 'Universal Library'

The apparently limitless extent of resources offered by the Internet is one aspect of the technology which is frequently cited as having significant potential to transform education, allowing individuals to construct their own knowledge. Apollon suggests that individual learners can bypass the traditional disciplines and acquire 'core knowledge without subordinating themselves to official providers' (Apollon, 2000:18). However this potential must be viewed with some scepticism as the danger for the unwary of endless cybersurfing is that much time is wasted for little reward. Effectively, students end up drowning in the vast seas of information. Selwyn reviewed four sites which offered sociology of education resources and remarked that instantaneous access can be a myth: "Even for an experienced Internet user, finding the four sites... took a considerable amount of time due to both the amount of irrelevant material brought up by searches and due to the general non-linearity of Internet searching. This alone points to the folly of assuming that students (let alone the average lecturer or professor) would be able to locate and retrieve useful information of even reasonable quality in a matter of minutes via the Internet" (Selwyn, 2002: 146). Another problem of online resources, even when carefully chosen by course designers is the phenomenon of 'link rot'. This is the problem where websites are removed or moved to another location and the link from the original document no longer functions.

Quality of Online Resources

Oscail - National Distance Education Centre in Ireland provides a range of undergraduate and post-graduate programmes and has over 3,000 students mainly resident in Ireland. Oscail is a faculty of Dublin City University but works in co-operation with most of the third-level institutions in Ireland. In this way, students with Oscail have access to academic libraries in local universities and other third-level colleges. Nevertheless, problems of access at times convenient to students and availability of appropriate material persist. For these reasons, Oscail has been investigating the potential of the WWW to provide study resources for its students. One initiative has been to identify Web-based resources relevant to different subject areas in Oscail's programmes. For example, students studying Psychology on Oscail's undergraduate degree programme in the Humanities can now log on to the university library site from home and are presented with a list of web resources related to their subject. This list includes:

BUBL – links to UK resources in Psychology <http://link.bubl.ac.uk/psychology/>

NISS – catalogue of networked resources <http://www.niss.ac.uk/cgi-bin/GetUdc.pl?159.9>

SOSIG psychology gateway – <http://sosig.ac.uk/psychology/>

HEANet Psychology links – Irish links <http://www.heanet.ie/links/psychology.html>

However searching on these sites can lead to lengthy cybersurfing without significant and useful results. A number of writers have commented on the need for students to acquire information literacy in order to enable them to benefit from the Web (MacDonald et al 2001). According to the American Library Association (1989) "Information literacy is a survival skill in the Information Age. Instead of drowning in the abundance of information that floods their lives, information literate people know how to find, evaluate, and use information effectively to solve a particular problem or make a decision". In 2000, Oscail received funding under the EU Minerva programme to test, among other issues, the use and exploitation of online resources in the context of an undergraduate distance education module in developmental psychology (for a detailed evaluation of the first phase of the project see Fox and MacKeogh 2001). Partners in this project include Oscail; Queen's University Belfast; Aarhus University and McGraw-Hill. This module has been presented in conventional distance education format for a number of years, including a specially written self-instructional course text supported by a textbook (Santrock's *Child Development*) published by McGraw-Hill.

The link-up with McGraw-Hill provided the opportunity to investigate the potential of the WWW to access another resource of material. The McGraw-Hill website associated with Santrock's textbook gives an annotated list of over 400 sites which are relevant to topics covered in the textbook. The sites are listed by chapter and references are made at appropriate points in the textbook to links with websites containing material relevant to the topic being discussed. Students were given the URL for McGraw-Hill *Child Development* site and asked to investigate the websites listed (and any other relevant sites) when searching for information on given topics.

In the evaluation of the module, students were asked to rate the quality of the sites they accessed. The average number of sites accessed was approximately ten. In general, the students were positive in rating the quality of the sites and most stated that they found them useful. However, there is another side to this issue. The course designers had envisaged that students would be requested to access a series of articles to be sourced online. However an extensive search of the list of websites given on the Santrock website and other publicly available online resources produced few articles that met the requirements of the Subject Matter Expert. Instead the articles were sourced from traditional academic journals which students accessed in the normal way. This exercise also raised questions as to the academic appropriateness of material available on the WWW.

It was therefore decided to investigate the websites listed on the Santrock site. One hundred and sixty (160) sites were reviewed. Classification of the sites presented some difficulties as they varied in the quantity of material within the sites and their quality. Some links comprised a single article (sometimes a short article) in a newspaper, journal or individual's site while others linked to portal sites which in turn led to a huge number of other sites. Nevertheless, some data of interest emerged. Of the 160 sites reviewed, 21 links were down (i.e. no link to the site could be made from the link given on the Santrock site) despite the substantial resources McGraw-Hill are known to be putting into keeping their site up-to-date. This fact is of some interest in itself as it points to the transient nature of the sites available on the Web. This means that when designing a programme of study consideration must be given to how to ensure the continuing availability of the essential web-based material.

The next item investigated was the quality and reliability of the information on the sites. Concerns have been expressed about the content and accuracy of the web particularly among faculty in the social sciences or language and literature areas (Herring, 2001). The type of the organisations hosting the sites may be regarded as an indicator of quality. Of the 139 sites accessed, the following were the host institutions:

- 49 Non-governmental organisations (35%)
- 33 University departments or research centres (24%)
- 24 Individual academics (17%)
- 14 Government or supra-government organisations (10%)
- 10 Private companies (7%) and
- 9 Professional organisations (7%)

The large number of non-governmental organisations is not surprising given the subject matter of the module (Developmental Psychology). These included organisations whose main purpose were advocating certain policies (e.g. children's rights or action on child poverty) or providing information (e.g. on

pregnancy or parenting). While these sites may contain large amounts of information (and advice), it was frequently not in the form valued by academics. For example, such sites gave information in declarative statements without referencing sources and without engaging alternative viewpoints. It is also undoubtedly the case that some of the organisations hosting the websites have strong ideological biases which would, at a minimum, gave rise to some concern about the impartiality of the information on their sites.

There would not, in general, be similar concerns with the university-based sites which taken together (university departments, research groups and individual academics) formed the majority of sites in the sample. The problem with these sites was the quantity of high-quality information on their sites. Research centres, in particular, often gave good background information on their research topics and individual academics often had course outlines and sometimes lengthy background articles on their course topics. However, this information was frequently introductory in nature. Within the context of the developmental psychology module, this material, by and large, replicated the material in the module text and textbook. University sites, especially those of individual academics, tended to list publications (generally without abstracts). In other words, the articles were not in full-text format which means that students would have to source any article of interest to them in the normal way. There were some exceptions with a few sites giving access to a substantial number of full-text articles written by academic staff. However, of the 57 university sites, only 10 sites could be said to have full-text articles likely to be of use to a student looking for in-depth information on a topic. In fact 10 sites is something of an overstatement as the Santrock list of sites included more than one reference to the same organisation (i.e. different parts of the organisation's site was relevant to different sections of the Santrock textbook). The 10 'good quality' sites in Santrock's list referred to 6 separate individual academics, research centres or university departments. Overall, the 57 university sites referred to 45 individual organisations/individuals. This multiple referencing of the websites of a single host organisation tended not to occur with the other type of host organisations.

In terms of quantity and quality of material available online, some of the government and supra-government agencies (such as UNICEF and the Maternal and Child Health Bureau of the U.S. Health and Human Services Administration) are very good sources of online information. These bodies frequently provide full-text online copies of their publications. Naturally, however, there is a tendency towards basic statistical data and policy research in their publications.

The private companies hosting websites are almost invariably publishers (of newspapers, magazines, online journals or the ancillary newsletter to a private business). Most of these websites contained a single article. The websites of professional bodies, like the websites of research centres, tended to give good background information but little in the way of substantial articles.

Before drawing any conclusions from the above, it should be stressed that the list of websites given in the Santrock textbook was not exhaustive and, indeed, students managed to find a few other relevant sites. Also, no extrapolation can be made to other subject areas - some subject areas may be better served with online resources than others. However, the review of the McGraw-Hill list of websites would indicate that the material available on the Web to students of Developmental Psychology is, in general, insufficient to allow them to source the type of academic articles which most academics involved in this type of programme would like them to access.

Before leaving this issue, there is one further point worth making. The discrepancy between the Subject Matter Expert's evaluation of the developmental psychology web sites and what the students thought of them (as indicated by their responses to the questionnaire) indicates that there may be a substantial difference between the type of articles that academics think students *should* be studying and the type of material which students believe *will* aid their learning. For example, some students may well benefit from the type of introductory material available on many university sites (even though they have similar material in their module texts). This material may act to reinforce material they have already covered or, because a different approach is taken, students get an alternative view of the material. Whatever the reasons for students' relatively positive view of the online materials, the question remains as to how best to design access to such material to maximise the learning of the student and reduce the amount of time students spend online searching for materials. (This latter factor was one also mentioned by students in their evaluation.) Nevertheless, the opinion of the PICTURE Project's SME was that the textbook links to materials available on the WWW were not of consistent quality to be useful to the students studying

Developmental Psychology on the Humanities programme. Instead further guidance is required from course designers in helping students' access relevant and helpful websites.

Online Full-Text Journals

There is another online source of materials, online full-text journals. In common with most university libraries, the Dublin City University library has been making available to staff and students of the university a variety of online full-text journal sources. A major problem with these sources, from the point of view of distance education students, was that access to these sources was not available off campus. However, in 2001, the DCU library negotiated with providers to allow students and staff remote access to its online journals. Now, some 80% of DCU's periodicals are accessible in full-text format through the Swetsnet database. Other databases providing online, searchable access to good quality peer-reviewed journals include Education Complete and Science Direct. A review of the online journals available indicates that there are a number of full-text journals relevant to developmental psychology. This resource opens up a number of possibilities. Developers and tutors can recommend or refer to articles, confident in the knowledge that students would be able to access them with relative ease. Students could be referred to a number of sources where different opinions are given on the topic under discussion.

Navigational aids and course maps

One of the clear lessons in relying on Web resources is the need to provide robust navigational aids and course maps particularly for distance education students who are especially time-constrained compared to the conventional on-campus learner. The current presentation of the developmental psychology module revolves around three pedagogical scenarios designed to foster higher-order cognitive skills. The scenarios are debate/resources; peer-tutoring; and group projects. The scenarios are mapped out over the forty weeks of the module, with pacing guidelines related to key deadlines for contributions to online debate and presentation of assignments. Students are referred to specific units of the distance education text, chapters of the textbook as well as references to specific websites and on-line full text articles. As an example, Figure 1 demonstrates the format of one of the debate topics set out in the resources/debate scenario. The specific resources to inform this debate are outlined although students are encouraged to bring additional resources into their contributions. Using a virtual learning environment developed by McGraw-Hill called PageOut, students participate in an asynchronous online virtual debate over a period of five weeks; they are required to make at least eight contributions on the topic of the debate and the quality of their contributions is formally assessed.

Resources/Debate: Topic 3 – Dented Self-Esteem

It's no wonder many of us grow up with a lack of self-confidence and all sorts of hang-ups. With its emphasis on 'failure', the education system, whether primary, secondary or tertiary, effectively wages war on our self-esteem from day one. Do you agree? Can you relate to this? Are things better today for younger children than in our day? Do mature students have greater self-esteem problems? If so, why? Are there any clues in the literature as to how we might build self-esteem rather than crush it?

Reading to get started with: Unit 3 Oscail Course Notes and Santrock Chapter 12

Cigman, R. (2001) Self esteem and the confidence to fail *Journal of the Philosophy of Education*, 35(4), 561-576. (available through SWETSNET)

Young, P. (2000). 'I Might As Well Give Up': Self-esteem and mature students' feelings about feedback on assignments. *Journal of Further and Higher Education*, 24(3), 409-418. (available through SWETSNET)

Figure 1: Example of topic set for online debate.

The use of these detailed course maps and navigational aids to resources (a) allows students to hone in on relevant material available online; (b) gives students exemplars of high quality resources; (c) allows students to explore the material available online and develop information assessment skills.

Conclusion

One major implication of the availability of high-quality online learning resources will be the shift in focus away from the content of programmes to how they are taught. In addition, no longer will educators need to concern themselves with the limitations imposed by the lack of access to learning resources by students. This could expand the potential for more individualised teaching and learning with students able (within the constraints provided by the programme curriculum) to easily explore areas of interest beyond the currently readily available resources. It also introduces the flexibility which will allow students to construct their own version of the course material.

More specifically, the availability of high-quality online learning resources has major implications for providers of distance education programmes. Rather than produce lengthy and detailed course texts, distance educators could provide guides to learning resources and construct learning paths for students. These resources greatly expand the range of pedagogical approaches at the disposal of distance educators while, at the same time, radically altering the cost base on which distance educators have, in the past, relied on for the successful delivery of their programmes.

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QUALITY CONTROL AND OPEN AND DISTANCE LEARNING INFORMATION RESOURCE SYSTEMS: THE EXAMPLE OF ICDL

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Abstract

This paper summarises the different kinds of open and distance learning information which can be made available in a computerised information system. Using the experience of the International Centre for Distance Learning at the Open University as an example, it summarises the different kinds of ODL information which can be recorded and discusses the most appropriate forms of quality control mechanisms and accreditation procedures.

Introduction

Computerised information systems can provide various types of ODL information. These can be grouped under three different types of information, as follows:

- providers, institutions, agencies, people (agencies and actors)
- developments, projects, research, publications, guidelines, resources, case studies - for providers, policy makers, researchers, developers etc (activities and resources)
- programmes of study, courses, materials - for potential students, learners, advisors etc (courses and teaching).

In the case of ICDL, there are three different resources available, which reflect these groupings. These are the institutions database, which lists providers worldwide, with details of the areas they cover; the literature database, which contains abstracts and details of a huge range of publications gathered from sources all over the world, and a complete listing of courses available in the United Kingdom. ICDL also provides specialised databases for other organisations such as the Commonwealth of Learning.

An overarching issue which has emerged most clearly in recent years is deciding whether resources really relate to open and distance learning or not. Should open learning packages without formal assessment, and courses involving flexible learning with a mix of conventional and distance learning, be included? What about a publisher providing materials for independent study towards a public examination? There has been an explosion of online components being introduced into conventional courses – are these now distance learning courses? How crucial is the 'open' component – are only courses open to everyone irrespective of previous qualifications and experience to be included? Are courses available to students in other countries? What about in-company open learning which may only be open to employees? Some distance learning courses or modules may be part of a programme and not available separately.

There are key books, articles, journals, conferences etc which deal exclusively with ODL. However, there are many others which may touch on ODL related issues or issues which might be included under a broader definition of ODL. For example a journal with articles purely about computers would be outside the field, but another on computers and education might include some articles specifically about ODL. Similarly, journals on education might also have articles on ODL which may or may not be relevant to ODL. Other books and conferences may also include chapters or papers on ODL issues, or deal with new areas that are becoming relevant. As with the difficulties of defining an ODL course, each new resource needs examination to determine their relevance to the field and to a particular information service.

What are the main ways in which the staff of ICDL exercise quality control of the resources surveyed for inclusion in the databases?

Quality assurance mechanisms and accreditation procedures relate to:

- the source of information
- the content of the information
- management of the information.

The source of information

The information about the field of ODL which is gathered for ICDL comes from a variety of sources. The concepts of primary, secondary and tertiary sources of information relate to how close the source is to what is being described. A primary source of information would be those who are directly responsible for an activity, document, institution, or course. That is, organisers or participants of an activity, authors of a document, officials of an institution, teachers of a course and so on. Secondary sources process information from primary sources for use in information services, publishing, advisory agencies, libraries, news services, marketing and brokering agencies, etc. Tertiary sources deal with information from secondary sources. A good example of this is a portal, which provides a gateway to a range of information collections, directories, repositories, databases etc. Portals may also provide facilities for customisation and enable users to configure the site to meet their own interests and priorities more directly. This is an area in ODL which requires further development as a powerful portal is urgently needed, given the large number of relevant services already available separately. It may be that ICDL takes on this role, or continues to work with existing portals.

For information services their overall quality depends on their comprehensiveness within their defined field, the quality of their sources, the content of the information and information management. An ODL information service would be poor quality if the field it covered was unclear, its sources were misleading and unreliable, it did not cover all relevant sources and that the process of collection, editing, coding, formatting, checking and updating the information was unsystematic, inconsistent, and prone to errors.

The content of information

Institutions and courses

Information about accreditation and quality assurance related to particular institutions or courses is of crucial importance for the maintenance of a quality service. This information forms the basis for decisions about whether to include institutions and courses. In common with the majority of information services, ICDL avoids taking on direct responsibility for accreditation and quality assurance of ODL itself, which is best left to the relevant authorities. However, a service can find itself in a position where course providers demand to be included or ask why they are not included. In these cases ICDL would normally refer to selection criteria based on recognition by relevant authorities, which reduces accusations of subjectivity or arbitrariness.

Providers of ODL include well known institutions specialising in these kinds of courses (eg. open universities, correspondence colleges), but also include other institutions which offer mainly conventional face-to-face teaching (eg. HE institutions, further education colleges), and organisations providing other services as well as ODL courses (eg. publishers, companies with training departments, professional bodies, agencies).

Quality assurance procedures affecting ODL may be defined by law, monitored through inspection and involve accreditation and authorisation of course providers, and be carried out by government, official agencies and professional bodies. Where quality assurance is the responsibility of an official body or quality assurance agency, it might be run by government ministries, statutory bodies, professional associations, training providers, or by groups of employers. In the private sector where organisations are operating on a commercial basis or providing in-company courses, government regulation may not apply. Quality assurance in this sector can be a private initiative and the procedures vary. They may include 'charters' or 'quality contracts', membership of coordinating organisations operating 'codes of practice' or 'quality marks', or adopt ISO-standards which assure quality of provider and process, but not of output

(skills and qualifications). In most countries higher education institutions are subject to accreditation procedures and their courses quality assured. In which case the decision about whether to include an HE institution offering a ODL course in an information service is relatively easy compared to other levels where regulation is more haphazard and diverse.

Various schemes for accreditation, recognition or membership require providers to apply procedures for assuring the quality of their courses. Also particular courses may be recognised or examined by external bodies who accept the learning outcomes as meeting their standards.

Literature

Decisions to include information about an article in an information service depend on whether it falls within the field covered by ICDL and whether its quality is acceptable. This can be done with reference to where it has been published and what procedures have been adopted to assure its quality, eg. expert and peer review, professional editing. The most important sources are books authored and edited, journals paper and online, and conference proceedings.

Because of copyright restrictions ODL information services generally do not reproduce full-text versions of publications but may include summaries, abstracts, and publication details. There are important issues related to the quality of this information as well as the quality of the original. In addition to the issue of accuracy and comprehensiveness of the details, the main issue concerns summaries, abstracts and coding.

Abstracts might be reproductions of the authors or publishers abstract or be produced specially. The quality and consistency of abstracts often varies, and checks are needed to ensure that an abstract actually represents the contents. This is one reason why ICDL keeps a library of full-text versions of every document.

Journals generally define the areas of interest of their audience as well as quality procedures, including peer review for accepting articles to be published.

The management of information

A collection of information about ODL on a particular website adds value to what users can achieve by searching across individual sites and pages. Rather than having to search, select, and assemble information for themselves, ICDL website users benefit from the information management work of others. The extent and quality of information management affects the value of the site. There are a number of problems which may occur. If any information is inaccurate and exaggerated, and is not edited or formatted, then it is going to be of limited usefulness and reliability. While formats have been defined aimed at ensuring that information covers a range of aspects (for courses - study time, level, subject, media used, assessment etc) sufficient information might not be forthcoming or available, there could be gaps, not enough details; or the information could be inaccurate, exaggerated, or otherwise misleading.

Most higher education institutions have their own websites and prospectuses which provide information about themselves and their courses. Generally course information originates from the teachers of the course, possibly in a format prescribed by the institution which might also take responsibility for editing all the course descriptions and where necessary request further information.

Quality assurance schemes usually require institutions to provide information to prospective students that is accurate, comprehensive and helps them make an informed decision as to whether the course is suitable. However, this does not ensure that this information is of acceptable quality for ICDL. Procedures and criteria are required to assure that the quality of information is consistent across institutions and courses. Available information might require editing, reformatting and elaborating before being included in the information service.

Conclusions

The field of ODL is continually changing and continuous and ongoing monitoring is required to identify new institutions, organisations, services, programmes, courses, projects, publications, websites etc. The systematic collection and revision of information is essential in order to remain up-to-date, and the overall quality of an ODL information service depends on comprehensive and up-to-date coverage of its area of operation. A service providing information on institutions and courses should aim for 100% coverage all of which meet its explicitly stated criteria, particularly those relating to quality. A service providing selected resources for a literature database must ensure that the material is reliable, relevant and readable. Working with other organisations active in the field – such as EDEN – is essential to monitor user needs and to gain additional information and access to other resources and new developments.

IMPLEMENTING INTERNATIONAL CO-OPERATION IN E-LEARNING: ARIADNE'S EUROPEAN KNOWLEDGE POOL SYSTEM.

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Abstract

European educational institutions – but also others, located in the Americas, Oceania and Asia – are currently struggling, mostly unknowingly, with two basic hindrances to their declared goal: cooperating in the field of E-learning. In this short paper, we describe these hindrances *a reductionist view of multilingualism* coupled to *the simultaneous advocacy of competition between educational institutions*. We also describe how these hindrances can be overcome through the acceptance and actual use of an *international, distributed, standardly indexed, multilingual repository of electronic "learning objects"*. The Ariadne Foundation is actually developing and maintaining such a technical system and a growing number of its members, in Europe but also beyond, are understanding and trying to benefit from its use. Strengthening and generalizing this co-operation scheme, through the direct involvement of historically well established European networks of educational institutions such as EDEN, EADTU, CESAER, CLUSTER, etc., would, in our opinion, be highly desirable and could benefit a much larger number of potential European citizens.

1. The Price of "lip-service only" Multilingualism

Europe is a highly multilingual region of the world, where, in most countries, education is still given in the local language. This is only natural, as children, youngsters and students, in any given such country, most often only understand their spoken mother tongue. However, in Europe, they quite often have a limited but non negligible knowledge of one or more foreign languages. Mostly for economic reasons, there are strong pressures to favor English as the first foreign language, and because many information technology tools are initially available in English (even if produced locally...), there is an erroneous belief that Anglo-Saxon speaking countries are leading the world in educational applications of these tools, i.e.: E-Learning.

We should also mention the enormous cultural pressure exerted by the media and publicity agencies, through the repeated and abusive use of English or American words and phrases in their day-to-day messages to people that are only considered as potential consumers.

For those of us that refuse to consider culture and education as a commercial commodity, and stick to the idea that they constitute a basic right of our fellow citizen, a strong and proactive reaction is considered as normal and urgent: In certain countries, there are already tendencies to abandon the use of the "vernacular" language in favor of the more fashionable, or sellable, American or English in certain areas of higher education. Ignoring or minimizing this tendency can lead to the death of our European languages as scientific ones.

An additional, considerable obstacle is also created for our researchers, who must compete with unequal arms with their Anglo-Saxon colleagues, both when they speak, write papers and grants or try to have access to international publications. Even the EU commission yields to this pressure by "recommending" that EU research proposals and projects be submitted in English, or trying to recruit "native English speakers" for EU official positions in the domain of science. Although such initiatives are completely illegal, most researchers do not dare write their grants in their own language, even if it is one of the official ones of the Union. This is certainly not the way that EU authorities should take if they wanted to abide by their self-declared interest in multiculturalism and multilingualism.

2. The Price of "all-out" Competition in Higher Education

In trying to implement E-learning solutions, all institutions must face the same bottleneck: dearth of appropriate contents and often a lack of convincing motives (the latter is not discussed here). Multimedia material is notoriously expensive and difficult to produce. This should be a strong incentive to cooperate with sister institutions in their development and re-use. But how can a higher education institution involve itself in sincere cooperation with similar ones, if its own governmental authorities are cornering it in a "compete or die" attitude by linking its funding to the number of students it can attract? Why should it share with others these education resources that, maybe, are making the difference?

The fact that sheer number of students is not by any measure related to the quality or achievement of an institution does not seem to bother our policymakers. Rather than aiming at a homogeneously distributed network of good quality, complementary educational institutions, that sincerely co-operate in the interest of their natural, regional users (the citizen or taxpayers), these policies favor the concentration of all kind of resources in a small number of "elite" institutions, leaving the remnants to all others. No matter if this means, for many students, moving away from their home region, with a high human and financial costs to themselves and their family – conveniently downplayed as the normal cost of a very desirable "mobility".

3. A Practical Step Towards Real Cooperation in Higher Education

Since 1996, the Ariadne project, relayed in 2000 by an international, nonprofit association, "the Ariadne Foundation for the European Knowledge Pool", has developed a technical scheme for multilingual cooperation in the domain of E-Learning.

The Knowledge Pool System (see Figure 1) is a distributed database of educational electronic material. Each node of the network is maintained by an educational institution (or in few cases, by a large corporation) that insert in the database its own educational components, using a now standardized indexation system, which is gradually being made available in many languages.

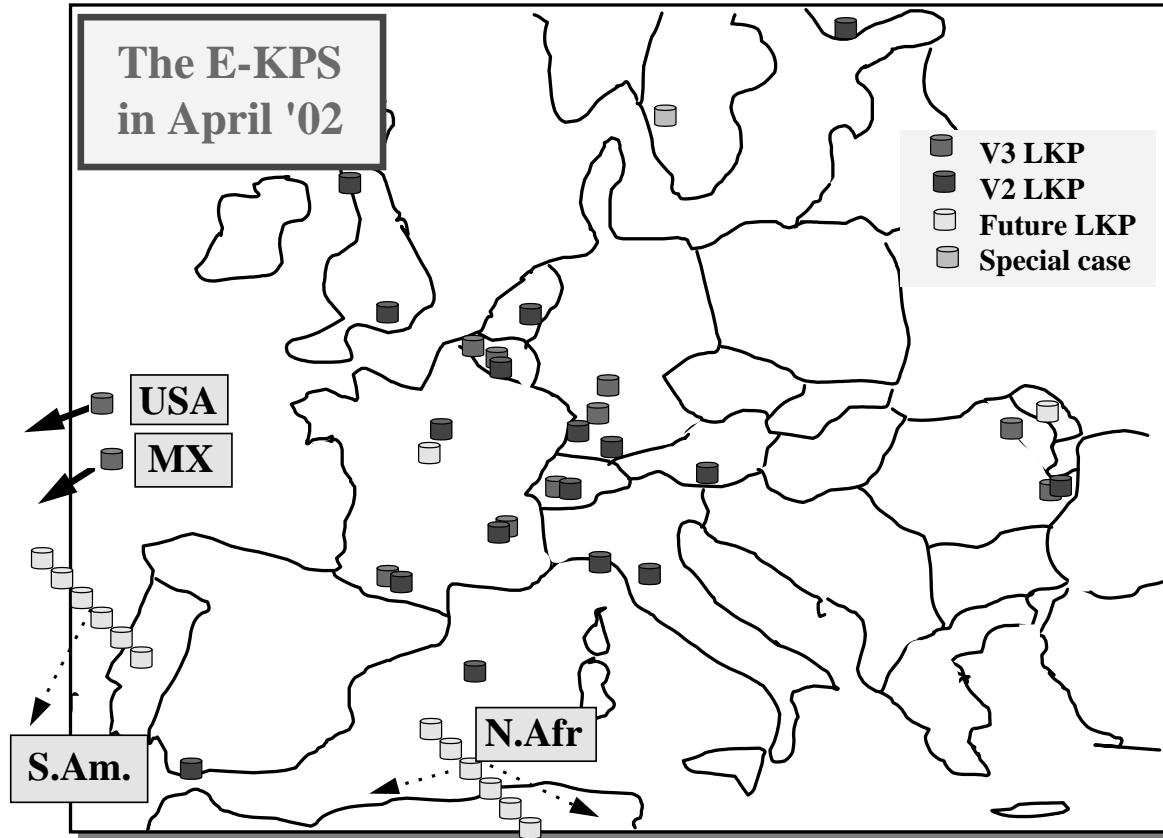


Figure 1: The European Knowledge Pool system in April 2002

This metadata system has its roots in work originally performed by the Ariadne project in cooperation with the U.S. based IMS project. The resulting system, known as the IEEE – LOM has gained wide acceptance thanks to the fact that it allows you to index in your own language your own documents, while still being able to introduce translations in other languages of important parts of your indexation fiches. Most current users accept to make freely available to others their educational content, provided that their citation right is respected. Thanks to the mirroring scheme imposed over this network, each node has access to the full table of contents of the Knowledge Pool System and to a personally selected set of educational documents from all other nodes. Sophisticated queries can help educational technologists discover what existing material is available for reuse in the ODL courses they are building. In the future, the system will evolve towards truly multilingual queries, enabling users to find contents covering a given topic in multiple languages. Educational institutions are finding that help from their librarians can alleviate the necessary indexation work, which can not easily be imposed onto their professors. The latter are finding that use of the Knowledge Pool is helping them, if only by easing their own access to their own material – and thus maintaining and reusing it!

Currently, most nodes are located in Europe and some 5000 educational documents are available to members of the Ariadne foundation. However, new nodes are being built in in the U.S. and Latin America, which could encourage us Europeans to publish and show the value of our educational material for the benefit and example of those very eager potential – and relatively isolated – users.

4. Concluding Notes

Maintaining and developing such an infrastructure is putting a heavy burden on the Ariadne Foundation (www.ariadne-eu.org), which depends mainly on the modest annual fees paid by its members. Cooperation with other European educational networks, such as EDEN, EADTU, CESAER, CLUSTER, etc., would, in our opinion, be highly desirable and could benefit a much larger number of potential European citizens. It could also, possibly, help change the attitude of current policymakers, who are not, to say the least, helping us either to truly co-operate or to protect our invaluable European cultural heritage.

Acknowledgments

The Ariadne KPS, the Ariadne authoring tools, the Ariadne course editor and the Ariadne E-Learning platform are collective undertakements, many individuals from several countries having played a part in their design, development, deployment and actual exploitation. In a way, and on a limited scale, these tools are similar to so-called *open source* projects. In due course, we hope that they will truly belong to this category of tools, which are well suited for use and maintenance by knowledgeable civil servants, as there are many in our Institutions.

EXPERIENCES WITH LEARNING OBJECTS REUSE SUPPORT TOOLS WITHIN THE EASEL PROJECT*

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Abstract

The use of web-based learning support systems is becoming more and more common in educational institutions, be it for running distance learning courses, as well as for supporting activities within traditional curricula. A large amount of educational resources is thus now at hand on the web. From the point of view of course authors and their organizations, a very desirable feature of open content management systems is support for learning objects reuse. However, content reuse is a complex problem, and it is very weakly supported even by most advanced commercial environments. This paper describes some of the experiences being done within EASEL [1], a European Union IST project. EASEL – Educator Access to Services in the Electronic Landscape - deals with data models and web-based technologies for learning objects reuse. One of the goals of EASEL is to define and experiment tools for easing several of the technically complex tasks that course authors face - while they create courseware from scratch - when trying to locate and reuse relevant material. In this paper we refer in particular to reuse in the context of humanistic university faculties. We describe some issues of learning objects reuse, and preliminary experiences with the EASEL system, involving non computer expert educators from the Philosophy school at our University.

1. Introduction

Due to the increasing number of distance learning initiatives in educational institutions worldwide, and to the spread of learning content management systems (LMS), a large amount of digital educational resources is available nowadays through the web. The introduction of third generation teaching technologies is becoming commonplace also in humanistic faculties. On the one hand, it allows to solve problems connected to teaching management, on the other hand it supports new teaching/learning patterns enabled by communication technologies.

Many universities – sometimes federated in consortia – have established production centres able to provide support to educators from all faculties in authoring and delivering digital courseware material to traditional and distance students. While portals and links for courses proliferate, little attention is being paid to sharing and reuse of digital learning material. The high cost of authoring good quality, pedagogically rich multimedia resources dictates instead that they should be highly reusable and available to a wide community of educators. Furthermore, the construction of tried and tested interactive assessment modules is in itself a costly process. Collaborative efforts and resource sharing should reduce costs to the educational institution, whilst also ensuring greater compatibility between assessments banks across institutions.

A current trend in research and development for supporting reuse of learning resources is based on the systematic and expert use of metadata. These allow a fine grained description of a resource to enhance its “found-ability”. This is already possible to a limited extent in some popular web search engines which organize the material according to predefined categories. In the large scale, however, a standard approach to metadata creation would help crossing national boundaries and allow resources to be found in open systems according to finely defined search parameters.

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The work presented in this paper is being done within EASEL, a European Union IST project. EASEL – Educator Access to Services in the Electronic Landscape – deals with data models and technologies for learning objects reuse. The objectives of EASEL include defining and experiment tools based on metadata standards for easing several of the complex tasks that course authors face when trying to locate and reuse material. In order to assess the effectiveness of the EASEL models and tools to support activities of non-computer experts, we consider the requirements for learning objects reuse from the perspective of educators in a human science faculty, and we describe experiments involving materials and educators from this area.

The rest of the paper is organized as follows. In section 2 we discuss issues in learning objects reuse. In section 3 we describe the EASEL architecture. In section 4 we present the experiences being done at University of Naples in trials of the EASEL system with material and educators in philosophy. Finally, we give some concluding remarks.

2. Issues in reuse of learning objects

2.1 Reuse forces and reuse process

Authoring course material - here in the sense of digital resources - is the task of producing electronic information resources, meaningful in the context of a teaching/learning activity. Such resources are often defined as *Learning Objects*. Learning objects can also be considered as information objects with specific learning strategies associated or embedded. Examples of learning objects commonly available on the web include lecture presentations (e.g. slides), video lectures, and exercises.

Authoring learning objects is an activity that involves many competences: subject competences, related to the definition of the content; pedagogic competences, related to the definition of teaching/learning styles and to cognitive processes; technical skills, mainly related to the usage of computer-based authoring tools. There are several reasons and situations that motivate reuse of learning objects. The main motivation is cost: authoring good quality, pedagogically rich multimedia resources has high costs; this raises a twofold need: a) reusing existing resources in the process of producing new ones; b) producing for reuse, i.e. authoring reusable objects that could become good candidates for reuse in the future. Furthermore, e-learning, be it understood as *on-line learning*, *distance learning* or *cooperative learning*, adds another dimension to the educational offering, i.e. the personalization of services, according to individual's needs. The use of technologies requires systems to be stationed in the course of life, adaptable, taking part in making learners responsible. Pellery writes: «Our age marked the outset of a new chance in the shared training field, that is one in which a training system does not depend basically on time and space, but rather one that is linked to user's needs and means. Terms are upset: it's not a question of learning for life, it's a life of learning» [2]. We cannot forget, finally, that every learner has an individual approach and pace to learning times. All these forces raise the need for e-learning systems to provide teachers and training experts with tools to prepare and adapt courseware to user's needs, re-purposing existing material.

Steps of reuse of learning objects available on-line may be thought as belonging to two phases:

- Search phase:
 - search and locate resources relevant to the author's goals;
 - download them,
 - examine them, then
- Reuse phase:
 - tailor or re-purpose relevant resources according to the specific needs;
 - building new electronic courses or course modules by assembling resources;
 - making the new material available to learners, e.g. through the author's institution learning management system.

As for the search, most of the information on the web is primarily intended for direct human consumption; reuse of learning objects, instead, would require to discover them through sophisticated search systems, in order to allow authors to “manually” examine only relevant resources to reduce the time and cost. With a generic web search engine, it is increasingly difficult to identify relevant resources against the “noise” of all other resources. Courseware authors (typically teachers and tutors) do not have time to filter what they need from a mass of irrelevant or unwanted search hits. A better search mechanism is needed, based upon innovative approaches.

After relevant and good quality resources have been identified, a new course constructor is faced with further problems to accomplish the subsequent steps that involve many technicalities. These include skills on how to assemble and package the new courseware in the proper computer formats, starting from the retrieved resources, and how to upload them onto the institution learning management systems. Such technical difficulties may hamper reuse, especially by authors that are not computer experts as many professors and tutors in non-scientific faculties.

In our project EASEL, the possibility of reuse is based on metadata. Metadata are usually defined as data about data. The basic idea of metadata is that of associating descriptive data to resources, to be used by information management systems for supporting user activities such as search and retrieval. This approach is rather common in domains as the one of digital libraries, where it is used for cataloguing and retrieval. The creation of learning objects encompassing content and metadata is a non-negligible investment. Clearly, standard data models and tools are needed to increase the value of such data and to facilitate interoperability and data sharing through time and space.

However, the availability of standards is not sufficient. Good practices still lack. We consider the production of meaningful metadata for resources a cataloguing rather than an authoring issue, requiring *ad hoc* competences. We envisage a multi-step process by which learning objects are developed, that involve several distinct roles, each requiring different skills. These include: (a) the **author**, who is knowledgeable in the domain for which the learning object is being produced, but is not expected to have advanced classification and technical skills; (b) the **cataloguer**, who produces the metadata, and is expected to have a sufficient understanding of the domain to which the object belongs, an understanding of the purpose of the object itself, and also a deep understanding of the relevant metadata syntax, vocabularies, and descriptive facilities; (c) the **technician**, who produces the final object in the digital formats suitable for the different target delivery channels.

2.2 Reuse of learning objects in human sciences

Learning resources of interest for educators in these areas often are not originally meant for e-learning, and they come from generic sources; examples include journal articles, essays, literature, biographies, anthologies, books and events reviews, annotated bibliographies, etc. In this sense, reuse opportunities for resources available on the web appear very promising to these educators.

A number of issues hamper reuse of learning objects by educators in human science faculties. Some of them are common also to educators in other areas, but additional ones are related to the specific field. One is the need for very user-friendly reuse support tools, since educators cannot be required to be sophisticated users of authoring and web tools. Pioneers in the use of technologies for education have often come from scientific faculties, or they were people already confident with the technology. If one looks at many authoring tools, one cannot imagine them to be for the less technically skilled. Technicalities of the process should be hidden to users if reuse is to be favoured in these faculties.

However, describing this kind of resources in a reuse-effective manner through metadata often involves also conceptual issues. While most of the metadata information is “objective” (e.g. author, title, date, format), some other information that would be relevant to describe a given resource are subjective. For many resources, these are related to the description of the hermeneutic viewpoint of the author of the resource. With the EASEL experiment described in the next section with learning resource from the topic “Reason of State” for a philosophy course, we attempt to investigate the effectiveness of tools for course construction and reusability in the humanistic domain. In many instances of humanistic courses, the idea of creating a course should involve the search of resources as they are seen in the light of different interpretations, either political, cultural and ideological.

3. Overview of the EASEL goals and architecture

Funded under the European Union 5th Framework, the **EASEL** project [1] explores technologies which can be integrated to offer course constructors an environment to create new on-line educational offerings. EASEL pioneers methods to enable constructors to readily combine existing learning objects into their new creations. In particular, EASEL explores technologies to offer educators [3]:

- – the opportunity to search, locate and access courseware;
- – the opportunity to configure new course offerings reusing discovered material.

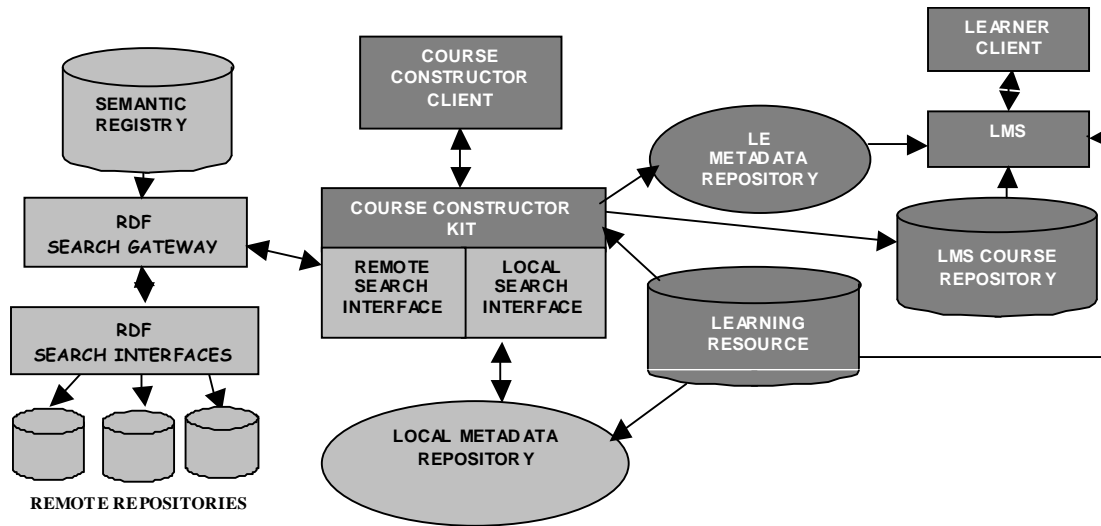


Fig. 1: The EASEL architecture

Figure 1 shows the architecture of the EASEL system where we can clearly identify a number of metadata repositories where learning resources are described. The approach followed in EASEL is to adopt a number of different standard metadata models to describe resources. These are the IEEE LOM [4], the IMS metadata [5] and the Dublin Core Metadata Element Set (DCMES) [6]. A single data model is in fact not realistic since different organizations or communities define their own schemas and taxonomies that are only applicable to their resources. Each organization keeps a local repository which stores metadata created according to the organization preferred standard and can search also across remote repositories which adopt different and even unknown metadata schemas. As for the actual resources these are independent from the location of the metadata describing them. They either reside in the LMS repository itself or are located elsewhere and referenced, for example as Web URL.

The key components of the EASEL architecture (Fig. 1), supporting the two logically distinct phases of course construction, namely the search for learning objects and the construction of a new module/course, are:

- *Search Gateway (SG) and Basic Semantic Register (BSR)*: the SG [7] is responsible for the construction and transmission of a user's query to Remote Repositories, and for the collection and presentation of the results to the user. All queries and results are couched in terms of schema elements, held in a Semantic Registry, and expressed using RDF Schema. The SG connects to a remote repository, it establishes the data elements with which the contents are described and then retrieves their definitions from the BSR. This determines the metadata fields over which a search can be conducted. This architecture is intended to provide flexibility in terms of any schema changes at the remote repositories. New data elements accessible for remote searching would be registered within the BSR and thus would automatically become available.
- *Course Constructor Kit (CCK)*: this is a tool for constructing learning modules, to be delivered as part of a general programme of learning and offered to students enrolled on that programme. The CCK allows modules to be constructed from a wide range of resources, both owned by the institution and available remotely over the Internet. For local resources, a query interface is supported, that interrogates local metadata repositories. The CCK also supports query of remote repositories through the Search Gateway.

4. The EASEL experience with philosophy learning objects

In order to investigate usability issues connected to standards and the CCK with educators from a non-scientific faculty, we have tested the EASEL system with users from the faculty of Philosophy. The trial scenario envisaged the construction of a new module on the topic of the “Reason of State” for the course “Political philosophy” at our University. The experiment followed three main phases:

1. Selection of a pool of learning objects to be used for the construction of the course;
2. Production of metadata;
3. Trials, in two steps:
 - A. Use of the EASEL search tools
 - B. Use of the EASEL CCK for building a new module

Material used consisted of critical essays on the “Reason of State”, authors’ biographies, critical bibliographies, anthological resources, reports of students who attend the on-going theoretical debate. Most of the selected resources were available in HTML format on web sites of our institution (www.filosofia.unina.it and www.archiviodellaragiondistato.it), some in Italian, others both in Italian and English. In order to further populate the pool of available resources a number of third party Internet resources were identified and described.

In order to test the search over both local and remote repositories we produced metadata according to the LOM, the IMS and the DCMES standard models. In this phase, we felt that fields of basic importance for supporting advanced searches with the SG were the resource description, its size, the expected learning time, numeric classification information, the relationship to other disciplines besides political philosophy.

Trial sessions were performed with a very limited number of educators who were not involved in the first phase and therefore were not aware of what resources were available to create the new course on the “Reason of State”. Extensive user trials were out of the scope of the project. Nevertheless, we tried to gather constructive feedbacks from these users, by building questionnaires aiming to assess several goals such as the efficiency of the EASEL tools and technologies to search across different metadata schemas and the efficiency of metadata for the retrieval of relevant learning materials; the effectiveness of metadata fields describing educational aspects of a resource towards the reuse of learning resource itself, the suitability of the course construction function to reuse and share learning material across the institutional, cultural and language boundaries; finally the potentials of EASEL technology to support both commercial and academic content providers in offering reusable learning material for the various education environments.

The results gathered from the trials can be summed up as follows:

- Search based on metadata schemas allows more precise and targeted search results. The advanced search greatly reduces the usual time needed for screening through masses of irrelevant resources. This is particularly true for humanistic resources where it is often useful to search for a given author’s work in relation to a hermeneutic approach. For the purposes of the trials the description field of the metadata record has been used to capture the subjective critical and cultural approach to the resource allowing for a more effective search process.
- Users would like to be able to tailor the resources found. Besides the issue of resource personalization there is also the problem of modifying the resource in order to provide a consistent look and feel of the course being created. The latter is not a problem in many cases especially in humanistic courses where a course comprises a collection of resources for the students to read, which come from different authors and are traditional heterogeneous in format and style. Nevertheless it stresses the need of creating resources which are reusable in their design.
- Users would like to use just a part of the resources found. This raises the problem of copyright infringement but it was not in the objectives of EASEL.
- Systems like the EASEL prototype can actually contribute to solve the problem of high cost of authoring good quality, pedagogically rich resources.

The CCK has shown its advantages with the political philosophy discipline contents in that: 1) it represents a useful means for sharing knowledge easily; 2) it enables a teacher to create teaching units, modules and courses starting from “fragments of knowledge” suitably indexed. Moreover it fosters the exchange of information, experiences and resources between different authors, perhaps in a trans-disciplinary context, therefore out of one’s own specific discipline. Figure 2 shows a screen dump of the course creation process.



Fig. 2: Snapshot from the web-based EASEL Search Gateway.

5. Conclusions

Nowadays, a large amount of educational resources is available through the web. From the perspective of authors building new electronic courses, reusing existing content is highly desirable. It is however a complex activity, stepping from searching and locating resources relevant to the author’s goals, to downloading, examining and then re-purposing them according to the specific needs, to making them available on-line as part of new courses. Many technical difficulties may hamper reuse, especially by authors who are not computer experts as many educators in non-scientific faculties.

In this paper, we have described the architecture of the EASEL system, aimed at offering user-friendly services to educators for the reuse of digital content. In the EASEL vision, standard metadata models for content description enable search and retrieval in an open architecture, while a course constructor kit allows to package and reuse content in the author’s institution learning management system. We have also described preliminary experiences with EASEL by educators from a human science university faculty. These show that authors can actually benefit from the availability of support tools, and that they can be built around now almost mature standards and integration technologies. However, in order to increase sharing and reuse of resources, we believe that a mental shift is still required: resources should to be authored in a modular way, and conceived for reuse from the very beginning, in order for them to become good candidates for reuse in the future. EASEL shows that the technology for advanced searches and resource reuse is mature to shift the problem to the application layer. The requirement of searching across multiple metadata schemas bears an intrinsic complexity as search interfaces are usually tailored for specific data models. This is still an area of future research. The use of metadata for the effective discovery of humanistic resources is not a trivial task. The approach followed here only serves as a proof of concept and further investigation would be required to explore optimal way of describing humanistic resources.

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A MODEL FOR BRIDGING CORPORATE KNOWLEDGE MANAGEMENT AND COLLABORATIVE E-LEARNING

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Introduction

Creating a 'learning economy' and managing related individual and organisational knowledge, as a source of sustainable competitive advantage in the digital age, seems to constitute one of the crucial assets of a competitive organisation. This paper is centred on the emerging trend of converging the formerly separated concepts of learning and knowledge management towards an integrated 'knowledge-based and learning approach' increasingly observable in academic theory as well as in business practices and building on this analysis provides a technological and methodological proposition to overcome those boundaries. [11] [12] [20].

Theoretical Background

e-Learning nowadays is perceived to be the engine of the 'knowledge economy' and especially 'Information & Communication Technologies (ICT)' are already vital enablers of 'Knowledge Management Systems (KMS)' and 'Learning Management Systems (LMS)' [1] [9] [10].

Recently published market analysis clearly show that the need for corporate e-Learning is mainly driven by technological change currently taking place [3] [7] [9] [10]. The rapidly decreasing lifecycles of relevant corporate knowledge often results in a lack of skilled labour force [18]. In this light technological change increases the complexity and velocity of working environments, but provides at the same time new vehicles for corporate learning and professional development, not longer perceived as a distinct event, but as a continual ongoing process. Especially so called 'knowledge workers' require greater flexibility in the electronic and mobile delivery of learning [13] [16] [17]. Those trends are backed up by the demographic changes of an aging work force age creating a need for 'Lifelong Learning (LLL)', both corporate and individual [1] [2] [13] [17].

Nevertheless the success of KMS enabling employees to acquire new and update existing knowledge – or in Piaget's terms learning 'the world' as the ability to adapt to it through accommodation and assimilation – is on the one hand highly dependent on the incorporation of real-life problems originating in real – time enterprises that 'Knowledge Management (KM)' can help to solve.

Furthermore leading experts regard 'Communities of Practice', or in other words groups of individuals formed around common interests and expertise as the ideal vehicle for driving knowledge and learning management strategies and as a consequence to build lasting competitive advantage, because they are enablers for extracting the required *tacit* knowledge – or the 'know how' of practitioners – stored "in the heads of the people" by providing a trustful, knowledge-sharing corporate environment [2] [4] [14] [19].

Learning through, with and within 'Communities of Practice' is in addition closely related to the theoretical concepts of intelligent collaborative working environments [8] [13] [18]. The approach has put special emphasis on the enhancement of positive interdependence among learners and individual accountability with the following key aspects: (a) *why* learners work together or task purposes (i.e. outcome structures), (b) *how* learners work together or solution purposes (i.e. means structures), and (c) with *whom* learners work together or social purposes (i.e. *interpersonal structures*).

be extremely helpful for this scenario. Capturing the content of intensive communication and interaction among practitioners, peers, mentors and experts – the tacit knowledge or ‘know how’ – will further enrich this knowledge repository. The objective is to enhance business judgement/acumen, provide in-depth exposure to different scenarios, and trigger a continuous knowledge exchange archived in a common BP knowledge backbone. The initial MCCS will evolve with the daily interactions between the users.

In concrete terms the application starts from the top-down assessment of corporate explicit knowledge. In a first step the management defines the content of the MCCS in order to build the critical mass of corporate knowledge. An additional way to manipulate the MCCS is the presentation of the content to the single employee or corporate learner. The actual presentation depends on a competence assessment of the individual employee’s pre-existing skills and competences, again self- or externally, formally or informally assessed.

Work-based e-Learning

MODEL defines work-based e-learning as the application and deployment of just the right amount of education and training at the right time, exactly to those employees having a need to possess the required knowledge or to learn the specific skill/competence for the execution of a BP or a set of BPs. Furthermore MODEL takes explicitly into account that supporting e-Learner is one of the most important factors to the success of e-Learning. To ensure the success of the system sustainable support structures as grouping practitioners into CCPs, internal e-Mentoring and e-Tutoring as well as on-line discussion forums were implemented within MODEL.

At the same time MODEL can be used as a learning tool as a part of a wider in-company training and qualification mix moving companies from current stand-alone to interactive, evolutionary e-Learning solutions. MODEL can be used as a self-study e-learning tool for informal learning as well as a pre- or post face-to-face training tool. MODEL allows practitioners to gain a base level of knowledge prior to other training events and to consolidate and advance their own learning afterwards by having the knowledge permanently available at the work place.

As described the MODEL Tool-set structures explicit individual and organizational knowledge, stored in an evolutionary IKCR. Then it captures tacit knowledge based on the practitioners’ daily work experience by reflecting, critically reviewing and annotating on the pre-defined layers of the Business Process approach. The related learning processes can be described as ‘*situated learning*’ (learning takes place in a structured setting and by a structured approach) and ‘*problem solving, informal & self guided learning*’ (practitioners directly relate their work experience with the knowledge base). The Tool-set enhances in parallel communication and collaboration by enabling CCPs and by supporting the exchange between the involved actors. The processes taking place can be paraphrased as ‘*group-based*’, ‘*CACL/CSCL*’, ‘*mentored and/or tutored learning*’ (the Tool-set stimulates the ‘Learner-Learner-Interaction [L2L]’ in a structured and systematic way).

Continuous Professional Development

‘Continuous Professional Development (CPD)’ can be defined as a structured way of recording, updating and enhancing professional knowledge and skills for employees, who are already qualified during their career. It adopts a typical *formative approach to self-assessment and self-development*. As such, after a diagnosis phase, the empowered individual identifies concrete actions. All through the process and at the end the involved individual carries out an assessment of the learning process and possibly intervenes with self-guided or external corrective actions whenever needed.

In this area working with MODEL lays the foundation for a more structured CPD approach integrating career guidance and planning alongside with training provision and qualification offers, which are systematically focusing on the personal development of individual competences of practitioners involved in the BPs. The opportunity of self-assessment is regarded to be crucial for an individual career planning e.g. to make a request to follow a formal training course. At every stage of working with the MCCS, the learner can check his or her performance on each layer by pre-defined self-assessment possibilities. The individual assessment might then either lead to additional external assessment, which forms the basis for individualised career guidance including in-house or external training and qualification measures.

Organisational Development & Continuous Improvement

Organisational development and continuous improvement is a company-wide process focused on achieving small-scale improvements on an ongoing basis by fostering a deeper involvement of people in their own work processes, and by capturing and building on the learning that takes place. Continuous improvement by definition is both a dynamic and evolutionary learning process. MODEL is offering a support structure that could in practice trigger and manage continuous improvements in an organisation. The MODEL Tool-set and methodology in this scenario can be used in an effective way on building and improving organisational competence i.e. the ability of a company to gain strategic advantage by extending involvement in innovation to a significant proportion of the organisation.

Working with the MCCS in this scenario can be utilised to improve corporate management routines and procedures. Bringing BP Practitioners – representing the corporate tacit knowledge – together with the management as the BP owner – representing the explicit company knowledge – in an ‘Integration Seminar’ provides either input to formalised ‘Business Process Improvement (BPI)’ approaches or lead into an informal up-date of organisational competence. Finally the quality feedback loop is closed by leading towards a refined definition of the MCCS incorporating the accumulated work practice of practitioners approved by the management or in other words putting potential knowledge – the ‘what will we know’ – in place.

The following figure finally gives an overview of the interaction of the MODEL Tool-set and the MODEL Organisational Application Scenarios within the so called the ‘MODEL Continuum’.



Figure 2 – The MODEL Continuum of Tool-set & Application Scenarios

Conclusions

The evaluation in the pilot sites showed that organisations put great emphasis on so called ‘*blended solutions*’ as developed by MODEL bridging the still existing gap of Knowledge Management and e-Learning. In the future MODEL will offer users the opportunity to adapt and personalise the solutions available, in terms of methodology as well as in terms of technological solutions. Thus, taking into account the high diversity of organisational cultures, methodologies and technical solutions already in place. Finally the results from organisational practice highlighted that MODEL has a great potential to

support (a) the management by strategic analysis & improvement of BPs, the (b) the operational and line management by operational effectiveness and the employees and practitioners by Continuous Professional Development.

To conclude and summarise the intention of the paper was to present ideas and developments on how to combine Knowledge Management and e-Learning. The innovative aspects of the approach adopted can be first of all allocated by the development and evaluation of organisational application scenarios combining in a flexible way both concepts. In addition corporate Knowledge Management and work-based e-Learning can contribute substantially to individual Continuous Professional Development and corporate Business Process Improvement. Finally the developed solutions were able to provide concrete support for employees on different hierarchy levels within an organisation. In this sense MODEL was able to foster the integration of 'knowledge-based *with* learning approaches' in the digital economy.

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LEARNING ABOUT SANCHO PANZA AND FOREIGN COUSINS: A CASE FOR INTRODUCING THE FUTURE OF E-LEARNING WITHIN THE SEMANTIC WEB

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Introduction

Many e learning project researchers and managers agree upon the need of having the learners work together as a community of learning. “Co-operation”, “community”, as well as “communicate” has to do with “having something in **common**”. Within a multi-origins group of learners and lecturers, people have a reduced version of the working language in common. But is language itself, as a set of words, the only way for understanding each others? I’ll propose to consider what learners from the Large Europe and Mediterranean area may have in common “before”, even if they are not aware of.

Then I shall consider the process in which they construct a common set of reference texts through browsing the web. The actual means and tools for retrieving are compared with the larger capabilities of the semantic web.

Before Babel: what the Euro Mediterranean learners may have in common

My experience is that, whatever the subject of the course may be, learners arrive at a point where they ask the question “what have we got in common?” They quickly discover that most of them use Arab words like Algebra, Indo-European words like Guitar, and Greek words as well and that, behind these words there are:

- Common conceptions that the elements of the world can be measured (Algebra, etc.).
- Common patterns for exchanging through music and words (the guitar allowing to play Arabo Andalus music as well as Rock and Roll).
- Common references to the writings of Plato and Aristotle directly or through local further writers.

Eventually, one participant may underline that they have something else in common, knowing that year 1996 has been proclaimed Nasreddin Hodja Year by UNESCO. Nasreddin is one of the names of a character within stories that are universal because they describe human nature and weaknesses of mankind everywhere. The second main orthography of the name is Nasrudin. This universal character inspired Cervantes for the actions and thinking of Sancho Panza. Their respective popularity can be verified on the Internet, with Google search engine for example.

The number of documents for Nasreddin is about 10 thousands, for Nasrudin and Nasruddin about 5 thousands and 200 thousands for Sancho Panza!

How amazed are the learners! At first glance, they thought they were so different. Speaking different languages, having different folkloric costumes, having different religions, having different political systems in their home countries. Having Algebra, Minor scales and Philosophical concepts in common is somehow “sophisticated”. But they realise that they laugh at the same character about the same situations!

Typical of this character is that he has a donkey. Let me tell a true story that happened in a learning community. A fellow, within the learning community, tells a story about Nasreddin, the donkey and the custom keeper. And a guy from Belgium, opening wide eyes, says to the group: “In Walloony, we have this same story but the hero is a Walloon and the donkey is replaced by a bicycle!” (1). Anthropologists observe that this common set of stories span from Ireland to North India. Other researchers investigate on what all human beings have in common that is not visible at first glance. Searches on the “original language” face methodology difficulties – Abehsera.

More promising are the works on the common construct of languages with metaphors – Lakoff & Johnson (1980). The work on ancient fairy tales – Propp (1927) and followers is well known. The facts explored by Jaynes are fascinating as well as those by Girard.

We shall keep Nasreddin, with the great number of stories he appears in, as our common core of texts retrieval example.

Retrieving for exchanging

In a community of learning, one major activity is to retrieve scientific information. Each learner has “ideas” and needs to enlarge, improve, strengthen his/her views, it is what learning is about. Before Gutenberg, the source of knowledge was people and hand written documents, then printed books and reviews filled libraries. In the 70’s, information networks began to store abstracts then full text. The first generation of the Internet is about full text and dynamic links between texts.

Retrieving from Dialog: the “old” way

Among different similar services, Dialog proposes “12 terabytes of content from the world's most authoritative publishers, and the products and tools to search every bit of it with speed and precision” (2).

Before the spreading of content through the Internet, Dialog was the main way to retrieve a set of texts on a selected matter. Most databases within the Dialog ensemble are made of text with a keywords section for each. These keywords were/are given by the authors and/or reviewers following strict rules of the place of keywords within a thesaurus, i.e. a tree organising classes and sub classes of objects or concepts (3).

Retrieving with Google: finding popular documents, missing pertinent documents

In 2002, how is it possible to find the pertinent documents on Nasreddin?

I choose to talk about *Google* because it has the highest number of trophies in the high speed search engine category (4) (5). Up to the need of the retriever, other tools may be useful:

- Other search engines (All the web, Altavista, Excite, Inktomi/Hotbot, Infoseek).
- Engines that use the content of other engines (Metacrawler, Ixquick).
- Directories (Lycos).
- Human-compiled directory of web sites (Yahoo, LookSmart/MSN).
- Human-powered search service (Ask Jeeve).
- Volunteer editors catalogue (Open Directory/Netscape).

Searching for “Nasreddin”, we already saw that *Google* finds 10 thousands links. *All the web* proposes 6 thousands. In any case, the volume of the finding is the problem, a two fold problem. First issue is to focus the research i.e. to eliminate all the answers that don’t fit with our issue which is: “What are the interesting texts about this cultural set of stories/views of the world that we have in common”. Among the links that we want to eliminate are, for example:

- the restaurants that are called “Nasreddin” (160+).
- the “Sancho Panza” cigars adds (more than 7 thousands out of the 10!!!).
- the documents about “Nasrudin” and “Buddhism” (219).

The second issue is the ranking of the documents. The choice of Google managers, for example, is to rank the documents through popularity i.e. the number of other documents that give links to the document. And the popularity of these pointing documents is itself evaluated. So the popularity given by Google has pretty good reliability.

But is this ranking adequate for the learner or is the pertinent document hidden within the list? Shall we consider the documents selected by Google for keyword Nasreddin. The first and eleventh documents give the description of the historical Nasreddin and stories (6). This is an interesting beginning. For Sancho Panza, it is a lot more difficult. The information is lost in a list with documents about cigars, sculptures, restaurants, other authors speaking of Sancho (ex. Kafka), music, etc.

If we focus our research, using a formula with three scope reducers:

- documents containing "sancho panza character".
- excluding documents with "-cigar -corona -bachilleres".
- keeping documents written in English only.

Then, only three documents remain, two about music and one text for students. It's pretty poor. If we focus "Sancho Panza origin", "Sancho Panza filiations", "Sancho Panza history", no document is found. Here is an illustration of the retrieving problem within the actual Internet. Researchers still need to use Dialog databases because of the capacities for searching within different areas (key words, full text, etc.).

On Internet, a formula with Nasreddin and Sancho Panza points to a very interesting non academic document on the universal character of the "holy fool". But we found it partly because, through Dialog database research, we new the answer, i.e. that Nasreddin and Sancho are of the same nature. Some researchers talk about Nasreddin or Sancho when studying "court jesters". (7)

The future Internet should combine the possibilities of the actual Google, of directories and Dialog.

The Holly Grail: the semantic web with ontologies

Both humour and wisdom of Cervantes story comes from the gap between the Holly Grail that Quixote searches and Sancho's Terrestrial Grail. In his peak moment of inspiration Sancho says to Quixote his dream of being the governor of an island. What are the dreams of curious learners as well as publishing scholars? They are starving for the tool that will allow them to find the right rare document quickly and accurately.

The art of tagging

Within the next ten years, one of the big deal of the Internet will be to organise the tagging of documents. Tags, as their name suggest, are hidden labels that are put "behind" the text of a document. For example, when having an HTML file on the screen with a browser or a text processor it's generally possible to ask the view of the HTML code. In the middle of this code one can recognize the main text of the document. At the beginning, there may exist tags like <title>, <author>, <last author>, <revision>, <created> or <last saved> followed by the corresponding information. The evolution of the web will be that these tags will be more and more used by software applications and that more and more types of tags will be available.

For example, within collaborative learning, collaborative writing is an interesting activity. The availability of the tags previously described allows a software application to manage the different versions of a document and the follow up of the intervening authors. (8) For the retrieving issue, tags allow many possibilities.

Today (2002) if one searches "Berners Lee" – the name of the inventor of the HTML language in the 80's and actual boss of the World Wide Web Consortium – about 100 thousands of documents are proposed. When the tagging systems that already exist (XML language complementing HTML) will be used, it will be possible to select only the documents authored by Tim Berners Lee. It will be a tremendous progress.

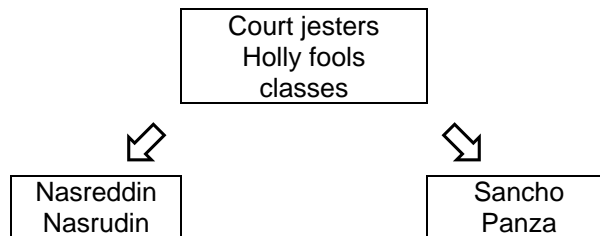
If we consider the future relationship between authors and learners, we can imagine a future of dynamic matching. For example, shall we imagine Tim Berners Lee writing about the semantic web. He would prepare paragraphs, drawings, spreadsheets and organise them with a set of rules. When a learners searches "semantic web" he is asked to be more precise about his concern, or he has his interest profile permanently defined. What he will receive is a customized article made of the pertinent items (paragraphs, drawings, etc.). Bois (2002).

These are only small examples of what tags allow to do both for authoring and retrieving. (9)

The art of meaningful tags

The tags we have seen before are only information tags, they don't carry any meaning. An author's name, a document characteristic (date, version, language, medium, etc.) doesn't give more than the label's content.

Shall we come back to our core example.



This diagram is a part of an ontology.

“An ontology defines the terms used to describe and represent an area of knowledge. Ontologies are used by people, databases, and applications that need to share domain information (a domain is just a specific subject area or area of knowledge, like medicine, tool manufacturing, real estate, automobile repair, financial management, etc.). Ontologies include computer-usable definitions of basic concepts in the domain and the relationships among them.” (10)

If we imagine the documents about Nasreddin and Sancho within a few year, these document will have a tag like <ontology> = the address of a document within an academic site specialized in this matter

<place1>= subclass of “Court jesters”

<place2>= subclass of “Holly fools”

The future browsers will have a button that will automatically call for the ontology and allow the learner to decide if the domain where the search is automatically oriented fits with his/her needs.

The effort for the Holy Grail

As described before, the semantic web, i.e. with ontologies is very simple to implement.

First, learned societies develop domain ontologies i.e. lists of allowed terms, their relations and definitions. Second, authors, using the new tag editing software applications, complete their text with tags. Third the retrievers use the new browsers that allow to select documents by specifying tag contents and relations. All this is simple, it doesn't mean that there is no effort. There is a quantitative effort for producing the ontologies and tagged documents. Qualitatively, there are many cases where consensus should be found between searchers within a same learned society and between learned societies to have one element described with the same name in physics and chemistry, for example.

Automated thinking

I have developed, here, only the first step of the semantic web. More important is the ability of computers to manage documents or sub-documents with contents and meaning defined by tags referring to ontologies. Both with ontologies – which carry the meaning- there is the need for a coherent syntax. Different bodies, including the Dublin Core Metadata Initiative (11), work on this matter.

Conclusion

One of the core need for e-learners is to work within communities of learning which share knowledge i.e., primarily, documents. This issue is even more important in the case of multicultural groups. The actual and future main source of documents is the Internet. Actual bad accessibility of documents on the web is

a temporary problem caused by low reactivity of actors toward this problem that was known long before when documents had to be retrieved in large libraries or institutions computer storage. The age of syntax and semantic standardization for the retrieval process on the Internet has begun and this problem is to be solved at the machine level. Then, all scientific writers and learners will have to learn how to use these new facilities.

Notes

(1) The story can be found in a book by Paul Watzlawick, "The language of change".

(2) <http://www.dialog.com/>

(3) Database producers as IEE for INSPEC database or MedlineUSA for MEDLINE have staff of one to several hundreds of people dedicated to indexing. Dialog includes hundreds of databases. Yahoo has more than one hundred people for indexing, etc. How many people in the world index documents every day?

(4) Studies about search engines performances can be found at <http://searchenginewatch.com/reports/index.html>

The history of the creation of Google within Stanford University can be found at: <http://www-db.stanford.edu/pub/voy/museum/google.htm>

Google includes a mechanism similar to the one of directories which allows to select within an area of interest:

<u>Arts</u>	<u>Home</u>	<u>Regional</u>
Movies , Music , Television , ...	Consumers , Homeowners , Family , ...	Asia , Europe , North America , ...
<u>Business</u>	<u>Kids and Teens</u>	<u>Science</u>
Industries , Finance , Jobs , ...	Computers , Entertainment , School , ...	Biology , Psychology , Physics , ...
<u>Computers</u>	<u>News</u>	<u>Shopping</u>
Internet , Hardware , Software , ...	Media , Newspapers , Current Events , ...	Autos , Clothing , Gifts , ...
<u>Games</u>	<u>Recreation</u>	<u>Society</u>
Board , Roleplaying , Video , ...	Food , Outdoors , Travel , ...	Issues , People , Religion , ...
<u>Health</u>	<u>Reference</u>	<u>Sports</u>
Alternative , Fitness , Medicine , ...	Education , Libraries , Maps , ...	Basketball , Football , Soccer , ...
<u>World</u>		
Deutsch , Español , Français , Italiano , Japanese , Korean , Nederlands , Polska , Svenska , ...		

(5) I made a test on Nasreddin within the Open Directory <http://dmoz.org/about.html>
The results were not pertinent.

(6) It is interesting to compare two versions of the same "knowledge.

First version at : http://w1.871.telia.com/~u87109316/index_eng.htm

Nasreddin Hodja was a cleric during Seljuk times. He was born in 1208 in Hortu village near Sivrihisar in Central Anatolia. As a young boy he must have enjoyed a free country childhood and lived in one of the cottages with adobe walls and flat baked earth roofs, typical of this region. He received his early education from his father, the village imam, and went on to study at the medrese.

After working as a village imam for some years, he moved in 1237 to the town of Aksehir. There he is known to have studied under such notable scholars of the time as seyid Mahmud Hayrani and Seyid Haci Ibrahim. Later he became a professor at the medrese in Aksehir and served as kadi. Nasreddin Hodja died in 1284 at the age of 76, and was buried in Aksehir in a tomb which symbolizes the absurdity in life which he had loved to expose while alive. A door with a great lock stands by the tomb, but there are no walls for a door.

Second version at : <http://www.turkey.org/groupd/chapter1/nhodja.htm>

The oldest Nasreddin Hodja story is found in the book called "Saltukname" written in 1480, which also contains other folk stories and legends. It is stated in "Saltukname" that Hodja was born in Sivrihisar and that the natives of Sivrihisar were famous for their strange behavior and ingeniousness. The strange behavior of the natives of Sivrihisar is also mentioned in a handwritten story book in Biblioteque Nationale in Paris. These documents are considered proof of his birth in Sivrihisar.

- (7) <http://www.omphalos.net/files/shaman/FOOL.TXT>
- (8) Collaborative software links <http://wwwfac.worcester.edu/owl/tech/techwrite.htm>
- (9) Tim Berners Lee about publishing in the semantic web era
<http://www.nature.com/nature/debates/e-access/Articles/bernerslee.htm>
- (10) Defining ontology <http://km.aifb.uni-karlsruhe.de/owl/>
Example of the chemical markup language
<http://www.xml-cml.org/schema/CML2/Core> in <http://www.ch.ic.ac.uk/rzepa/codata/>
Scientific publications in XML - towards a global knowledge base.
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- (11) <http://dublincore.org/documents/dcmes-qualifiers/>

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KNOWLEDGE MANAGEMENT IN DESIGN EDUCATION

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1. Knowledge Management

Since the early eighties, knowledge management has become a hot issue. Business researchers, consultants and media pundits from all over the world have exhorted today's companies to consider knowledge as an important aspect of production and a source of competitive advantage. Toffler (1981) and Drucker (1993) have described the transformation of western society from post industrial production (labour, capital and raw materials) to a society where knowledge is the predominant aspect of production and economic growth.

Trends in economic globalisation have led to ever increasing competition and shortening of life cycles of products and services. According to Porter and others, only organisations which are focussed on ever increasing added value will survive competition. According to Reich (1989) the recipe for survival in the post-industrial information society is the creation of organisations which value learning, creativity and the ability to innovate.

Institutions in higher art & design education are by nature organisations which value learning and creativity. Education and knowledge creation is the core business of these organisations. As such, it is quite remarkable how poorly developed the notion of knowledge management is at an institutional level. Although lecturers and educational staff put lots of energy at enabling knowledge creation and facilitating learning at a student level; very little organisations have developed a knowledge vision on how they can enable knowledge creation at an institutional level.

Universities are faced with the same challenges as other organisations. The educational market is not any longer the exclusive field of classic universities. Over the years consultancy firms, publishers and broadcasting companies have extended their services successfully into the realm of education. Local universities are faced with competition from abroad and the establishments of so-called 'in-business' universities.

Lifecycles of products and services are decreasing. The same applies to knowledge and information. Especially in the field of digital media, the lifecycle of curricula are challenged by the speed at which knowledge deteriorates. In order to meet these challenges institutions in higher education need to install a knowledge vision on how they retain and promote the creation of knowledge on an institutional level. In the LEDA project, universities in the field of design education, work together to apply aspects of knowledge management at an institutional level, by re-engineering educational practices and the implementation of information-management technologies. This paper reflects on the way LEDA caters for the creation of knowledge (within the field of digital media education).

2. Leda and its aims

LEDA (learning environments for the digital academy) is a partnership of four universities and an industrial partner working together to develop new educational practices and knowledge management systems to meet the challenges of education in the highly innovative field of design and digital media. The institutions were faced with ever changing demands and (technological) innovation in industry which was reflected by a strong demand for just-in-time knowledge at the level of courses and training. The institutions realized that meeting these demands would imply an assessment of the way knowledge creation was enabled on an institutional level and a need to focus on knowledge management strategies.

As such the institutions focused on the potential of knowledge creation within research and project work. By designing new approaches to learning and the design of information management systems these institutions are trying to capitalise on the knowledge generated by students and educational staff within research and design programs.

LEDA will build learning environments which are specifically designed to facilitate and promote the exchange of student acquired knowledge, skills and attitudes. Where most learning environments are developed from a very traditional educational point of view, the LEDA learning environments are aimed at the articulation of both formal and tacit knowledge. The combined research effort of three universities in art & design has provided pedagogical mechanisms which promote the creation and exchange of knowledge.

The LEDA learning environments will be designed as a networked system that enables students to publish assets through intranet technology without prior technical knowledge. The LEDA technology will provide in fully configurable publication templates through which students can store and retrieve knowledge assets. Technological research will be conducted in the area of effective pre-analysis and filtering mechanisms as ways to enhance effective use of information within educational contexts.

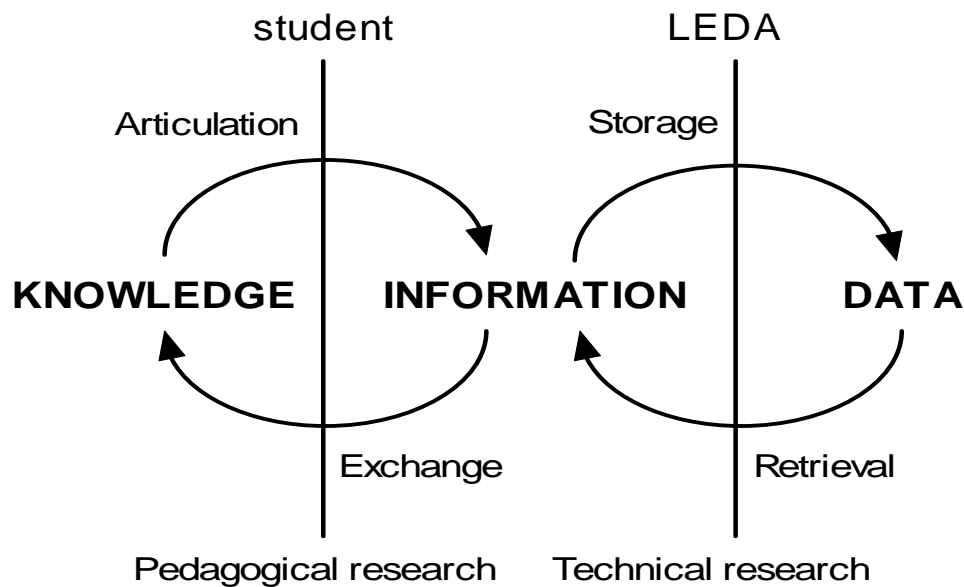
3. About Knowledge, Information and Data

In writing about knowledge management there is a clear need to describe the differences between knowledge, information and 'raw' data. This paper makes the distinction in which data are merely figures, information is meaningful data and knowledge can be understood as information which is part of a meaningful social context like a social group, a specific knowledge system or a culture (Weggeman, 2000). Following this definition, knowledge cannot exist outside an individual or a group. As a consequence of this approach, knowledge itself cannot be stored or transferred between individuals. In this regard advertisements of IT companies claiming technical solutions to knowledge management should be approached with reserve.

The only way knowledge can be exchanged is when knowledge is articulated into meaningful information. Articulation can be interpreted broader than just the codification of meaning into texts. Codification of meaning can occur by means of oral (speech, sounds, music), visual (body-movement, graphics) or even tactile codification.

Information in digital form can be stored and manipulated as data. The possibilities of manipulating, cross searching and storage of large data sets boosted the knowledge management hype. Especially the popularity and growth of the Internet in the mid nineties brought about all kinds of technical solutions to facilitate the logistics of data-sharing and enabling the management of information.

The LEDA research combines both pedagogical and technical research to design pedagogical approaches to the articulation of knowledge and technical solutions to facilitate information management. The model below illustrates how the research in the LEDA projects is organised around the distinctions between knowledge, information and data.



Pedagogical research in the LEDA project is targeted on the organisation of knowledge creation processes in research- or project-teams and in what way knowledge is articulated as information.

The technical research is oriented at the logistic facilitation of information storage, retrieval and manipulation of data as technical enablers of the knowledge creation process.

4. The knowledge creation process

“Learning is a process of creating knowledge” (Weick, 1991). The definition of learning in this way implies that knowledge is both the input of a learning process as well as the output of a learning process. Learning, seen as such a cyclic process involves three types of learning activities: ‘collection of information’, ‘processing & synthesising’ and ‘creation and evaluation’ (Renger, 2000).

In this cyclic approach, the first stage is ‘collection of information’. Information to be collected can range from ideas, research materials or individual outcomes of prior learning cycles. In this stage of the learning cycle, information is collected for processing.

In the second stage, ‘processing and synthesising’ information is ordered, structured, valued, interrelated and synthesised into new knowledge. For example, research material is being processed to support concept development, whether in the form of a research report or a structured data collection. It is a collection of activities with the purpose of the transition from raw data, rough ideas, brainstorm session outcomes etc. to concrete articulated ideas or solutions. As such, this stage is highly process-oriented and not product-related.

The creating aspect of learning is positioned in the third stage of the cycle, ‘creation and dissemination’. In this stage the results of processing & synthesis of information (from rough ideas to concept, from production to final product) is synthesised into new created knowledge which can be articulated in various ways (such as articulated ideas, models, presentations or prototypes). By evaluating the newly created knowledge, the cycle can be re-entered to create solutions for new problems or refinements on existing knowledge.

5. Enabling the knowledge creation process

LEDA’s main purpose is to enable knowledge creation processes by using learning environments which facilitate the articulation and exchange of knowledge. In their publication “enabling knowledge creation” Krogh, Ichijio and Nonaka (2000) have defined key enablers which promote the knowledge creation process:

- Creating the Right Context
- Managing Conversations
- Globalising Local Knowledge

5.1. Creating the Right Context

Effective knowledge creation depends on an enabling context, which can foster ideas and facilitate the articulation, creation and evaluation of experiences and knowledge. As such the “whole process of knowledge creation” requires the necessary context or “knowledge space”. Knowledge creation can only happen through an organisational structure that reinforces enabling and is aligned with strategy. LEDA reflects these requirements by promoting knowledge articulation within the context of specific educational programs like project-based learning or the conduct of formal research at PhD level.

Creating a ‘right context’ is crucial to student-centred learning. Research into the facilitation of group projects that were carried out by students at the HKU showed that a critical factor to effective knowledge creation was the necessity for students to be physically concentrated in space. This sense of ‘nearness’ was crucial in stimulating the exchange of ideas, tacit knowledge and experiences, the provision of a stimulating social environment, and the generation of social pressure and a sense of mutual responsibility.

This ‘nearness’ was defined at first as a physical quality of the learning environment of students working in the same space, in terms of Euclidean distance. But students also extended their physical nearness to cyberspace using ICT tools as FTP, ICQ, email etc.

However, for co-operative learning to take place, more is needed than putting students together in space, whether it be physical, or in the case of LEDA, virtual. Students need to share a mutual frame of reference and structure which in LEDA are shared learning environments, shaped according to the pedagogical settings students are working in. LEDA will provide students with a work environment in which they can articulate their experiences and connect to intellectually related students or information.

5.2. Managing Conversations

“It is quite ironic that while executives and knowledge officers persist in focusing in expensive quantifiable databases and measurement tools one of the best means for sharing and creating knowledge already exist within their companies... Conversations” (Krogh, Ichijo, Nonaka, 2000). According to these authors good conversations are the cradle of social knowledge and the most important enabler of knowledge creation.

Educational facilitators in student centred education do value the beneficial effects of conversation on knowledge creation processes. In coaching student groups educational facilitators often rely on conversations for the purpose of stimulating intellectual effort, promoting the articulating of progress and structuring the workflow. These Socratic dialogues stimulate students to articulate on the knowledge and learning experiences acquired and promote critical reflection. In the LEDA project the Socratic dialogue is translated to the digital domain.

The LEDA learning environments consist of pedagogical scripts which reflect the workflow a learning environment is meant to facilitate. These scripts consist of facilitating materials for the task at hand but more important, contain questions designed to promote the articulation and exchange of tacit knowledge. In designing these pedagogical scripts the dialogues are matched to the various motivations students can have in articulating their learning experiences, skills and knowledge:

- To comply to institutional requirements
- To share knowledge as part of the communal learning process
- To facilitate guidance and evaluation
- To showcase their work

One of the difficulties in designing pedagogical scripts to promote the articulation of knowledge in design education is to keep a good balance between articulation effort and killing the creative process by over-questioning students. A careful balance should be struck between registering crucial pieces of tacit knowledge while maintaining a good overview and representation of the entire design process. Striking this balance is very difficult, since there is not much existing research on how these particular processes take place in multidisciplinary group environments. The LEDA research aims to give insights into the underlying learning processes and procedures in art and design contexts in order to maximise articulation and exchange of knowledge while at the same time limiting the amount of knowledge-assets stored.

5.3. Globalising Local Knowledge

As the labour market in the field of digital media design is becoming increasingly internationally oriented, co-operation between institutions of higher education becomes increasingly important. However, international differences in curricula and course contents pose significant limitations on the possibility to design and distribute courses on an international scale. The knowledge derived from experience, however, is highly fit for exchange because it is not directly related to the specific contents of curricula, while keeping its relevance for students in the same discipline, and even across disciplines. As stated in the paragraph about the nature of knowledge, knowledge itself can not be transferred as such. Articulation of knowledge into meaningful information however, can be stored and manipulated by means of technology.

When retrieved in the right learner's context, mere data can acquire relevant meaning and become part of a knowledge creation process. The positive effects of the exchange of 'knowledge' assets depend entirely on the appropriateness of the data in the context of learner's activity. The LEDA technical research is aimed at providing solutions to the effective exchange of information. This research is once again related to the concept of 'nearness' as put forward in paragraph 5.1.

Here the concept of nearness is looked at from a contextual point of view, where it is projected on a subject matter which could share relevance with subject matter. An example of this principle can be found at *Amazon.com*, where a customer, whenever he/she orders an item, is confronted actively with items other people (who ordered the same item) ordered as well. In order to globalise knowledge in the context of the LEDA learning environments 'Nearness' can be defined as "the proximity value of information for knowledge (re)creation in terms of people working together and/or subject matter being relevant to people in a knowledge creation process".

Metadata are used to describe and define the context knowledge is articulated in. As such information inherits meta-information about subject-area and usage contexts. Matching metadata at the level of pedagogical scripts provide in so-called 'related topics, related issues, related persons', listings of potentially meaningful data which can facilitate knowledge (re)creation.

6. Conclusion and discussion

In the previous sections notions about knowledge management were illustrated with research associated with the LEDA project. A research and development effort to put knowledge management to practice in the realm of student centred design education.

The paper emphasises the notion of enabling knowledge creation processes as important aspects of learning. At this moment the LEDA prototype is being developed and soon will have its first educational evaluation within the EMMA and PhD programme at three institutes which run the EMMA and the PhD programme; The University of Portsmouth, Merz Akademie Stuttgart and the HKU (Hogeschool voor de Kunsten Utrecht). The results of these evaluations will generate data to test and validate the concepts as described in this paper.

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MOTIVATION AND COGNITIVE ENGAGEMENT IN DISTRIBUTED LEARNING ENVIRONMENTS: LEARNER DIFFERENCES THAT TRANSCEND INTERNATIONAL BOUNDARIES

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Most educators and designers of instruction agree that learner characteristics must be central to the planning of any effective learning environment. In this paper we argue that successful models of open and distance learning need to address key learner differences, and that motivation and cognitive engagement are critical differences. We will summarize two converging lines of research that show the importance of these differences in an e-learning environment in the US and in traditional learning environments in Slovakia and Spain. We discuss what we see as the implications of this research for distributive learning environments.

We begin by defining and explaining our use of the term “distributed” learning in place of the term “distance” learning. When telecommunications technologies were first used in education, the goal was typically to reach out to learners who were unable to easily travel to a site where instruction was being held. The technologies were able to broadcast the instruction to people who were literally learning at a distance. Currently, however, electronic technologies allow for such experiences as CD-ROM-based and web-based instruction to be used across all types of educational settings. In higher education these technologies are now often used in both distance and traditional settings. No longer does the issue of actual distance explain the instructional use of electronic technologies that can be accessed “any time, any where.” Instead, the newer technologies allow for learning to be distributed in time and space regardless of whether the learner and the learning institution are located in the same region or separated by physical distance.

Given that the boundaries between “distance” and “traditional” instruction are blurring with new electronic technologies, it is even more crucial for educators to understand the learner characteristics that are important for success in distributed learning environments. One factor that differentiates traditional from distributed learning situations is the greater independence required in distributed learning. Typically there is considerably less external structure provided in distributed learning than in traditional learning situations where an instructor develops and manages the course schedule and due dates.

A trend toward learning environments that require more independence is a positive trend, if we believe that experience as an independent “learner” will ultimately foster independent “learning.” This trend, however, can also pose new challenges in our quest to use technology to accommodate the unique needs of each individual learner. Elsewhere we have argued (Dillon and Greene, in press) that the focus on learning styles is not well supported by empirical research (e.g., Dille & Mezack, 1991; Geiger, Boyle, & Pinto, 1992; Pugliese, 1994; Pittenger 1993, Sewall 1986) and we further argued that a more powerful and expedient method of addressing individual learner needs may be to identify effective approaches to learning and then help students learn those approaches. In the current paper we discuss two different lines of research that support a focus on how learners approach learning.

Defining Approaches to Learning

By “approaches to learning” we mean the characteristics that learners bring to achievement settings. Different from traits, these approaches can vary from setting. In our research, approaches to learning include the achievement goals, self-efficacy, and strategy use that students report having in different achievement settings. Achievement goals are the reasons that a student gives for trying to learn in a particular achievement setting (Miller et al., 1996). There are three key types of achievement goals important for understanding motivation to learn. Learning goals are goals that are related to the desire to increase one's understanding or skill level. In contrast, performance goals (also called ego-oriented goals), are related to the desire to perform better than others and to protect one's ego (e.g., Miller et al., 1996; Pintrich & Garcia, 1991). Future goals refer to distant goals (e.g., eligibility for extra-curricular activities,

college admission, & career opportunities) that depend, to some extent, on how well the student learns and performs in the current learning situation. Both learning and future goals have been found to support successful learning (e.g., Miller et al., 1996; Greene et al. 1999), while performance goals have been found to hinder use of study strategies that support successful learning (e.g., Greene and Miller, 1996; Miller et al., 1993; Nolen, 1988).

Self-efficacy refers to the confidence learners have in their ability to successfully perform the achievement task currently confronting them (Bandura, 1986). According to self-efficacy theory, when we doubt our ability to perform well in a given situation, we often try to avoid the situation or diminish its importance to us. Tasks that we believe to be within our range of competence (i.e., our self-efficacy is high) are more likely to be approached eagerly and with considerable effort, than are tasks that we believe are outside our range of competence (i.e., our self-efficacy is low). Thus our efforts to learn in a particular situation are partially determined by our confidence in our ability to successfully perform a particular task. There is a great deal of research that supports these theoretical assumptions (Ames and Archer, 1988; Greene and Miller, 1996; Greene et al., 1999; Miller et al., 1996; Pintrich & Garcia, 1991; Zimmerman and Martinez-Pons, 1990).

Strategies are the behaviors a learner employs as they approach the learning process. Strategy use is influenced by both goals and self-efficacy (e.g., Greene and Miller, 1996; Miller et al., 1996; Pintrich & Garcia, 1991). Researchers and educators often differentiate between deep and shallow strategies (e.g., Craik and Lockhart, 1972; Greene and Miller, 1996). Deep strategies involve processing new information in terms of how it relates to existing knowledge. The to-be-learned information is elaborated on, and integrated with knowledge already residing in memory. Shallow strategies involve processing new information separate from existing knowledge and in the form in which it was originally encountered. The strategy of rote memorization, along with other types of superficial engagement with new information (e.g., simply reading a chapter twice), captures the notion of shallow processing.

There is evidence that deep strategy use is important for learning and achievement (e.g., Greene & Miller, 1996; Pintrich & DeGroot, 1990). There is also some evidence that shallow processing strategies may hinder learning (Greene & Miller, 1996; Ravindran and Greene, 1999). In the distance education literature, Kember and Harper (1987) found a relationship between a surface approach to studying and non-persistence in a correspondence study program.

Current Work on Approaches in an e-learning Environment in the US

We have been conducting a series of studies examining the self-efficacy, goals, and study strategies of students in a chemical engineering course that uses CD-ROM-based instruction. In Study 1 we compared the performance and motivation of students who participated in a traditional classroom section of the course with those who chose to participate in the CD-ROM based section (Dillon, Greene and Crynes, 2000). The findings from Study 1 showed no statistically significant differences in performance between the two groups, though, the CD ROM group scored 15 points lower on the final exam. That group also was statistically lower in their reported self-efficacy for having the required background knowledge (science and math). That variable, self-efficacy for background knowledge, was positively correlated with final exam performance. In reflecting on this finding, the course instructor recognized that he inadvertently encouraged students who were less prepared to take the CD ROM section by telling the students that he would be more lenient given that he was experimenting with the CD ROM as the main instructional tool.

In that first study we also explored within group differences to examine approaches to study used by successful and less successful students. Students who earned a grade of A or B were classified as successful; and students with a final grade of D or F were classified as unsuccessful. The findings from the first phase of the study were somewhat surprising because the successful and less successful student showed little differences in level of motivation, effort, and goal orientation (Dillon, Greene and Crynes, 2000).

To learn more about the factors contributing to success, selected students from the two groups were interviewed (Greene, Dillon & Crynes, 2001). Analysis of the interviews identified some important differences between the successful and less successful students. The less successful students focused upon

memorizing and applying what they had memorized. The successful students focused upon understanding the concepts. The less successful students skipped the easier parts of the work and in doing so may have failed to take advantage of the opportunity to activate prior learning. While the successful students reported skimming the easier parts, they were also looking for areas that they failed to understand. The successful students talked about “how they learned” and the less successful students did not. Both groups used surface strategies, but the successful students also used deep strategies and appeared to be aware of the difference between these approaches. They seem to be able to use this awareness to make decisions about how to approach learning whereas the less successful students continued to rely upon strategies that were not working.

The following year we again studied the students enrolled in the Chemical Engineering course. In Study 2, the CD ROM was the only choice for all sections of the course. In this second study we used regression analysis to examine the contributions to predicting success made by self-efficacy, goals, and strategy use (both deep and shallow). We defined success with both a final exam score and percentage of course points earned and used a pretest score as a covariate. In the prediction of final exam scores, after pretest scores explained 11% of the variance, deep strategy use predicted a unique and statistically significant 17% of the variance, and the motivation variables predicted another statistically significant 16% of the variance. The final equation, with all variables entered, explained 44% of the variance ($F(9, 35) = 3.09, p = .008$).

In the prediction of percentage of course points, after pretest scores explained 5% of the variance, self-regulation predicted a unique and statistically significant 14% of the variance, and the motivation variables predicted another statistically significant 25% of the variance. As with the prediction of final exam scores, the final equation for percentage of course points, with all variables entered, also explained 44% of the variance ($F(9, 35) = 3.10, p = .008$).

The above findings clearly show that both motivation and cognitive engagement are important for successful learning with technology in a chemical engineering class. Most important is the fact that the motivation and cognitive engagement variables were able to explain considerable variance in both final exam and percentage of course points after prior knowledge related to the course material was taken into account through the pretest performance. This means that above and beyond what prior knowledge does for students, motivation and strategy use are still very important. More specifically, learning and future goals were important, while performance goals were uncorrelated to course achievement. As expected, self-efficacy was also positively related to achievement. Additionally, both shallow strategies and deep strategies were predictors of learning in this course.

Motivation to Learn in Slovakia and Spain

We used a similar methodology to study relations among perceptions of democratic principles and processes, academic motivation, and cognitive engagement in academic tasks (i.e., the amount and type of effort used) among university students in emerging and young democracies. This work was done in traditional university classes (meaning that technology was not used for delivering instruction) in Slovakia and Spain. The addition of perceptions of democracy to this line of research was informed by recognition that the development of democratic school and classroom structures was the centerpiece of school reform movements in the US (e.g., Coalition of Essential Schools and the Oklahoma Networks for Excellence in Education) and in Slovakia (e.g., the Orava Project). These movements emphasize the need for schools to operate as democratic institutions that share decision making among the different constituencies within the school and community.

Additionally, current perspectives on how to foster student motivation endorse similar notions of democratic education in that they emphasize student autonomy and the development of self-regulation (e.g., Maehr and Midgley, 1991; Nicholls, 1989). These foci on democratic principles in education suggested a need for research that examines both how and why democratic education initiatives might positively influence student motivation and achievement. Additionally, although socio-political influences on student motivation to learn are consistent with motivation theory (Maehr, 1984) and with evidence from socio-cultural research (e.g., Ogbu, 1991; Kao, Gibson, & Ogbu, 1996), such influences have not yet been empirically studied. Therefore, data concerning links between attitudes toward one's socio-political context and motivation to learn were examined.

With 245 Slovakian and 373 Spanish students we measured the same Approaches to Learning variables as we did with the US Chemical engineering students, but we also included two other motivation variables that measured intrinsic and future valuing of the subject matter. Thus, the following motivation variables were measured: learning goals (4 items), future goals (6 items), performance goals-avoidance (4 items), performance goals-approach (4 items), intrinsic value (2 items), future value (3 items), self-efficacy (8 items), and deep strategy use (18 items). All questions asked about how students approached the learning in the class in which they took the surveys. The final question on the Approaches to Learning survey was a multiple choice item, with 5 options, that asked about the student's effort put forth in the current class, relative to other classes. Additionally, we used the Attitudes Toward Politics and Political Process survey that contained 28 items, which are not described here as they are not germane to the present paper. Finally, there was a series of questions about how often they engaged in discussions about political matters or problems facing their country.

We used the same regression procedures used with in the US study and examined the extent and pattern of prediction of strategy use scores. For the prediction of the Slovak strategy use scores, we first entered the scores for goals, values, and self-efficacy, which accounted for 25% of the variance ($p = .000$). Next we entered the average score for the Frequency of Political Discussions, which did not add to the prediction. Finally, we entered the Attitudes Toward Politics variables, which accounted for another 5.4% of the variance (ns). The overall analysis, with $R^2 = .31$, was statistically significant, $F(19, 202) = 4.70$, $p = .000$. There were two statistically significant Beta weights, for learning goals (.222, $p = .018$) and future values (.24, $p = .008$).

For the prediction of the Spanish strategy use scores, we first entered the scores for goals, values, and self-efficacy, which accounted for 30% of the variance ($p = .000$). Next we entered the average score for the Frequency of Political Discussions, which added another 3% to the prediction ($p = .000$). Finally, we entered the attitudes toward politics variables, which accounted for another 2.5% of the variance (ns). The overall analysis, with $R^2 = .348$, was statistically significant, $F(19, 309) = 8.8$, $p = .000$. There were (3) statistically significant Beta weights for learning goals (.35, $p = .000$), self-efficacy (.21, $p = .000$), and frequency of political discussion (.165, $p = .000$).

What is most important to note for the present paper is that these findings with European students show very similar patterns between the motivation and strategy use variables. In the European samples, learning goals and self-efficacy were reliably the best predictors of strategy use. Future values, which is similar to future goals, also was important in the Slovak sample, as they tend to be in US samples.

Conclusions

Taken together, we think these two research programs converge to provide evidence that variables that measure approaches to learning are essential in understanding whether or not students will be successful in either distributed learning environments or in traditional classroom environments. We think the evidence strongly supports our assertion that effective models of open and distance learning need to address key learner differences, and that motivation and cognitive engagement constitute such differences. We also believe that this is an outcome worthy of optimism because students can be encouraged to adopt approaches that are more likely to lead them to success in different learning environments. Given that the growth of distributed learning throughout higher education will continue place more responsibility for learning upon the learner. When designing distributed learning environments, we must focus on strategies that help students learn how to learn, whether our learners are learning at a "distance" or learning in more independent learning on campus.

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THE TEACHER'S NEW ROLE

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Introduction

How do we as distance teachers reach a discriminating and conscious Nintendo generation with web-based courses? Is it not true that the computer game industry is in the process of creating demands for educational web products?

The role of the teacher, actually the entire school world, is undergoing change. For distance educators like us the demands for adaptation originate from several different sources, not just from the younger generation. Knowledge and education are to be accessible to all target groups. The initial attempts to adapt courses to learning styles are beginning to bear fruit and methods and tools to adapt study material and courses for the disabled are under development.

At our workplace, the Swedish Agency for Flexible Learning (CFL), the interest in web-based courses has recently increased substantially. Today, almost half of the students studying Swedish A (language skills) and Swedish B (text analysis) register for one of the web-based courses. Six months ago the figure was barely 10%. This development has led us to consider how to best take advantage of the potential of computers. It is absolutely clear that we must identify a new language for the message we want to convey.

Reading a text on-screen takes up to three times longer than reading the same text on paper. This has an impact on the language used. It must be pared down and compressed.

Information is presented in point form, more or less. However, when part of the language is removed you can add other elements in order to convey the message. In web-based courses these are pictures, animation and interactive elements.

Our foremost guiding principles in the creation of web-based courses have been “visualisation and interactivity” which we regarded as the computer's two most prominent means to supplement the written word. We wanted to exploit these as much as possible with the limited funding at our disposal.

Visual elements fulfil different functions

The hierarchical structure of web-based courses forced us to think in terms of other structures than the strictly linear. Course content could not be formed around a central guiding principle but needed to be arranged hierarchically, layer upon layer. With printed material one can relatively quickly get an overview of the content via the number of pages and chapters. With a web-based course this overview must be made as comprehensible as possible so that the student does not get lost among links and html pages. We settled on three levels for the web-based courses.

One of the experiences gained from our first generation of web courses was that they were compact with text and offered too little visual stimulation. Now, with our second generation, we want to make better use of the computer's capacity to display images. In other words, many of the illustrations serve to attract attention or stimulate the viewer.

Images can also contribute to creating an overview. A map of southern Scandinavia serves as an overview of the Swedish A course. The student travels by train along a circular, westerly route from Norrköping to Stockholm and makes eight stops along the way. Each stop contains a study unit and includes a visit with a known author. The train's journey provides an overview of how much of the course has been completed and how much remains.

On the homepage of Swedish B all of the sections are presented in the form of images. They can be clicked on and have the mouse-over effect. This allows the student to quickly see the scope of the course and facilitates navigation.

When a section is selected a bookcase is presented. Here the student gets an overview of the literature discussed in previous sections as well as which new works will be covered. The mouse-over effect also provides a little information on the new books on the shelf.

A clickable language tree is used to provide an overview of historical language events.

By using images it is possible to communicate with a minimum number of words. In the literature and history of literature course there are a number of slide presentations including one that very briefly describes the Nordic story of the creation and another tells the tale of Tristan and Isolde. The student gets a brief and pleasurable insight into literary themes. The circumstances surrounding the Trojan War form the foundation for a multitude of literary works through the ages. Via a mouse-over exercise in the form of a chain the students can construct their own stories originating from the Eris and the Apple of Discord. Hopefully during the course of the task several of the unusual names will stick in their memory.

In the same course there is also a clickable “era guy” for each section. The “guy” briefly outlines what influenced thinking during the era in question as well as how contemporary authors described human beings.

This is easy to demonstrate a time axis and relationships using illustrations. One section of Swedish B deals with loanwords in the Swedish language. Using a drag and drop exercise a number of loanwords are moved back to their original language. The exercise activates both the visual and tactile senses. The student gets the timeline for the waves of loanwords, as well as a review, into the bargain.

For a long period of time we have thought about how to explain grammar in a comprehensible manner using a minimum of words. In other words, we want to explain abstract concepts in a concrete manner. At this point we have only finished the two opening sections of what will be a module on parts of speech.

Learning style survey

In order to create courses that work we needed to learn more about how different types of students function in a learning situation. We compared learning style theories and, based on them, attempted to identify practical applications.

We also conducted a small study of the learning styles of our students, compiled by network consultant Johny Alm.

From April to October 2001, 80 students enrolled in Swedish A and B, were presented with an on line questionnaire, in which they were asked to answer questions in order to establish their learning style. The students completed the test at the beginning of the A- or B- web course, and after having completed all the questions they received a reply by e-mail. The reply consisted of a learning style profile that illustrated their strengths and weaknesses and supplied them with advice and recommendations. The result included the student’s profile according to VAK (visual, auditory, kinetic) preference, dominant brain hemisphere, information processing and preferences concerning context, etc.

The students were instructed to consider 50 statements on a scale from zero to ten. “If you totally agree mark the figure 10; if you completely disagree mark the zero”. Examples of statements are given below:

I have to do something with the knowledge to be able to learn 0 1 2 3 4 5 6 7 8 9 10

I remember things that I have seen as mental pictures

I like to study alone

I like listening to music while studying

I want to take notes while attending a lecture

I’m a creative thinker

The distribution according to sex was as follows:

Men	26	32,50%
Women	54	67,50%

The learning style profile of our students was compared with a reference group assumed to represent the average of the Swedish population (1949 Swedes). The mean values are given below:

	Our students	Reference group
Solo focus	34.35	27.61
Practical/active	33.21	32.91
Tactile/emotional	33.14	30.69
Visual perception focus	32.19	30.58
Gestalt-oriented hemisphere	30.36	31.07
Analytic cerebral hemisphere	28.85	28.54
Theory/mentally focus	26.43	24.89
Kinetic perception focus	22.24	21.38
Auditory perception focus	18.46	20.14
Group focus	16.15	21.65

The outcome was much as we expected. However, the students at Swedish Agency for Flexible Learning are to some extent more inclined to study alone than the ones in the reference group.

When it comes to VAK, the tactile/emotional preference comes out strongly, while the auditory channel is the least preferred. These figures suggest that we should provide the students with opportunities to work with their hands and to create an environment with positive feelings. Although, auditory stimuli in general were not important, the value of auditory stimuli should not be underestimated, as individual students preferred this type of input.

Our students, in particular the females, preferred self-governed studies.

The students were more practical than theoretical in their approach to learning. These needs may be more difficult to satisfy in distance learning. The students also showed a greater interest in theoretical focusing than did the reference group.

The distribution of “right- versus left brain thinkers” was as follows:

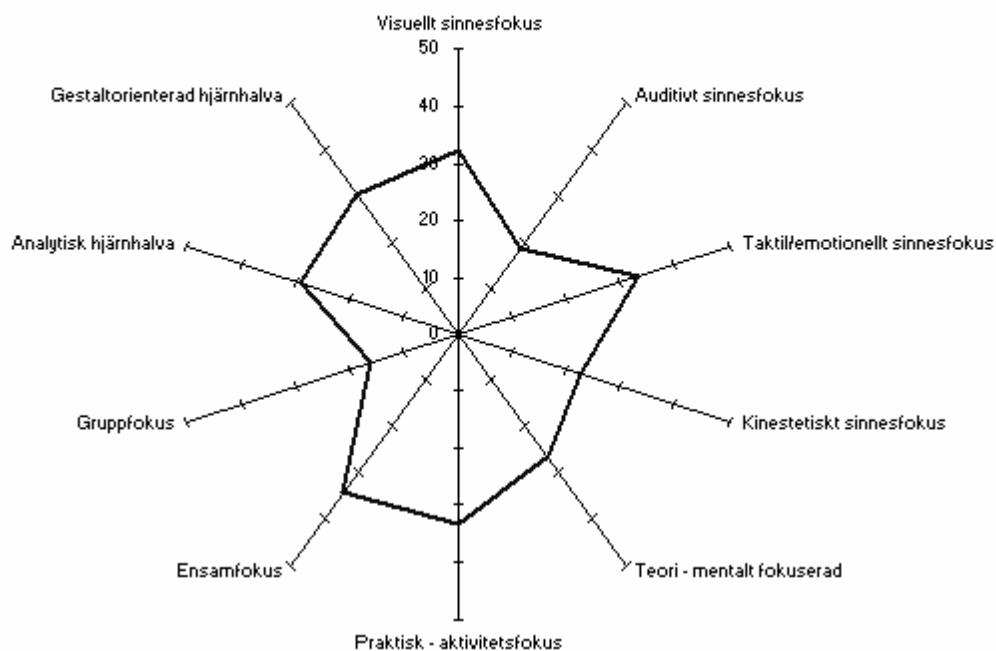
	Men	Women
Left brain	26.69	29.89
Right brain	29.93	30.91

	Our students	Reference group
Left brain	28.85	28.54
Right brain	30.36	31.07

As there were more “right brain thinkers” than “left brain thinkers” we have to provide our students with a global approach alongside the sequential structure.

Mean Values for the Entire Group

Medelvärden hela gruppen



Visuellt sinnesfokus = Visual perception focus

Auditivt sinnesfokus = Auditory perception focus

Taktil/emotionellt sinnesfokus = Tactile-emotional perception focus

Kinestetiskt sinnesfokus = Kinetic perception focus

Teori – mentalt fokuserad = Theory-mentally focused

Praktisk – aktivitetsfokus = Practical-active focus

Ensamfokus = Solo focus

Gruppfokus = Group focus

Analytisk hjärnhalva = Analytic cerebral hemisphere

Gestaltorienterad hjärnhalva = Gestalt-oriented cerebral hemisphere

The test scales describe the students' characteristics in ten dimensions. The graph indicates that our students were more visually and kinetically oriented than audio oriented. They also prefer to study individually rather than in cooperation with others.

Ninety-four percent of the participants responded that they had actively selected the distance education alternative. In other words, it was not that they were unable to study at traditional adult education institutions. Ninety-five percent of the respondents concurred with the statement "I chose distance studies because the distance form suits me best".

Teamwork

Previously teachers have worked individually to produce the text-based study guides that have formed the foundation for distance education. The web-based products that increasingly replace the text material are considerably more complex and require a new working method. In our experience the production of web-based courses should be done in closely-knit project groups. The team should include a reasonably computer-literate pedagogue, a reasonably pedagogic web designer and a creative web illustrator. In addition, the team requires a school leader who will generously allocate time and resources.

It is in the meeting of different fields of expertise that new, innovative ideas arise. The team members learn from one another and the courses are the result of a synthesis of technical solutions and education experience and theories. Furthermore, every team member must be goal-oriented so that the product is completed on time and properly maintained since web courses tend to have a short service life!

In the future we hope to be able to work in a more integrated manner involving everyone in the team, from idea to final product. Regardless of how we choose to convey our message, who we choose to cooperate with and what form the finished product has the goal remains unchanged. To awaken interest in the subject, to stimulate, to satisfy the thirst to learn, and reach learning for life!

From idea to reality

During the last two terms we have created a total of three **web courses**. There was not much time to get the job done. We had four weeks each for each course, and during that time we were supposed to write a stimulating and informative study guide, invent interactive exercises, ponder upon the assignments for each unit (8 units in each course) and put together the examination test. We also searched for pictures and links and contacted authors and publishers to ask for permission to use certain texts. Sometimes they would answer; sometimes they wouldn't; and sometimes the texts were far too expensive. The four weeks were extremely intense and often included evenings and weekends.

While working we "built" our course by taping the pieces of paper to one of the walls in our workroom. This proved to be the easiest way to see the hierarchical structure. Quite a lot of brainstorming took place during this process and quite a lot of ideas and material were scrubbed after second thoughts.

When everything was in its proper place it was time to make the storyboard. The web developers wanted everything written down in one big manuscript:

- the written parts with clear headings, subheadings and page breaks;
- distinct sketches and drawings to be shown to the vector graphic artist (we are allowed to buy a couple of pictures; they are expensive)
- the links and photos put in the right place
- instructions where to find our Powerpoint presentations or pictures
- the interactive parts in writing and drawing and put in their proper context.

Now it was time to meet the web designer, who was allowed to spend 200 working hours making the course "weblike". After presenting the material and the thoughts behind it, we often felt both encouraged and discouraged. The web developers always have a positive and enthusiastic attitude, but unfortunately there is never enough time to implement all of the ideas. The crosswords, the grammatical love story, the puzzle that would make it easier to understand the meaning of compound words, the drag-and-drop-symbols-to-the-right-explanation-exercise, the test-yourself-bookshelf were only some of the things that could not be included in the courses for the time being. The time was simply too short. In fact, there are lots of interactive exercises in our drawers waiting for the right time to come ...

One might perhaps think that now that the storyboard had been handed over to the web department our part of the work was done. But no! It's not always easy to get a grasp of our ideas, and since it's always possible to interpret ideas in many different ways, the web developers keep in touch while doing the job. They often get ideas of their own and find unexpected solutions, but sometimes they need further clarification on certain points.

Finally the course ends up on the web, and now it's time for the proof reading check. At this moment it's very frustrating to discover that there are still mistakes to be corrected; missing links, spelling errors, mixed up pages and incorrect answers to the interactive exercises. The errors tend to be there no matter how many times you scrutinize the material before putting it on line. There are so many things that might go wrong.

Anyway, now that the course is on the web the students will find their way to it. An interesting communication is about to take place.

Links to Learning Style Models:

Click on the list to the left to reach *Dunn & Dunn Model International Learning Styles Network*, St. John's University, New York, USA. <http://www.learningstyles.net/>

Click on *What is 4Mat* in the navigation bar at the top. About Learning Inc. is a training, consulting and publishing company based in Wauconda, USA, <http://www.aboutlearning.com/>

The page is mirrored at Colrain School, MA, USA, <http://www.colrain.k14.mass.edu/>

Click on “Staff Page”, then “Deb Campbell” to reach information on VAK.
<http://www.colrain.k14.mass.edu/Campbell/styles.html>

The Telecommunications for Remote Work and Learning website, Great Britain
<http://granite.cyg.net/~jblackmo/diglib/>

Click on “pedagogy” at the bottom of the homepage and then “Learning Styles of End Users”. Under “Kolb's Theory of Learning Styles” you will find more about Kolb's theories,
<http://granite.cyg.net/~jblackmo/diglib/styl-d.html>

Donald Clark, Edmonds, Washington is a behavioural scientist, educator and logistics expert. He writes about VAK, Kolb, Gardner and learning styles in general.
<http://nwlink.com/~donclark/hrd/learning/styles.html>

Neuro Linguistic Information Center, USA. The site offers a host of NLP links, <http://www.nlpinfo.com>

This page is mirrored at Jacksonville State University, USA, <http://www.psychology.org>

Type in <http://tip.psychology.org/> Click on “the theories”, and then on “Andragogy” to read out Knowles and then to “Minimalism” to read about Carol.

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THE ROLE OF NAVIGATION AND MOTIVATION IN E-LEARNING THE CRIMP-APPROACH WITHIN A SWEDISH-GERMAN RESEARCH COOPERATION

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Abstract

Software programs are widely used in education which is undoubtedly a result of the rapid development of hard- and software. This technological development enables software developers to create hypermedia environments. Hypermedia offers a great potential as a framework for modern e-learning tools as it allows the incorporation of constructivistic learning strategies. However, hypermedia systems have to cope with severe drawbacks such as cognitive overload and navigational problems. Therefore, the question arises how to create efficient computer based learning environments. Scientific research on print material can provide helpful hints as well as the promising approach of the cognitive theory of multimedia learning. But further scientific investigations are necessary to bridge the gap between those studies and the complexity of real hypermedia systems in order to reveal if their predictions are applicable to more realistic complex settings.

CRIMP (Criteria of Evaluation of Audiovisuals in Multimedia Productions) is one of five projects within a German-Swedish research network called VASE (Visualization and Simulation Environments to Solve Difficult Learning Situations). Its partners are the Learning Lab Lower Saxony (L3S) and the Swedish Learning Lab (SweLL). CRIMP will investigate navigation, motivation and predictions of the cognitive theory of multimedia learning by evaluating the impact of four different versions of a complex hypermedia learning environment on learners in Germany and Sweden.

The increasing importance of e-learning in education

The amount of e-learning-tools in its different forms has been expanding rapidly during the last 20 years. An important reason is undoubtedly the fast development within the PC-hardware sector which in turn influenced the software. First, powerful hardware settings facilitate the operation for users by graphical user interfaces. Second, it gave the technological basics for an evolution of simple and monomodal e-learning-tools (i.e. software was based exclusively on visual text) up to hypermedia systems.

According to Gerlič and Jaušovec (1999), there has been an explosion of computer-based multimedia applications in education in recent years. The incorporation of pictures, movies and sound is characteristic for multimedia components and their implementation in e-learning material seems reasonable because on-screen text is hard to read when compared to traditional printed material (Weidenmann 1997). However, the increase of use of online-learning is slower than expected and its future development will most probably differ between sciences and arts (Beck, Glotz et al. 2000).

A huge amount of studies has evaluated the efficiency of e-learning environments. Kulik and Kulik (1991) found in their meta study evidence for an advance of computer-based learning as compared to traditional learning styles. Similar results have been reported about the use of computer technology in schools (e.g. Software Publishers Association 1995) and universities (e.g. Kazmerski and Blasko 1999, Steyn, du Toit et al. 1999). However, other studies reported different results. Fricke (Fricke 1991) found only slightly or no differences. Merchant, Kreie et al. (2001) investigated in their study a multimedia computer based training (CBT) which turned out to be less effective as compared to other instructional methods. Generalizable statements about e-learning tools compared to traditional learning styles seems to be difficult due to the variance in software tools and traditional learning styles (Draschoff 2000 and references herein).

Merchant, Kreie et al. (2001) stress the importance of further research into what factors might affect the success of computer mediated learning environments. Since the heterogeneity of software tools is high, this is a difficult task (Schulmeister 1996). Additionally, the efficiency of computer mediated learning tools depend on several factors, e.g. the topic of the software (Korfiatis, Papatheodorou et al. 1999) and the learning style (e.g. Smith and Woody 2000). Brünken and Leutner (2000) and Mayer (1997) give an overview about the different factors leading to individualized aptitude of the user.

The role of motivation

Spitzer (1996) claims that motivation is a central aspect in instruction. It seems to be obvious that high motivation will enhance attention and therefore learning success. This assumption does not have to be the case, because “good feelings” during learning sessions are not necessarily an indicator for learning effectiveness (Holzinger 2000).

Generally, users find the presentation of new media interesting and stimulating. This Hawthorne-effect has to be taken into account while evaluating e-learning software because it diminishes after a certain use of the software and might therefore lead the researchers to false conclusions during the initial phase of the evaluation (Schulmeister 1996). It do not seem to be reasonable to assume that multimedia motivates learners per se (Weidenmann 1997).

Whereas some researchers state that the analyses of motivational aspects is becoming an important task in research of multimedia based e-learning tools (Astleitner 2000, Leutner and Brünken 2000) others claim that the factor motivation is overestimated or may have even a negative impact on learning effectiveness due to a distraction effect (Kerres 2001 and references herein).

The role of navigation

The first attempts to use computers in education had only a simple navigation implemented. Their teaching path was mainly fixed and linear. Hypermedia is the most recent way of using computers in education and its main criterion is the possibility to navigate free among the teaching material. Hypermedia systems have the power to build a framework for a modern constructivistic e-learning environment. However, hypermedia systems may incorporate severe drawbacks:

- The freedom may cause students to lose touch with educational aims by the “serendipity-effect”. This effect describes the phenomenon that users become distracted by non-relevant information while browsing through the hypermedia network (Holzinger 2000).
- Losing the educational aim may also be a result of the “lost in hyperspace” phenomenon which describes the problem of disorientation.
- Hypermedia may cause a cognitive overload if the learner has to deal on three different levels with the system (Kuhlen 1991):
 - information on the content level
 - navigation on the structural level
 - system functions on the system level (hard- and software)

Holzinger (2000) points out, that different mechanisms may be helpful in order to avoid the “lost in hyperspace” problem:

- classical navigational aids (table of contents, glossary, index)
- multimedia specific tools (e.g. site maps)
- bookmarks
- guided tours
- “fish-eye view”

Möller and Müller-Kalthoff (2000) showed that the integration of graphic navigational aids do not automatically lead to better understanding or improved memory achievement. Their results reveal an interaction effect of navigational aid and domain-specific prior knowledge because navigational aids promoted a stronger improvement for persons with low prior knowledge.

How to design and implement multimedia modules – the need for experiments and a cognitive multimedia theory

The value of a hypermedia learning environment depends, besides navigation properties, on the value of its single components which in turn depend on the content and its instructional presentation. This straightforward statement points out the requirement of answers about the following two questions:

- What is valuable content?
- What is a valuable instructional design?

The question about the value of the content cannot be answered in general. Content developers have to adopt the content for each e-learning tool separately as it has to match the necessities of the user in focus. Too simple content as well as too complicated information does not facilitate learning (see Holzinger 2000).

In order to evaluate the value of the instructional design experimental settings are necessary which investigate and compare the effectiveness of special aspects under controlled and constant circumstances. Two drawbacks have to be taken into account for evaluation studies (Schulmeister 1996):

- Artificial experimental settings might lead to artificial results which cannot be transferred into the real world.
- The number of investigated variables in these studies has to be very restricted because otherwise statistical analyses become impossible since the number of test persons is a limited factor.

Schulmeister (1996) came to the conclusion that, due to the large amount of relevant variables, a serious experimental design cannot be done. However, even if it is problematic, experimental studies for the evaluation of the impact of important factors in e-learning software tools are necessary and seem to be possible if one concentrates on relevant variables which have to be selected on a theoretical basis (Draschoff 2000). A theory of multimedia learning provides researchers with suitable predictions. These hypotheses can be used as a guideline for asking the right questions and overcomes therefore the criticism of Schulmeister (1996).

Support for computer-based multimedia applications develops from cognitive theories. Especially the cognitive processing of pictorial information in acquiring knowledge is one of the major topics in the present discussion about learning with multimedia (Brünken, Steinbacher et al. 2001). Mayer and his colleagues have established a cognitive theory of multimedia learning (e.g. Mayer and Sims 1994, Mayer 1997, Mayer and Moreno 1998, Mayer, Heiser et al. 2001) that seems to be able to serve as a guideline for the research of an enhancement in effectiveness in multimedia modules. Schnotz and his colleagues presented a similar model (Schnotz and Bannert 1999, Schnotz, Böckheler et al. 1999). Both models differ mainly in their assumptions about the internal processing in the human mind.

In practice, costs for production of multimedia components are important. Therefore, efficiency is of greater relevance than effectiveness because (unlike effectiveness) it takes into account the bear of costs (Kerres 1997). The additional expenditure for the creation of computer-animations in e-learning environments instead of still pictures has to be justified by a better learning outcome (Kerres 2001). Especially the development of high-quality three-dimensional computer-animations for their use in multimedia e-learning environments is doubted by Kerres.

The approach of the CRIMP-project

In order to evaluate the impact of e-learning tools, different questions have to be taken into account (Glowalla and Schoop 1992):

- What is the amount of knowledge acquired by the user?
- What time amount is acquired to elaborate the software?
- What learning style will be used?
- What is the opinion of the user about the e-learning tool?

We are addressing these issues in the CRIMP-project.

CRIMP (Criteria of Evaluation of Audiovisuals in Multimedia Productions) is one of five projects within a German-Swedish research network called VASE (Visualization and Simulation Environments to Solve Difficult Learning Situations). Its partners are the Learning Lab Lower Saxony (L3S) and the Swedish Learning Lab (SweLL).

CRIMP uses an experimental approach in order to unravel questions about the effectiveness and efficiency of learning in a hypermedia environment. Therefore experiments are carried out together with pupils, the target group of the used e-learning environment (see below). Until now, more than 50 pupils in Germany were involved in the project, a number that will be enlarged further on in Germany. Similar experiments are planned for the evaluation with Swedish pupils in the next year.

The role of navigation

One central topic of CRIMP is its focus on questions about the role of navigation, which will be evaluated by log-file analyses of experimentally modified versions of an existing hypermedia software. This software “The Cell 2: The Powerhouse” deals with a topic of cell-biology and is the winner of the “digital 2002”, one of the most important prizes for multimedia products in Germany.

- Since there are different opportunities to navigate through this hypermedia product log-file analyses document what kind of navigation will be really used during a session.
- Is the navigation dependent on computer literacy or learning style? Both factors will be evaluated by questionnaires before presenting the software.
- Does the “lost in hyperspace” (Conklin 1987, Tergan 1997) phenomenon occur and is it dependent on the prerequisites of the users, i.e. learning style and computer literacy?
- How efficiently is the hypermedia software used for a target oriented task? Is the hypermedia structure useful or will users be distracted by other, extraneous content?

The role of motivation

The question of motivation and arousal will be evaluated by the production of four different versions of a module of the hypermedia software “The Cell 2: The Powerhouse” thus leading to four slightly different versions of this hypermedia software. Whereas one version includes two three-dimensional models and a content page with a three-dimensional look, the other versions are gradually reduced in their complexity. The smallest version consists only of a two-dimensional content screen. However, the content in each four versions does not differ because it is presented by equal auditory speeches.

- Do additional three-dimensional animations or close-up views foster motivation and therefore learning output?

A short introduction instructed the pupils to look explicitly on this module. Afterwards, retention and transfer questionnaires check how many of the content has been incorporated. The test-persons are additionally able to state their impression of the module and the software in general.

The role of animations

The third theme of CRIMP deals with the design of animations and their effectiveness for learning. Therefore, another module of the hypermedia software was established in four different versions. The versions build a 2x2 factorial design with one factor being degree of reality (two-dimensional or three-dimensional) and the other factor being visual cueing elements (with or without). Since these versions are

embedded into the complex hypermedia environment this experiment bridges the gap between studies focussing solely on single modules and the reality and complexity of modern e-learning tools.

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THE IQ FORM - TOOL, AN INFORMATION TECHNOLOGY-BASED INSTRUMENT FOR SUPPORTING EFFECTIVE LEARNING IN HIGHER EDUCATION

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Purposes of the demonstration

The presentation will introduce the IQ FORM - tool, an information technology-based instrument for supporting effective learning in higher education. The IQ FORM consists of an interactive Intelligent Questionnaire databank and a tutoring set, which have been adapted to learners' needs. The multidisciplinary IQ project has created instruments through which students can learn about themselves as learners and develop strategic learning skills for virtual courses. The interactive databank of the IQ FORM provides information about learners' qualities, e.g. their strengths and weaknesses as learners, and motivational structures, as well as social navigation during their studies. The IQ FORM tutoring set offers online guidelines to students how to become more efficient learners. The IQ FORM is intended for an individual student, students groups and teachers of virtual courses in higher education.

The aim of the presentation is to focus on the following issues: (1) how the interactive tool works from the users' point of view, including examples of how the tool provides an interactive support for learners and their teachers. It also (2) makes transparent the conceptual analysis and theoretical solutions on which the tool is based and, it (3) introduces the initial results of empirical data collection in the project.

The IQ project-homepage is available at: <http://www.edu.helsinki.fi/iqform/>

Theoretical framework - "Towards empowerment of learners"

The IQ FORM product is a cooperative project with researchers in education, psychology, computer science, information and communication sciences, and media culture. The theoretical framework originates from this multidisciplinary ground. Conceptually the project has hierarchical levels: meta theories which guide the high-level objectives of the project, as a comprehensive mission. The other theoretical selections are in line with the meta theories and they have steered practical tool sets.

Meta theories

The psychological and educational theoretical perspectives arise from the assumption that a learner is an active contributor, but he/she needs support and facilitation to find his/her capacity and power. Theories of mediated learning (Feuerstein, 2000; Kozulin & Rand, 2000), distributed cognition (Salomon 1993), and individual differences in learning (Gardner 1993; Snow & Corno & Jackson, 1994) provide the meta-level theoretical background for the project.

The idea of reciprocal symbol systems and distributed cognitions (Salomon 1993; 1998; Salomon & Perkins 1996; Pyysalo 2001) has given the guidelines for the interactive databank and tutorial set. Symbol systems of learners' own capacity, virtual learning environments, self-assessment tools, and tutoring systems have been constructed to interact in an intelligent and reciprocal way. Computing science and technological solutions are also modified with these adaptive and interactive principles.

Empowering a learner in virtual environments also means a need for collaboration and human interaction. In a virtual environment, a comprehensive and direct human interaction is deprived, but we have many ways to enrich the learning processes through interactive systems, which also provide a real humanistic component in technology-based environments. Ideas of mediated learning have offered the principles how to help learners to support each other to find intentionality, reciprocity, transfer and meaning of their learning (Feuerstein 2000; Niemi & Latva-Karjanmaa 2001).

The summary of the covering theoretical principles are introduced as follows:

The learning concept

- individual differences
- collaborative knowledge creation
- interaction with external symbol systems (distributed cognition)
- active and intentional processes

The teaching and tutoring concept

- supporting learners for self-regulation
- providing strategic learning skills (cognitive, affective and conative)
- providing resource management skills
- creating collaborative learning space
- serving as moderators in mediated learning

Theories of test banks

Students' learning qualities are measured using H. Gardner's (1993) multiple intelligence theory and P. Pintrich's motivational self-regulation theory (Pintrich & Ruohotie 2000; Boekaerts & Pintrich & Zeidner, 2000; Pintrich & Garcia 1991; Pintrich 1999; 1995). The questionnaires work as a databank. Students may select different questionnaire combinations, aiming at becoming more conscious of their learning styles and motivational strategies, and changes in these qualities during the course. Their profiles also tutor them to get help and support from their teachers or peers, and to encourage them to use new types of learning material or routes to find more effective learning strategies. Tutoring packages, which guide students and teachers to use information about students' aptitudes and motivational qualities, are constructed on the same theoretical basis as questionnaires. In the initial stage of the project, four tests are available (IQ-Research group 2001a; 2001b):

1. **WHO AM I AS A LEARNER?** – Students' self-assessment of their strengths and weakness using a questionnaire based on Gardner's differentiation of different human intelligences. The IQ group has modified and validated a MI test for higher education students and the newest version consists of 7 x 4 items with a seven-point scale.
2. **HOW DO I TRUST MY CAPACITIES?** – A test for efficacy of learning measured on five dimensions: expectations of success, performance anxiety, inner reward of one's own studies, concept of usefulness of studies, self-efficacy and self-confidence. The IQ group has modified and validated a MSL-IQ test and the newest version consists of 5 x 5 items with a five-point scale.
3. **WHAT ARE MY STRATEGIES IN LEARNING?** – A test for time management, self-management in learning, persistent in learning tasks and help seeking strategies. The IQ group has modified and validated a MSL-IQ test and the newest version consists of 4 x 5 items with a five-point scale.
4. **HOW CAN I EXPAND MY LEARNING SKILLS?** – A test of basic learning skills in higher education with the following learning operations: rehearsal, critical thinking, finding essential points, connecting newer and older knowledge, using keywords and advance organizers, applications of theories, self-assessment skills of learning. The IQ group has modified and validated a MSL-IQ test and the newest version consists of 7 x 3 items with five point scale.

Students can get their test results online after completing the test or tests. They also are provided with statistics of the results of the group in the same virtual course. The tutor has access to the group profiles and to an individual student's profiles, assuming this access is granted by the student.

Intelligent systems – “Towards adaptation to learners needs”

The IQ FORM acts as a flexible tool for data collection from a large number of students. This requires that the software architecture design has to consider the scaling issues already in the early stages of developing the tool. This is quite standard web-technology with only some minor differences (e.g. highly distributed storing of the profiles etc.) to the usual server solutions. However, more interesting issues arise when considering the IQ FORM tool as a profiler, i.e., modeling the students learning profile, and adaptive use of this profile. In the IQ FORM, this modeling is based on building probabilistic models in the Bayesian framework (Howson & Urbach, 1993). Although some recent work has addressed user modeling, based on for example Bayesian networks (a particular class of Bayesian models that can be represented in graphical form), the IQ FORM technology is unique in its application of these techniques in the open learning environment domain (Kurhila et al. 2001). It is well known that the recent developments in Bayesian modeling exhibit significant advantages over the more traditional statistical approaches.

The Bayesian probabilistic models as student profiles provide an interesting and well-founded new approach for adaptive learning environments. The models built from earlier student data sets can be used to classify new users of the tool into categories (profiles) that describe various learning styles and skills. The use of such profiles is twofold. First, it will give feedback to the student as a learner, and consequently helps her/him in orientating towards the learning process. More importantly, this profile can be used to personalize the learning material to better suit the student's needs. This of course also requires coordination with the course producer, and for this purpose the IQ FORM also introduces a simple mark-up language for tagging the online learning material. The IQ FORM is not restricted to any specific virtual learning environment and it is intended to be used with different course materials.

“Only heaven as a limit for learning” – Information technology and semiotic perspectives

The graphics [PL1] used in the tool provide a strong image of empowerment through learning. Information technology with semiotic perspectives has been applied to create an encouraging learning atmosphere. After completing the tests a student will have profiles which describe his/her own and his/her group's qualities. The test profiles use the following visual metaforas:

Raising balloons for seven intelligences, giving an image that we all may grow and develop. A student may click a balloon to have more information about each intelligence area and how s/he may develop this quality. There is also a short animation for each intelligence by which a learner may test her/himself in each ability area.

Shining suns for self-efficacy qualities emphasize the importance of self-confidence and the will to win in learning tasks. By clicking the sun(s) in a self-efficacy profile, students receive tutoring support, e.g. how to perform and overcome performance and test anxiety.

Flying planets for learning strategies make visible the power of learning strategies. The four planets profile tell a learner how strong her/his own strategies are. By clicking a planet, a learner receives information and practical guidance, e.g. how to become stronger in time management in virtual courses and how to use help-seeking strategies in learning groups.

Shining stars in the dark sky symbolize learning skills and reflect an image of our learning, opening for us the richness of the universe.

The visual profiles are also available as statistical parameters and the students may follow their own progress throughout the course and compare their own profiles with the group information. The tutor may use this information in course moderation. The IQ FORM tool provides a tutor with information and practical guidelines on how to help students to become effective learners.

Data sources

The project has collected data with four IQ FORM tests, at the beginning of 2001, from 300 students from different disciplines in three universities in Finland and from 100 students in China. The data has been analyzed for test validation. The dimensions of each test have been accepted following a careful explorative and confirmatory factor analysis.

The IQ FORM is designed keeping the Bayesian modeling methodology in mind, and it allows for the modeling of very large data collections. Pilot courses in the virtual university environments, 2001-2002, have given new data for the further development of the tool. The project has been in the pilot stage in 2001, and the conference demonstration focuses on introducing theoretical and practical implications of the version IQ FORM.0.

The initial testing of the usability of the tool was carried out in August 2001 and individual users were interviewed in August and September 2001. Feed back from different user groups in the Finnish Virtual University as well in the Open university on Finland has been collected in the beginning of the year 2002. Results of this data will be introduced at the conference. The tool is available in Finnish and English, and later in the year 2002, it will be open to Swedish speaking students.

Educational implications of the theories

The IQ FORM tool provides learners with information about their own learning, on line, through multiple presentations (e.g. visual, numerical, linguistic symbols and animations) and also allows them to make comparisons with changes in their learning over time. Furthermore, it gives an opportunity to compare their own profiles with group profiles of learners in the same virtual course. The profiles have links to an interactive tutoring package, which mediates guidelines to learners and their teachers to achieve effective learning strategies. The learners can construct their own learning portfolios in which they are able to save their own test results and reflections on their own learning strategies.

The main pedagogical principles in the construction of the IQ FORM are:

Flexibility

- can be a combination of various scales and used for different purposes
- the data will be qualitative and quantitative

Interactive

- allows a dialogue between learners and tutors

Supportive

- gives information to learners about their own learning and how to steer it effectively

Tutoring

- gives supervision to learners to find options which help them to learn more effectively

Educational or scientific importance of the IQ FORM

Supportive learning environments for web based learning and for higher education have been required by many researchers (e.g. Anderson, 2000; Wolfe 2000; Niemi 2000; Wolters 1998; Winne, 1996; McInerney & McInerney & Marsh 1997; Welle-Strand, 1999). The information produced through the IQ FORM can be used by the producer of the course - the manuscript writer must also have a concept of different learning routes and difficulties. In addition, the course tutor and learning partners need a meta knowledge of learning offered by the IQ FORM. The very user is a learner, as him/herself - a tutor of one's own learning.

The information is needed for

- Accepting learners' differences
- Interaction between learners and course providers
- Interaction between learners and peers
- Awareness of one's own learning processes
- Keeping up motivation
- Providing new learning skills

This kind of knowledge is needed at different stages of the learning process in the course: At the beginning, throughout the process and at the end of the studies.

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A STUDY ON SKILLS REQUIRED FOR HIGHER EDUCATION ONLINE LEARNING

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1. General Background

The Mediterranean Academy of Diplomatic Studies was established in 1990 as a joint project undertaken by the University of Malta and Geneva's Graduate Institute of International Studies, Switzerland (MEDAC, 2000).

Amongst the courses offered, the only course that would subscribe to the parameters of online distance learning within the planned research context was a post graduate course offered by the Mediterranean Academy of Diplomatic Studies situated within the University of Malta. The course is a Post Graduate Diploma in Information Technology and Diplomacy offered over a period of one calendar year. Broadly speaking, the course is composed of an induction phase, whereby the students come over to Malta for a period of ten days, where they are provided with the skills and techniques so as to pursue their students in the distance learning phase which approximately eight months.

Students and staff reside in their resident countries across the entire globe throughout the online distance-learning phase. A hybrid combination of synchronous and asynchronous means of communication employed between all the parties involved.

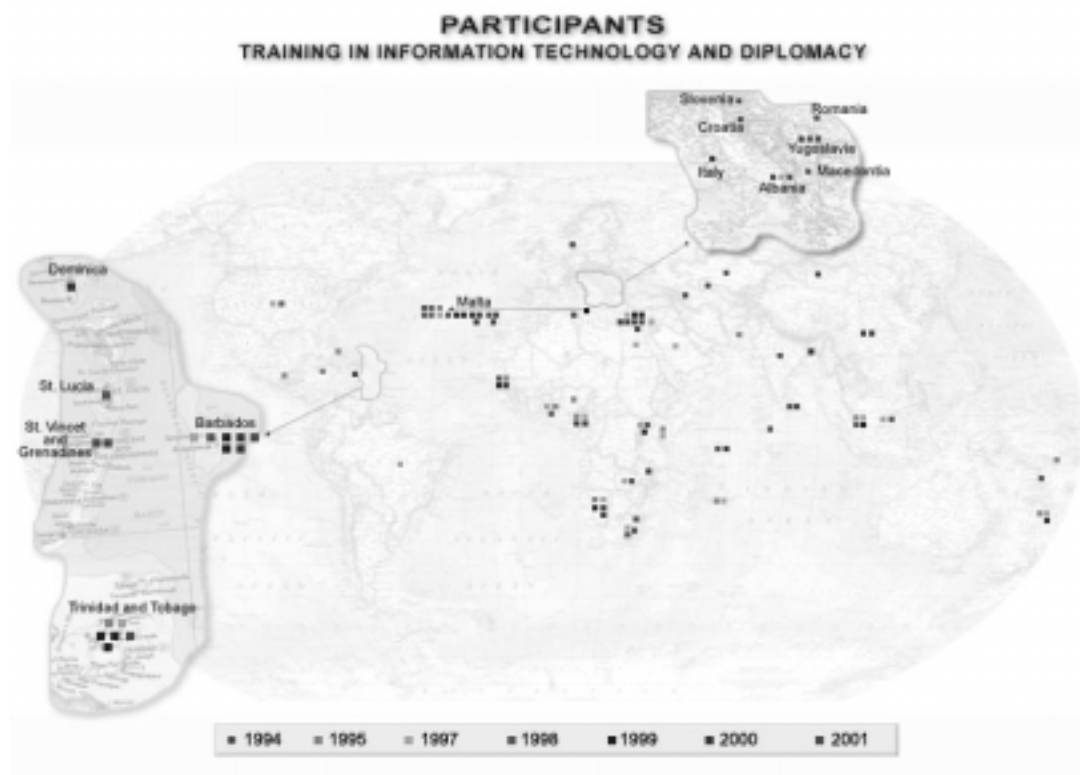


Figure 1.0 Participants' Area of Origin

(With permission from the Mediterranean Academy of Diplomatic Studies (2001), Official Website.
[Http://medac.diplomacy.edu.default.htm](http://medac.diplomacy.edu.default.htm))

2. Research Context

The aim of this study is to focus on the skills required by students. Electronic learning courses may be either self-paced by the learner or the entire course is on line and students would have to connect at specific times just like attending lectures – the concept of a virtual university. (Figure 1.1).

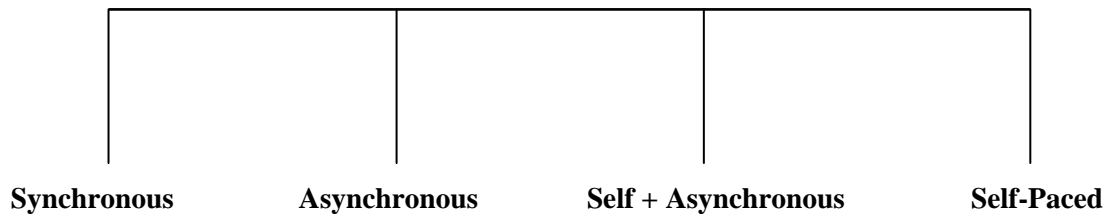


Figure 1.1

(Adapted from Peterson, R.W., Marostica, M.A. and Callahan, L.M. (1999). Helping Investors Climb the E-Learning Curve. U.S. Bancorp Jaffray, 1999, p22)

Nevertheless, all forms require both students and instructors are required to behave differently than when within a 'traditional' full time course framework. The instructor's role has been modified. From the 'sage on the stage' to the 'guide by the side', illustrating the right direction for the students to follow (Bourne, McMaster, Rieger & Campbell, 1997). Students are no longer empty receptacles to be supplied with knowledge. Instead, students are expected to go forth and seek the knowledge they perceive as necessary to their area of study or research. New learning skills and techniques need to be assimilated in order to take full advantage of on line learning. While evidence suggests that some on line learning models may require the adoption of a set of particular skills over others, they all aim to create an independent, reflective learner capable of searching and going through information (Carswell, Thomas, Petre, Price & Richards, 1999), (Nance, 2000).

It is however, fundamental to pinpoint the essential skills required by students and instructors at an early stage. Only when these skills have been mastered can participants interact within the on line course framework and create the right environment for successful learning.

2.1 Principal Research Questions

1. Which skills are fundamental to students before and throughout electronic learning?
2. In what ways can students acquire these skills effectively?
3. What methods may be employed to reinforce these skills in on line learning courses?

3. Research Methodology and Findings

The following methods were employed.

1. Direct Observation
2. Interviews
3. Questionnaires

3.1 Observation Period

The observation period lasted the entire induction workshop period. Students and staff were engaged for ten days within a conference room within a hotel. Participants could thus have their meals on premises without the need to leave. Many of the participants were actually residing at the same hotel. Sessions started at 8.30 and went on until 17.30. There was the facility for student to remain well past that time in order to improve any particular skill acquired during previous sessions. Computer hardware was made

available to all participants. This enabled students and instructors to carry out research on the Internet, develop web-based material and practice with the hypertext program in a simulated online discussion.

Support staff was always on hand to clear any difficulties. The emphasis was always on hands-on practice from the students in order to get to grips with the relevant I.T. skills. However, this resulted in some members of the administration staff did stay well past the last session time, helping students out. Quite a few students took advantage of the opportunity to practice and used to stay up to and past 10.00pm.

A brief questionnaire was issued to the students attending the induction workshop. A response rate of 64% was achieved. While not statistically significant, it was still possible to observe some trends. Over 70% of students indicated that during the induction workshop they had attained an adequate level of skills (or more than) that would enable them to proceed during the online learning phase. This data would be then compared with collected when the students are well set into the online learning phase

3.2 Interviews

3.2.1 The Induction Workshop

All the students interviewed concurred that the induction workshop was very hectic. ***“Too many things in a relatively short time”***, was a predominant comment. They all commented that it was the norm to stay until 8.00 pm Saturdays and Sundays included. The level of support provided by the staff present during the session was considered to be exceptional. If a particular student had a serious difficulty, a competent member of staff would spend all the time required by the student to get over his/her difficulties.

3.2.2 The Distance Learning Phase

All the students interviewed found the online chat sessions and the use of hypertext extremely stimulating, and convenient too. A small assignment was issued every week, which made it necessary for students to go regularly on line in order to be able to follow the development of the arguments posed. Students were quite positive about the entire process. It was possible for student to work in groups as assigned by the tutors or catch up on missed sessions.

“If I missed a session due to other commitments, I could always log on later, check the various comments posted by the other students, and add on mine. Hence, I was able to catch up and continue with the discussion during the next chat session.”

(Student)

When the issue of time management was posed, all the students insisted that it should have been catered for in some way. Most of the students had no idea of what a part-time course via distance learning would entail. Student B did remark that since a person is committing herself to a part-time course, the student should ensure that she would be able to find sufficient time for study and research. On the other hand, she said, that it was possible for her to cope due to a relatively light workload during that period. If she happened to be in another section of the foreign affairs ministry, such as being stationed in an embassy elsewhere, she would have had less time at her disposal.

3.2.3 Online Questionnaire Survey

The aim was to investigate the effectiveness of the skills imparted in the induction course, whilst the students were in the distance-learning phase, which was exclusively via the use of the Internet.

The responses indicated that most students were able to handle the various tools at their disposal easily without any help from the support staff (Figure 3.0). The major difficulties were found in using the online chat sessions (23%) and finding documents on the Internet (33%). These respondents indicated that they required some extra practice, but again no help was sought.

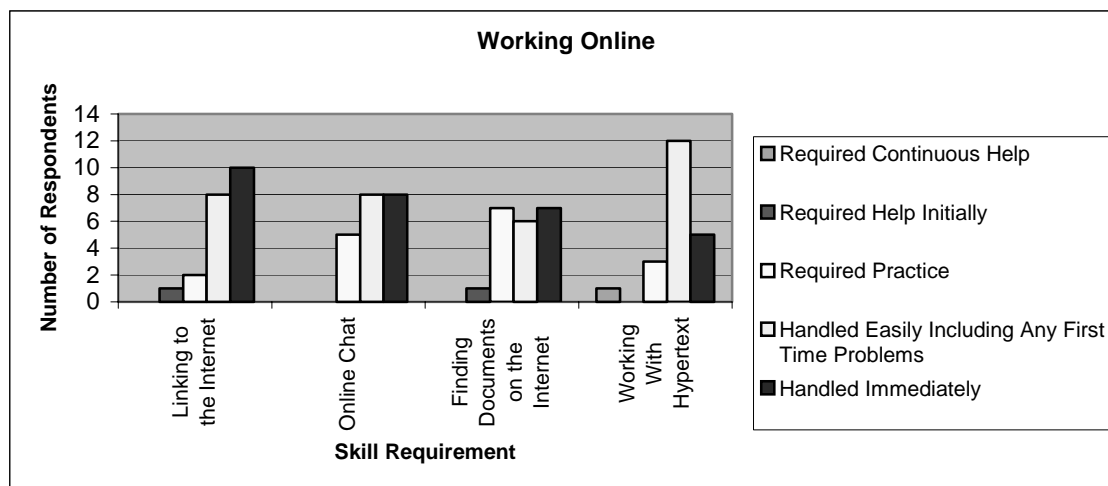


Figure 3.0

Chart Illustrating Problems Related to Skills Required to Work Online

The nature of the course required extensive use of the chat lines provided and other web-based tools. Weekly chat sessions meant that students had to link up every week to participate in the exercise and post hypertext links in order to support their arguments. The latter would serve as references. Generally speaking, most students seem to have coped well. There is however, a significant minority of totaling at 30% of the respondents that had various degrees of difficulty throughout the chat session. Some managed to solve their difficulties with some practice, but others had to revert to the online support provided by the Academy (Figure 3.1).

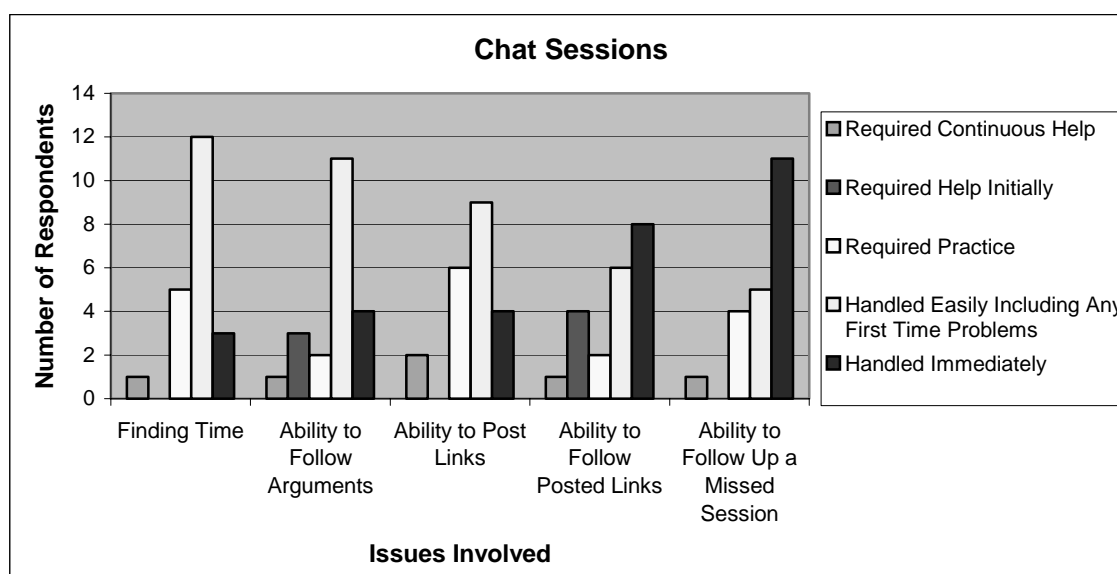


Figure 3.1

Chart Illustrating Difficulties Related to Online Chat Sessions

4. Discussion and Conclusions

The findings seem to indicate the validity of training prospective online learning students in the required skills and tools that need to be used in order to engage successfully in an online learning environment. The research findings seem to be in line with the views expressed by Baptista Nunes *et. al.* (2001). Within the Academy's framework, adequate training in IT related skills does seem to enable the great majority of students to pursue the various course related activities with relative ease and henceforth, complete the course successfully.

It would therefore seem plausible to extend this argument to other areas where students may be provided with adequate training in order to acquire the required skills. Gooley *et. al.* (2001) indicate the following list of essential skills required:

- Learning to learn skills
- Literacy and numeracy (including ICT literacy)
- Understanding others and working in teams
- Information skills and problem solving
- Personal mastery and effective communication

This list should enable the learner to interact effectively with the instructors, fellow students and the academic content as advocated by Belanger and Jordan (2000).

Whilst I.T. related skills are clearly given their due importance, other skill categories are less catered for during the induction workshop period. In their responses, students make it clear that some form of training in personal time management would have facilitated matters. It appears that the main reason lying behind student dropout is not due to the lack of I.T. skills but rather the difficulty of juggling between work, study, family and other commitments. Although students reading for this online course tend to have long hours of work due to the nature of diplomatic activity, there is no doubt that students reading for other online-based courses encounter similar problems. This view is shared by Wegerif (1998), and is in contrast with the feedback obtained from the Academy's teaching and administrative staff, whereby the general view was that a student engaging in an online learning course would know what is expected from him/her.

The hybrid setup of the Post-Graduate Diploma under study provides for the training to be carried out prior to the start of the online learning phase. Baptista Nunes *et. al.* (2001) propose a similar strategy, albeit in a different course structure. Hence, any acquisition of skills must be done prior to the actual online learning phase in order to have the students proficient in the use of the tools provided by the online learning setup. Moreover, students would be in a position to pace their learning in accordance with a suitable schedule of work that would include their work, social and other commitments.

It is equally important to ensure that the staff is also provided with the right set of skills in the same skill categories. Rossman (1999) provides an exhaustive list of skills and techniques that an online instructor must be able to employ while interacting with students. This research exercise indicated that the staff interviewed does not feel the need for training as such. On the other hand, the majority of the staff within the Academy has been involved with this course since its creation. This resulted in an approach similar to what is advocated by Belanger and Jordan (2000) where they recommend that staff is to be actively involved at an early stage. Staff would be in a position to provide feedback about instructional goals yet familiarise themselves with the instructional technologies being applied.

Developments in the field of online learning are occurring at such a rapid pace that it is easy to fall behind. This calls for a dynamic training setup, capable of adapting to the rapid changes witnessed in technological applications today.

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(RE)SEARCHING FOR LEARNERS: LEARNER DEFINED NEEDS IN A RURAL COLLABORATIVE PROJECT INVOLVING ICT

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1. Introduction: The Focus of the Research/Paper

For some time, all three of us have been based in what is seen as an urban university, but are part of a team concerned with encouraging people from the rural fringes of the West Midlands of England to engage in higher education. Whilst the project is considered to be successful, there are tensions in identifying and meeting the needs of potential rural students – hence the title and the juxtaposition of ‘searching for learners’ (people not previously involved in higher education) and ‘researching’ such learners and their needs. The tensions that arise in such a project in turn are based upon deeper conflicts in values as well as concerns over the nature of civil society and some of the developments concerning citizenship. Despite such concerns, the project has sought to engage with learners, and elicit their learning needs in a variety of ways, including questionnaires and interviews as well as guidance and counselling. This paper and associated conference presentation provides evidence from some of the surveys that we have conducted as well as consider those wider debates that will be expanded upon in the presentation at the Eden conference in Granada. A key debate is not only the nature of distance education, but also the nature of education at a distance. The paper thus begins with an overview of the context and the issues that arise from that context before presenting and considering some of the learner needs research.

2. The Context of the Rural Opportunities Project

In discussing the Rural Opportunities project, and in particular the learner perspectives therein, it is necessary to understand the different contexts in which the project is located. These contexts are:

1. The national context with its associated policy settlement around up-skilling and inclusion;
2. The regional context; and
3. The organisational context of the project.

2.1 The National Context of the Rural Opportunities Project

According to Hyland (2001: 677), ‘The vocationalisation of education and training at all levels has been the *leitmotif* of developments from school to university over the last two decades or so’ (italics in original). That is, the centre of attention of education has been refocused from amongst the range of aims or functions it is considered to have (Robbins, 1963) to the pre-eminence of education meeting the needs of industry and commerce. The British Government of Tony Blair has recently affirmed the desire to have 50% of all 18-30 year olds in higher education by 2010 (Woodward, 2001). Woodward (2001) goes on to suggest that, in order to reach the targets, higher education has to improve on the 25% of entrants who come from the 50% of the population in skilled manual, semi-skilled or unskilled families - social classes IIIM, IV and V. But therein is the problem, for the vast majority of people in those social class categories do not have the entry qualifications appropriate to enter higher education, despite there being clear evidence of a ‘pool of ability’ (Robbins, 1963) available and untapped. This failure to attract people into higher education is a particular feature of the three rural counties covered by our project (see 2.2 below, and Foley And Martin, 2000, Fothergill, 2001). This means, consequently, that widening opportunities projects have to innovate in ways that current providers do not in order to attract students.

2.2 The Regional Context of the Rural Opportunities Project

Whilst this project involves ICT, and particularly the use of internet access via laptop computers moved around locations, and thus distance education, the concern here is also with education in the context of

distance. The project has the central physical base on the University of Wolverhampton campus at Priorslee, Telford, though the county project workers do also have a local base within their areas. What is important to remember, however, is that these counties are included within more urban West Midland area of England. The characteristics of the counties thus are that they:

- Are 3 Rural counties of England bordering Wales
- Except for 'new town' of Telford, are the main rural 'fringe' of the West Midlands Conurbation with generally low population densities
- Employment is typically in SMEs and low skilled agricultural posts (with the exception of Telford)
- Have limited HE access, or provision in area , and
- Have a tradition of migration out of the area to participate in Higher Education.

At the same time that the Labour Government has set the target of 50% of 18-30 year olds with a higher education experience (not necessarily a Degree) for 2010. The Herefordshire and Worcestershire LSC Development Plan comments that,

Our current baseline shows that in 2000 27% of adults were at this [HE] level, which suggests that a target of 30% [for 2004] might be appropriate, bearing in mind that a 1% Increase in achievements by the 20+ economically active workforce is 760 (extra) individuals in Herefordshire and 2,640 (extra) individuals in Worcestershire (3,400 in total).

Such targets as indicated by the use of the word 'extra' in the LSC quote above show the magnitude of the problems of recruitment facing University institutions, and emphasise the necessity for proactive strategies for enticing such numbers of people into higher education establishment and vocational qualifications. Consequently, nation and local initiatives must of necessity be built upon 'the rejection of any form of exclusion or discrimination, and gender equality' (Presidency Conclusions, Lisbon European Council, 23/24 March, 2000, Para 11), to which we would add rural dispersal and diasadvantage.

2.3 The Organisational Context of the Project

The organisational context can mean a number of things, many of which cannot be dealt with to any degree in this paper (See Moreland and Smith, forthcoming). The Rural Opportunities project is supported by 14 institutions of higher and further education with Wolverhampton and the Open University leading. As Moreland and Smith (2003) indicate, the realities of collaborative work do not always match the formal commitments of the institutions to the project, for a number of barriers exist to successful and full co-operation.

With hindsight, it is clear that the project has operated with a number of basic assumptions or principles of operation. These Five Project Partnership Principles are to provide or support:

- Environment: Provide local places and study formats conducive to lifelong (Higher) Education;
- Entitlement: Opening up access to local learning opportunities as a right;
- Enablement: Providing support systems to enable recruitment and retention of new students;
- Engagement: Involvement with the local populations in order to generate a commitment for lifelong (higher) education; and
- Empowerment: Providing people with the authority and confidence to act.

On the de facto basis of these principles, the project has attempted to develop new ways of providing higher education, and thus be proactive, invoking particular concepts of rights and citizenship. As Ellison notes,

Such interventions could include the promotion of new kinds of democracy or the voicing of demands for the recognition of 'differences', or special status, in an effort to promote the interests of particular 'solidarities'. (Ellison, 2000: 2 (brackets inserted by us)

These strategies in the Rural Opportunities Project can be classified under five headings, these being:

1. Stimulating New Opportunities (e.g. promoting mediated distance learning);
2. Providing Information about Existing Opportunities (e.g. websites, targeted advertising,);
3. Assisting access to Opportunities/Information (e.g. undertaking needs research and analysis, providing transport costs to centres, careers conventions etc.)
4. Providing Practical Support (e.g. study centres for students); and
5. Providing assistance to help overcome obstacles (e.g. assisting institutions to recognise the variety of routes into HE).

In a philosophical vein, the project has unknowingly sought to operationalise the two related aspects of freedom highlighted by Sen (1999), those of processes of involvement and freedom to do so. This is where surveys of potential learner needs arises, for such surveys are simultaneously seeking to engage and empower the learners in line with the five ontological principles enunciated above. Indeed, the project has been very active, and has sought the views of many potential learners.

Examples from these surveys will form the bulk of the conference presentation and subsequent analysis, so two examples here will suffice. Table 1 contains some of the results from a 17 strong Young Farmer's group in Worcestershire who were asked what they wanted to do/study if given the opportunity.

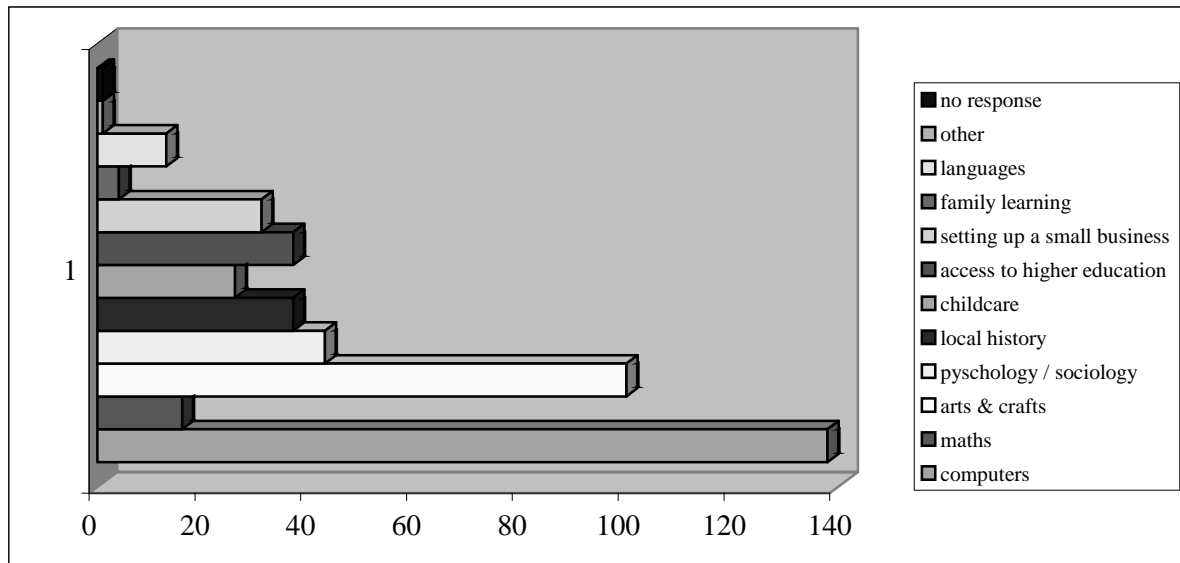
Table 1: Reasons for Interest in Rural Opportunities (Young Farmers).

Reason	Male	Female	Total
Trying out computers to help with business or work	2	0	2
Improve employment prospects	4	4	8
Start, improve or diversify own business	2	1	3
To complete farm-related forms online	1	0	1
Develop new interests	7	5	12
Improve social life	7	5	12
Total	24	15	38

From Table 1 it can be interpreted that the dominant reasons for involvement in Rural Opportunities are to widen their interests and to provide opportunities to socialize for a dispersed group of people. It is perhaps not surprising, in response to a question about what they wanted to do, that sport numerically was their first option for an activity. After that, their concerns were more education focused, and involved either with what one might call basic skills, which included IT capability, or with essentially rural topics and issues such as agriculture, environment and rural tourism. At the moment, few of those needs are provided locally and in a format that suits their needs for social interaction as well as learning.

Another survey of people living in the rural areas of Telford found that the preferred topics for learning were as follows.

Chart One: Proposed Learning Activities: Rural Telford



From the 200+ respondents, the overwhelming interest in rural Telford was in computers, followed by arts and crafts. Like the Young Farmers, direct work related study was not a priority, but they still overwhelmingly wanted the learning opportunities to be provided locally. As we shall discuss in the conference presentation, such results have interesting implications for further and higher educational establishments.

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STUDENT AUTONOMY IN E-LEARNING

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Introduction

The European Council held in Lisbon in March 2000 marked a decisive moment for the direction of policy and action in the European Union. Its conclusions affirmed that Europe has indisputably moved into the Knowledge Age, with all that this will imply for cultural, economic and social life. Patterns of learning change apace. This means that individuals and institutions must adapt to change quickly.

The adaptation to changes means applying new kinds of technology. Due to the development of ICT, the most significant one of these is the spread of e-learning. New players enter the e-learning process and the roles in traditional education change.

In my lecture I would like to concentrate on the change in the student's situation i.e. the increase in student autonomy as well as to give an overview of the role changes, which are the following:

- change in the role of the management
- change in the role of the teacher
- change in the role of the student.

What makes e-learning more than traditional distance education?

E-learning needs a stronger institutional support. It requires a documented technological plan, which includes electronic security measures to insure both quality standards and the integrity and validity of information. The reliability of the technology delivery system must be as failsafe as possible.

The course development needs guidelines, regarding minimum standards that are used for design and delivery, while learning outcomes – not the availability of existing technology – determine the technology being used to deliver course content. Courses are designed to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements.

Students' interaction with faculty and other students is an essential characteristic and is facilitated by a variety of means, including voice-mail and/or e-mail. Feedback on student assignments and questions is constructive and provided in a timely manner. Students are instructed in the proper methods of effective research, including assessment of the validity of resources. Before starting an online program, students are advised about the program to determine if they possess the self-motivation and commitment to learn at a distance and if they have access to the minimal technology required by the course design. Students have access to sufficient library resources that may include a 'virtual library' accessible through the World Wide Web. Students are provided with hands-on training and information to aid them in securing material through electronic databases, inter-library loans, government archives, news services, and other sources. Throughout the duration of the course/program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and convenient access to technical support staff.

Technical assistance in course development is available to faculties, who are encouraged to use it. Faculty members are assisted in the transition from classroom teaching to online instruction and are assessed during the process. Instructor training and assistance, including peer mentoring, continues through the progressions of the online course. Faculty members are provided with written resources to deal with issues arising from student use of electronically accessed data.

The new tasks of the management

The school management faces new tasks in the course of electronic training. We already dealt with the new tasks of the management in detail on the European ODL Liason Committee Conference held in Lisbon, 2000.

As a reminder we recall these tasks:

to create the logistic system of ODL
industrial-like, production, service
cost effective planning at an optimal scale
standardisation
quality assurance
teacher training for the new method and continuous in-service teacher training to ensure the same requirements
to prepare students for working individually
extensive promotion to fight against traditional ideas.

And these are only the basic tasks, as the management has to be very innovative for the on-line learning and for the virtual environment.

The new role of the teachers

What do the teachers have to decide in the case of electronic training?

the frequency of testing,
the validity of reports
the ways and validity of control
the size of the educational units.

The motivation of students and the continuous maintenance of interest are the teacher's stressed task. The teacher has more and more strategic tasks. He or she is to size up the needs, to analyse, to plan and to adapt the learning process. The curriculum development is also taken on by the teacher.

Here it has to be mentioned that teachers are becoming specialized. There will be so called 'star'- teachers who have the most excellent presentation skills, their lectures will be built in the electronic curricula and there will be some teachers who will be specialized on curriculum development.

The introduction of e-learning in schools is modifying the educational contract, as the teacher has to consider technology in some way as a mediator of the educational process. Moreover e-learning increases educational complexity as it modifies the object of teaching and suggests both new approaches to learning and new forms of interaction, thus modifying relationships in the classroom.

In the case of learning, computer networking, for example, can play a critical role in helping people to develop collaborative forms. Collaborative learning involves social construction of knowledge, consequently, new ways of looking at the role of social interactions mediated by the computer.

As to interaction, note that laboratory activity, which constitutes a central aspect of the use of technology, creates favourable conditions that help educators and learners create a co-working climate, thus modifying their traditional roles.

To make the change in the educational setting effective, however, educators have to be trained in how effectively to use new technologies in their work. Training must overcome the view of technology simply as a commodity useful for solving given practical problems. It must also be pointed out that computational environments can be useful tools in the educational decisions. In the school context, moreover, teachers should be helped to establish links with the industrial world to understand operatively real technology applications.

Finally, educators themselves should experiment with the new possibilities offered by e-learning to encourage the formation of autonomy ability. In our opinion, this kind of work should be carried out following two different lines:

- Within courses about e-learning and its uses, devoted to teacher training. As is generally acknowledged, teachers usually teach in the manner in which they themselves were taught, so these kinds of courses can provide an excellent opportunity to get future teachers to carry out activities which allow them to understand how to use the new method so as to give students autonomy.
- By means of e-learning material, devoted to the continuous in-service training of teachers. As it is well-known, competence in the learning processes is based on personal experience and on comparison with that of others. Teachers can be helped to develop this kind of experience by means of e-learning training tools which, rather than giving instruction, guide them to update their educational knowledge of a topic following their own approach to the content, examining it from different points of view, forming a plan to reach an educational objective.

Increasing student autonomy

The labour market requires the students to be able to activate and utilize the acquired knowledge and competencies quickly in various situations.

The daily practice of education is becoming continuously student-centred. Pedagogical means are being formed in accordance with the students' needs. Personality-centred pedagogy supports independent, simultaneous knowledge acquisition of a number of students, who need the means of information technology and self-expression.

The increase of student autonomy manifests itself in the following factors:

Factors	In traditional distance education	Fully in the case of e-learning
1. democratically developing higher education, increase of institutional autonomy	x	x
2. 'learning path' for individual students (credit system – subject register)	x	x
3. study period determined by the student	x	x
4. students can choose from the mediamix supporting learning (they can acquire the curriculum from the net, video or in the form of personal consultation)		x
5. performance – measurement with self-control		x
6. establishment of thematic discussion groups on the Internet, whereby students' knowledge can be applied productively		x
7. free choice of the place of training		x
8. free choice of the date of learning		x
9. globalized training institutions, free choice of institutions		x

Let's see the explanation of the advantages of the above factors.

In a distance learning situation particularly, but in all learning situations in general, we face the inhibiting factor of loneliness. This inhibition is negative in the majority of cases, while the healthy competitive factor with colleagues is missing. Loneliness is also disadvantageous because teachers can often help students to overcome critical parts of the material and to understand the issue at hand.

The usual situation in a community is that students of various talent work together and being so they are able to correct each other. The result is an easier, more rapid learning. Being surrounded by others motivates the slower ones, the availability of explanation and quick help offers them success experience. This becomes reality in an e-learning environment.

Another critical situation is getting lost in the material. Browsing among the pages, students face the problem of not knowing where they are in assessing the material. The well-structured multimedia based e-learning material can solve this problem.

The content of education, namely the mass of competencies to be acquired will not change. Learning organisational principles will change and move continuously towards the needs of people longing for self-realisation. Flexible electronic training is one possible framework for self-realisation by learning.

Conclusions

The world of e-learning and technology-supported learning is constantly changing and keeping up with news is a challenge for all practitioners and policy makers.

The new e-learning initiative, which is part of the broader e-Europe initiative aims to place the student in the centre of learning procedures.

To be in the centre means autonomy, equal opportunities and a good chance to get competencies.

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ASDL: A SATELLITE SOLUTION FOR DISTANCE LEARNING AND ITS USE FOR THE SUPPORT OF IMMIGRANT COMMUNITIES IN EUROPE

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Introduction

Telespazio S.p.A., presently the main satellite asset of the Telecom Italia group, was founded in 1962 and it is placed on the telecommunication market as a satellite operator, representing Italy in all the main international satellite Consortia as Intelsat, Eutelsat, and Inmarsat.

During 1994, when the Telecom Italia group was constituted, Telespazio becomes an integrating part of it, however maintaining its peculiarity, and developing its business towards the following market segments: remote sensing, mobile and localisation systems, telecommunication services.

Telespazio has its headquarters in Rome (together with a first operational site) and operates the following earth stations:

- Fucino, which is the greatest earth station in the world in terms of number of antennas and offered services;
- Lario (nearby the Como lake), which is mainly devoted to the provision of info-mobility services;
- Scanzano (in Sicily, near Palermo), which is also devoted to the provision of info-mobility services;
- Matera, which is mainly devoted to the provision of remote sensing services.

Moreover some transportable earth stations, distributed all over the national territory, are able to provide technical support especially for TV services. The multimedia market birth, together with the Internet broadening, led to an evolution of the Telespazio portfolio offered services. Besides the “traditional” telecommunications services, essentially linked to the connectivity or to the satellite received data interpretation, emerges the need to offer turn-key services that conjugate to the basic satellite communications technology some contents, in terms of software applications, which makes them self-sufficient once released to the clients. A remarkable example in this class of services is the distance learning service via satellite. The outcome of experimentation and studies in this new field led Telespazio to design, realise and launch into the market its new multimedia service platform: Evolv-e.



Evolv-e generalities

The Evolv-e multimedia service platform is a completely new concept in the Telespazio portfolio offered services, because for the first time what is offered is a service environment which has not the connectivity as the core business, but considers it a simple tool in order to guarantee very high performances in terms of quality of the offered services. The platform is conceived as a configurable modular system constituted by separate “elementary” services concurring in a top-down logic flow to generate different high added value services, classified into four main classes:

- **Specialised Services:** in this class are collected services to be realised through the engineering of high level functionalities, integrated with a market analysis and with a precise knowledge of the specific service scenario. The result is a set of well-defined packages to be offered to (not-so-much technology aware) customers in each market segment and anticipating or driving their requirements.
- **Added Value Services:** this class collects services oriented to customers relying on their own technological know-how and capabilities, but requiring the engineering of evolved satellite solutions

based on more elementary services provided by the Evolv-e Platform. Resulting implementations will be the integration of Evolv-e Platform functionalities with the customer existing technical solutions. (The analysis of the reference market is left to the customer who also assumes the risks and benefits of the end-to-end service.)

- **Web Services:** these, mainly, include Satellite Internet Interactive Navigation and Edgecasting. The Interactive Navigation service is aimed to offer "IP Surfing" capability for Corporates that require access to common enterprise data, using satellite. This service is well-suited for companies having branches or remote foreign offices, especially where there is a lack of terrestrial infrastructure, offering high degree of security and data encryption; it may also provide external Internet access, as option. Edgecasting is a managed network caching service that delivers popular Web content instantly to the edge nodes of an access provider's network (points of presence, cable head ends, or DSL hubs). With Edgecasting, ISPs can serve users at full line speed, regardless of their connection type, thereby improving the Web surfing experience, especially for broadband users. It also allows ISPs to reduce their dependency on expensive upstream connectivity to the Internet backbone.
- **Access Services:** these functions are always available in a common ISP environment, as they define the basic infrastructure of the Evolv-e Platform Service Centre. These basic functions are used, transparently or not, by other services: in general they are not and should not be directly offered to any customer, but are available to all of them at the extent defined as part the provided service design.

As a fifth, transversal class, **Management Services** provide functionalities supporting at various levels the services provisioning, both for internal network management purpose (e.g.: troubleshooting, fault detection), or related to information relevant for customers (CRM, Help Desk, accounting & billing). The number of Access/Basic Services required by a Specialised/AV Service to operate normally will be the main key driving its actual cost; nevertheless, business strategy considerations could modify in whole or in part this simple rule of the thumb.

The services are provided with the following performances:

- Satellite Info Bit Rate = 38,01475 Mbit/s;
- Satellite link availability up to 99.9% (outbound) – depending on geographical location and antenna size.
- Inbound Satellite Link Availability = 99,5 %.
- Maximum Throughput per single TCP/IP session: 600kbps (depending on terrestrial return channel).
- Maximum Throughput for multiple TCP/IP sessions is 2 Mbps (global – depending on terrestrial return channel.
- Maximum Throughput for UDP/IP (Multicast) is 4 Mbps.

The ASDL (Advanced Satellite Distance Learning) service

Within the Added Value Services an important place is occupied by the ASDL service, based on a multimedia learning/training system that allows interactive video/audio/data delivery to multicast users at high speed. The service may be offered in live mode, with a teacher and a number of remote classrooms interconnected, or in real-time recorded mode, where the end users watch a real time streaming of already recorded and stored video training material. The multimedia contents will form various offerings, consisting of text, graphics, A/V clips (Multicast) and tools allowing interactivity (Unicast).

The interactive multimedia environment offers interesting features as a good video quality for teacher's lesson (Windows media format), a shareable clipboard where the teacher and the students may co-operate working on the same document (Office for Windows format), an audio and textual terrestrial return channel via Internet which allows interaction between the teacher and the students (questions and answers) a training sessions scheduler that allows the management of entire courses, and the transmissions planning and scheduling and a web mail access.

The QoS features are guaranteed by a server that divides the whole channel into slices, available for the services. Every kind of communication service will obtain a channel slice together with a management strategy with the aim of optimising the channel whole utilisation.

A wide range of bandwidth speeds are available in downstream mode, following the $n \times 64 \text{ Kb/s}$ scheme, up to 2 Mb/s for standard service provisioning; the bandwidth can be assigned according to one of the following options:

- Reserved (fixed) mode;
- Guaranteed (with a CIR) mode;
- Best Effort (only for Navigation mode).

Fig.1 shows the architecture of the Evolv-e Platform.

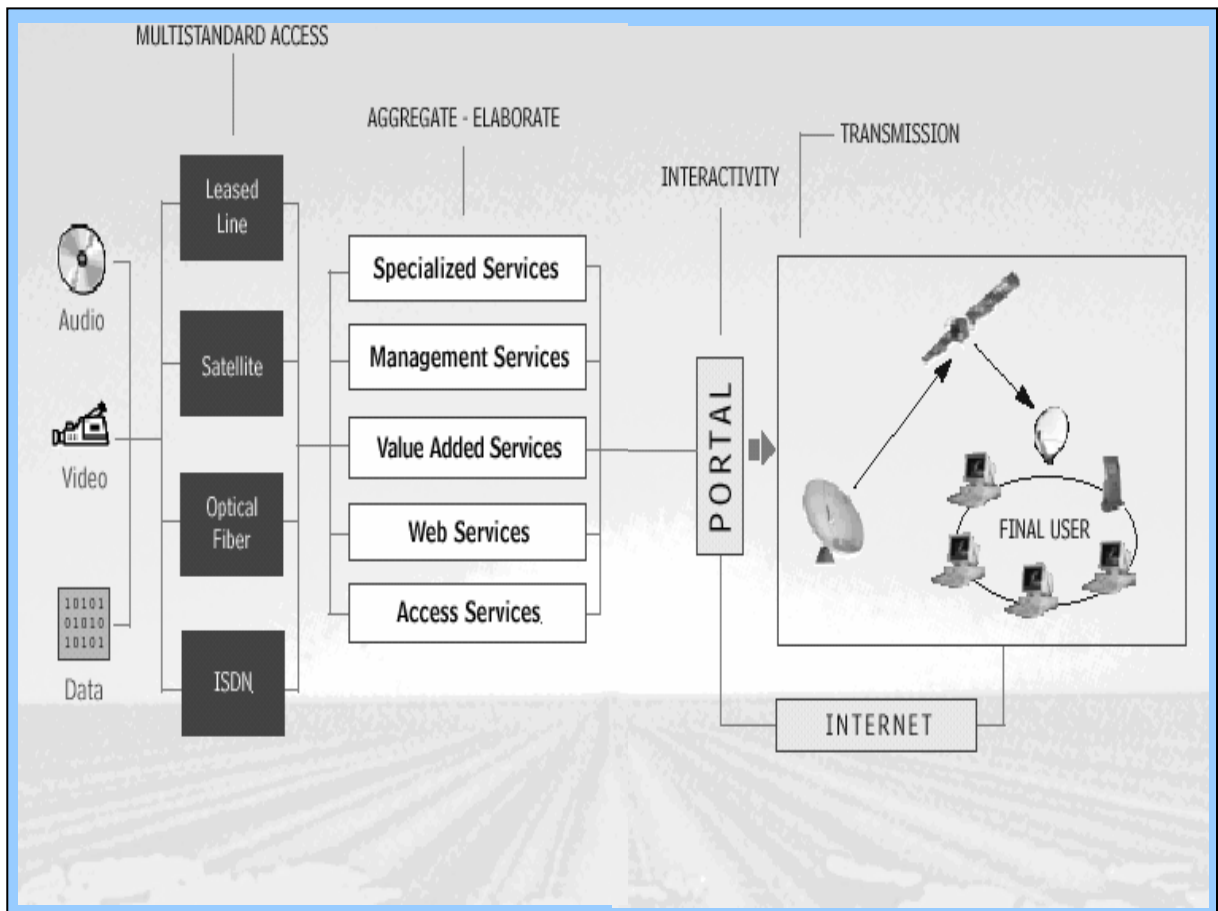


Fig.1: Evolv-e Platform Architecture

Case study: The CROCUS Project (CROSS CULTURAL Satellite services for immigrant communities in Europe)



Introduction

The main aim of the project (born under the aegis of the European Space Agency) is to create a satellite operated tele-education service showcase with the potential to convince organisations in the E.U. involved in the education of migrant communities of the value of integrating such services into their existing teaching practices. In order to achieve this objective, the project partners developed a series of educational and information services based on a one-way Internet-satellite system. In parallel with the development of the satellite system, the schools involved in migrant pupils education – in strict collaboration with CROCUS Project Training Production team – prepared the learning environment, supported in this task by the educational technology experts in the project. Pilot trials have been addressed to a total of about 300 learners. The CROCUS system has been publicly showed for the first time at the 2001 TED Exhibition (Technologies for Didactics) in Genoa, promoted by the Italian Ministry for Education, and subsequently during other exhibitions, workshop, fairs and seminars. The promotional activity of the CROCUS Project was carried out mainly in central and northern Italy (mostly concerned by a wide presence of linguistic minority students in the schools), attracting the interest of schools and institutions involved in public education. The activities promoted by the CROCUS project are in line with government policies, which support a more tight relationship between the schools and their surroundings.

At an international level, the project aims at developing a strategy that continues to allow the immigrant communities, their home countries, their transitional countries and their rebound countries to participate and co-operate on educational issues. This strategy promotes also the preservation of existing relationships among the communities that are spread on the European continent. The CROCUS system has been implemented in some schools around the Italian territory and can be accessed through Internet. It is estimated to complete a didactic program made up of 14 lesson units for the 4 ethnic languages (Albanian, Arab, Chinese and Romanè) used in the pilot program and of two level of Italian as a second language.

CROCUS Services

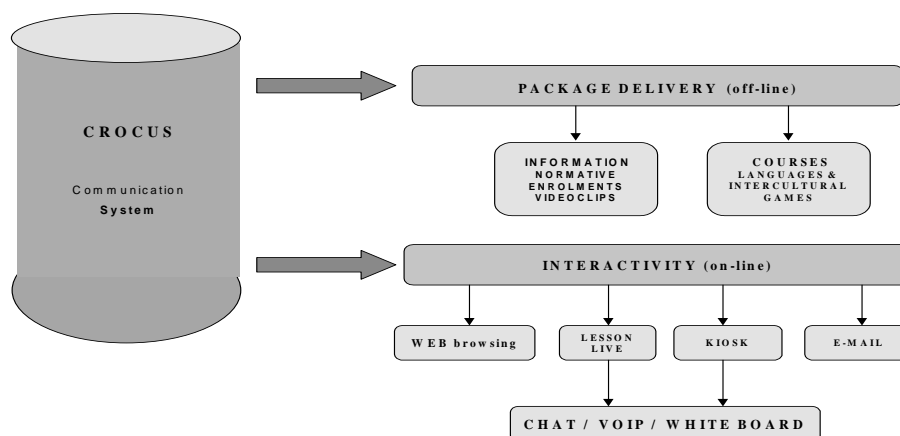


Fig. 2: Modality of Services Delivery

According to their typology and to the need of interactivity, the CROCUS services are delivered in Interactive or in Package Delivery modality as shown in Fig. 2 CROCUS users (students tutors or teachers) can enjoy CROCUS Information services (kiosk) and Formative services both on-line (real time) and off-line through a link to the CROCUS portal (<http://CROCUS.teleospa.it>).

Information services (Kiosk)

The information services have as main objective to inform and give a concrete help to immigrant students and their families (and also to the schools administrators) about various legal aspects related to the immigration issues, procedures for the school enrolment, curricula presentation and social/medical assistance information for the foreign communities. Such services are related to a series of contents (text pages, video-clips, etc.) that could be accessed both directly on the single user PC (contents delivered periodically via satellite and fruition a posteriori without a network connection) or in interactive navigation on the CROCUS satellite Portal reachable by the user via an Internet connection.

Formative services

These services concern the delivery of Italian language or native language courses, intercultural programs and games for the students section and of documentation files for the teacher/tutor section. Language courses, intercultural programs and games are sent to all user stations mainly in package delivery modality in terms of a pre-determined schedule. Contents are accessible through the Home Page and could be enjoyed by schools without connecting to the network at their preferred times. After the authentication procedure, students are able to access at courses and exercises. When exercises are compiled, they are automatically sent via mail to the tutor address. Answers are archived and tutors can check them, using a password. Moreover in interactive modality real live lessons can be managed. The teacher, could exploit, being present in audio/video mode, of the learning tools of the distance learning platform, called NetStre@m. This modality could be used also for the evaluation activity (final exams to earn formative credits).

The technological platform

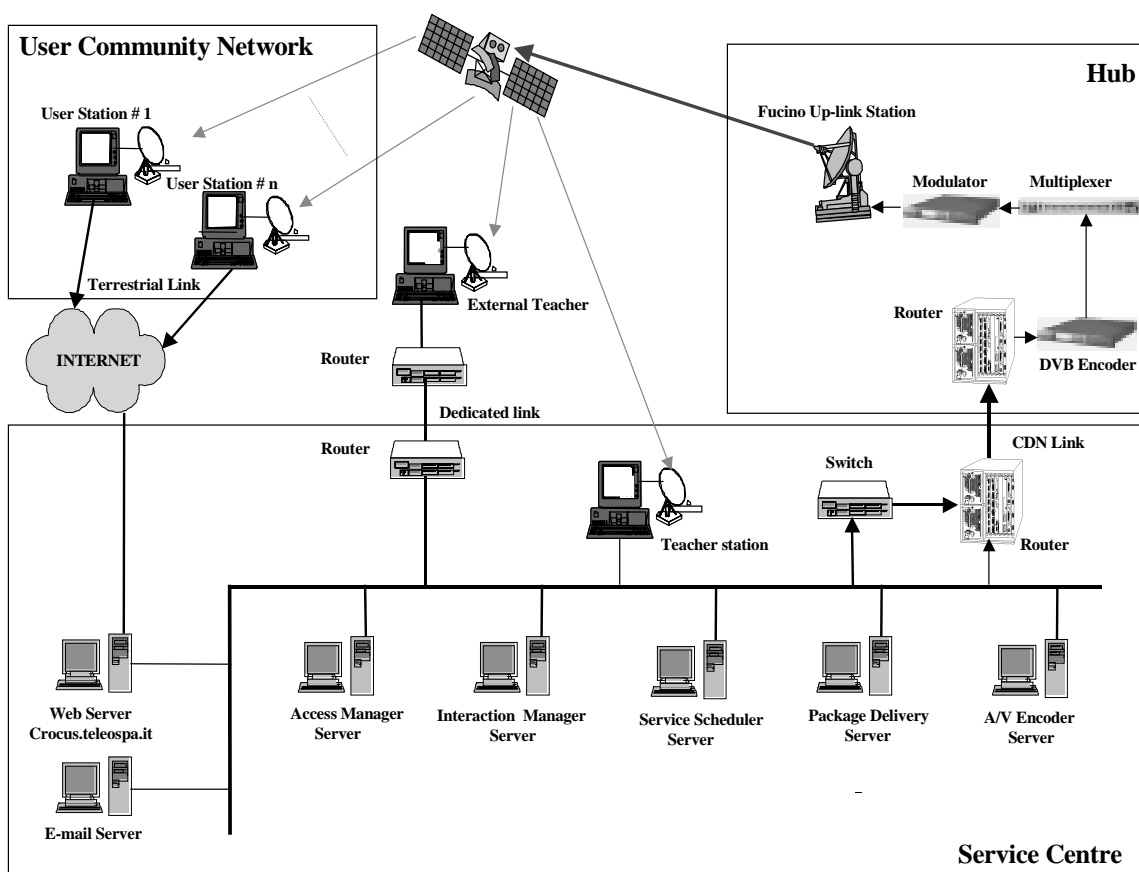


Fig. 3: CROCUS communication system architecture

In Fig. 3 is outlined the current CROCUS communication system architecture, including three main blocks which will be briefly described hereinafter.

The Service Centre

This is the core of the technological platform where a lot of equipment is placed. In the figure above depicted the following elements are highlighted: the equipment needed for the satellite connection, the teacher station (which can be also located externally to the Service Centre by means of a dedicated link), an E-mail server (useful for the tutoring functionality), a web server (where all the CROCUS contents are stored and enjoyable through Internet) and some servers strictly belonging to the integrated Distance Learning platform (called NetStre@m and designed by the ITS company) that allows the integrated utilisation of different application tools (textual Chat, audio (VoIP), Whiteboard, Learning management, Package Delivery) and a more flexible management in the provision of the Information and Formative services.

The Hub

This satellite station, located at the Telespazio Space Centre of Fucino, is in charge of receiving data coming from the Service Centre and perform the up-link towards the satellite involved in the service (typically one of the Eutelsat Hot Bird fleet located on the 13° (or on 7°) East position of the geostationary arc and operating in Ku Band (12-14 GHz). Concerning the bandwidth, it has been made available a 512-kb bandwidth.

The User Community Network

The user stations are equipped with commercial HW (a multimedia PC, an 80-cm TVRO dish and a DVB PCI card). Each user is connected to the Service Centre by means of a terrestrial Internet link.

Conclusions

ASDL is a very efficient solution for e-learning; it summarises all the main peculiarities of a satellite application network:

- Wide area connectivity, without the need of terrestrial infrastructures; this allows to connect a huge user community without difficulties in improving it
- Multicast transmission, whose the important consequence is a better bandwidth utilisation, completely independent from the number of the connected users
- Broadband service, which allows to perform live video sessions, which improve level of students' attention and knowledge result.

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THE NEW VISUAL LITERACY: THE PEDAGOGIC VALUE OF STREAMING VIDEO

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Abstract

The creation and use of web-based video is now not only open to non-specialist educators and even learners themselves, but also has the potential of becoming a routine component of eLearning. The vision is clear: to move away from the static text-dominated content currently prevalent on the web towards a media-enhanced environment. Visual literacies, including video, have been too long marginalised within the design and delivery of eLearning. If we wish to develop and design new models of production and delivery of eLearning in the international perspective, clearly visual literacy should take a major role to enable cross cultural participation. The pedagogical challenge faced by teaching staff and practitioners is not only to choose the appropriate streaming technology but also to design meaningful learning events. In this paper we introduce a way to analyse video use through what we have named the *Three 'T's Framework* – image, interactivity and integration. This conceptual framework seeks to help teaching staff and practitioners with the pedagogic design and development of video streaming resources for eLearning.

Introduction

Although the educational use of film and video has a long history, its take up has always been limited by costs of production and distribution difficulties. Production costs have now dropped and the web has emerged as a mainstream educational distribution medium. Video itself can be used in many ways: 'talking head', interviews, video diaries, video labs, simulations, instructional sequences, 'fly on the wall', video help etc. However, the web is not a simple delivery medium. Via the web browser 'streaming' video clips can be linked to slides, text conferencing, video conferencing, and other applications. This seamless integration offers an unprecedented opportunity to move away from predominantly text-based information and communication technologies (ICT) to establish the moving image as a focus for eLearning. Streaming video can be used for example to show experts and apprentices in practice, linguistic samples in real situations, laboratory procedures and artistic performances. The moving image can provide the focus for observation, analysis, interpretation and dialogue within a media rich learning environment (Goodyear and Steeples, 1998), and might be particularly applicable to cross cultural approaches to education.

However, the 1999-2002 UK-based JISC/DNER 'Click and Go Video' project (Asensio, Strom and Young, 2001) which aimed to help academics move beyond their common understanding of video as a purely presentational tool, found an acute lack of pedagogic resources, research and evaluation on the use of video streaming in education. Despite its long history, video and particularly its new streaming incarnation still lacks an established 'pedagogic space' within mainstream eLearning (Young and Asensio, 2002).

One of the key problems uncovered by the project was that participants do not have either a pedagogical conceptual framework or a shared vocabulary to describe the ways they envision using digital video with their students. The lack of an established literature and lexicon for visually based forms of learning is particularly marked in comparison with other areas of eLearning such as text-based conferencing. An unexpected part of the project therefore was the development of a framework to attempt to interpret the academics' actual or intended use of video streaming. This framework was seen as a necessary prerequisite to the evolution of a decision tool to help educators not only to evaluate streaming video for their own teaching needs but also develop technically appropriate solutions. This paper reviews the different approaches to categorising video use and explores the 'value' of video in education as a new form of literacy. We introduce a way to analyse video use through what we have named the *Three 'T's Framework* – image, interactivity and integration. This framework seeks to provide a way of unravelling the often

complex ideas academics have for using video and provide a route to help the design and development of the resources themselves. Ultimately we expect that by exploring the value of video and its use, we can better understand how to enable communication and collaboration amongst distributed learners.

Frameworks for video use

One of the primary tasks for the project was to find out how streaming video was being used in universities and colleges. Quantitative information on use is almost impossible to obtain at the moment, but qualitative and descriptive models are beginning to appear. For example Peters and Collis (2000) describe five categories of learning resources and activities associated with streaming video in what they describe as constructivist learning environments:

1. Capturing and re-using a communication event (such as a lecture or a presentation)
2. Giving access and depth to real events (by inclusion of original material)
3. Supporting a learning process (documentaries, tutorials, interviews etc)
4. Developing and accessing a library of cases or units of learning material
5. Constructing and sharing one's own resources

Although categories of use provide us with a useful checklist of ideas and applications, it does not help us to think about how our video should be shot and digitised, to what quality, how it should be presented to the student and how the students themselves can be involved in the process (particularly if working with distributed cross national learners). These turn out to be key questions when academics think about constructing their own libraries of resources. For this reason the project needed to deconstruct the use of video a little further to explore the pedagogical value and utility of video streaming.

The value of video streaming and the Three 'I's framework

Although nowadays the technologies are relatively easy-to-use and affordable, the development of video resources proposed by Peters and Collis still represents a considerable time investment by an individual or institution. In the absence of any widespread evaluations of learning outcomes of this medium the question arises as to what is the real 'added value' of the moving image for any pedagogical setting. Broad descriptions such as 'giving access and depth to real events' and 'making an emotional appeal' are not really detailed enough to inform design decisions. For example, what specific elements of the video give depth or appeal to the emotions? Essentially we are trying to explore the interface between pedagogical value and the practical utility of the technology to deliver those values.

One way to start is to reconsider the list of technologies from a historical perspective. Something that film, television, videotapes, videodisks, digital desktop video, multimedia, CD-ROM and web media all have in common is the focus on the moving image itself. However from the late 80's to the mid 90s the selling point for videotapes, videodisks, digital desktop video, multimedia, CD-ROM was actually the promise of 'interactive video'. The image was still important, but was overlaid with the idea that the user could have easier and more controllable access to the resource. In the mid 90's the web reinforced further accessibility and interactivity, but added a new element, 'integration'. This meant interlinking with other web materials and of course communication and collaborative tools. This is partly a case of new technical opportunity, but also the influence of prevalent pedagogical theory interpreting the tools in new ways and seeing opportunities in them for curriculum reform.

Thus in the purely historic context we can see three overlapping phases of interest in video accompanied by a subtle change in the control over the resources;

- image (film, television, videotapes - teacher in control)
- image and interactivity (videodisks, digital desktop video, multimedia, CD-ROM - learner in control)
- image, interactivity and integration (web media - distributed control).

In the next section we will describe these three values on more detail.

Value of video: Image

As the most established and indeed the underpinning ‘value’, the role of image is clear: to complement and add visual richness learning resources. Duchastel and Waller (1979) observed that the use of illustrations in text attracts attention, aids retention and recall and is explicative when written or verbal forms are not enough. Goia and Bass (1986) noted that students had grown up in an intensive environment of television, movies and video games, have developed learning styles where comprehension occurs through visual images. Several researchers have made the connection between visual clues, the memory process and the recall of new knowledge e.g. Shepard and Cooper (1982), Mayer and Gallini (1990). Referring specifically to video, Goodyear and Steeples (1998) note that video can provide vivid descriptions to articulate tacit information and knowledge difficult to articulate through text and verbally. It would be wrong to consider only the visible educational messages of video, however. Undoubtedly it also carries hidden or semi-hidden messages such as narrative, emotion, authority, authenticity and symbolism. These may be more important than the explicit visual message.

Value of video: Interaction

Although conventional film and broadcast television are far superior in visual quality they have a major drawback in education. As Rosenberg puts it “...the main reason why television did not become everyone’s teacher was because it lacked the very essential quality of teaching: the ability to interact with the learner” (2001:22). Thus the advent of interactive video in the eighties was met with some enthusiasm.

“The potential applications of interactive video technology in educational and training fields is virtually unlimited.” Thus concluded a contemporary report sponsored by UK Department of Industry (Duke, 1983:104). The key to interactivity was the linking of computers to video technology (initially VCRs and videodisks), allowing control over the pace and direction of the video programme. This control enabled self-paced learning leading, according to Palmer (1987), not only to time saving and standardised results, but also distributed learning to a large numbers of learners. ‘Interactivity’ in the original sense was not confined to computer-human transactions but included

- Access – availability of the material asynchronously and independent of location
- Choice – a library of materials to view ‘on demand’
- Control – ability to start, stop and review material

This should be contrasted with the more narrow view of computer-centred interactivity e.g. Kistof and Satran (1995) where interaction is seen only in terms of control of pace, sequence, media, variables etc. rather than wider access to the resources themselves.

It was not until the early nineties that the combination of desktop digital video and CD-ROM enabled the high levels of control and integration with other computer-based learning materials we are familiar with today. The rise of the web in the late nineties promised even greater access and choice but, as described above, resulted in problems of video quality. The video streaming compromise between image quality and access is particularly acute in terms of interactivity. One of the principle justifications of streaming media is its use in asynchronous, distance modes, yet ironically the nature of the web as a distribution medium is also digital video’s main limiting factor.

Value of video: Integration

Although video can be used on its own, more frequently on the web it is interlinked with slides, supporting texts, discussion boards, chat, resource links, self assessment quizzes and so on to form or as part of a ‘virtual learning environment’. This brings the possibility of designing novel learning experiences and ways of interacting with the media. The assumption is that adding an additional channel of communication to transmit a message will increase the quality of communication itself. This notion is based on two theories that support the use of several communication channels.

Multi-channel communication supporters claim that learning is effective when cues presented across channels are related or 'redundant' (not in the negative sense but complimentary or parallel). Thus Severin (1967) argued that multiple-channel communication is effective when the cues have meaning. Interestingly redundant information presented across channels increases the dimensionality of the information and the stimuli for one channel provides reinforcement for the other, which improves the quality of communication (Hsia 1971). The dual code theory also supports the effectiveness of multiple-channel communication. Paivio (1971, 1991) argues that information that is supported by both aural and visual cues should increase recall and retention. Studies by Mayer and Anderson (1991) have also shown that visual information helps to process and remember verbal information and vice versa. Critics to multiple-channel communication have contested that overloading the senses through multiple channels could result in less efficient learning, and that addition of cues in a second channel or even excessive cues within the same channel can be distracting and detrimental to learning. We could ask whether learners nowadays are used to deal with even more stimuli than those of a decade ago. Showing video is not only a question of running video and audio together. Integration is permitting the ability for a learner to associate the video with the other media on the screen, thus allowing the learner to find the relationship between the video and the other media. With the opportunity of combining video with other interactive elements such as communication and assessment tools, learning environments nowadays can now be far richer than the multiple channel theorists could imagine 30 years ago. The impact of these new combinations of video and networked applications has still to be explored and evaluated.

Conclusion: towards a decision tool

The ultimate purpose of the Three 'I's Framework is as a design, not a descriptive tool. We believe the framework is the first step towards a decision tool that could help academic developers make informed and effective decisions on their use on streaming video that encompass both pedagogical and technical considerations. We believe this simple method of splitting up a proposed video application into its components of image, interactivity and integration greatly clarify the otherwise complex design decisions associated with streaming video and reach compromises appropriate for a range of specific learning outcomes. By trying to devise a decision tool we are exploring in depth the added value of video itself for education purposes. This can provide to the larger community with a tool to help in the conceptualisation and design of video streaming resources. Video as a form of literacy and communication can potentially break free of the text-based modalities of most eLearning and ODL designs. This is particularly relevant when considering issues such as accessibility and participation from an international perspective. We believe that new designs should be more visually inclusive. This in turn is an unprecedented opportunity to move away from predominantly text-based information and communication technologies (ICT) to establish the moving image as a focus for international communication and collaboration.

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CHALLENGING STREAMING VIDEO IN E-LEARNING

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Abstract

The success of the large scale inter-university IT course in Flanders in 1998 – 2000, using live ISDN-videoconferencing, persuaded the Institute for Continuing Education (IVPV) at the Gent University to organize a second edition, taking into account the remarks of both students and supporting industrial partners.

Taking up current ‘best practices’, a renewed course framework based on streaming video on CDs has been set up. Considering the unsatisfactory performances of available commercial products, an in-house system for streaming video has been developed, with emphasis on animation and interaction. Following a successful trajectory, the new student evaluation showed aims were largely achieved. Currently the IVPV started a new project to integrate the learning materials with a global open management system based on an e-learning framework. At the same time, contacts are being made with countries where student’s mobility is restricted in order to make all produced learning material available to those countries.

Setting out the milestones

In [1] a large scale continuing education programme in IT organised in Flanders (Belgium) from 1998 to 2000, using massive ISDN-videoconferencing at 384 kbps (6 ISDN channels) has been described. The target of this programme was to train a new generation of IT-professionals by the year 2000. It was jointly organised by the 4 main Flemish universities (Ghent, Leuven, Brussels and Antwerp). In twelve sites, spread around Flanders, for 417 hours, two times a week in the evening hours, 3 hours of interactive videoconferencing were set up, complemented by 87 hours of hands-on exercises. As much as 1145 participants subscribed to this massive continuing education programme of 206 213 [participants*hours], 80 of which passed the necessary assessments to obtain a full academic certificate and 317 obtained a modular certificate. The course was largely self-supporting.

In the follow-up of this course, a scientifically based evaluation of the complete educational programme among the participants was carried out to gather information about the effects of the videoconferencing framework as such. More detailed data can be found in [1], but the mainstream results were as follows:

- the well known obstacles of videoconferencing remain in effect: too static, little interaction, no ‘classroom feeling’...;
- the limited quality of the image together with a good sound quality was not seen as a real problem;
- the real-live animation of the videoconferencing (animated powerpoint slides + mouse interaction) was considered as highly beneficial to enhance the learning behaviour;
- the possibility of bridging time and space was seen as a main advantage;
- the accompanying electronic discussion forum (Majordomo) was appreciated very much.

All this resulted into an overall satisfaction degree of 79%.

Following those assessment results, a fundamental discussion with main representatives from the industry in Flanders was engaged to set out the framework for the second issue of the programme (2000-2001). The output was that the main idea of the videoconferencing was all right, but that the necessity for people, working in industry under high pressure, to be lively present at fixed times was impracticable, and that a swing to more asynchronous learning was highly desirable.

Therefore a modified framework for the course was designed as follows:

- the videoconferences have to be digitally recorded on CD or DVD in a format which:
 - keeps in any case the animation of the slides (building up slides / mouse movements);
 - enhances possibly the image quality (audio quality was satisfactory);
 - maximizes the amount of lectures per disc;i.e. *streaming video on CD*;
- the interactive electronic discussion lists have to be extended with more features;
- a minimal live interaction with teachers / assistants should be safeguarded;
- participants should be tightly kept into a study rhythm in order to avoid ‘free lunch’ behaviour.

The Streaming Video framework

The lecturer typically prepares his/her lecture in Powerpoint (or similar: pdf,...), and breaks it down in pieces (‘paragraphs’) of some 5 to 15 minutes, depending on the topic at hand. Thereby he/she utilizes the whole scale of animations (slides transitions,...) available, albeit obeying some basic rules about fonts, colours, picture sizes,... He/she gives his/her lecture (cut in ‘paragraphs’ as said) live in the multimedia studio (eventually for a ‘live audience’), whereby he/she freely uses mouse / cursor movements to clarify his/her lecture. The presentation is captured from the computer output (vga...) itself together with an image by a professional video camera directed to his/her head. The studio technician mixes in real-time the computer output with the image of the teacher (being it in full scale, being it as a ‘stamp’ picture-in-picture) resulting into one digital signal recorded onto a digital Dvcam tape.

One of the important aspects of this recording system is that – starting from a lecturer with slides at hand (the ones he normally uses in old-style lectures) - the extra workload on the lecturer is kept to a very strict and acceptable minimum. We *postulated beforehand that the preparation time may only be as long as the lecture time itself*, i.e. the total time may be maximum the double of the lecture time.

Post-processing is done as follows:

- the video-fragments are read from the Dvcam, via I-Link (Firewire), into a MPEG-2 video editing station for real-time compression to MPEG-2, 4 Mbps (IPPP).
- these MPEG-2 video fragments can be edited if necessary; normally this is never done;
- the finished video fragments are compressed to the RealNetworks[®] video format (chosen because of its neutral computer independent platform); thereby the choice of optimal conversion parameters is very critical: i.e. they largely determine the quality of the resulting sound and image, and consequently indirectly the amount of space occupied on the CD;
- the RealNetworks video files are incorporated as multimedia objects in a standard HTML document, together with the other learning material as one CD-R master copy:
 - the powerpoint files as such (or pdf’s thereof), so the student can visualise it eventually in full screen resolution or print it out;
 - per video ‘paragraph’ a short description of the contents;
 - the background material: course texts, URL-pointers, book references, exercises, solutions, application software,...
- the net result (for the IT course) was an image with the following characteristics: 512 kbps / 12 fps / 512 * 348 pixels / 3 (wall)hours of lecture per CD;
- the master CD-R is multiplied and labelling is done in a CD multiplication robot.

Compared with off-the-shelf commercial products for streaming video, the main difference is that the full animation both with slide transitions and cursor movement are maintained on the CD, giving huge educational benefits, since the student's attention is constantly kept during the lecture: the animation is really *the glue* between the lecturer's voice and the image.

Although originally not intended, it turned out that some companies put a copy of the CDs on an internal streaming server (provided the bandwidth of their intranet was sufficient).

The overall course structure

The IT-course was composed of 5 distinct modules: *A: computer architecture / P1: programming / P2: information and programming structures / O1: analysis and design / O2: object-oriented software development*. The layout of each of the 5 modules was identical:

1. one *videoconference* session: the purpose was to get the students acquainted with the physiognomy of the lecturer, and to create a practical opportunity to distribute the CD-sets to the students;
2. '*home study*': a number of weeks for asynchronous learning by the student;
3. *lab exercises*: on Saturdays (to avoid traffic jams) students came to the university to perform hands-on training on PCs under the guidance of qualified university assistants;
4. one *live feedback session* (also on Saturday's): where the students could forward final questions / remarks to the professors;
5. time for *project work* and final *preparation time* for the examination;
6. the *examination*: the form depended somewhat on the module: some were written exams, some were PC-exercises, some were projects.

The course language was English.

The table below summarizes the course load as calculated.

<i>Module</i>	Theory Videoconf.	Home	Lab exer- cises	Feedback	Project / study	Total hours	Number of weeks
A	3	18	6	3	18	48	4
P1	3	18	12	3	42	78	7
P2	3	18	9	3	42	75	7
O1	3	12	9	3	30	57	5
O2	6	29	15	3	70	123	11
Total	18	95	51	15	202	381	34 i.e. 11 hrs/week

The course structure was furthermore complemented with enhanced discussion lists (Agora): one per module, and one global for organisational aspects. This platform enabled interactive discussions among students and with the professors / assistants. It was largely used during the course: e.g. for module A, some 197 messages / answers were posted. For each module an assistant professor was assigned as an *online coach*, who was continuously available to the participants in a module, but *only for a fixed amount of weeks*: after the predetermined period the list was closed. This mechanism intended to put some strain on the students to stimulate them studying the corresponding module during the period as scheduled, at

the same time giving them enough freedom to do their own time-management. The discussion platforms and the way they were implemented, were thoroughly discussed beforehand with the industrial partners, and was also seen as a substitution of the social control among students during in-house videoconferences (as in the previous course issue).

The course was subscribed by 206 students (approximately 150 students per module), 70 of which finally received the academic certificate after successful examinations and project work. Organisationally the course was self-supporting.

Currently, in the preparation phase of other similar courses (telecom / environment), we have screened the market for new commercial streaming video products. After confronting a panel of specialists in human communication with those products, currently our in-house streaming video system came still out as being the best, precisely because of its more direct interaction with the student during the learning process. On the other hand, most of today's commercial products use static images (e.g. jpeg encoded powerpoint slides) as learning material, thereby consuming the available bandwidth more economically, and hence providing better image (resolution) quality and more learning (wall)hours per CD. But they all clearly lack animations and cursor movements, which, especially in technical courses (with many drawings and schemes), is of the utmost importance to catch the audience's attention. Meanwhile, our technical staff has optimised the video encoding parameters, leading to a drop of bandwidth from 512 kbps to 200 kbps without significant loss of image and sound quality, thereby resulting into an equivalent increase of the number of lecture (wall)hours per CD.

Project Evaluation

As in the first issue of the course, a new student evaluation was carried out by the department of (human) communication sciences at the Ghent University (prof. Els De Bens and prof. Gino Verleye [2]). Although the inquiry dealt with all aspects of the course (including content and teaching skills of the learners), only the results on the course format as such are presented below.

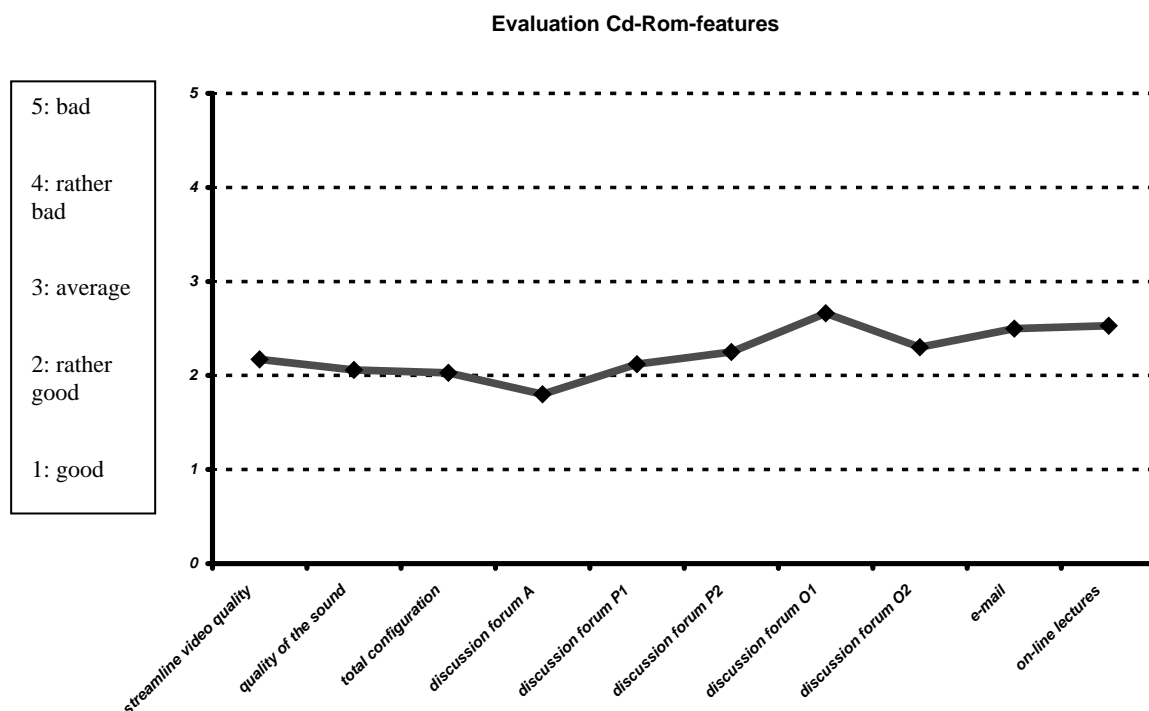
(Legend: ++ Fully agree / + Agree / 0 Neutral / - Disagree / -- Fully disagree)

Attitude towards CD-Rom supported education.

<i>This kind of education bridges distance as well as time. It's a solution for the mobility problem</i>	++
<i>This kind of education gives me enough opportunities to ask questions in a direct and interactive way</i>	+
<i>This kind of education stimulates interactivity and contacts among the students of the course</i>	0
<i>This kind of education stimulates interactivity and contacts with the teachers</i>	-
<i>This kind of education implies a very isolated situation for the students of the course</i>	0
<i>The personal freedom as far as time management is concerned (following your own rhythm to study, and choosing moments which fit you the most) is definitely a strong advantage of this kind of education</i>	++
<i>This kind of education is a weak substitute for the traditional way of 'live contact'-education</i>	--
<i>I would prefer a 'live teacher' to CD-Rom-supported education</i>	-
<i>The Cd-Rom has no added value as compared to a videotape</i>	--
<i>This way of education implies a lack of social control by colleague students</i>	0
<i>One needs a high dose of self-discipline to finish a course which is given in a Cd-Rom-supported way</i>	+
<i>Cd-rom supported education is only interesting when it goes together with a sufficient degree of and possibility to interactivity and asking questions (discussion fora, short term-answered e-mails)</i>	++

Quality of E-mail and discussion forum.

	e-mail	discussion forum
Good	41.7%	47.2%
Average	22.2%	30.6%
Insufficient	8.3%	8.3%
n.a.	27.8%	13.9%



The conclusion of the evaluation is clearly an overall satisfaction degree, which was also confirmed for the other aspects (content, teaching skills). The course format was regarded as an ideal way for people with a busy professional life:

- to bridge time and distance;
- to keep the liberty to follow its own rhythm and to determine its own study moments;
- to have interaction possibilities among each other and with the teachers.

People commented on some facts as follows:

- although a rhythm has been imposed, you need a good dose of self discipline;
- interactive exercises on the CDs would be desirable in future;
- although many moments of contact between students (class room exercises) were built in, there was some feeling of isolation, also because the doorstep to go onto the discussion forum is for some people too high (afraid of 'silly' or 'rtfm' questions);
- on the one hand you have the freedom to study the CDs when and how you choose yourself, but on the other hand you have to study them (and not few) *nevertheless...*;

It was summarized by one respondent as follows: *"The advantage of personal time management and the solution for the mobility problem is more important than the lack of personal live contact with the teacher. There are still the lab sessions to communicate with experienced people"*.

Internationalisation

Due to the ability of the course format to bridge time and distance, and to overcome mobility problems, the developed material is extremely well suited to be used in countries where mobility is restricted. Contacts are currently being made with universities outside Europe in order to use the material in IT programs. Bethlehem University in Palestine, for example, is highly interested in using the developed material to strengthen their IT program. Under their proper guidance, and provided they could (re)build up the necessary infrastructure and distribution channels, it is hoped that the material would bring leverage to many youngsters and professionals in Palestine.

Current activities

Since the beginning of 2002 the Institute – in cooperation with the department of Information Technology of the Ghent University – has started an e-learning project to encompass the current format by a global e-learning architecture.

e-Learning can be viewed as the online delivery of information, communication, education, and training. It makes use of a network (LAN/WAN or Internet) for delivery, interaction, or facilitation. e-Learning provides a new set of tools that adds value to all the traditional teaching and learning experiences and processes.

The e-Learning framework that is put forward will achieve integration and interoperability of separate systems. Our vision includes a system that will involve a learning management system (LMS). The LMS integrates various tools and processes. It provides an integrated platform for content, delivery, and management of learning, as well as accessibility by users: i.e. a system that will automate the process of learner enrolment, registration, monitoring, transcripts, schedules, and reports. The system must also incorporate evaluation, assessment, and testing capabilities.

In addition to the LMS, the framework will include a content composition and integration system. This system will mainly consist of a content repository. This repository will be based on reusable components. The reusable components will be arranged in a flexible hierarchy to create material or courses tracks. It is also intended to create another repository to manage and contain the content meta-data: i.e. all the rich and built set of course units the Institute for Continuing Education has developed in the foregoing years.

A learners management system is another integral part of the envisaged e-Learning framework. This system will be built using a learner's repository. This repository should be set up in a way that makes it possible to be linked to a legacy database.

The target is to build a system that is extensible in the sense that it must be able for additional components to be integrated easily using some form of open and component-based software architecture.

Conclusion

The experiences with the IT course based on streaming video, surrounded by e-coaching, hands-on exercises, live feedback sessions and project work demonstrated that – even if technology and bandwidth are still far from ideal – a workable framework can be set up. The appreciation of the students and the successful study results proved that an intensive study-load of 11 hours per week during one year for fully employed people could be digested by distant learning in that way.

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THE AD-HOC PROJECT: ELEARNING ANYWHERE, ANYTIME

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Abstract

The AD-HOC project¹ aims at the development of an innovative advanced multimedia language learning tool for European travellers who on location are willing to acquire certain language skills, in order to communicate with locals in the country of their destination. The main outcome of the project will be the AD-HOC system that will be composed by three levels: content, service provision and learning environment. By creating mappings between content and services using database technology and metadata, the system will maximize reusability of existing content. By decoupling the learning environment from the educational services, the system will achieve personalization, localization, contextualization, adaptability and ease of maintenance. By supposing wireless networking the users is placed at the centre of an ambient, always available, device independent educational environment. This paper presents the basic principles of the AD-HOC system and the current status of its development.

1. Introduction

The AD-HOC project's [1] innovative application allows travellers (for business, leisure or educational purposes) to access the web through the advanced new communication applications (PDA applications, GPRS and UMTS). These new applications allow for fast transfer of data (text, sound, picture and video) through the mobile device (phone, palmtop) of the user. The AD-HOC system will serve users regardless of time and location. An on-line manual, acting as an on-line tutor, will be developed also in order to support the self-directed ad-hoc learning.

The system aims to present linguistic content embedded in its cultural context furthering the understanding of European's cultural and multilingual diversity. It is proven that the mutual understanding in the communication process depends not only on linguistic competence but also on the awareness and perception of cultural behaviour, cultural differences and similarities. Only the need and wish to communicate in a foreign country, motivates individuals to learn a language or at least acquire specific limited language skills, but usually in travel situations no learning tool is available and back home often lack of time and appropriate learning material absents individuals from language studies. Increasing mobility of individuals, either for business, training or educational purposes, indicates the need for innovative, flexible, fast retrievable and user-friendly language learning tools, catering the needs of the modern «mobile» European, who does not have the time or intention for in-depth involvement and requires an immediate limited information.

The AD-HOC project's objectives are to encourage linguistic diversity throughout the EU and support the 'life-long learning' by motivating and aiding individuals to learn languages any time and in any place through the development of an innovative language learning tool, which serves the specific needs of travellers through:

- The presentation of authentic communication and real life situations in the cultural context.
- Its ad-hoc availability on travel occasions.

¹ The AD-HOC project is a European cooperation project (2000-2002), co-financed from the European Commission, DG Education and Culture.

- The offer of different, basic levels, based on the survival level.
- The choice of thematic fields for the acquisition of language skills for requirements of specific situations and specific purposes (business travel, travelling of young people etc).
- The choice for acquisition of only partial competencies, e.g. oral comprehension and expression.

The new technology application of AD-HOC project supports the pedagogical method of autonomous self-directed learning [2] and allows for a self-directed acquisition of language skills to meet users individual communication needs.

2. Usability Issues

Handheld devices have become very popular information devices for millions of users. Many applications have already been developed for public agencies, commercial companies [3], [4], even for University courses [5].

A key problem for handheld devices is usability: the screens are too small, they don't have keyboards but scribble pads, and the available speech recognition programs do not really work.

The small glass displays of the current handheld devices essentially limit how much information can be presented at one time. Lack of screen space is not a problem that can easily be improved with technological advances; the screen must fit on the device and the device must be small; screen space will always be in short supply. A second usability problem is represented by the fact that presenting dynamic information on devices with small displays is difficult. Techniques for large displays again do not generalize well to small ones.

Given these limitations, "mobilizing" existing PC-based e-learning applications can result in a frustrating or nearly unusable mobile service. The solution exists in taking a different approach to how the information is streamlined and targeted to the user. The first step toward this solution is to integrate a user centered investigation into the e-learning system's development cycle.

According to the 1998 ISO 9241 standard for usability [6] one must include the following parameters in system's usability, usefulness, functionality, learnability, memorability, effectiveness, efficiency and desirability. Even with such a checklist, it is still very easy for a designer to make a tool, which is quite unusable. This is partially because design is not sequential process – design decisions affect which people can use a tool, thus requiring the original design to be rethought, and partially because designers are not the potential users and driven by other forces such as a love for technology. Nevertheless there is hope. There comes a time when the design of a system is no longer driven by technological advances, but instead drawn forward by the users who have expectations of usability and take for granted the basic performance. The methodological approach of the AD-HOC project plays a fundamental role for the development of such a system: user-centered design [7] and scenario based design [8] are means for assuring that the final system is appropriate to the user and to the context of use.

The AD-HOC system will fulfil the following general requirements:

Interactivity: it should provide means of communication between learners and teachers. It should allow for feedback by the teachers that will be accessible to learners.

Interdisciplinary: Content should be presented in an interdisciplinary way incorporating information of different disciplines, thus promoting the idea of informal learning.

Unobtrusiveness: so that the student can capture situations and retrieve knowledge without technology obtruding on the situation.

Availability: its functions should be available anywhere and it should provide seamless communication inside and outside buildings.

Adaptability: it should adapt to the learners' evolving skills and knowledge;

Usefulness: it should be suited to everyday needs for communication, reference, and learning;

Suitability: Content should be corresponding to specific learning needs of users, e.g. content for the same subject should be presented in several ways and provided according to the specific users' profile;

Easy to use: it should be intuitively easy to use, by users with no computer experience.

3. Technical Description of the Ad-Hoc System

The aim of the AD-HOC project is to develop a device- independent platform that will make Internet services available with GSM and UMTS terminals. At the time of access the user will inform the service provider of her/his terminal characteristics (display dimensions, computing capacity, graphic processing capacity, etc.), and the provider will transmit the required information, adapting representation to the indicated characteristics. Consequently the same information will be presented in different ways, according to whether access is from a desktop computer or from a mobile terminal. The AD-HOC platform will have the capability to specify information and represented graphically, to integrate profile and service management, while it will allow for fast application development through a visual programming environment.

Another important objective of the AD-HOC project is to develop and evaluate communication patterns and possible infrastructures for interconnected embedded technologies among devices. Communication between devices can take place by using RF technologies like Bluetooth or 802.11b. The utilization of Bluetooth seems to be a good option, as it is low power and cost, with data as well as speech transmission capabilities, although there are some important open issues. Problems like power consumption of Bluetooth devices, their integration in embedded systems with tight memory capabilities and successive devices management have to be researched and dealt with.

The platform services will be delivered via an advanced user-interface, where the user will have to log in. The first major component of the user-interface will be the Personal Learner's apprentice: this is the core software agent of the system and the main part of the user-interface. It is responsible for interacting with the user. It will:

- Manage the user-system dialogue
- Support students in declaring their goals, by using each user's personal ontology and the domain ontology
- Perform skills gap analysis by matching the user profile and personal ontology against the domain ontology
- Pro-actively suggest content to the student, based on his/her profile and ontology, the domain ontology and the available educational modules
- Attend to users queries about content and suggest modules that meet his/her declared needs, based on the available educational modules
- Decompose the user queries and goals into sub-goals to be met by the system and then co-operate with the response planner in order to compile a list of suggestions
- Monitor the correct delivery of courses and record user's learning behaviour in order to update his/her profile
- Optimize the delivery of content with respect to momentary network availability and device capabilities

Based on user's model and profile, this agent will synthesize "on the fly" the user interface for the particular educational session, using frames that combine interaction templates with aspects of context. By decomposing the user-interface into dialogue description, content, layout and device capabilities, the system will support flexibility, adaptability of interaction, while taking into account linguistic and cultural preferences of the users.

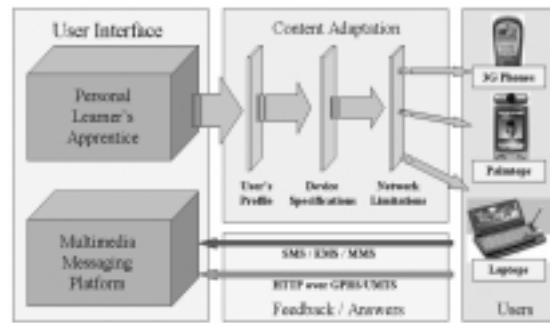


Figure 1: The platform services will be delivered to the user via an advanced user-interface. The main components of the user-interface will be the Personal Learner's apprentice and the Multimedia Messaging Platform

A Multimedia Messaging Platform (MMP) will be developed that will provide two-way communication. The MMP will be the second major component of the user-interface. A web-based application will provide the interface for the delivery of the multimedia messages. A web server will be used to collect user responses either through the web or directly from the mobile network. Certain work can be delivered to learners using this platform and questions or feedback can be collected from them. Collaboration among the learners will be enhanced with such a service that allows for easy and immediate exchange of information (transmission of quality photographs, sound and video will be possible enabling instant, high quality collaboration among the users).

4. Educational Content

Educational content is what the AD-HOC system actually delivers to its users. The project is developing a generic software platform for storing, retrieving and dynamically synthesizing educational modules to meet each learner's goals. To achieve this, the content will be broken into small, independent multimedia educational modules. These will be stored and retrieved using a database management system. Content modules will present domain topics in many different formats. Meta-data will be used to describe the modules. An international standard (or near-standard) such as the IEEE P1484 will be adopted. Aspects to describe using meta-data include the format of module and other technical aspects, its language, its technology requirements, its duration, its role in the learning, pre-requisite knowledge or modules etc. Then, a set of software modules will be used to dynamically synthesize a course, according the user's profile and language, and the learner's goals. The system will:

- Decompose a query issued by the learner into educational sub-goals, or perform an analysis of his/her skills profile
- Retrieve the appropriate educational modules from the database
- Synthesize the modules into a Personalized Virtual Document (PVD) based on a methodology that will be developed during the project. The methodology will take into account the user's context of learning, his/her personal ontology and his/her goals, and will implement an appropriate instructional strategy

When applying this methodology for course synthesis, the system will come up with a range of educational modules for the learner to select, depending on the constraints set by the learner. These may include educational objectives, duration, delivery platform, etc.

The approach, which will be adopted in the framework of the project, is to use scenario-based design methods [8] as a means of defining suitable educational applications of the mobile technology. Scenario building is one of the partnerships main design techniques to explore new forms of interaction in which the physical environment is able to react to human behavior, using handheld devices as a mediator. In the framework of the AD-HOC project a series of scenarios will be developed describing different situations. Language will be presented through written text, audio and, where applicable, through animations or video. The language modules will be divided in very limited sub-modules to help the learner in the fast access to the specific language patterns he/she is looking for. The learner will receive choices for links to little scenes, to the cultural context, to grammar explanations and to interactive exercises, also to similar language

content/scenes/cultural context in the other languages. The interactive exercises will allow for voice recognition and will offer the option for correction and reply. In this way the learner will be able to create a live dialogue or even use the device as assistant during his/her communication with another user.

5. Current Status

So far we have focused on two axes: PDA's multimedia capabilities and short-range wireless communications technologies.

Using Embedded Visual Tools like Embedded Visual Basic 3.0 and Embedded Visual C++ we develop testing applications from scratch, to take full advantage not only of the mobility of the device but mainly of the exploitation of all multimedia capabilities, like download and reproduce audio and video files.

Moreover, we are not only examining mobile Internet connectivity but we are extensively research for different download methods. In these methods the content is pushed to the PDA whenever the user "syncs" the device with the AD-HOC system. Another programming challenge on which we are working is the availability of "device-to-device" networking using Blue tooth. So there is already under development a Blue tooth wireless LAN for testing wireless communications and downloads using some exemplary AD-HOC scenarios.

The piloting of the application is taking place in repeated cycles of learner-centered trials in Greece, Italy, Austria and Germany. Each cycle includes the design, the development, the trials and the evaluation, which is the input for the next cycle in the student-centered product's development approach. The in-situ trials are not only meant for evaluation purposes but involve both students and teachers offering them the chance to provide feedback to the project and its technical and pedagogical aspects.

6. Conclusions – Future Work

The AD-HOC partnership considers that the challenge for the future generation of educational systems at the dawn of the third millennium is to develop didactic environments for mobile phones and mobile computers as the availability of mobile devices spreads to a billion of users. The mobile telephone is becoming a trusted, personal device with Internet access, smart card usage, and a range of possibilities for keeping the learner in touch with the institution's student support services, in contact with learning materials and fellow students, while at home, at work or traveling.

During the application an extensive usability evaluation that will offer the guidelines for the human computer interaction and psychological contents required for the development of the final version of the AD-HOC system. The consortium aims to investigate the impact that handheld technology has on how final users experience wireless e-learning applications.

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A DISTRIBUTED TRAINING LABORATORY

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Abstract

The paper presents an architecture for the development of a distributed laboratory. Experiments can be shared between users remotely through the internet network. Sample case studies are reported and discussed.

Introduction and motivations

Continuing education is becoming a mandatory issue for many manufacturing industries, service companies and consultants. Many facts can be listed that support the previous statement. One reason comes from improving technology that quickly pushes out of the market companies not able to keep pace with innovation. Another aspect comes from European Union (UE) regulations that are continuously updated when not newly introduced. Highlighting examples are found in several engineering fields such as telecommunication recommendations regulating transmission schemes and technology, electromagnetic compatibility standards that mandatorily require manufacturing of products being in compliance with severe new rules concerning the electromagnetic field being generated by the equipment. Moreover, quality certification of companies by rule, imposes the companies themselves to be committed in the continuous update of knowledge of people working in certified companies. Failure in such commitment may result in a failure in obtaining a quality certificate for the whole company, with obvious negative consequences.

Both teachers at any level, but especially higher schools ones, and technicians need upgrading their knowledge by attending courses. Sometimes the point of view of teachers and technicians slightly differs. Teachers need to be acquainted in new fields or are upgraded in their knowledge degree but are usually not urged to solve specific design or production problems. On the contrary, technicians often need a view in some new area in a way that enables them a quick porting toward their practical applications. Teachers need setting up sample experiences, exercises or case studies, that will be then performed by the technicians or students attending courses.

For many engineering sciences laboratory practice or in-the-field experience are both welcome and more often highly desirable to be accomplished in order to practically support theoretical lessons.

Moreover, the increasing use of programmable instruments has determined great modifications in the operating procedures adopted for solving practical problems. Before the availability of programmable instrumentation, the user was required to set-up the test system by connecting the device under analysis to proper instruments; then, he had to choose the best excitation signals and configuration of instruments by interacting with their front panel. The results were obtained by reading the data displays of the instruments, sometimes after some further calculations made by hand. Nowadays, this operating scheme is outdated and often cannot be applied. In fact, many intelligent instruments are not provided with a front panel; moreover, modern tests are performed first by writing a suitable program for a host computer that controls the instruments, and then by running that program with the Device Under Test (DUT) connected to the test station.

Such new operating scheme has a noticeable impact on the degree of knowledge required to a modern engineer, and hence in the training. In fact, it is required not only to properly use rather complicated programmable instrumentation, but also to know the programming techniques which are required for computer-controlled test stations.

To this aim, the organisation of a remote computer controlled test laboratory is proposed. The laboratory is currently maintained, within a common project between the University of Padova and the Politecnico di Torino (which are located in the extreme east and western north Italy respectively), and it is now in use. It

is provided with test stations controlled by a host computer; each host is connected at one side to the Internet network, and on the other side it interacts with programmable instruments permanently connected to a DUT. A server program runs within the host computer, receives commands from the Internet, forwards them to the instruments and eventually transmits the results to the sender of the requests. People interact with this remote test station by using suitable programs that run on workstation or Personal Computers (PC), often located far apart from the hosts. The server is structured to serve the requests on a first arrived first served basis and has queuing capability so that, many students can concurrently use the available test stations in a sort of time sharing.

Different programs are available to the end-users, organized at different difficulty levels. At a first level the developed programs allow understanding the behavior of complex instrumentation under various configuration options. At a higher level people are invited to write by themselves the necessary code for a remote configuration and control of the instrumentation.

The outline of the paper is as follows. In the next session the architecture for the remote laboratory is presented, then some case study are reported and discussed. For the sake of clearness in the following the term "student" will be used in order to generically identify a high school teacher, a graduated technician or any other people attending the laboratory. The term "teacher" will be referred to the people responsible for the laboratory set-up, maintenance, and organization.

The proposed architecture

A deep knowledge about computer network programming is required to develop a remote laboratory from scratch. Such prerequisite could be a major constraint to both the teacher and to the student, and hence could constitute a serious limit to the development of a number of experiments. To overcome this problem, the authors have firstly tried to define a simple though flexible communication protocol between client and server computers and then have developed a set of programs and libraries that are intended to help other teachers in the organization of a remote experiment; in such a way they will no longer be required to tackle with network programming issues. By using these programs that constitute a "service layer", the teacher can concentrate the attention strictly on the organization of the standard computer-controlled laboratory experiment.

The topology of the distributed measurement laboratory developed in this work is schematically represented in the Fig. 1.

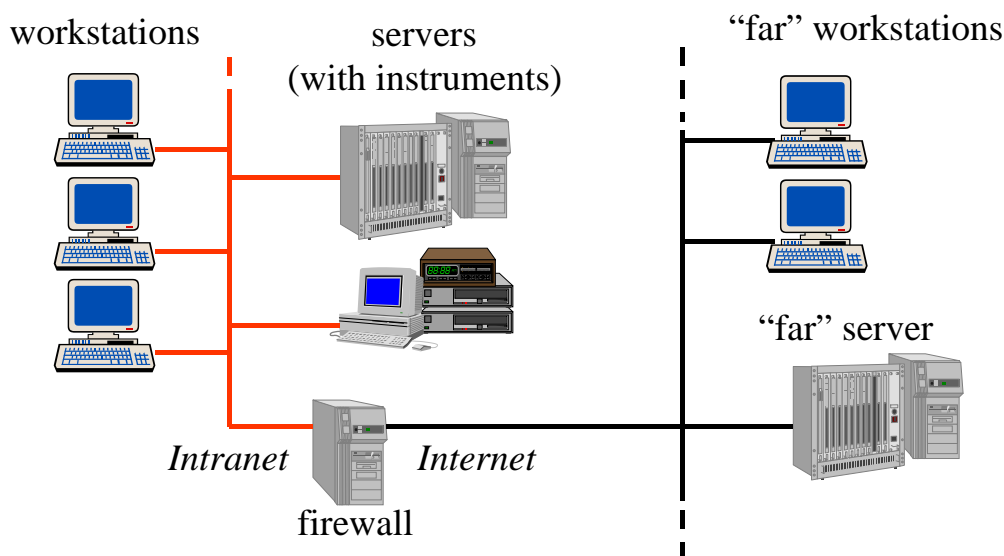


Fig. 1. Architecture of the proposed remote laboratory.

The laboratory can be composed by any number of "test stations" each controlled by a server (SVR) computer. The server is connected at one side to a network, and on the other side it interacts with programmable instruments. The instruments are permanently connected to one or more Devices Under

Test (DUT's) by means of a switch matrix, not shown in the figure for the sake of clearness. The "client side" of the laboratory is composed of several workstations (WS's) installed at the same laboratory location. Such workstations are connected to the same computer network of the laboratory and provide the programs used by the students. During a classroom guided exercise, the students use pre-arranged programs that interact with the instrumentation to highlight the lesson topic. The students can freely choose an application on a test station to work with. If more student groups decide to use the same test station, the server programs which control the instruments grant the remote access to the DUT's in time-sharing fashion with suitable priority policies.

The local computer network of the laboratory can be connected to other computer networks, in particular to the Internet one, by means of an optional firewall computer. In this case, other "far" workstations may access the instruments and DUT's controlled by the laboratory server computers by exchanging information with the firewall. In this way, the students can use the laboratory devices without reaching the university location, for instance from their home.

The firewall is responsible for applying proper user authentication procedures and for hiding the IP addresses of SVR and WS computers to the rest of the network. One should note that if security is not a major issue the use of a firewall can be avoided, and in this case it is assumed that the WS and SVR computers are all directly connected to the Internet network.

Several advantages are obtained by employing this configuration. First of all valuable and expensive instrumentation can be shared between many users. This allows the development of laboratory experiments even when many students attend the same course, without making overwhelming money investments.

The availability of remote test stations that can be used from any far location allow the students to best tailor the number of laboratory hours to their effective needs. The laboratory can be left unattended, or unqualified personnel can be employed for laboratory surveillance. Hence, the teacher can better be involved in discussions with the students concerning the problems they have encountered in the development of the exercises, rather than in trivial supervision activities.

The network topology supports a high flexibility in the definition of the number and on the kind of test stations. Since the programs that controls instrumentation are designed for a co-operation with a firewall, minor connection problems are expected if the students obtain the access the Internet network from a workstation permanently connected to the Internet, rather than from third party a service provider. Moreover, the SVR computers can also host hypertext web pages, which better explain the experiments available by connecting to that computer, and the procedures that they have to follow. This additional documentation can greatly decrease the time, which is required by the students for carrying out the experiments.

Examples of laboratory tests

Different programs may be made available to the students, depending on the actual need of courses. Moreover different remote devices can be remotely controlled by means of simple plug-in modules, here referred to as "metadrivers", that can be easily added at the server side in run-time. For a theoretical point of view any equipment that can offer an electronic interface toward a computer can be then controlled in the above system it suffices to write down the code for a suitable metadriver. Such a code fragments are reasonably simple and basically have to translate a function call originated at the server side in the corresponding operating system call toward the actual device interface. At the present time metadriver for any measurement instruments provided with serial, and IEEE-488 standard interfaces are supplied.

For the sake of simplicity some case study are presented in the following in order to let the reader understanding the capabilities of the whole system.

The simplest example is just constituted by client applications that present a replica of the front panel of one or more instruments, which are physically connected to the test stations. The students can interact with the remote instruments by means of the graphical interface, which is provided by the programs. They can easily change the instrument configuration and observe the corresponding effect. Such programs are

designed to prevent the user from using improper set-up conditions, so that the students can quickly learn the correct use of complex instrumentation.

Fig.2 shows together the front panel of three client programs of this type. Program 1 is designed to remotely control a Dynamic Spectrum analyzer which is connected to a distorted square-wave input generator, Program 2 controls a set of three instruments connected together and to suitable demo test circuits. Program 3 collects waveforms from a time-varying non-linear source with a digital storage oscilloscope. All the programs continuously update the corresponding plots shown in Fig. 2.

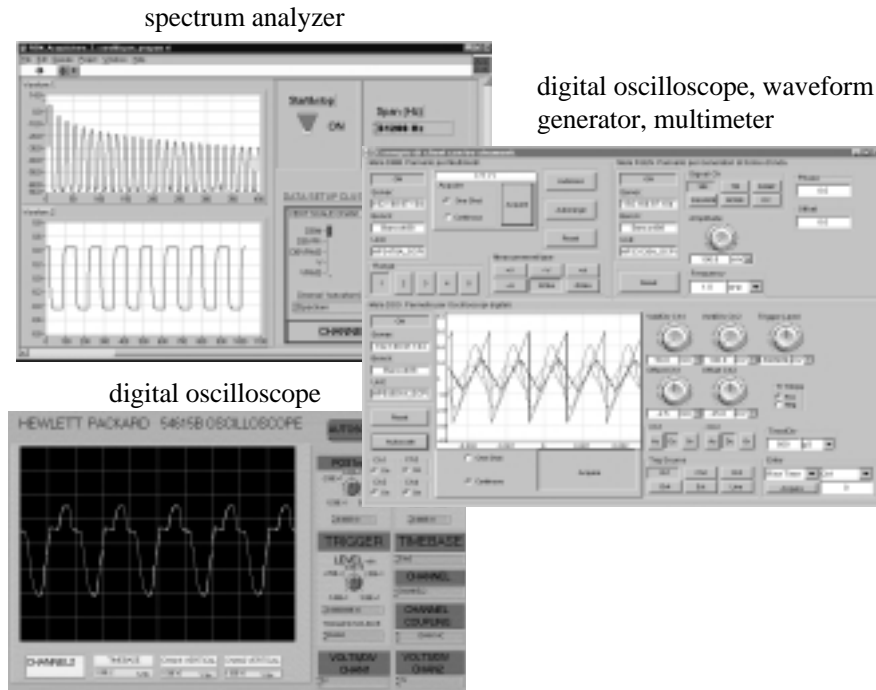


Fig. 2. Sample client applications

In order to obtain a connection between the client computer and the remote workstation, client programs pop-up some dialog boxes before displaying the window represented in Fig. 2. In these dialog boxes the user has to choose some configuration parameters, such as network addresses, and provide a login/password pair for authentication.

At a higher difficulty level, the students are required to interact with the remote instruments by using a programming environment. In this second case, the students can exploit the library of communication tools in order to simplify their task. Several sample programs of increasing complexity have been designed in order to make the users acquainted with the various programming issues. The samples are organized in hypertext documents, which can be read while concurrently interacting with the programming environment: in this way, basic programming commands, samples, and hints can be more effectively found.

An example of library function and of the corresponding use is found in Fig. 3. The function is written for the LabVIEW programming environment, which is commonly used for the control of instrumentation by means of a computer. Other programming environments can be supported in a similar way. The function is designed to send a command to a specific unit of a remote bench. In Fig. 3 (a) the interface Virtual Instrument (VI) is represented. It receives at its input some information concerning the destination of the command (unit info in) and the command parameters (data string). In Fig. 3 (b). It is seen a sample code fragment that uses the "send" VI in order to set-up the span parameter in a DSA. That code fragment can be used for the development of the client program "spectrum analyzer" of Fig. 2.

Fig. 3 (a). Example of library function for the remote control of instrumentation

Fig. 3 (b) Example of use of the library function of Fig. 3 (a)

Fig.4 represents the source code of the sample client "spectrum analyzer" shown in Fig.2. Despite the full functionality of the client program and the complexity of a physical spectrum analyzer, it is seen that the source code is rather simple. In fact it suffices to call a few library functions in order to perform the remote control of the DSA itself.

Fig.4. Source code of the sample client "spectrum analyzer" represented in Fig.2.

Fig. 4 also proves that it is easily possible to organize higher education courses where the students are required to develop programs that remotely controls the instrumentation. In fact, the programming efforts are rather limited, despite the complexity of the program they can develop. This means that the students can concentrate their attention on the issues related to the automated test procedures in a distributed environment, rather than on lower-level programming.

The various laboratory experiences are all described in web pages that the students are invited to read before performing the experiences. They contains usage manuals for the client applications and manuals for the programming of new applications according to the supplied libraries.

Programs similar to the ones originating from Fig. 2 have been provided to the student of some university courses (300 students approximately each year). Then the actual physical devices have been made available to the same students for new tests performed in the well-known traditional "in the laboratory" way.

Varios education experiments have been performed during two years. One simple yet interesting case is reported here for the sake of brevity. The first year a group "A" composed by the student of one course

have been asked to directly come in the (physical) laboratory rooms and perform some experiments. The second year a new group (group "B") of students of the same course have been asked to use the remote programs before attending to the physical laboratory in order to perform the same experiments made available the year before to the students group "A". The remote applications were specifically designed in order to not present an exact replica of the actually available instruments. Moreover, the actions that have to be performed in order to obtain a given result with the remote programs were significantly different to the corresponding actions required to obtain a similar result with the corresponding physical devices. This choice was done in order to not let the student of group "B" to become acquainted with a given physical device before having actually touched it. Anyway, it was noticed a significant improvement in the performances of the group "B" with respect to the experiments done with the physical devices by group "A". We justified this result with the consideration that the students of group "B" had more time to spent with some equipment even though they in practice saw two kind of devices: the "remote applications" and the physical instruments. Hence their skill level was improved.

Conclusions

The authors feels that the usage of internet-based tools as a support to traditional laboratory experiences can significantly improve the learning curve of students. Moreover an internet based distributed laboratory considerably lower the costs since expensive equipment can be more efficiently shared between more courses for teaching purposes.

Co-operation with other faculties and organization is advisable and will be carefully considered by the authors.

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ON-LINE PHYSICS LABORATORY EXPERIMENTS: RESEARCH ACTIVITIES IN THE LABNET2 PROJECT*

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1. Introduction

The recent growth of interest of teachers to introduce the use of computer as educational tool encourages the development of didactic environments so that the use of computer classrooms and the resources of the web become daily tools. An aspect of distance education not currently supported by most support environments – commercial and experimental – is related to the possibility of performing laboratory exercises remotely. In the present paper, we illustrate on-going research activities and experimentations within the project LABNET2 of the Italian Interuniversity Computer Science Consortium (CINI) in the National Laboratory for Multimedia and Telematics (ITEM) in Naples. ITEM runs a set of projects, called LABNET, for the experimentation of technologies of remote access to laboratories. Such projects foresee the creation of laboratories, into which real technical-scientific equipments are remotely accessible to teachers and students. Such objective is achieved through the realization of a suitable computer and network infrastructure and the development of necessary software applications. The research activities described here are aimed at remote management of a physics laboratory. By taking advantage of telematics and multimedia technologies, some experiments available in the Physics laboratory (called LAFIDIN) of the Engineering Faculty of the Federico II University of Naples have been made controllable remotely over the Internet. The remote management allows students to perform experimentations, control equipments and visualize the results of the experiments as if these were performed locally. The access to a real laboratory, even if realized through remote control, aims at a greater didactic effectiveness when compared to conventional techniques of virtual laboratories, supported by advanced environments for distance learning. In this paper, we discuss also results of trials run in cooperation with 10 high school institutes of the district of Naples and Avellino. Students performed physics experiments on remote equipments through Internet connection from their schools. During the execution of the experiments, students had the possibility to have a complete vision of what happens in the laboratory through a remote controlled video camera. The camera helps to improve the pedagogical effectiveness of the experiments, remarking the difference with computer simulated experiments.

2. The experiments

Two kinds of experiences have been identified: basic and advanced experiences. Basic experiences interest students attending secondary schools and basic physics courses within scientific faculties. Traditional physics subjects concerning mechanics, thermodynamics, electromagnetism and optics have been considered. Fundamental experiments include:

- Ohm law; non linear behaviour of resistors
- Resistance vs temperature for noble metals and semiconductors
- Discharge phenomenon in low pressure gases
- Biot and Savart law applied to solenoid
- Electromagnetic induction
- Analysis of RC, RL, RCL circuits.

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Special worksheets have been made available, as tutorial for the experiences, to fix the theoretical basis, to clarify how activate the channels for collecting experiment results and, finally, to summarize the fundamental physical parameters involved in the interpretation of the phenomenon. In particular, the worksheets describe the scientific equipments, experiment steps, and a scheme of the homework to be performed by students after the on-line experiment. Additional information are provided live by teachers during the experience.

Advanced experiments are classified in two typologies: the first concerns both classical and modern physics crucial experiments, the second concerns innovative experiments able to emphasize some aspects of modern applied research. They give the opportunity to understand complex issues requiring knowledge of different fields of physics. The experiences selected are:

- Experiment of Frank-hertz
- Experiment of Rutherford
- Stationary magnetoelastic waves
- Interference of magnetostrictive mechanical waves in a magnetoelastic solid.

For each topic, the following educational activities have been scheduled:

- Preliminary theoretical lesson(s) in the computer classroom, supported by slides and multimedia products
- Pre-test questionnaires
- Pre-experiment lesson, describing how the experiment will be performed; this is based on accurate examination of the worksheets
- On-line experience
- Summary session: students produce a report summarizing results of the experiment, with support of spreadsheets, following pre-defined templates
- Post-test questionnaires
- Processing of pre- and post-test questionnaires and examination of the students' reports, for the correction of the errors

3. Technological solutions

The overall architecture realized in LABNET for supporting on-line experiments is depicted in Fig. 1.

Digital equipments for a given experiment, controlling laboratory devices and gathering measurements data from sensors, are directly connected to a Personal Computer, acting also as a server for that experiment. Experiments can be run by students and/or teachers from a remote computer classroom, or by students from home. Remote classrooms for basic experiments are located in high schools, connected over ISDN links. The ISDN connection to the LAFIDIN lab is provided to schools by the ITEM infrastructure, which acts as Internet Service Provider and access server, routing data flows to LAFIDIN at high speed over a HDSL link.

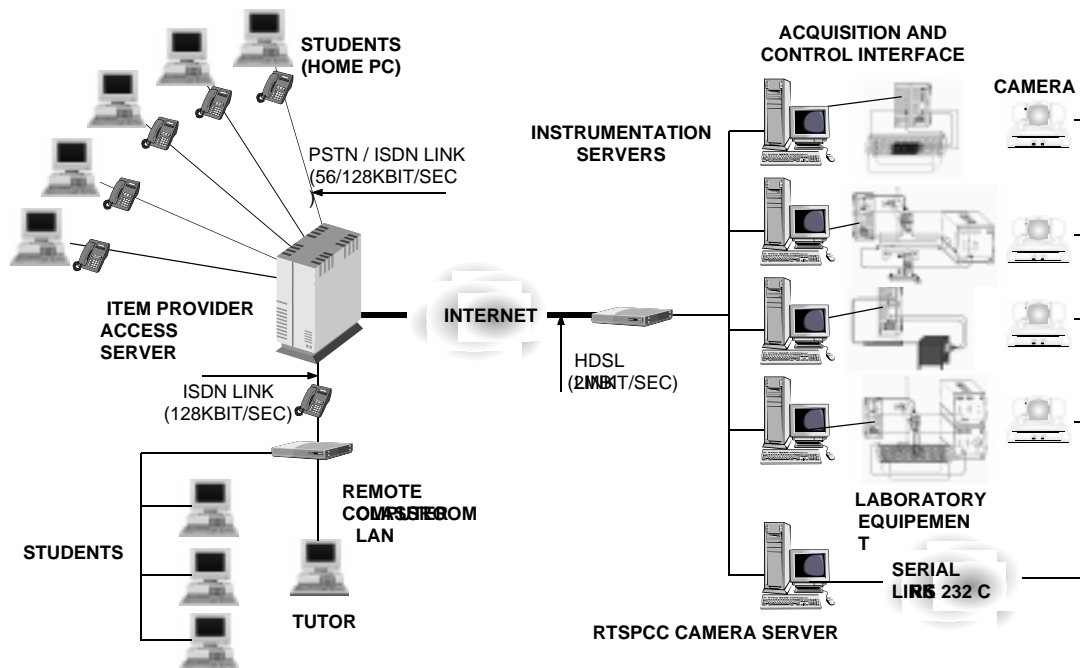


Figure 1. The architecture for remote experiments.

Strong requirements for the architecture included to minimize the application software to be installed on client PCs, to use only public or commonly available applications, and to use thin clients, possibly based on the exclusive use of a web browser.

In order to increase the interest and the involvement of the students, the execution of the experiments is supported by video flow captured by a video camera located inside the laboratory (right left in Fig. 1). This makes students to be able to observe and check both outputs and reactions of real devices to given inputs. A client-server application has been implemented for remotely controlling the video camera so that the learner will have a complete vision of the remote laboratory. This application allows students to control remotely the video camera through a graphics user interface using commands, such as pan, tilt, zoom, and focus.

As shown in Fig. 2, the interaction between the remote client and the server, connected directly to the camera through a serial link, is regulated by RTSP-CC protocol (Real Time Streaming Protocol Command and Control), defined with the specific objective to allow the remote control of video capture device state and movement. Such a protocol derives from the RTSP standard protocol. RTSP is an application level protocol, conceived for the streaming control of multimedia flows through VCR-like functionality. The syntax, the extensibility as well as the concepts of method and session state, characterizing the RTSP protocol, are inherited by RTSP-CC.

In order to control remotely the video camera, the client sends RTSP-CC commands to the server, that translates them in a predefined format and forwards them to the device driver, that, in turn, sends them to the camera through serial connection. The connection between client and server, on which control data are transmitted, is based on TCP sockets. This choice has been made due to the need of a reliable connection.

As far as the video flow transmission, the application selected is Microsoft NetMeeting, due to its simplicity of use and to the fact that most common versions of the Windows operating system support it. Furthermore, thanks to adopted coding techniques, NetMeeting introduces a good compromise between video quality and bandwidth requirements, thus representing a technological solution suitable for the connection with the schools based on ISDN (Integrated Services Digital Network) technology. The adoption of this technology guarantees the needed bandwidth availability to the video streaming application. Moreover, since the schools are connected only during laboratory class a fulltime connection is expensive and oversized.

4. Formative high school sessions

The first phase of trials with school students covered experiences related to the study of the characteristics of common resistors among which the filament of an incandescent lamp. Lessons are carried out with the support of the school teacher of physics and a supervisor of the University Physics Laboratory (LAFIDIN).

The integrated measurement environment (Fig. 3) consists of an application that control the instruments and the sensors through acquisition channels, a NetMeeting window for the visualization of video flow and, finally, a button pad for control of video camera.

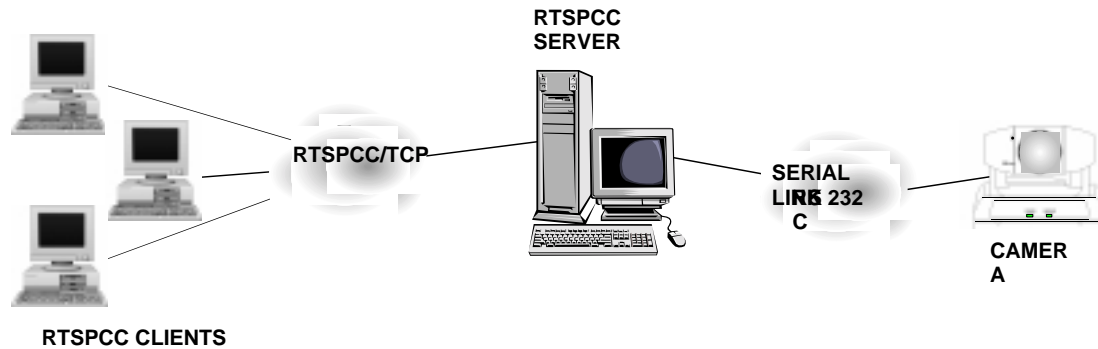


Figure 2. The architecture for remote control of a video camera.

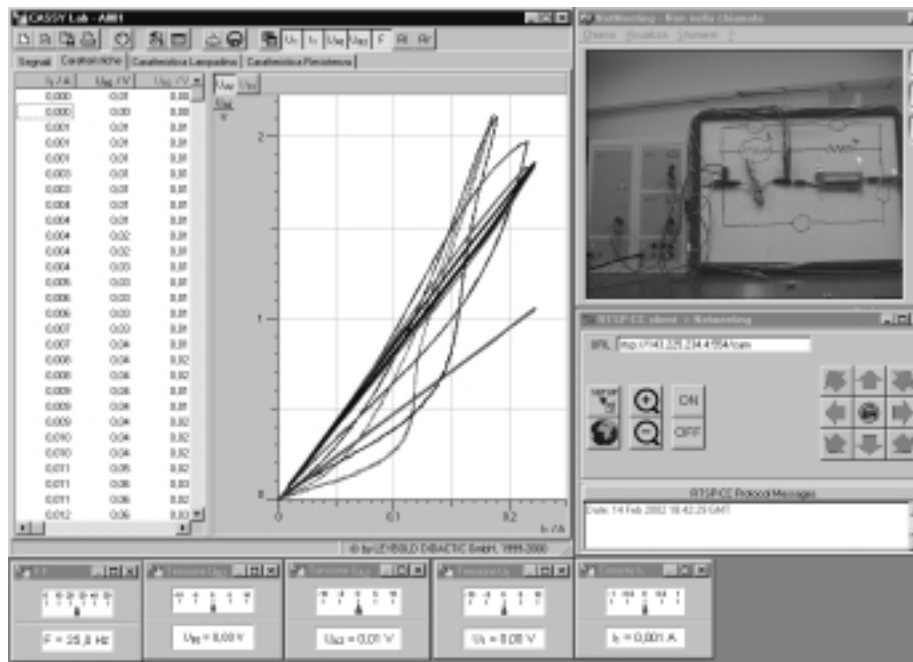


Figure 3. Snapshot of the integrated measurement environment.

The exercises have allowed to investigate characteristics of the resistors mounted in a simple electric circuit, emphasizing, for the power resistor, a behaviour linear and independent from the frequency of load-unload ramps (signal with triangular waveform 0-5 vpp, frequencies 0,1-50 Hz). For the light bulb, students can notice a non linear behaviour that depends on the power developed for Joule effect in the filament. Learners can also appreciate the change of the value of the resistance, by visualizing the Volt-Ampere characteristic using the power frequency as a parameter, as shown in Fig. 4. The Volt-Ampere characteristics are represented by the red closed loops of Fig. 4, denoting the resistance change caused by temperature. Actually, one observes that the stabilization of the filament temperature for dynamic equilibrium is strictly dependent on frequency. By increasing the frequency the filament is cooled more times and, consequently, the dynamic equilibrium will be reached after a proportional number of cycles.

In the right side of Fig. 4 the effect is observed at 2.5 Hz (stabilization is reached after 1 cycle). In the central part of Fig. 4 the frequency is 10 Hz, and more cycles are needed to achieve stabilization. At low frequency the bulb filament quickly reaches a working rate.

This example shows the effectiveness of the interactive on-line system we realized in supporting active learning, by allowing the learner to chose the diagrams to display, representing the relationships between physical quantities under measurement. In this way, students involved in the user trials could “learn by doing”, giving quantitative explanations to “qualitative” descriptions of the physical phenomenon, such as the heat dissipation by radiative effect in the light bulb, that is thermally coupled to the environment.

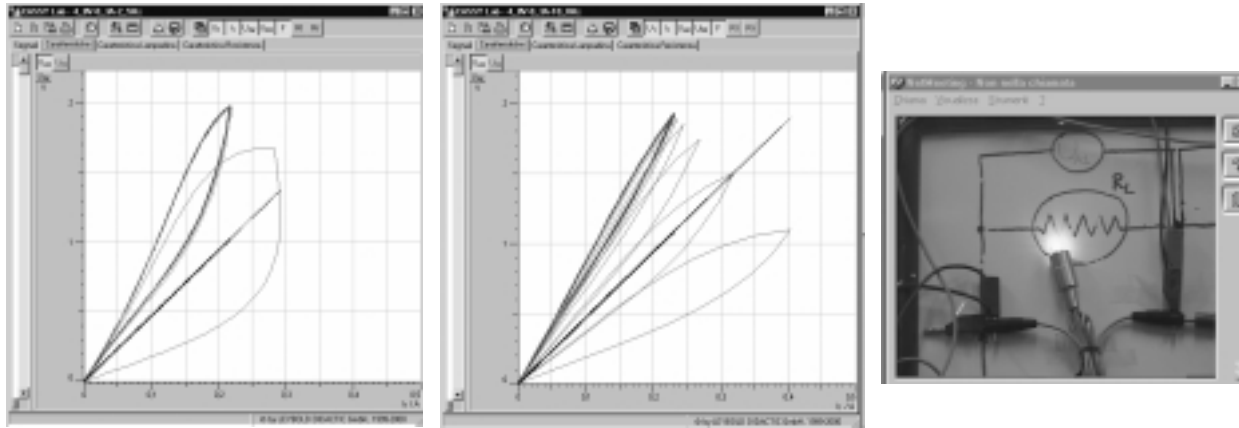


Figure 4. An example of results of experiments: dependence of the V-I characteristics from the frequency, f. Left: $f=2.5\text{Hz}$; centre: $f=10\text{ Hz}$; right: a live zoomed image from the camera.

The experiences on the light bulb give to the students the opportunity to study the temperature of the filament (Boltzmann’s law), the evaluation of the light emission, the dependence of light from distance, the transient phenomena at filament fusion.

For user evaluation purposes, we submitted a questionnaire to a population of 145 students; results are summarized in Fig. 5 (the ‘T’-like mark on each bar in the figure represents the expected percentage).

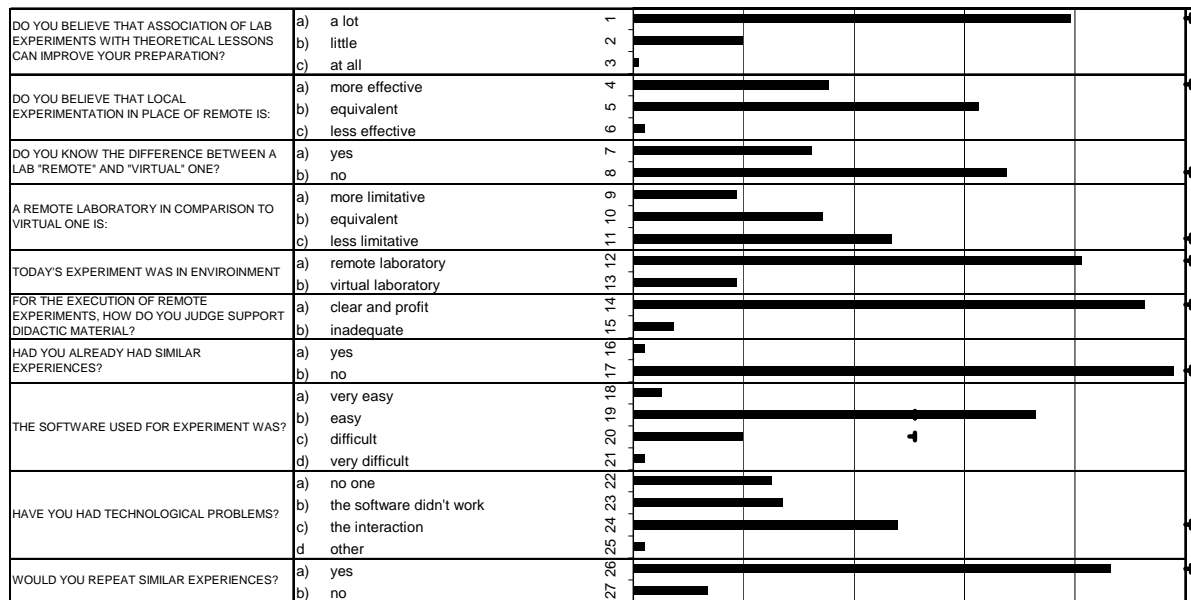


Figure 5. General prospectus with the results of the questionnaires filled by students.

Main considerations from user evaluation can be summarized as follows:

- a. no similar experiences were previously made by students;
- b. students believe that exercises of remote laboratory can improve their understanding of the phenomena;
- c. nearly all students agreed to repeat the experience despite some of them met difficulties in the understanding of the integrated environment of measure.

Generally, students showed a strong interest for computer tools and also revealed a good level of interaction with the environment of measure. Very meaningful is the distinction between remote but real laboratory experiences and virtual laboratory experiences operated by the students. Often, the term "virtual" is misleading in the current language; in effect the students, by fillings the appropriate blank of the questionnaire confirmed they understood and appreciated the distinction.

Before learning to control remote experiments, students had to perform real experiments in the school's physics laboratory. Elementary experiences were generally realized with low-cost devices in the school's lab, or directly in the classroom. Real experiments provide students with a valid and necessary knowledge so they become able to perform the on-line ones. The use of easily available and low-cost material allows students to develop essential ability and to make individual laboratory activities. After experiences in the classroom or in the real laboratory, students practice the essential concepts in measuring physical variables and in the interpretation of the data-set; the use of on-line instrumentation results simpler after even a very simple live experience in the real lab. The students recognize that the on-line control of equipments through a PC simplifies data acquisition, visualization and processing in real time.

5. Conclusions and future developments

Making a remotely administrable laboratory introduces different problem concerning (a) the control of the instrumentation and the multimedia equipments (b) the scheduling of user sessions (c) the evaluation of the effectiveness of on-line lab sessions to achieve the educational outcomes.

In the course of experimentations organized in high schools, some technical and organizational problems were individuated. From the discussions with teachers and students it resulted the necessity to improve the educational offer, discussed in this paper, in the following directions:

1. Independent access to the experiences and exercises also in house
2. More bandwidth
3. Training on remote control and and-learning with steam of video
4. Group exsercises for the students and forum among students of different schools
5. Didactic media on line within a portal evolved web
6. Multimedia product
7. New experiences

The results, the interest and the participation manifested by teachers and students were notable; this proves an increasing necessity to implement the educational offer by using, besides the real (traditional) laboratory, an innovative system to do experimental physics that uses equipments and real experimentations, often derived and/or integrated with the scientific research.

6. Acknowledgment

We are grateful to Prof. Renato Papa of the ITC "M. Pagano", Prof. Graziella Bucci of the ITIS of Pozzuoli, Prof. Corrado Fadini of the high school "V. Cuoco" and Prof. Antonio De Caro of the high school "Aeclanum", that have provided very useful feedbacks on pedagogical issues during the actual experiments with students. We also thank Fabio Luponio for data-entry from classroom tests and Dr. D'Andrea Giovanna for help in traslations.

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DISTANCE LEARNING WITH TELE-CONTROLLED DEVICES

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Changes in Learning

Five years ago it was usual for students to spend their afternoons in laboratories. Generally, about twenty people shared one machine. Therefore only a handful of participants could be active and the others were only watching. In addition, caused by the investment costs for the high-end technical equipment and qualified staff, every university only specialized in only one subject field.

At present the manner of learning is changing radically. More and more the internet is being used to obtain information. This form of learning has several advantages such as full independence concerning the time, place and individual speed of learning. As a result this training can be more intensive and therefore more efficient. With respect to the training of engineers this means the possibility to use several laboratories at different places. As a result the training becomes more multifaceted and a lot of various combinations are imaginable.

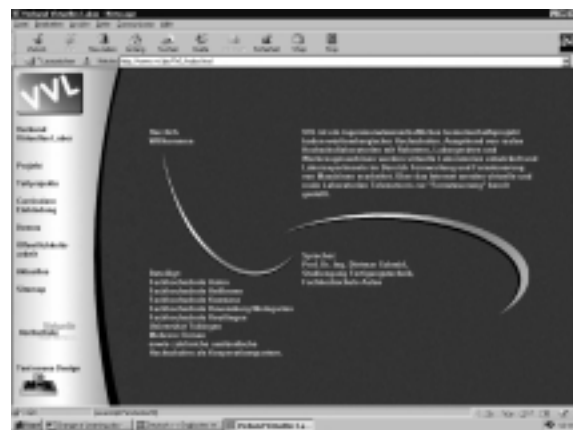
VVL-Network of Virtual Laboratories

In April 1997 the government of Baden-Württemberg decided to encourage the development of a virtual university [1], [2], [3]. The idea was to substitute certain parts of courses by virtual components. The research project VVL consists of seven sub-projects in the fields of automation engineering, robotics, machine tools, image processing, computer science, communication technology and a didactical support subproject.

The period of promotion was limited to 5 years, divided into two sections. At present, we are in the second section which ends in June 2003. The aim of this section is to develop evaluated learning and practice modules which can be integrated into the course of studies and runs without expensive servicing.

Virtual laboratories are useful for acquiring knowledge and they are also objects of research. VVL contains knowledge and experience of the following areas:

- Robotics [6],
- Automation Technology [7],
- Control Technology,
- Cybernetics,
- Drive system engineering,
- Image processing,
- Communication Technology,
- Computer science,
- Telematics,
- Teleservice.



<http://www.vvl.de>

At the moment the development of several learning modules has been completed and tested and evaluated by students from various universities. Every interested person can use our virtual laboratory via Internet after obtaining an admission ticket. He (she) is a so called "Test-User". In the future, students can still use the virtual laboratory for free, commercial user will have to pay.

The following learning modul belongs to the field of robotics, located at the Aalen University of Applied Sciences.

The Subproject „Robotics“

Students are not only expected to acquire theoretical knowledge but should also experience the way of handling devices. Therefore the laboratory of robotics at Aalen is a established part of engineer training.

As a part of this practical training the students (staple, broaden) their skills in handling an industrial robot, concentrating on problems with accuracy (ISO 9283) [4] and the usage of sensors. Another main focus is tele-diagnostic with the assistance of statistics [5].

The learning modules are differentiated in three levels. Level 1 is an experimental modul consisting of step-by-step instructions and study controls. Normally these modules are intended for one afternoon. On level 2 a student gets only a few instructions and support for self-verification. The participant has to decide on the way how to solve the problems by himself. On level 3 a target is given and the technique is made available, the student has to work completely autonomously.

At present the subproject “Robotics” offers four learning modules:

1. Ascertainment of the absolute accuracy for a manipulating industrial robot

Learning objectives:

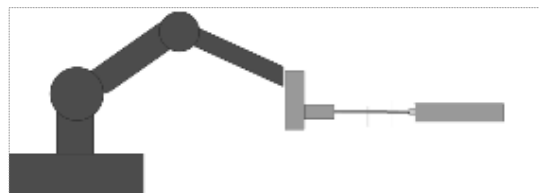
- Writing a simple robot program.
- Gaining experience concerning the precision of an industrial robot.
- Using statistical methods for evaluation.



2. Ascertainment of the linear accuracy for a manipulating industrial robot

Learning objectives:

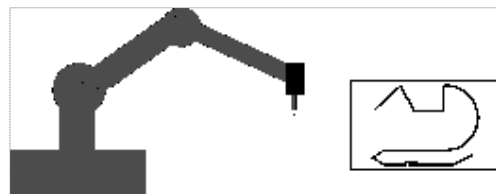
- Getting familiar with different movement interpolation objectives.
- Determining the linear accuracy of an industrial robot depending on different parameters.
- Determining quality characteristics.



3. Ascertainment of the path accuracy for a manipulating industrial robot

Learning objectives:

- Getting familiar with dynamic path behaviour in different proceeding speeds.
- Assessing dynamic path behaviour.



4. Ascertainment of sensor parameters for a manipulating industrial robot

Learning objectives:

- Writing a program for a sensor-controlled robot movement.

- Getting familiar with differences between a sensor-controlled or a fixed programmed path movement.
- Determination of the sensor control parameters.



Typical structure of a learning module

Our learning modules (level 1) are usually intended for one afternoon (about five hours). Depending on the field the module is divided in up to five units. The standard module starts with the description of the educational objectives, the specification of the experiment and technical and theoretical suppositions. The practical part begins with the calibration of the hardware before the units are performed. Every unit has a separate section analyzing the previous procedure with a look back. At the end of the learning module all the units have to be common evaluated and a résumé must be found.

Exercise: Special field Sensoric

The main targets of this learning module are the knowledge of how to measure data with a tactile inductive transducer, to gain experience in the validation, handling and statistical analysis of large quantities of data. In addition, the learner practices programming an industrial robot, thus acquiring knowhow in using telematic environments.

The different units of the sensoric module are:

1. Calibration,
2. Determination of robot behaviour in open control circuit,
3. Calculation and optimization of sensor parameters in closed sensor control circuit,
4. Evaluation and optimization of sensor parameters while moving along a sine wave path.

Unit 1: Calibration of the distance sensor

This unit is a prerequisite of the following measuring units. The calibration values are needed in other experiments to calculate robot ways and distances. While performing the unit, you get a great number of measuring data which are to analyse with programs like Excel, MATLAB, LabVIEW... Therefore this unit also is used as an introductory example of general measurement engineering and statistics. Methods like the exclusion of outliers, recognizing and evaluating systematic mistakes and the treatment of stochastic mistakes must be applied.

Specification of the experiment

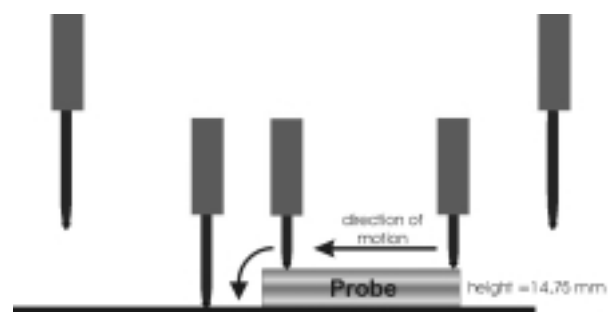
The robot moves with the distance sensor over a step of a fixed height (14,75 mm) and records the sensor way. With these data the relation between the way (x mm) and the voltage (y Volt) can be calculated.

Execution

After passing a survey the student will recheck his knowledge in the special field of the actual experiment. In this case the student must have the following requirements: Basics of robotic, security in handling a robot, terms of use for the robot laboratory and proficiency in statistical calculations, e. g. with Microsoft Excel. According to that the used tools, components and robot programs are described in detail.

Half an hour to sixty minutes later the student reaches the first hurdle: he has to pass a test, which will be evaluated automatically.

If all questions are answered correctly, the student get a password to start the practical part.

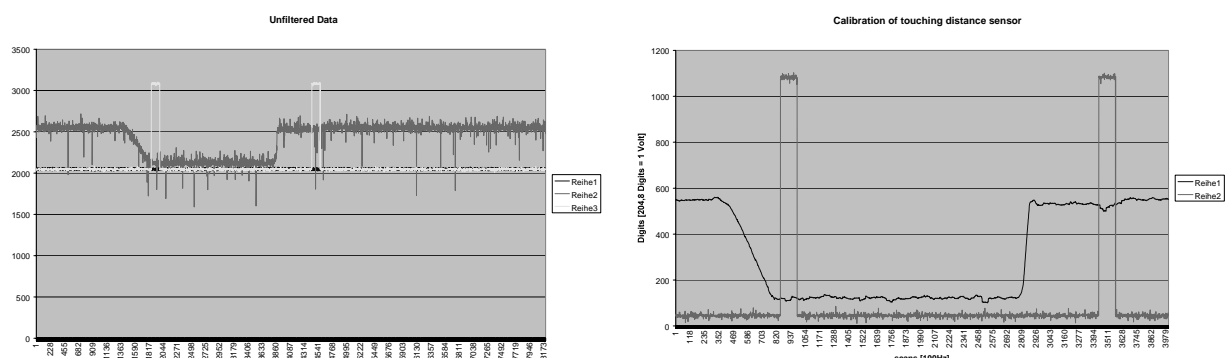




On the left side the student can see the images of three LiveCams. The first and second can be moved and zoomed by the student over the oval panels. The third shows a fixed overview. The middle region contains the parameter settings and a virtualised control panel, which establish the bi-directional connection with the robot. The virtualised control panel corresponds in all details to the real robot control panel. Messages and descriptions can be found on the right sides.

After setting the first parameters, the real robot in Aalen can be started via control panel. The robot takes the stylus, moves to the one end of the probe, hits the ground, moves along the whole probe, falls down to the table and a short time after moves back to start position. During the complete movement measuring-data were recorded and can now be downloaded by the student.

The analysis of the data requires several steps. First the student has to save the data as Text-file before he can import the data into a statistic program, e. g. Microsoft Excel. Second, the relevant data must be filtered and the great oscillations must be eliminated. Based on the graphic of the remaining data the student can detect the relation between the measured voltage and the covered distance.



Now Unit 1 is finished and the following unit can start.

Unit 2: Determination of robot behaviour in open control circuit

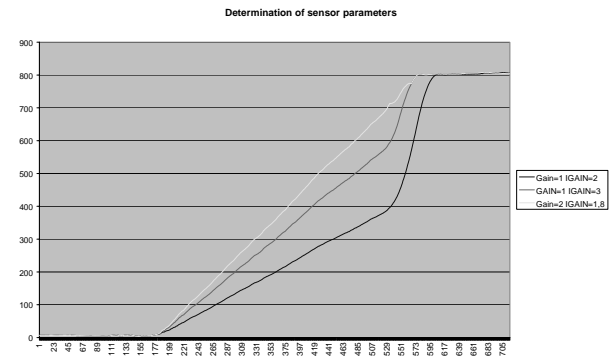
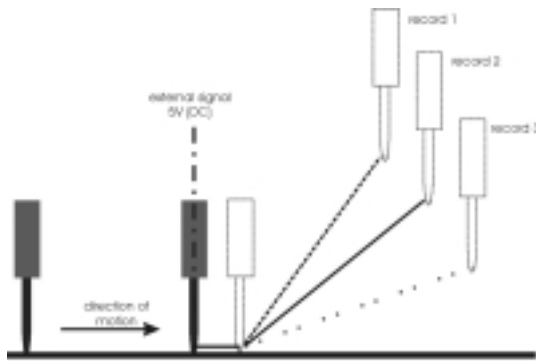
In this unit dynamic robot behaviour in an open control circuit is determined. This is necessary to calculate the velocity of the robot's reaction to a defined input-signal.

Specification of the experiment

The robot moves with its distance sensor across the table. After a defined time an external signal (5 V DC) is given to its analogous input device. With the programmed parameters the robot reacts to this signal.

Execution

The student's main task is the same as in the first unit, but in this case he has to calculate the reaction velocity of the robot. Therefore he takes the stored measuring data, carries out some filtering-operations and can determine the velocity either graphically or arithmetically. At the end of this unit the student is able to determine the sensor parameters for the closed sensor control circuit.



Unit 3: Calculation and optimisation of sensor parameters in closed sensor control circuit

Similar to unit 2 the robot behaviour in the closed control circuit is being calculated. With these new data the robot's answer to a changing input signal can be shown and, as a result, the robot's movement while driving over a step can be optimised.

Specification of the experiment

The robot moves with its distance sensor across the probe. When the distance sensor falls down to the table, the robot gets the changed input signal and has to react to it with the predefined parameters.

Execution

By changing the parameters the student can explore the robot's dynamic behaviour. The task is to find an optimum record of parameters: The robot should follow the step as fast as possible without any or with a low overshoot. Hereby the student gets the feeling and the experience for sensor guidance in case of fast-changing input signals.

Unit 4: Evaluation and optimisation of sensor parameters while moving along a sine wave path

In this concluding unit the robot has to follow a sine wave path. The robot's reaction to this slowly changing input signal is a little bit different than in Unit 3.

Specification of the experiment

There is programme of a straight line above a metal work piece where a sine is milled in. By this the input signal oscillates while moving the sine curve up and down. Like in the other units the measuring data are recorded.

Execution

The student has to optimise the already calculated parameters (unit 1 to unit 3). The aim is to get the maximum speed for a defined delay or the minimum delay for a defined speed. This is important when processing real work pieces with changing widths to get optimum results in grinding or cutting.

Résumé

At the end of the learning module the student has to compose a final report. The report must include:

- The description of everything he has done,
- the insights he has gained and,
- the conclusions he has drawn.

Conclusion

As has been demonstrated by the learning module virtual laboratories have several advantages. These are not only full independence concerning the time and individual speed of learning. You can also use the technical equipment of the Virtual Lab from any place in the world. You might say, you've got a "takeaway" robot laboratory.

In addition to the training of students in engineering, the virtual laboratory is also an instrument for further education or specialized training. You can, for example, imagine that technical staff can use the robot of Aalen to refresh their proficiency while remaining at their companies.

So this new instrument of learning will quickly get established in several subjects.

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A VIRTUAL CITY TO ACQUIRE THE ITALIAN LANGUAGE

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Ponte Italiano

In this paper, I will attempt to analyse and comment on an ongoing project for teaching Italian on a basic level through Internet. The work on this project started in January 2001, whereas the teaching started up in January 2002 and is due to end in November 2002. The project is called Ponte Italiano (www.italiano.no) and has been realized thanks to funding from SOFF and the Faculty of Arts at the Norwegian University of Science and Technology (NTNU) in Trondheim, Norway.



In 1999 the Department of Roman languages at NTNU offered the campus students a new course in basic level Italian language. The experiences from this course gave inspiration and birth to the *Ponte Italiano* project.

Norway is a long and narrow country (ca. 385.155 km) with many small, isolated cities and only four universities (Oslo, Bergen, Trondheim and Tromsø) located far from each other. In a country like this all types of communication can be difficult and expensive, and the use of Internet as a media for communication is steadily turning more important. In Norway, already 71% of the population have a computer at home and 52% have access to the Internet, thus giving a rise in the number of people who want to attend on-line university courses. The University of Bergen has with success introduced educational courses for the German, French and Spanish languages on the Internet. But all these courses were designed for an upper middle level and focuses on students who already speak the language and want to extend their knowledge and specialize. In our course the teaching of Italian does however not demand any previous knowledge in the language, and so a new question has appeared. Is it possible to learn a new language entirely through the Internet?

enCore MOO

The technological platform selected for this project is an *enCore MOO* system. MOO is an acronym for Multi-User Domain Object-Oriented, where one can construct any type of virtual world. With a built in server-side client called Xpress the enCore MOO can be used with any forth generation Web browser, and offers synchronous and asynchronous forms and forums of learning and interaction where the surroundings are described with both graphical and textual elements. Actually can any WWW based element also be stored and used in the MOO system. The users in the MOO world move and interact within the surroundings using the unique command language (where the most used commands have been translated to Italian) or just by clicking around with the mouse like on any other web page. The writing process is however most relevant in the system, for communication and interaction with the other users, for instance through a chat window. Without dwelling too much on the technical details of the enCore MOO system, we can with the aid of command language add any type of virtual object to the MOO world. We have in our project constructed the MOO world to be a virtual edition of Venice with old palaces, canals, gondolas and a famous university building. In these surroundings it is possible to work both alone and in groups. As a user in the MOO community one can send and receive electronic letters, participate in scheduled lectures, collaborate and write simultaneously on documents, read recorded lectures, construct personal rooms, solve interactive exercises, listen to the radio and much, much more.



Two fundamental questions

After deciding on the platform we still stand with two questions:

1. How to bring the students to learn a completely new language entirely through Internet – which tools and didactic method will be needed?
2. How to bring the students to use the tools that are made available for them in the MOO and on Internet in general?

Looking for answers to these questions have been among our primary goals with this project and are also the theme for this paper. The paper will report our findings from the planning and programming phase, as well as from the teaching phase this spring semester 2002.

The planning and programming phase started in January 2001, and in January 2002 the course started up with 17 students from all over Norway. What I particularly want to analyse in this paper are the difficulties which one stumbled upon during the first part of the teaching phase. I will try to give some answers to the above-mentioned questions, but also comment on some of the first failures.

The planning and programming phase

Questions on design and interface are of course strongly linked to the planned didactic method and the tools we wanted to make available. There is further computer security and the users supposed prior knowledge in the use of the computers and Web browsers not to be taken lightly when constructing both the home page and the teaching environment (MOO world). The Ponte Italiano *home page* is designed to be used like any other a page or program, which most of the students will have encountered using a computer. The home page is meant to function as a project showcase and as an introduction for the users to the MOO World and the MOO command language.

The paper will also present the considerations for selecting the particular interface structure in the MOO system and the translation of commands. On the *home page* one will immediately find a navigational map of the virtual city where the *Canal Grande* and the bridge *Ponte di Rialto* is seen. The *Ponte Italiano* name (ponte = bridge) was chosen because it represents the learning process very well – crossing a bridge to gain new knowledge.



Audio and group work

The decision to incorporate the use of synchronous audio has shown itself to be vital in teaching Italian on a basic level. Much time and effort has been invested in finding an audio program that could be integrated with the MOO system, finally deciding on an Open Source program called OpenMcu / OpenPhone. Some of technical difficulties are still to be solved, and the teaching is now supplemented with telephone conferences during some of the exercises. It has also been a goal to make the students work in groups (this knowing that one of the greatest problems in teaching through Internet is the isolation of students). Also for that reason have we planned on obligatory assignments to be solved in groups of 4 or 5 students, where it is required to find information elsewhere on the Internet.

The teaching phase

The second part of the paper will discuss our experiences in teaching on the Internet. During a lecture the teacher is active in many ways: in preparing the tools and materials, participating and directing the learning process. The teacher observes what the students do, evaluates their activities during activities, and influences with his presence all the processes of learning (Haraway, 1992). What happens with the teachers role in a virtual class, where one does not have the possibility to face the students, to read the body language, to see if the students have understood the explanations, if they are becoming bored or if they want to continue with the same exercise? To hear the each other's voices helps a lot to note if the students are following a lecture. We have this far not been able to use the audio program during the entire length of a lecture due to technical difficulties, but it is an absolute goal. Here follows a list of some problems which I as the teacher have encountered this semester:

1. In order to make the most of the MOO environment it is necessary to learn some basic commands for communication, browsing and constructing objects. Most of the students though, unlike our first presumption, did not read the guide to the most common commands. They just leaped into the virtual Venice and learned a few commands by try and failure, thus making a great confusion during the first lectures. The teacher plays an important role here, and must help the students to discover the use of the different commands, but how is this to be solved? The only possible solution is to activate the students and force them into using different commands. Naturally, this new situation caused a change in the preparation of the lectures and everything went slower. An exercise where the students were asked to describe their own virtual apartments revealed itself to be much more important than at first thought. Another important aspect is to actuate the students who already know the system very well. In fact, some students have been very helpful and often know how to help and answer other students that cry for help faster than the teacher. Some of the students also manage to exploit the possibilities to find information elsewhere in the WWW very well, and could for instance when the teacher spoke about the famous Italian actress Valeria Golino demonstrate web pages with additional information about the actress.
2. When communicating on the MOO it is important to follow certain etiquette. It is to be emphasized that when 18 people are writing synchronously in a common chat window, this can lead to many repetitions of the same information, and will delay the lectures. Although one can scroll back to previously written statements, one will from time to time loose the thread and ask for something to be repeated. Concrete examples are easy to find as every lecture is logged and stored in the MOO. Some students also type faster than others, so there is a constant danger that some are left inactive for longer times than others. Here, the MOO system offers the teacher a helping hand; just by a mouse click the system can list how long all the students have been inactive. Some students again like to be in the centre of the communication and will for that reason also answer when it is somebody else's turn. The anonymity can lead such students to be more uncontrollable than during a normal on campus lecture. Not to alienate the students; the teacher must always try to maintain control without being too aggressive or too rigid. Over time though, the students themselves will turn more active and often ironically point a finger when someone is breaking the rules of etiquette.
3. The educational progression on the Internet must constantly be kept in focus. Teaching through Internet forces the teacher to be very flexible, always prepared to use the proposals from the students, to change the turn to speak and to ensure that the lecture is not becoming a teachers monologue. In addition to all this, the teacher must all the time keep an eye on each student activities on the MOO (during and off lectures) in order to monitor each student's progression.
4. The group exercises emerged to have a greater didactic potential than first thought, and revealed to be very important in creating friendship between the students. After working in groups the students learned to use more commands than before, and they spoke and joked much more – in Italian. There are also many other advantages with group exercises on the Internet compared to real life meetings, such as the easiness to arrange group sessions. Virtual space is in surplus and it does not demand the students to move from their workplace. A conventional on campus student will normally have other lectures to attend, before or after, and will therefore have more problems joining a group exercise.

As one can read in this brief draft there are many interesting subjects to discuss and to deal with other teachers and researchers with an interest in teaching through Internet. Still, the course is not finishing before December 2002 so more questions will surely arise.

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A SURVEY OF POSSIBILITIES FOR COORDINATING UNIVERSITY FUNCTIONS FOR SUPPORTING AND DEVELOPING ODL

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Summary

An information and communication society increases the demands for lifelong learning as well as the number of university students. However, funding has lagged behind, which has put an even higher pressure to offer education at a lower cost without a decrease in quality. The purpose of this study has been to make an overview of the support the different university departments have requested for the optimal development and implementation of distance courses. Interviews were made with teaching and administrative staff from all the eight departments and the central administration unit. The result presents the departments' joint support requirements in five areas: i) information and marketing; ii) experience exchange; iii) IT-infrastructure; iv) IT-platform and v) problem solution. The interpretation of the result should be that the focus of distance teaching for the individual teacher has shifted from structure and technology to content and pedagogics.

Introduction

Along with the growth of modern information and communication society (ICT) there has developed an increasing interest in information, knowledge and learning issues. Traditional teaching methods are being more and more challenged by new ones. A shift of focus has taken place from broadcast learning to interactive learning (Tapscott, 1999). One characteristic of interactive learning is lifelong learning via hypermedia, including Open and Distance Learning (ODL).

However, ODL involves higher demands on collaboration between different parties in an educational organization, for instance between teachers, students, subjects, departments and nations (Crook, 1996). Flexible learning, independent of time and space, also entails the globalization of learning, which in turn paves the way for increased international collaboration (Karran & Phjonon, 2000). Since the early 1990s the percentage of students in higher education in Sweden has almost doubled. In December 2001, the Swedish parliament decided to allot resources for developing ODL courses in Swedish universities. *The basis for the decision includes the following arguments for investing in ODL:*

- lifelong learning – a high rate of social and industrial change makes increased demands on learning and re-learning,
- pluralism – an increasing number of students whose social or cultural background is under-represented at the university today counteracts socio-economic divergence,
- regional and industrial policy – access to higher education irrespective of place of residence,
- internationalization – courses in English should be developed to give international students access to Swedish universities.

Personnel and economic resources have not been allotted proportionally to the vastly increasing number of students, which leads to the question how a university's different support functions can be identified and coordinated to the best benefit of quality and cost effectiveness.

In this paper we will go through and point out those university functions which can be coordinated to support and stimulate the development of ODL. One of the purposes of the overview is to identify common support functions for countries which are interested in ODL development.

Short presentation of study context

Växjö University is located in the south of Sweden. The population of Växjö municipality is about 76,000. The social and industrial environment includes public service, administration, trade and a number of small and medium-sized companies. In the year 2001 Växjö had 12,000 students, 8% of whom were ODL students. The number of employees in 2001 amounted to 680, 440 of whom were teachers. The university organization contains two research areas, the Faculty of Humanities and Social Sciences and the Faculty of Mathematics, Natural Sciences and Technology. These faculties are divided into the following eight interdisciplinary departments or schools: the School of Management and Economics; the School of Biosciences and Process Technology; the School of Education; the School of Humanities; the School of Mathematics and Systems Engineering; the School of Industrial Engineering; the School of Social Sciences and the School of Health Sciences and Social Work.

Aim of the survey

The overarching aim of the survey has been to map the demands for support made by the different departments in order to develop and carry out distance courses in the best possible way. A further aim was to identify the demands for support that were common to the departments so as to develop the optimal basis for university ODL as regards quality as well as cost effectiveness.

Method

During one month all the eight departments and the Central Administrative Unit (including admissions office, study counselling, IT sector, information, library and students' union staff) were visited by two or three representatives of the University Pedagogical Center (UPC). Interviews were conducted with the Deans or Heads of Departments (7 people), teachers and other staff (27 people) involved in ODL. The interviews were carried out in the departments in question and normally lasted for two hours. There are a number of different ways to describe interviews (See e.g. Altrichter et al., 1993; Anderson et al., 1994), but they usually emanate from everyday situations. Their purpose is to gather individual perspectives, interpretations, questions etc. The differences in describing and understanding what the *interview* concept represents methodologically force researchers to try to explain what they mean by the concept and how their study has been conducted. To minimize the risk of gathering misleading and biased information high-status informants (department heads) as well as low-status ones (teachers experienced in distance teaching) were interviewed (Miles & Huberman, 1994). The presence during the interviews of several UPC representatives was a further attempt to increase the quality of the collected data.

An Ethnographic interview and analysis

Our choice of interview could be best described as the ethnographic interview based on open-ended questions. The purpose was to provide a cultural interpretation of every department and its need for joint support in creating conditions for ODL. We used what Spradley (1980) calls descriptive or grand tour questions. This type of questions gives the interviewees freedom to give an account of what they do and how they look upon different everyday problems. During the interviews the interviewers made notes in writing. These notes were then individually compiled by each of the interviewers. After that the three UPC interviewers' notes were compared and included in a joint document whose results are presented below. The open interview questions were:

- What are your plans for developing distance teaching courses in your department?
- What central support from the university do you require to implement the distance courses?

Ad hoc methods for interview analysis

In an attempt to create meaning in qualitative texts Miles and Huberman (1993, p. 245 ff) discuss and exemplify a number of ad-hoc models. Ad-hoc analyses are probably the most common type of interview analyses. Within this tradition no standard method is used, but instead different techniques alternate freely. Thus, parallel quantitative and qualitative interpretations may be made. To avoid an arbitrary analysis of the interviews we endeavoured to consider the following methods (for a more detailed

description of the method of analysis, see Miles & Huberman, 1994): *themes* (a), *plausibility* (b), *compilation* (c), *creating metaphors* (d), *counting* (e), *making comparisons* (f), *distinguishing variables* (g), *subordinating single phenomena to the general pattern* (h), *determining relations between variables* (i), *finding intermediate variables* (j), *establishing a logical chain of evidence* (k) and *creating a conceptual/theoretical context* (l).

In reality we did not use all the methods to the same extent but instead allowed the relevance of each method to the answers obtained to determine the extent to which they were applied. Several of the methods were well suited for our interview material, whereas others turned out to be less useful. However, during the analyses of the interviews we endeavoured to consciously consider the analysis and verification methods stated above.

Result

Based on our analysis five different support requirements were identified. To obtain control of a large amount of qualitative data, the first measure is usually to quantify it (aa). The following table lists the departments' joint support requirements:

Support requirements	For	Uncertain	Against	No opinion
Information and marketing	9			
Experience exchange	8			1
IT-infrastructure	8	1		
IT-platform	7	2		
Problem solution	6			3

The table includes the support requirements expressly stated as being important by at least six (6) of the university departments and/or the central administrative support unit.

Information and marketing

The views are unanimous as regards the merits of marketing the university ODL programs jointly for the purpose of recruiting students and also as regards information processing and distribution to ODL students. These are a few examples:

- contribute to making the current of program and course catalogue available via the web,
- develop general information and study material, supplemented by the departments with more course-specific information,
- illustrate the total university distance program with a matrix (See example below) to enable prospective students to get a simple overview of programs and requirements.

Course	Start	Study rate	Obligatory classes/ Video sessions	Class length	Technical equipment/ Internet	Other
Psychology 10p	Flexible	Flexible	1/0	Tel + email	Varies/yes	
Business Adm 20p	15 Sept	50%	8/0	6h Saturdays	Daily/yes	Test Sat
Media Techn. 10p	20 Sept	25%	0/2	3h evening	Weekly/yes	Test eve.
Forest Econ. 10p	20 Oct	25%	2/4	4h Fri/3h	Weekly/yes	

Experience exchange

A recurrent theme in the interviews is the importance of learning from others with ODL experience. It happens quite often that ODL is used by a few teachers only in the different departments, which makes it necessary to compare experiences, discuss ideas and learn new things. All the departments requested experience exchange. However, there were different views on how this should be done:

- arranging seminars around different themes (e.g. student counselling, distance pedagogy – practical implementation, work methods and examination forms),
- making every department responsible for reporting its experiences of ODL,
- forming virtual conference groups (locally, nationally and internationally).

IT-infrastructure

All the departments emphasized the vital importance of IT-infrastructure for conducting courses in ODL with a good quality and good results. These statements are to be seen as requirements for pedagogical work:

- high level of the operation security concerning the infrastructure,
- the server must be able to manage the future development of courses involving picture- and sound-transmitted lectures.

IT-platform

Today university lecturers use about ten (10) platforms to be able to teach with the aid of information and communication technology (ICT). Within several departments there arose a discussion whether a joint platform should be offered or whether every department and every individual lecturer should use the software/platform considered best by the lecturer. An overwhelming majority of the departments are positive to a joint solution but also want to retain the freedom to choose alternative solutions. For the choice of a joint solution the following requirements have been made:

1. Technical support
2. Pedagogical support.

To the question what a good IT-platform should contain, the following answers were given:

- stable/reliable/robust,
- simple and clear interface,
- flexible, i.e. adaptable and possible to develop in an active learning process,
- chat function – enabling interaction between teacher-student and student-student,
- capacity for sound and picture transmission and also transmission of lecture script,
- good evaluation capacity.

Problem solution

To facilitate the practical and cost-effective implementation of ODL courses the departments also require:

- a project organization with the directive to integrate the implementation of ODL in the regular work,
- a guideline – a check list for university employees working with ODL (from information/marketing to application – admission – implementation – course certificate/degree).

Discussion and proposal for action

Every department has a high degree of independence, leading to different cultures and attitudes to the need for support and freedom vis-à-vis central functions. For the department there may occasionally arise a clash of interests between its degree of freedom and the influence of central functions. It is, however, apparent from our study that several departments are in agreement when it comes to developing joint ODL support.

ODL seems to be entering a new phase. From having been the concern of a few enthusiastic teachers we are today on our way into a post-ODL phase. This is a phase characterized by a growing volume of students, an increase of international contacts and new ways of looking at knowledge through the growth of ICT. We have found that the five aspects of the result (information and marketing, experience

exchange, IT-infrastructure, IT-platform and problem solution) are required to facilitate the teachers' work situation and at the same time make room for the teachers to concentrate on their main task – to create a good learning environment and pedagogical conditions for qualitative and cost effective ODL.

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VIRTUAL CAMPUSES IN CONVENTIONAL UNIVERSITIES: DIFFICULTIES TO BE OVERCOME

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Introduction

A common trend of the current universities is to run programmes and actions leading to change the mind of faculty and train them in order to do them capable to adapt the university to the new demands of the so-called Information and Knowledge Society.

By taking this way, most of them are using the traditionally deserved “open and distance learning” strategies to update and improve their own teaching practices. The strategic view underlying the use of ODL practices in conventional face-to-face universities is going further than a simple modernisation of teaching.

The existence and the use of virtual spaces that could be shared by different higher education institutions is highlighting how virtualisation is facilitating the building of strategic alliances and partnerships. Keeping this in mind, the assumption of a virtual platform to support online courses must be seen as a first milestone in a much more extensive development.

The Universidade da Coruña (UDC) has started to develop an ambitious plan to do that. On a hand, a online courses through a virtual campus are being implemented in several knowledge areas. On the other hand, with the institutional support, the CUFIE, which is the University Centre for Educational Innovation and Faculty Development, is designing and implementing the ITEM Project. A number of professors have been trained in order to be able to develop new educational resources using ICT as a complement of their conventional classrooms and some funding has been facilitated to do that.

Research focus

The present paper analyses two main aspects: first of all, which could be the handicaps to implement a virtual campus in such university as UDC. Secondly, which could be the main implications to develop co-operation projects with other universities through this kind of virtual activities.

To do that, the authors interviewed four professors – that belong to UDC – from four different knowledge areas, the fundamental ones in this university. The objective of the interview was to know the perception and the interests of our faculty about the creation of the UDC virtual campus and its future implications,

Research methodology

The qualitative interview was the procedure we used to explore these interests and perceptions on the possibilities to implement virtual learning environments and the involved difficulties, because it is considered the best tool for developing a qualitative research.

When finished, the interviews were transcript and categorised following the pattern suggested by Guba and Lincoln (1982).

Although the interview developed a more extended number of questions, as a framework for this paper we specially focused on those related to the associated problems and handicaps to build a virtual campus and their links with effective co-operation in such a environment.

After the categorisation, different analysis were done: an individual intracategories one, an individual intercategories one and a comparative intercategories analysis.

Research results

Both advantages and difficulties were highlighted by the interviewed faculty (we will call them INF1, INF2, INF3 and INF4).

An **easier transmission of information** was one of the most recognised advantages, as it was said: *"... information is going to come better than it comes through other methods, better than you can do it just speaking ..."* (INF1). Also the **increasing communication opportunities** are well valued: *"... without it, it would be impossible to believe that you could connect this morning with a institution in Canada and other in Iceland from here, Coruña ... and sending some attached files through your e-mail containing information about data equipment, problems you need to solve, etc. ..."* (INF1). Some faculty were surprised after some experience: *"...it was amazing ... this not expected story about the "multicommunication" between some students ... a simultaneous dialogue space was created ..."* (INF4).

Another positive aspect is the need to **renew the underlying principles of traditional teaching**, given the fact that a new approach is needed when using virtual environments: *"... if you are introducing in your web site information on a particular subject, both textual and graphical, and you think that's all enough, that's very dangerous ..."* (INF1). Also positive results on the educational process are remarked. In general, interviewed faculty suggest the creation of a virtual campus should be a **significant advance in teaching quality improvement**: *"... it is clear that it accelerates the educational process, not just for the increasing amount of information, but because you can give a better approach, a more appropriate approach to the student needs ..."* (INF4).

On the other hand, far away from some specific commented topics as the need for an **appropriate training**: *"... our training capabilities in this field are poor and I don't think nobody is guilty for this, it is a social problem ..."* (INF1), it is important to remark some ideas on the big amount of doubts that faculty is dealing to manage: *"... (the professor) is not just feeling threatened, even if he or she is thinking the change could be positive ... He or she could not feel to be able to do that, feeling him or herself insecure ... it is an unexplored field ... emmm ... So, I think this ... this barrier is very difficult to overcome ... perhaps it is important to emphasise ... to convince people, to explain through examples how could be applied in each case ... I think this is more complicated ..."* (INF2). A special sensible behaviour is recommended when offering certain kinds of training: *"... sometimes, when you want to teach something to someone, this gets blocked ..."* (INF4).

The most highlighting handicap some interviewed people remark is the **risk of loose of humanisation** of this kind of education: *"... it could be something difficult, too cold for faculty and students ... it probably requires a minimum learning ... it is a tool that should be well used, but we must not forget that interpersonal contact is essential ..."* (INF1). On the same direction, INF4 says: *"... because in a social organisation you do need contact with people ..."*.

Also **accessibility** problems were commented: *"... I don't think the first aspect to consider would be to build a virtual campus ... First of all we must get people could easily access to this technologies. Maybe by using slides to communicate better ..."* (INF1). On the same way, another interviewed says: *"... Yes, but this implies that all the people must really have a guaranteed access ..."* (INF2).

Specialisation in technical aspects is another of the remarked points in the interviews. They point out the need of having **support teams to help faculty** in technical aspects in order to optimise their teaching time: *"... the need of taking into account a group of good professionals that could do their job and allow you to do yours ... everything needs a time to prepare, to plan ... even a virtual classroom, doesn't it ...?"* (INF1). *"... we cannot demand these kind of knowledge ... it should have a specific department of ... audiovisual media for teaching applications ..."* (INF2). In more depth, differentiation between methodology and content is also analysed: *"... we need to make compatible the work between the media specialist and the content specialist, because the media specialist could tell you "I can do all that, but which content can I offer? ... It is important to give some support ..."* (INF3).

Finally, **institutional support** appears as one of the key issues for making possible any kind of project, and specially this: *"... it is necessary to have an institutional support to develop any project ..."* (INF1). *"... I think the university must facilitate the needed resources in order not to have any lack of balance ..."*

(INF2). Inertia must be won by a strong will, not only individual but institutional, in order to overcome the logical reluctance to change: "... *systems have a tremendous resistance and inertia that could prevent any innovation ...* " (INF4).

Conclusions

After analysing which are the problems we should overcome in order to guarantee a profitable development of a virtual campus in a conventional university, we are going to use them to think on their implications on the development of co-operation projects through these environments.

It is obvious that the use of virtual learning environments can contribute to a major number of opportunities to collaborate between institutions. Some of these experiences have been related in some other articles (Sangrà, 2002, in press), and which their benefits could be have been analysed.

As a brief summary of this presentation, we would like to highlight which are the major issues we should take into account in order to promote effective co-operative projects by using virtual campuses, specially from the faculty perspective, a basic approach to get the final success.

First of all, it is suggested to develop an institutional perspective in front an individual one. Thus, we should overcome professor to professor experiences going through more organised and institutional supported partnerships.

Secondly, it is important to take into account the kind of universities that are going to collaborate. They should be as homogeneous as they can, to ensure the platforms they are using are compatible and the using materials are standardised enough.

Inside each university, different faculty is advancing to different speed, and their level related to the knowledge and use of ICT is usually also heterogeneous. Good training programs, based on the understanding of the philosophy and on the effective use of ICT in education are strongly suggested. On the other hand, faculty must not be overloaded with technical work. Specific support teams should help them to guarantee efficacy and efficiency.

If communication is the great advantage of this kind of environments, to facilitate dialogue is the fundamental point to develop. Promote interaction to facilitate contact between people involved in the project could be the basis for its success.

Finally, we also must keep an eye on some conclusions and recommendations of previous research and experiences (Bang and Dondi, 2000; Sangrà and Cabrera, 1999), in order to ensure the participation of students and take the maximum profit to these co-operative projects.

Despite of virtual environments will probably not substitute conventional universities, in the very next future they will play an important role in inter-institutional co-operation.

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3 STEPS TO PREPARE UNIVERSITÄT STUTTGART FOR THE VIRTUAL COMMUNITY

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1. Introduction

Information and Communication Technologies (ICT) have found their way inside the ivory towers of the classical European universities and their potentials will contribute to building up the university of the 21st century. The new technologies contain strategic relevance for restructuring the universities [1] and for helping them to play their part as one of the important resources for the economic development of Europe. Not only the European Union is promoting the ICT-use, e.g. by funding projects that explore and implement tools for web-based teaching and learning or by supporting the creation of academic networks for exchange of courses and joint development of programmes [2]. But also the national governments are interested in ICT-approaches and are funding various projects. There exist already numerous conceptions and networks for virtual universities, as the "Campus Virtuel Suisse" [3] or on the regional level for instance in Germany the "Virtueller Campus Rheinland-Pfalz" [4].

At this stage the great enthusiasm should be mentioned with which the universities themselves have begun to take up the ICT-potentials [5]. There is a large amount of activities to be found in the use of ICT in teaching and learning on- and off-campus, most of which starting from the institutes, the smallest university units. Usually the university activities are not well recognised in the public, in addition there is a lack of awareness of particular developments and achieved results, and a kind of general or institutional strategy can hardly be detected. So the headship of the Universität Stuttgart has developed a broad strategy on

- how to improve teaching and learning by means of multimedia technologies,
- how to bring the knowledge gathered and worked on in the university to the public,
- how to gain direct economic impact from the university's teaching and learning products,
- how to coordinate ICT-projects and their results within the university.

A general three step concept has been worked out to realise the strategy. It will be presented in part two of this contribution. The first step, the so-called programme "100-online" is introduced in part three. The linking to the second step of the programme including considerations about the standardisation of the results received in step one is described in part four. The contribution is concluded with a few summarising remarks.

2. The Three Step Concept of the Universität Stuttgart

The concept can be outlined by the following scheme (figure 1):

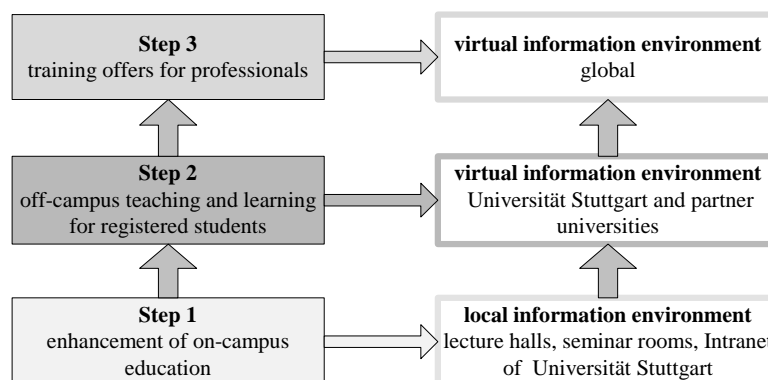


Figure 1: the tree step concept

Step 2 and 3 are depending on the preceding ones. Step 1, the programme 100-online, contains the basic ideas to initialise and motivate the complete concept. Each step is connected to a different stage of information environment, beginning inside the Universität Stuttgart and moving towards the wide spread use of the Internet.

The fundamental aim of the concept is to prepare the Universität Stuttgart to participate in the ICT-community and the international e-learning competition. It was obvious from the beginning, that the university, which consists of 14 faculties and is attended by about 17000 students, has to start its concept on the very bottom, although there are already a few institutes developing and applying sophisticated multimedia solutions and web-based technologies for teaching and learning.

The concept intends to reach the great majority of the academic individuals in order to make them enthusiastic about the idea of improving the on-campus teaching via multimedia elements and browser-based material such as animation, video films and simulations in the first step. One of the main purposes is to enable the teachers to generate these materials in a straightforward way and an acceptable period of time and to handle web technologies autonomously. So support is offered in the starting phase to provide the opportunity to achieve the technical and didactical competence, which is necessary for the teaching staff to create and include multimedia elements into their lectures and courses. In addition a definite management structure is imposed in the first step, to operate the acquirement of competence. The first step, the programme 100-online, will be described in detail in the next section.

The second step, which will start in early summer 2002, enables the registered students to prepare and repeat the on-campus lectures independent from learning place and learning time. This stage of the concept will lead to off-campus learning, taking into account the ICT-materials from the programme 100-online. The on-campus lectures and courses have to become suitable for self-directed learning. Asynchronous assistance will be given and teacher controlled exercises will help to consolidate the lectures contents. With respect to the third step well structured data bases have to be created and standardisation agreements have to be achieved in order to make the teaching and learning material reusable and exchangeable.

In the third step, starting in near future, hybrid online study courses and special online training courses for professionals will be designed and offered for payment to the public. The external marketing will be delegated to a service provider. The topics will not only be chosen from the modularised teaching and learning material turning up from step one and two, but also from specific research results. The courses will be conceived in a virtual environment as learner-managed, but with the possibility of scientific assistance. The courses will offer different levels of information and a certificate after successful participation. The concept on the whole is planned to be realised in a period of three years and will include not only the results obtained within the programmes mentioned above, but also the relevant output from other ICT-projects, carried through at the Universität Stuttgart [6].

3. The Programme 100-online

The programme 100-online, which was started in April 2001 and will be closed in July 2002, had the intention to encourage the teaching staff to improve at least one hundred lectures, courses and exercises by means of browser-based multimedia material. In detail the programme claimed the following objectives:

- Enrichment of lectures, courses and exercises by creating and applying multimedia elements such as animation, video, audio and simulations in on-campus teaching,
- Design of reusable online teaching and learning material in order to initialise the next steps requirements for online learning and extension studies for students, graduates and professionals,
- Interactive communication between students and teachers,
- Technical and didactical competence for the teaching staff in view of applying web technologies.

Before opening the programme, the financial support was provided, a supervisory board was set up and the collaboration with a pedagogical university was initiated in order to participate in specialists web-didactical know-how.

The interest in the programme was overwhelming. Instead of the expected one hundred applications 248 were received, coming from all faculties and from more than 50% of the university teachers. 230 applications have been allowed (see figure 2).

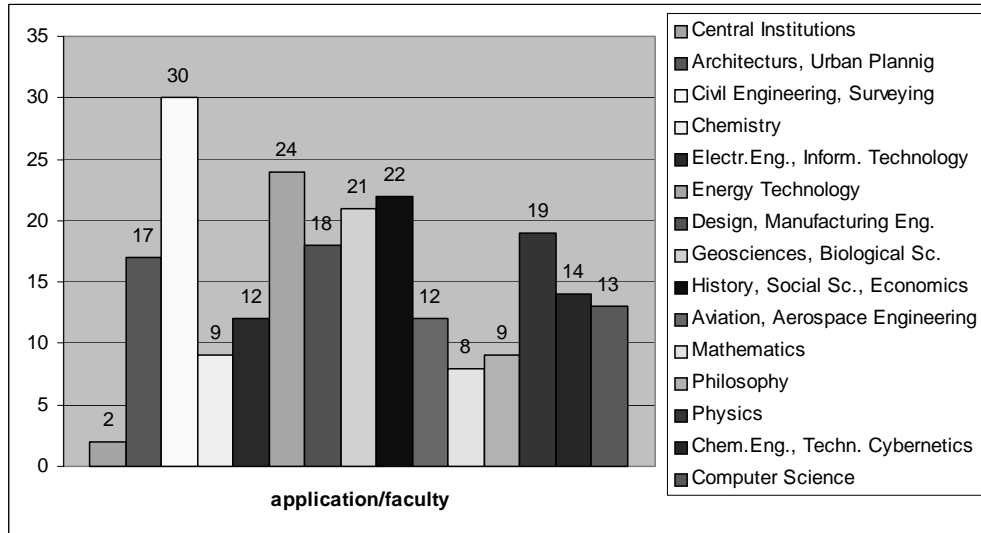


Figure 2: participation in the programme 100-online

The topics of the submitted applications were wide spread. We obtained proposals for i.e.

- development of online teaching and learning materials,
- transfer of knowledge via Internet,
- generation of web sites,
- online communication,
- student online support for preparation and verification of lectures,
- online learning efficiency check up,
- online exercises,
- simulation and visualisation of processes.

This shows clearly that the teachers had already tended to apply multimedia technologies to enrich their lectures, but they obviously needed a starting sign in terms of financial support and technical assistance.

Besides the financial support given by the university the coordination of the programme including additional kinds of support is carried through by the computing centre of the university. The offered support covers a wide range of areas and can be divided into technical infrastructure and technical/didactical assistance [7].

To work successfully in the ICT-field, the technical infrastructure of the university had to be enhanced by supplying the lecture halls with video projectors and audio/video facilities, and by installing especially equipped rooms adapted for video conferences and online teaching. The institutes needed portable beamers and notebooks, and additionally some special equipment such as digital cameras or movie cutting machines had been purchased and can be hired from the computing centre or used on site along with technical assistance. A working group has different authoring tools and learning platforms under consideration at the moment with the aim to provide a range of tools from straightforward to sophisticated in use, to cover the teachers' requirements.

The crucial factor for the success of the programme is to support the teaching staff with technical and didactical training courses. So a set of introductory courses on the preparation of basic materials for online teaching and generation of html-based multimedia applications was arranged. Further on didactical courses, dealing with the special didactical requirements in the ICT-context are offered. For technical and didactical questions a helpdesk is institutionalised by a team of institute and computing centre collaborators, and subject-orientated working groups organise workshops on special technical and didactical topics or copyright and author's right questions.

The organising committee of the programme has further tasks to work on. The information exchange between the programme coordinators and the project partners has to be guaranteed via mailing lists and a communication server, which is installed on the university's Intranet. The results of the projects will be stored in a database-system, which is currently developed, and a newsletter is edited periodically, providing the opportunity to publish the results of the projects. The newsletter is accessible via the university homepage [8], so the results and progress of the programme are open to the university community and the public as well.

4. Transition to Step 2 of the General Concept

The great variety of multimedia material, which is produced in step 1 will mostly be transformed into reusable and interoperable material, yielding input to step 2, the off-campus learning. Therefore not only quality standards have to be defined, but also consensus is needed on data models and open interfaces and with regard to step 3 additionally on conceptional support structures and services.

We began the standardisation process by defining the three terms multimedia element, learning module, and learning entity.

- **Multimedia elements** (ME) are reusable transparencies (e.g. Powerpoint, FrameMaker, TeX), graphics, video and audio objects, animations and simulations, which on their part can consist of ME as well.
- **Learning modules** (LM) are thematically complete, reusable learning objects with clearly defined learning tasks. They may be subdivided into other LM. Technically a learning module consists of a set of multimedia elements and introductions and links between the subdivisions, which also are realised as ME.
- A **learning entity** (LE) deals with a clearly defined subject area and consists of a set of learning modules, which are embedded in a curricular conception. The learning entities can be combined to training courses.

The correlation of these definitions to the three step concept is shown in figure 3.

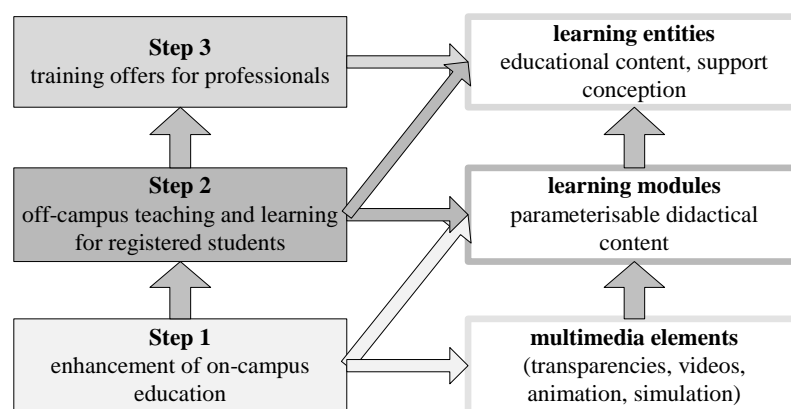


Figure 3: correlation between definitions and concept

In order to enable reuse, exchange and interoperation among the multimedia objects created in step 1 to step 3, that is to say among different formats and authoring tools, we have decided to store the learning

elements, modules and entities in a XML (extensible markup language) format. We are planning a two phase procedure, illustrated in figure 4:

1. Structural criteria have to be developed or chosen from existing ones, formalised as Document Type Definition (DTD) or XML-Schema [9].
2. Transformations have to be defined, which translate the XML-repository of multimedia elements, learning modules and learning entities to the output formats, according to the authors/users requirements. XSL (extensible stylesheet language) will probably be chosen as transformation language, because it is an appropriate tool to formulate complex transformations to HTML or PDF.

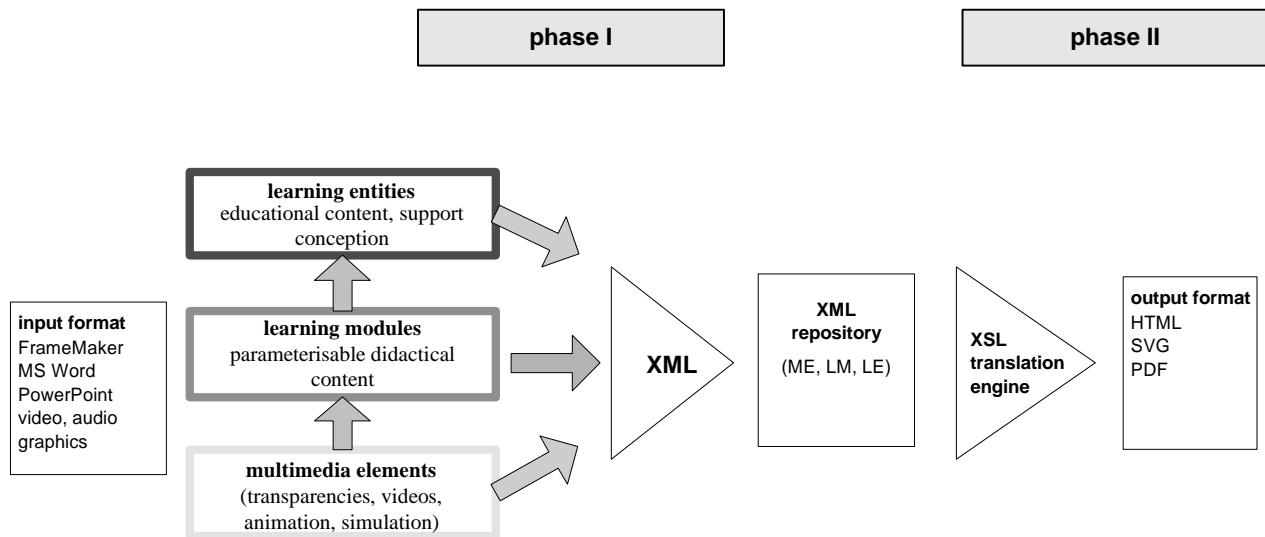


Figure 4: standardisation procedure

The metadata system we need to characterise the multimedia objects will also use a XML format. We have classified 5 groups of metadata [10]

- general metadata
- textual metadata
- didactical metadata
- technical metadata
- copyright metadata

and will take into account the results from the European project CANDLE (Collaborative and Network Distributed Learning Environment), which includes the IEEE-standard LOM(Learning Objects Metadata) [11].

The technical realisation of the suggested standardisation procedure and the metadata system will be performed within two projects supported by the Federal Ministry of Education and Research [12], [13], which are not directly connected to the university's three step concept but will in the context of the overall strategy yield output to achieve the envisaged aim.

5. Concluding Remarks

In summarising the experience gained up to now, it should be pointed out that the "bottom up" approach combined with the "top down" management of the conception can be regarded as the main reason for its success. On the one hand the commitment of teachers, tutors, technicians and administrative staff is absolutely necessary to avoid resistances during the implementation of the programmes. On the other

hand coordination of activities and preparation of concrete actions by a steering committee instead of the broad basis of participants is far more effective. In particular the special engagement of the university's headship has to be mentioned, which is mandatory for the success of each of the steps.

Concerning the unresolved problems there is, besides the technical realisations of the reusability of ICT-materials and the storage in a database system a need for evaluation criteria for off-campus teaching, i.e. quality of developed teaching and learner support material, participation in staff development activities etc. With regard to step 3, the hybrid online study courses and the special online training courses for professionals, a quality assurance model has to be designed in order to formulate the requirements and to control the quality of the offered courses.

Altogether the implementation of the ICT-concept is an exciting and encouraging experience in which a growing number of people and institutions take interest. So step 3 will in future probably be extended to the Campus Online Universität Stuttgart.

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CRITICAL SUCCESS FACTORS OF THE E-LEARNING PROGRAM AT THE UNIVERSITY OF INFORMATION TECHNOLOGY AND MANAGEMENT, RZESZOW, POLAND

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Introduction

The goal of the paper is to discuss an influence of the New Economy on the classical learning paradigm, especially in the context of academia environment. Some of the consequences of the influence are new pedagogical principles essential in development of electronic educational process. New Education is an inherent part of the New Economy. Widespread doctrines of the New Economy apply also to the phenomenon of electronic way of teaching. This paper explains the creation of pedagogical principles related to e-learning and their application at the University of Information Technology and Management in Rzeszow (UITM), Poland. Also drawing from business sectors and corporate training practise UITM has gained much experience in justifying e-learning investments and aligning the educational program to organisational goal. Many of these ideas have been collected and revealed in this paper as the overall directions for strategy for e-learning program development.

University of Information Technology and Management in Rzeszow, Poland

The University of Information Technology and Management in Rzeszow is a newly established private university in Eastern South Poland. For the last five years on the market the school has managed to place itself among several best private universities in Poland. Through various forms of academic, economic and cultural activities it has become a permanent partner in the education of the intellectual elite in both the region and the country. The current enrollment at the University is approximately 10,000 students and last year a first group of about 1000 master degree students graduated from UITM. The University Board has recently decided to launch e-learning platform in order to contribute to the learning process.

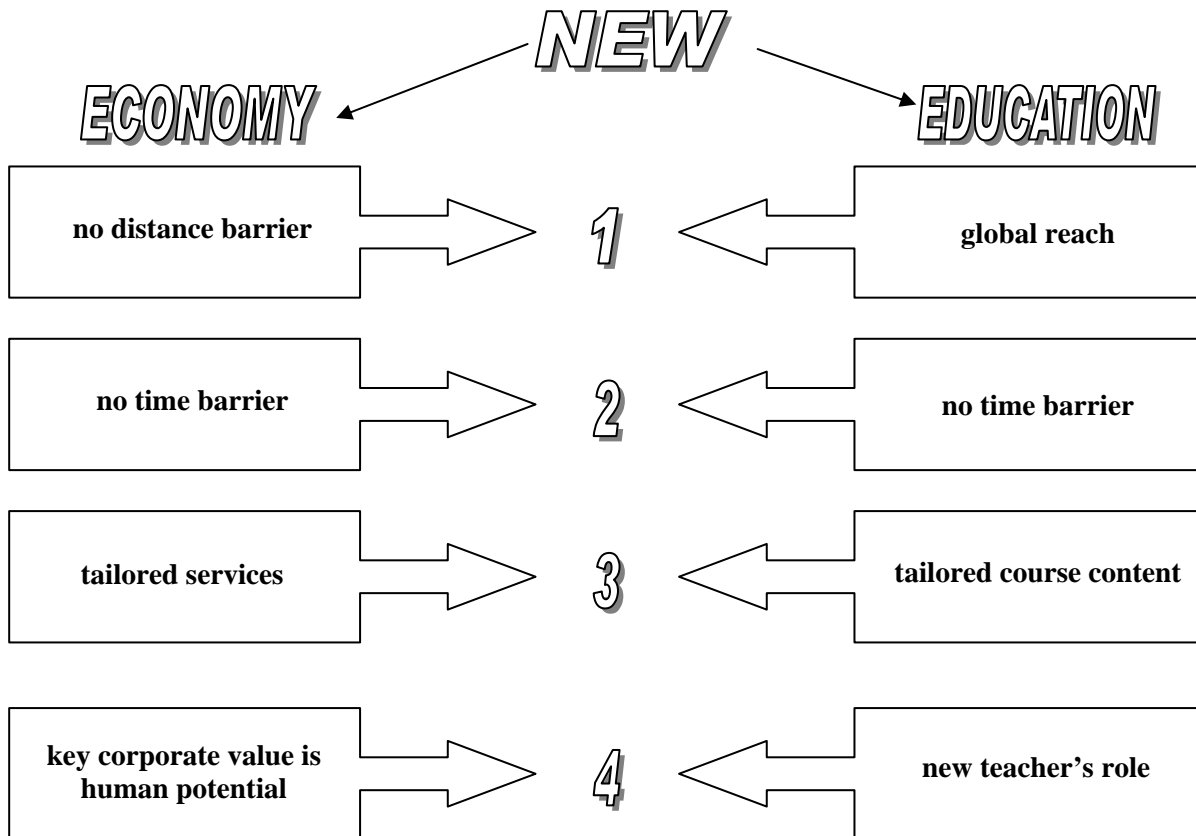
Modern information technology is already supporting University's efforts to offer students as much customised approach and knowledge as possible. The IT infrastructure of UITM is outstanding – far better than the one of any state universities in the region. The computer literacy of each student is a must. All students and staff of the UITM have personal chip id card, applicable while managing all administrative and teaching/learning related matters (schedule, grades information, financial matters, etc.). It will be left at student's discretion whether he or she decides to learn from home or use University's infrastructure. E-learning platform and IT as a whole is considered also as a factor of significant reduction of the school's operating costs.

The region of Eastern South Poland, where UITM is located, is relatively underdeveloped. The lack of properly educated human resources and slower economy of this part of Poland cause the growth of unemployment rate. Therefore one of UITM's goals is to fulfil demands of labour market and encourage business-related activities of the province. Information Technology and Economics faculties will play a commanding role in e-learning program at the University. In that case it is important to understand that most of the payoffs of e-learning are expected rather in the long term period.

Drawing From Corporate Training & Business Activities

For the purpose of e-learning strategy implementation at UITM it has been decided to identify and analyse several e-learning principles which are derived from strategies widely used by business corporations. For instance questions how to align training with company's goal and how to justify expenses on information technology have been asked thousands of times when it comes to business

applications. Business people have found several principles of justifying these investments, and many of these judgments have been published as guide books, white papers, managerial manuals, etc. Analysing several areas of e-learning development in business and comparing them to academia environment allowed UITM employees to formulate a number of pedagogical rules of the New Education. These rules allow to understand better how to justify e-learning investments in academia and how to align e-learning with university's goal. The following diagram illustrates the example of some similarities and convergence between business and didactical forms.



New Pedagogical Rules In The New Education – UITM Experiences

1. Practical verification of the theoretical concepts

The basis for fruitful and efficient work in the New Economy is the ability to solve the problem. The digital teaching model is oriented towards causes, possesses less academic content and more concrete problems to be solved. The pressure is put on practical skills and the course content is designed with real background. The lack of direct contact with students might be a problem for focusing attention. Thus the classes should involve activity, and constant interaction is a must. The learning program at UITM provides several subjects in case of which the verification of theoretical concepts is vital. E-learning platform is expected to broaden the usage of didactical IT tools capable of practical knowledge delivery. So far at UITM several particular tools such as computer simulation games, application development environments, etc have been used for theory verification. With e-learning it shall all be much more complex. For instance e-learning platform, through the delivery of several communication tools, allows students of e-commerce faculty to cooperate more efficiently in formulation of e-business strategy. Also for students of computer science and application development it is much easier to exchange ideas and concepts related to work on programming team projects.

2. The new role of the teacher

The teacher as a leader is a guide and motivation expert. He or she acts not only as the knowledge supplier but also directs students in the learning process showing the possible solutions and the tool application. The teacher must be keen on modern technology devices. UITM teaching staff is generally a team of young and entrepreneurs people who know well how to take the most advantage of IT infrastructure. Also the University board and experienced professors are very open to any new applications of modern technology and helping to align them to the learning process.

3. The new role of the student

The student is supplied with content, a knowledge source and educational tools. He or she can solve the problems and study the educational content alone or share any doubts with teacher or co-students. This didactical model involves ingenuity, and should encourage an active approach and precise questioning.

4. New tools of knowledge transfer & new communication channel

The course supported by information technologies and conducted on-line provides more practical knowledge than the traditional one. The elements of software, oriented towards the functional aspects of the teaching process are: web accessible multimedia presentations, virtual laboratories, virtual tutorials, simulation games, etc. All these elements favour a creative approach to education problems. A professional e-learning platform contains additional tools such as word processors, dictionaries, calculators, etc. New methods of communication, for instance video conference and electronic mail enforce not only the change of the teaching technique but also the way of thinking. Internet provides rich resources of links which can be used without leaving for the library, bookstore, etc.

At UITM e-learning is concerned to become a part of the larger information system. The University has already launched several solutions to contribute to communication processes, information management, financial and human resources systems, library management, etc. Some of the most important solutions are the ones that allow students to access electronic information kiosks where they can get any information related to their academia activities. It is planned to launch similar system for the employees of the University. E-learning would not be a separated program at UITM, it will rather favour the creation of large information community open for further development not only in academia.

5. Materials

The didactical materials must meet the cognitive abilities of the student. The course content should be characterized by outstanding quality, simplicity and ought to be prepared in various languages. Relatively quite a lot of students find it difficult to adapt themselves to what is mostly self-study. Great efforts must be undertaken in order to select the courseware that both motivates and provides a desired outcome. Also, one of the most important aspects of e-learning launching at UITM was the significant reduction of costs related to study materials production. The strategy of e-learning program at UITM requires that each department within the University identifies the possibility of implementation of the offered subjects as online courses. Also, the program assumes the creation of the knowledge objects database for the purpose of later course evolution and modernization. Of course we are well aware that technology still has and probably will have limitations. Not all courses and subjects are appropriate to be taught by a computer. In many cases e-learning platform can however add some value to the subject.

6. Learning is not associated with university facilities

Students in the virtual class are spread apart. A decentralized model of knowledge supply creates education of digital era quality. It means the educational content is accessible anywhere and anytime. It is especially important also in case of UITM. E-learning establishment at the University is connected with the fact that university has its premises in dispersed locations what is inconvenient for students. The premises of UITM's tourism faculty for instance are located in environmentally attractive locations far from the city centre. Many teachers however have their offices at the headquarters downtown Rzeszow. When classes are taught on-line students and teachers do not have to move from one building to another.

7. Ingenuity endorsement

The e-learning system is permanently innovation oriented. It is a consequence of the short e-content lifecycle. Apart from that ingenuity is strongly supported by personalised knowledge delivery process. Many education organisations, especially those which must compete for students, are not able to act properly in the field of individual approach. For universities that teach tens of thousands of students at the same time it is simply impossible to perform the individual approach. Since UITM was founded it was also a permanent problem. On the other hand the managing board of the University understood well the benefits of personalised approach. Customisation of student's progress with e-learning software means that knowledge is delivered based on what students have learned and how they have performed. A good example would be a student who logs onto a learning server and gets a customized course generated from the content database that identified which courses the learner has already taken, how well he or she has done, which problems are most difficult, etc. This means focusing only on skill gaps and as a consequence saving both time and money. Positive side-effect might also be higher motivation, thanks to self centred experience. University will benefit also from the higher knowledge retention rate. It's all about what stays in students' heads after all.

The delivery of knowledge content in small units, tailored to the student's needs, usually contributes to a longer lasting learning effects. The average knowledge retention rate for a traditional instructor-led class does not exceed 60%, whereas e-learning experience improves the retention rate by 25 – 60%. [2]

8. New role of the university as an educational organization

In today's virtual environment, the need for new university organization structures arises. The need affects not only didactical efforts but also and mainly behavioral procedures such as documentation, examination and graduation systems. Also the aspects of aligning organisation's goal with e-learning are far better visible when e-learning is applied at universities. Institutions of higher education usually have a consistent and clearly identifiable goal which is to spread out as much knowledge as possible. Creating highly flexible faculty profile that should correspond strongly with job market demands must be supported by e-learning solutions, and this has been taken into consideration while formulating e-learning strategy at UITM. The University is determined to offer courses and subjects that will support graduate's attractiveness in the local labour market. All these settings are much simpler and cheaper if a large part of classes is taught with use of information technology and e-learning philosophy. At UITM we noticed that e-learning is easily applicable and acceptable by older students. Social and demographical changes going on in the Polish society direct education toward this group of people. In many countries, researches show that the fastest growing group attending higher education institutions are students older than 25. [3] Each university of the New Economy era should take it into consideration while constructing education programs.

9. Application of metrics to justify e-learning

For business corporation a popular method to justify investment in training is to show them in terms of financial payback. Being able to produce a precise and defensible Return on Investment (RoI) has long been a tricky challenge of the e-learning activities. Tons of papers have been written on the topic, but ultimately every estimate contains a degree of subjectivity. Financial calculations can however be based on the reduced time of teaching or increase in the course quality. Justifying investments in e-learning with RoI might be easier applicable with large organisations with many employees, particularly when many of them need some kind of training. The design and launching costs are extremely high for the small and medium sized enterprises and for them an e-learning strategy is difficult to justify. Also it is always preferable to apply RoI measure to short term calculations. E-learning hardly ever provides a financially definable payback in short time.

Unlike to business corporations, justifying e-learning investments with RoI is not very fortunate in academia. Any financial metrics are hardly applicable in case of universities, which apart from a few examples are non profit organisations. The board of UITM is well aware of that and instead of financially expressed payback, University expects profit from the reduced time of teaching, increase in the quality of teaching or better knowledge retention rate. The other payoff components from the skills acquired by student, will be rarely different from traditional classroom education. Also at UITM it is believed that e-learning will support further development of the school's position and possibly even stimulate some new fields of activities.

Summary

Paper describes the philosophy of e-learning implementation based on UITM experiences. The University expects technology to modernize education, making knowledge more accessible and affordable for a larger number of students. Technology will enable them to study anywhere, anytime. Basically, for UITM a question was not whether to launch e-learning or not but how to do it efficiently spending reasonable amount of funds and efforts. The experience of UITM shows that offering courses online does not require overcoming very sophisticated barriers. Following reasonable initial investment and e-business experience any organisation can start to exist as a school without walls.

At last, at UITM e-learning is seen as having an essential role to play in general organisational strategy. The experiences also show that the management model, in case of business and academia is not so different after all. E-learning (in case of courses accessible for both students and teaching staff) not only makes e-culture possible within the organization, it also constructs synergy between knowledge management and high quality management activities. The strategy of e-learning program exploitation at UITM assumes also several activities in order to establish University of information society era. In helping itself the UITM seeks for partners experienced in e-learning in many activity areas from all over the world.

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NETWORKED E-LEARNING: OPPORTUNITIES, OBSTACLES AND SOLUTION SCENARIOS FOR OBSTACLES

NETCAMPUS: IMPROVING ODL IN A NETWORK

Ilse Op de Beeck, Wim Van Petegem, Jef Van den Branden, Georges Van der Perre, EuroPACE, Belgium

Introduction

E-learning in an international network of universities can offer significant added value to the student's learning experience. Although many experiments and individual initiatives take place, a full-stretched development of networked e-learning is far from current practice.

The objectives of the NetCampus-project are both to promote a better understanding and to clearly demonstrate the potential of ODL developed in an international network of universities ("networked learning"), and to remove the barriers that obstruct a successful large-scale implementation of this kind of learning in mainstream education.

The project aims at identifying a comprehensive list of all critical factors - benefits as well as threats - of networked e-learning. Starting with a review study of existing expertise and experience on providing ODL in a networked environment, it is the objective to gather in an efficient and effective way the state-of-the-art knowledge on models for networking, barriers and obstacles to a successful implementation, potential benefits and added value. Next, solution models and scenarios to overcome obstructions and obstacles identified as being obstructions for networking are developed and tested through pilot activities. Finally, a variety of dissemination activities are set up in order to improve ODL in a network of universities. This paper describes the current state-of-the-art in the project.

Opportunities and obstacles of networked e-learning

The implementation of ODL in a networked environment offers a great potential, like flexibility, joint course development, or cost sharing. But, in spite of the various efforts that have been invested in the different e-learning networks, there is still a great reluctance to embark on large-scale activities that are self-sustainable and permanently embedded in mainstream education. When trying to introduce ODL successfully within a single institute, one is often confronted with a number of problems that need to be solved. Doing the same in a networked environment opens great opportunities, but introduces at the same time new obstacles that are specific to the network context. A review study allowed us to make an inventory of opportunities and obstacles of networked e-learning. We first take a look at the benefits, added value and opportunities; afterwards we elaborate on the pending problems, obstacles and hindrances perceived by individual universities to engage in networking through ICT.

Benefits

The potential and advantages of e-learning in a network of universities seem quite obvious:

- An on-line setting provides a level of flexibility and convenience not provided by traditional classroom courses. Learning opportunities are provided in a more flexible and customer-aware manner.
- Networking allows taking the learning from many institutions to many sites. Learning is no longer location dependent and learners are able to take courses independently of their physical location, be it their homes, their places of employment, or elsewhere.

- ODL increases a broader participation in learning: not only is it possible to ‘accommodate’ more students and to expand the student population, there is also more flexibility towards the traditional audience and new target groups: people of all ages, remote audiences, lifelong learners, international students, disadvantaged regions and individuals,...
- International networking allows students to come in contact and to work collaboratively with students from other countries and cultures (“virtual Erasmus”). The intercultural experience gives educators, trainers and learners with different worldviews the opportunity to exchange ideas and information, and learn from each other.
- Institutions enter an international and competitive marketplace. They perceive that ICT will enable them to increase their market share and to extend their influence in an academic area. The university can decide to capitalise on the institution’s existing “brand” name, in a quest for increasing profit.
- Transnational co-operation between universities is needed to disseminate scientific knowledge in targeted education and training settings. Not only collaboration between universities but also collaboration between universities and businesses can be beneficial.
- Working together can generate economies of scale. On a practical level, functions such as the development and distribution of learning materials, tuition, assessment, online registration, marketing and sales, learner support, and general administration can now be shared. Sharing of resources also results in economies of scale, e.g. exchange or sharing of learning material and courses, seminars, access to the equipment, laboratories of other institutions, the maintenance and creation of databases for reusable learning and teaching materials,...
- Joint development of courses provides an international dimension and richness that supports the globalisation of education and life. New degrees of collaborative work between geographically disparate teams are possible. Networking gives the opportunity to universities to collaborate not only on the design and development of courses but also on the delivery of courses, and on Internet or web based education materials and curricula.
- Networked learning provides learners with access to the course instructors, textbook authors and experts from other institutions that have rare expertise or recent knowledge. Expertise not available in a given university can be addressed and easily transported through the network by all actors involved in education: students, teachers, researchers and university decision makers.
- For the universities the opportunity is offered to improve and widen their learning offer, to diversify programs and to bring in the best courses, the best teachers, the top researchers (in the country, in Europe, in the world). A student enrolled at one of the partner universities thereby receives access not only to courses, learning materials, infrastructure, resources (libraries, laboratories...), but also to teachers, tutors, researchers and peer students of all the other universities in the network.
- A firm partnership can act as a more effective pressure group to realise interoperability of equipment and platforms and the creation of standards. Consortia should be able to negotiate more powerfully than individual universities.
- Funding can be attracted more easily where several universities come together and resources are pooled for maximum impact.
- The development of virtual delivery models will most likely result in a higher degree of cost-effectiveness and cost reduction. Costs can be reduced through standardisation, resource sharing, increased productivity, by purchasing hard- and software jointly, lowering of travel costs. There is a potential to share costs (for the development of the virtual campus platform, delivery systems, development of joint courses, teacher training,...) and to distribute risk.
- Through networking the institutions might enhance the quality of their programs. It helps teachers to reconsider their routine practice and to add innovative elements and an international dimension in their courses to match the requests of trans-national collaboration. Networking can also contribute to the quality of education by organised introduction and operation of quality assurance systems.

- There is a belief that networked e-learning can improve efficiency and/or effectiveness of learning, e.g. more access to information and learning resources; a learner centred model of education where students take the responsibility for learning; improvement of the learning process through interactive learning; integration of students in a collaborative learning environment, while keeping the benefits of a structured presence in a university campus,...

Obstacles

Networked e-learning has of course also drawbacks. Obstacles to be met when setting up joint networked activities can be divided into two categories according to their nature: the attitudinal and practical problems. Examples of the latter kind of problems include copyright issues or language problems. These practical obstacles seem to be often used as an excuse by individuals (professors, researchers, management staff) to hide another kind of obstacles in achieving networking for ODL. Some examples of those attitudinal problems are the prejudices against ODL as an alternative for face-to-face education or resistance to the changing role of teachers. All obstacles were at the same time classified in terms of their characteristics: this means whether it is either a pedagogical, technological, and/or organisational problem. In this section each issue is described and it is indicated on which level a certain issue most likely will pose a problem: it can cause difficulties on the practical level as well as on the attitudinal level and/or on the pedagogical, technological and organisational level.

Some of the issues mentioned in the previous section will come back here. A benefit can in fact become an obstacle when looked at from a different angle. Cultural differences in the audience, for example, might cause difficulties when giving or developing a course. On the other hand, intercultural experience can be seen as a real personal enrichment for the people involved in the course.

- **Cultural issues** (*pedagogical/organisational – attitudinal/practical*): Different learning styles of students, different teaching styles of instructors, different administrative procedures, and ways of working among participating organisations all can cause frustration. When making a distance-learning course for an international audience, one should always be aware of cultural, social, and/or political differences among a group of learners, educators and trainers. The types of distance learning available, the technologies required, and the way course content is structured and presented need to be planned with a multicultural, multinational audience in mind.
- **Language** (*pedagogical – attitudinal/practical*): Instructors are not always willing to teach in a different language, students not always willing to attend courses given in a different language. It has to be discussed in which language the teaching will be done, the courses will be offered. Because of different languages communication problems can easily occur between instructors and learners.
- **Pedagogical models** (*pedagogical – attitudinal/practical*): Instructors have negative perceptions of technology-supported learning and ODL. They prefer a face-to-face learning environment and can't see the educational benefits or are ignorant on the potential of new ICT-based methods. The web and the Internet are indeed technologies that require new pedagogical models or the optimisation of existing ones.
- **Pedagogical/teaching skills** (*pedagogical – attitudinal/practical*): Teachers and faculty often are reticent to embrace the use of ICT caused by a lack of teaching skills. The institution should provide teachers and staff with an adequate training in the running of distance courses, the use of learning technologies, organisation of ODL learning and production of learning materials.
- **Support – reward** (*pedagogical/technological/organisational – attitudinal/practical*): Support for the teachers, technical staff and the students is a very important issue to be taken care of. Faculty will need additional time to learn how to use these new technologies and students also have to learn to study effectively online. Not only pedagogical support is necessary, faculty who do to effort to engage in technology-based education should also get a fair rewarding for it (monetary support, professional prestige,...).

- **Copyright – intellectual property** (*organisational – attitudinal/practical*): When courses are developed jointly in a network of universities and materials are made available electronically or on-line, copyrights and intellectual property rights become a very important issue. One of the main questions that rises here concerns the ownership of a course that is developed by multi-institutional teams. Therefore, there should be a clear policy on copyrights, intellectual properties, the ownership of the material,... Last but not least there should be a revenue policy in place to define who can sell the developed courses and how the revenues will be shared.
- **Quality** (*pedagogical – attitudinal/practical*): There is often concern over a loss of quality and level and effectiveness of education that is delivered through the use of virtual models in comparison with the traditional face-to-face environment. Quality assurance systems should be put in place to ensure the quality of the curriculum, teaching and learning, assessment, student support and to be sure that a course meets the standards and criteria of quality defined at the institution and is worthy of credit.
- **Accreditation/credit transfer** (*organisational - attitudinal/practical*): A first aspect of the accreditation and credit transfer problem is that courses attended at another university or offered by a consortium on line may not be accredited in the student's home university. How to define the amount and type of credit of a course can be the next question to be solved. And when a course is accredited the problem of the transfer of course credits among institutions turns up.
- **Individualisation/tutoring** (*pedagogical – attitudinal/practical*): Teaching and learning in a network of universities means that people, located at different places access the network from behind their computer screen. It is often feared that interpersonal contact is lacking. Different locations constrain community building, individualisation is lost, instructors have to grade students they don't personally know. Especially tuition and mentoring of students by the instructors can pose a problem.
- **Changing roles** (*pedagogical/organisational - attitudinal/practical*): Teachers need to adapt their perception of what it means to be a teacher. There is a fundamental shift from a teacher-centred environment in the traditional classroom to a more learner-centred environment online. The role of teachers changes from transmitting knowledge to mediating learning, from the role of instructor to one as mentor and guide. The students become constructors of knowledge, self-directed and independent learners; in fact they become more a 'teacher' themselves.
- **Loss of control/autonomy** (*pedagogical/organisational - attitudinal/practical*): While it can be agreed that each member in a partnership remains independent, it is unavoidable that decision mechanisms that support the joint activity also affect the extent of control of the activities of each separate partner. More and more courses will be developed jointly and academic staff will increasingly have to work with and have to take into consideration instructional designers and technical staff, not only from their own institution but also from the partners in the network.
- **Competition** (*organisational - attitudinal/practical*): Traditional universities face a significant and growing competition from other and new types of e-learning providers, all offering the same type of courses. To stand stronger in this competitive environment, universities can team up with other universities. However, the visibility of each partner becomes different in a distributed environment, preventing some universities, wanting a maximum visibility (e.g. for reasons of funding) to enter a partnership. It might also dilute the value of the institution's "brand" name.
- **Practical organisation** (*organisational – practical*): Institutions offering programmes across countries should also take care of some more organisational and practical problems, for example timing (co-ordination and planning problems may emerge because of working in different time zones), access to local facilities (how to make available to distance learners textbooks, non-electronic learning materials, and in particular library resources), enrolment (how to support registrations via telephone, fax, the Internet), and the practicalities of receiving payment in an acceptable form.

- **Financial aspects** (*organisational - attitudinal/practical*): Networked e-learning causes a cost increase for the organisation: costs to develop and deliver online courses, the cost for the infrastructure (e.g. connectivity, network access). Especially the front-end costs associated with the development of the infrastructure and ICT-based instructional materials are difficult for organisations to finance. On the income side distant and online courses must be priced at a sensible level: neither course fees nor the cost for accessing the network etc. should be a limiting factor for interested students.
- **Motivation** (*pedagogical/technological/organisational – attitudinal*): Introduction of ICT in education requires that students as well as instructors are interested and motivated to learn how to work with computers, to learn how technology can be used efficiently in education. The institution itself should also be motivated: often a clear vision that guides these kinds of activities is lacking and is not seen as important.
- **Workload** (*pedagogical/technological/organisational – attitudinal/practical*): Concern about an increasing workload can indeed be a considerable obstacle. A significant time investment for planning lectures, for preparing supplementary materials, instructional delivery is needed, courses itself take a longer time span because of new forms of activities, e.g. the mentoring/interactive aspects. Increasing access and therefore a larger number of students also places greater demands on the time of the tutor or instructor, etc.
- **Common platforms/standards** (*technological – attitudinal/practical*): Instructors and students do not like to learn how to use a new electronic learning environment that they have not yet used before. On the other hand it would be inappropriate that every university develops its own platforms. Technical standards need to be adopted to optimise interoperability with other institutions in areas such as the creation of learning objects and information databases, libraries, administrative systems,...
- **Security** (*technological – attitudinal/practical*): When all contact and communication between universities, teachers, and students is happening through the web, security becomes an important aspect. There have to be rules governing access to information that is available through the web. Universities should know who is participating to the course (online authentication) and should thereby protect themselves against people who are not registered or do not have the necessary authorisation.
- **Infrastructure/access** (*technological – attitudinal/practical*): Students and teachers can be frustrated by the computer and network facilities available to them or by features in the electronic tools they are being asked to use. On a more practical level, virtual education is often limited by the lack of appropriate technical infrastructure or the uneven quality of infrastructure between different partners, e.g. between the countries in Europe. While also the disparity of access to the infrastructure is great, it must also be ensured that students and teachers have the best possible access to it.
- **Technical skills** (*technological – practical*): Lack of technical background, lack of basic computer literacy of the students as well as of the instructors and at the support side, are an obvious obstacle in introducing ICT in education.

Scenarios to overcome obstacles in networked e-learning

Dealing with practical obstacles within a single institute has already been the subject of different projects, but the second kind of obstacles and their potential solutions are less studied. The NetCampus project wants to offer some solutions to these network-specific obstacles. Typically, practical obstacles can be overcome through the introduction of common standards, (bilateral) agreements, schemes, models, etc. The search for solutions for this type of obstacles is ongoing and by now, partially answered, tentative models and standards are being developed or have been advanced in projects and literature. The attitudinal obstacles are less tangible and hence, not so easily pinpointed and described. They are, however, very serious obstructions for the further successful implementation of ICT-based university networks and of ICT in education in general.

When universities work together in a collaborative network, we can identify at least three general patterns that may occur as they pilot different sorts of strategies for working together on instructional delivery and networked e-learning. In the NetCampus project we elaborate on the following scenarios:

Scenario 1: Within an existing course, on-line interaction with learners or resources in a partner institution

In this scenario, there are two possibilities: (a) Instructors of existing local courses at different network universities arrange that their own students as part of their own course collaborate in some form with learners at other places. Students stay at their own universities during the course and collaborate and communicate with teacher and other students via electronic media. Or (b) A course in one institution makes use of laboratory, library resources or other learning material from a network-partner institution, using technology for remote access.

Scenario 2: Offering a course via technology, distance participation

Students at different locations participate at a distance in a network course, delivered via technology, e.g. the Web. The course may have been developed by network-partners or it may have already been developed by one of the partners and subsequently made available to students of the other network partners. It is necessary for the online students to be able to attend the course via an Internet connection either from their university or from their homes. There is an essential need for electronic communication

Scenario 3: Supporting physical mobility

In the third scenario, instructors and students from one university travel physically or virtually to another university in order to participate in a course or courses there. Face-to-face meetings as well as the use of ICT communication channels are assumed to be part of the learning activities in such programmes. The most familiar option is that of the Erasmus and Socrates programmes, where students physically attend a course offered by another university, as on-campus students at that university. Another option is the exchange seminar, where it may be the instructors who are physically mobile.

These three scenarios are in practice not mutually exclusive, when applied to solve the problems listed above. The aim of the NetCampus project is to refine these scenarios and to identify in which way they address the problems and find solutions for networked e-learning. The scenarios are tested through pilot activities with the purpose of validating or falsifying them. The selected pilot courses are implemented, run and evaluated in the network of the participating partners of the project, eventually extended to partners of the project participants. This method of working will allow us to generate validated implementation scenarios for ODL in networking, specified in terms of operational models for a variety of problems.

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SURVEY ON INTERNATIONAL NETWORKS FOR E-LEARNING

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Introduction

Networked e-Learning: definition

In this paper we consider e-learning as learning supported with the aid of all kinds of information and communication technology (ICT). We do not restrict e-learning to only using the Internet for didactical purposes in higher education as is often the case. Also more traditional media as video, audio cassettes, television, radio, telephone, CD-ROM, or even satellite communication are envisaged as well.

Networked e-learning goes one step further. It assumes that more than the two direct partners (teachers and students) are involved. Different possibilities may arise. It could be that students at different universities in different countries establish a learning community and take the same courses, collaborate on the same projects and communicate in a sophisticated virtual way. It could also mean that teachers across institutional or national borders find each other and jointly develop courses, share learning material and divide the tutoring activities. It could include far-reaching collaboration and policy making amongst institutes of higher education on the educational use of ICT at the highest strategic level. It could be of interest to other parties as well, like financial institutions, local municipalities, ngo's, etc. enriching the network partnership by adding different competences and possibilities.

As a summary: networked e-learning should not restrictedly be defined as learning through the Internet, although it is certainly of utmost importance and probably the most obvious and most visible format.

Networks for e-learning and the NetCampus project

Over the past years, networks of different nature have been established between traditional universities and their partners (e.g. telecommunication companies or spin-off companies) that facilitate networked e-learning or open and distance learning, especially in higher education. A broad spectrum of these networks already exists for a long time and new ones are daily popping up, on a more local scale, either on an international level.

In the NetCampus project the existing (international) networks for e-learning are screened in terms of different characteristics. The purpose of this exercise is both to survey the most relevant networks, and also to determine the key factors that allow them to enforce benefits and to solve problems of networked e-learning. In this paper we first elaborate on the development of the characterisation scheme and we then apply this scheme to a few networks for e-learning.

Characterisation of Networks for E-Learning

As mentioned above the NetCampus project aims at identifying critical issues in international networked e-learning, and more importantly, at elaborating scenarios to enforce its benefits and to solve potential problems. Therefore, one research topic in the project deals with characterising existing networks of higher education institutes together with eventually other partners, and identifying how and why they are more or less successful with their networked e-learning activities.

Original characterisation of networks for e-learning

In the original NetCampus project proposal we distinguished four types of networks [1,2]:

- *Discipline*-based networks refer to networking of individuals or groups (departments) with a common research interest. These (thematic) networks have mainly been developed for the improvement of (joint) research activities, but they also spark educational initiatives. Their strength lies primarily in a firm base of contents-related expertise.
- *Profession*-based networks refer to networking of organisational units in universities in charge of education and training for a particular professional profile (e.g. engineering or medicine). The value of such a network is mainly based on the internationalisation of education, bringing together (the best) teachers and students across borders, giving them a flavour of the world where they will exercise their profession.
- *Institution*-based networks refer to networking at the level of the university management. The aim of these networks is strategic cooperation based on the potential of synergy for policy development (e.g. on the introduction of ICT in education) and the possibility of economic benefits (economies of scale).
- *Service*-based networks refer to networking of central services at universities that offer central support for the implementation of ICT in education. The strength of these networks lies in the possibility of pooling resources and services and of exchanging expertise.

However, the distinction between those four types of networks however seemed too rough to work with further in the project.

New characterisation of networks for e-learning

Based upon extensive literature search concerning benefits and problems of networked e-learning, we came to the conclusion that the above classification should be refined in order to enable a better understanding of critical success factors that could distinguish the network organisations with respect to e-learning activities.

Therefore a new scheme was developed with following network characteristics

- *Common interests*: what is the reason why a network exists?
- *Partners*: who are involved in the network?
- *Organisation models*: how is the network set up and what types of links are there between the partners in the network?
- *Responsibilities*: who is taking up certain responsibilities in the network?
- *Activities*: what types of networked e-learning activities are going on in the network?
- *Boundary conditions*: what boundary conditions are to be fulfilled for an optimal functioning of the network?

In the next table these characteristics each with its own subdivisions, are presented in a matrix.

Common interests	Partners	Organisation models	Responsibilities	Activities	Boundary conditions
Discipline – network of excellence	Higher education institutions	Ad hoc – project related	Pedagogy	Education	Mix of competences
Degree – profession	Individual, academic staff	Consortium	Content	Courses	Interdisciplinary
Strategy – policy	Faculties	Foundation	Tutoring	Programmes	Interinstitutional
Commercial benefit – economies of scale	Central services	Membership organisation	Coaching	Training	International
.....	Institutions	Strategic alliance	Quality control	Research and development	Mutual trust
.....	Student bodies	Association	Service	Meetings	Commitment
	Institutional networks	Public-private partnership	Technology	Seminars – conferences	Business model
	Companies	Virtual university	Consultancy	Working groups – special interest groups	Communication (internal – external)
	Customers	Open university	Finances		Adaptability – flexibility
	Investors	.....	Marketing		.....
	Media	.....	Secretariat	Knowledge brokerage.	.....
	Service providers, on-line enablers	.....	Organisation	.....	.....
	Professional organisations		Administration	.....	.....
	Government		Student registration	.....	.....
	Regional		Student certification		
	National				
	European.				

This matrix is now used as a template to characterise different networks, known by the partners in the NetCampus project, in order to identify critical issues in how they deal with potential benefits and problems of networked e-learning activities.

Characterisation of EuroPACE and EDEN

In this paper we will only describe two networks according to the presented characterisation, namely EuroPACE [3] and EDEN [4].

EuroPACE

EuroPACE, the Professional and Academic Channel for Europe 2000, is a trans-European network of universities, enterprises and organisations or other networks with an interest in the field of distance and continuing education and training. EuroPACE is a not-for-profit organisation according to Belgian law, based at the Katholieke Universiteit Leuven (Belgium), where it has direct access to expertise in educational technology and instructional psychology and to audio-visual and multimedia development and production facilities. By using various models EuroPACE demonstrates and develops the potential of ICT and multimedia for education and training. Through its network EuroPACE can build on the results of fundamental and applied research from Europe's leading centres of excellence. It has been involved in a number of projects dealing with the introduction and implementation of ICT in university education and it organised 'The Wanderstudent 2000' Conference, in October 2000 in Leuven. Members of the EuroPACE network are entitled to a number of services:

- an information service built around a portal site
- the virtual campus VirtUE with access to a number of EuroPACE courses
- training and consultancy on ICT in education
- support in European projects
- participation in special interest groups (SIGs)
- the opportunity to become an active node in the EuroPACE – EPYC contents and services network

This range of services is especially designed to meet the needs and concerns of people and organisations involved in distance and continuing education and training in a networked ICT-based learning environment.

Applying the above characterisation scheme to EuroPACE leads to the following description:

Common interests: Different institutes want to develop and share common ideas on a strategic policy level.

Partners: Members in the network are higher education institutions, institutional networks, and companies both as customers and as service providers or on-line enablers.

Organisation models: EuroPACE is a membership organisation.

Responsabilities: EuroPACE takes all responsibilities in terms of pedagogy, service, finances, marketing and secretariat, except for certification, which is left to the member institutes.

Activities: All kinds of activities (education, research & development, meetings, seminars, SIGs, knowledge brokerage) are taken place in the network.

Boundary conditions: Its interinstitutional and international character, mutual trust and commitment amongst the members, its internal and external communication, its adaptability and flexibility are considered as of utmost importance.

EDEN

The European Distance Education Network (EDEN), as a non-governmental educational association, was formally established in May 1991 following the first pan-European conference on distance education in Budapest in 1990. Its aim is to foster developments in distance education through the provision of a platform for co-operation and collaboration between a wide range of institutions, networks and individuals concerned with distance education in Europe.

According to the Constitution of EDEN, the association is open to members from all the countries of Europe. It is embracing all levels of formal and non-formal education and training, including vocational and non-vocational sectors. There are two sections of the membership: the Institutions Section and the Network of Academics and Professionals - NAP (individual section).

In legal terms, EDEN is a non-profit company limited by guarantee, registered under English law with its registered office in Milton Keynes, UK. The Secretariat of the Association is hosted since 1997 by the Budapest University of Technology and Economics, after seven years of functioning at the Open University, UK in Milton Keynes.

Applying the above characterisation scheme to EDEN leads to the following description:

Common interests: Different members want to develop and share common ideas on a strategic policy level, especially the Institutions Section of EDEN.

Partners: Main types of institutions in the membership of EDEN include educational institutions, national ODL associations and European networks. It is further open to companies as well as individuals.

Organisation models: EDEN is a membership organisation.

Responsibilities: EDEN takes all responsibilities in terms of pedagogy, service, finances, marketing and secretariat, except for certification, which is left to the member institutes.

Activities: The scope of EDEN activities includes participation in projects (research and development), organisation of annual conferences and research workshops, and a publication and information service.

Boundary conditions: Especially its interinstitutional and international character, its relation with other networks and associations, and its internal and external communication are all important boundary conditions.

Conclusion

In this paper we described what networked e-learning activities are and how (international) networks are dealing with them. In the framework of the NetCampus project these networks for e-learning are screened in terms of different characteristics, in order to survey the most relevant networks, and also to determine critical issues. We first developed a characterisation scheme and we then applied this scheme to a few networks for e-learning, namely EuroPACE and EDEN. The purpose of this exercise is to discuss what general characteristics could be defined as the key factors that allow these networks to enforce benefits and to solve problems of networked e-learning.

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INTEGRATING SCENARIOS FOR COLLABORATIVE LEARNING: EXPERIENCES FROM A COURSE ON 'GROUPWARE'

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Collaboration and communication has a growing relevance in the process of integration of education within countries and cultures in Europe. In the NetCampus project on networked open and distance learning, problems in realizing collaboration and communication were discussed and structured in a framework. Within the same framework possible solutions were developed for these problems. The framework has the form of a matrix and is differentiated into use in three scenarios for educational collaboration. A series of pilot courses are then developed and delivered to represent these three scenarios. One of these courses is the course 'Groupware' which is provided by the University of Twente. Students from four different locations all over Europe attend the course, either on-campus or at a distance. Course delivery, resources and communication methods were given as high flexibility and possible to serve varying needs from learners. The paper discusses the rationale behind the course, the structure, resources and instructional events that were used and problems as encountered and how they were / are being solved in relation to the framework.

Introduction

The NetCampus project builds on the expectation that networked course development and delivery of courses among universities can add a substantial benefit over existing courses. However, to achieve the situation that this happens problems have to be solved and existing mis(beliefs) overcome. This paper starts with a brief discussion of networked learning and how scenarios of networked learning can be defined. Further problems and possible solutions are presented as they have been developed within the NetCampus project. In the remainder of the paper a pilot course is presented, that was developed and delivered at the university of Twente, in collaboration with three other partners in the project. Finally practical experiences during the pilot are related to problems as discussed in the first part of the paper.

Networked learning

Learning methods that use communication and collaboration as a substantial element in methodology and content are becoming relevant in these days. In Harasim et.al. (1999) 'learning networks' are defined as "groups of people who use CMC networks to learn together, at the time, place, and pace that best suits them and is appropriate to the task". This implies that in networked learning always more than one learner are involved, that computer-based networks are used and that flexibility is a primary characteristic of learning methods being used. Networked learning also has a major influence on learners and other people involved. The role of the teacher becomes more one of coach or facilitator. Students become more active and independent. Education becomes more learner-centred. Personal communication among learners is increased. And the teacher-student hierarchy is broken down to some extent.

Networked learning within NetCampus is analysed from different perspectives. These are the learner perspective, the perspective of the instructor, and the perspective of the organisation such as the university. These perspectives are analysed with the help of three scenarios. These scenarios are presented in the next section. For each of the scenarios a number of problems are discussed that might occur and solutions to overcome or avoid these problems. After this theoretical part the relevance of the problems and the value of the solutions are validated in a pilot study, which is then discussed in the second part of the paper.

Scenarios

When different universities work together in a collaborative network, there are at least three general patterns that may occur as they pilot different sorts of strategies for working together on instructional delivery. These three scenarios can be considered as follows (Gommer et al, 2001).

Scenario 1: A course is offered within a university. In this course not only students from the home university are accepted but also students from other universities either within the same country or not. An online course environment is provided for both on-campus and distance students. The on-campus students participate in face-to-face sessions and the distance students via online interaction. Course management is usually organized online. Course resources such as study texts are provided online but paper-based readers might be produced for more convenient reading.

Scenario 2: A course is offered via technology. There are no face-to-face sessions scheduled. Students can only participate in the course at a distance. All communication is organized over an online course environment. Just as in scenario 1 students come from different places and cultures. This also in scenario 2 can lead to problems in collaboration and communication. A difference with scenario 1 is the role of the instructor. As in scenario 1 the instructor has at least partly a teacher role, this role in scenario 2 is much more one of being a coach or guide.

Scenario 3: Supporting physical mobility. This scenario supposes students from one university going to a foreign university to study there for a period of time. In this scenario, persons (instructors and students) from one university travel physically to another university in order to participate in a course or courses there. Examples of these are the ERASMUS and SOCRATES programmes, where students physically attend a course offered by another university, as on-campus students at that university. Other options are exchange seminars, where it may be the instructors who are physically mobile, or it may be that a course is seen as a series of sessions, offered one after the other at each of the participating organizations. Students meet physically at a first organization, work together online for a period of time, then meet again physically, but at a second organization, etc. Face to face meetings as well as the use of electronics communication is assumed to be part of the learning activities in such programmes.

Problems

As all three scenarios are more or less different from the 'traditional' way of teaching and learning for both learners and instructors (and also managers and other staff) problems are often a natural occurrence. Problems in implementing networked learning are structured in the NetCampus project in the following framework:

- The nature of the problem: A problem can be either attitudinal or practical. Attitudinal problems are problems originating from the people that are involved in the situation, the context in which the problem occurs. Practical problems are problems originating from the infrastructure, the equipment, the culture, the organization etc. An example of a problem with an attitudinal nature is the resistance of people against technology in education. An example of a practical problem is the lack of network capacity to deliver a networked course adequately.
- The characteristic of the problem: this means whether it is a pedagogical problem, a technological problem or an organizational problem. In pedagogical problems the educational processes of the course are central in the problem. In technological problems the technological infrastructure within which the course is delivered is central in the problem. And in organizational problems the organization in which the course is delivered (for instance a university) is central in the problem.

To understand the problems occurring in the context of design and delivery of networked learning courses and to find adequate solutions this framework is linked to the three scenarios that were presented earlier in this paper. The next section discusses briefly this differentiation in scenarios before in the remainder of the paper one of the pilot courses is dealt with.

Solutions

Problems can be characterised by the following: usually problems do not come on their own and problems are almost always linked to the context in which they occur. This has led to the conclusion that solutions should be connected to scenarios and be used to solve problems occurring within these scenarios. Per scenario the solutions for problems will be:

- Focusing on people: problems originating in people and how they act in one or more of the three scenarios. An example of such a problem is that learners are not willing to attend courses at a distance because they fear they don't get enough coaching by the instructor who is a far distance away. A solution to this problem can be to integrate on site co-instructors at remote locations and to keep those students active and involved in course activities throughout the course. This is especially expected to be important in scenario 1 when students abroad might feel neglected compared to students at the university where the course is offered.
- Focusing on equipment: problems originating in the equipment that is used for networked learning in one or more of the scenarios. For instance differences in learning environments or software tools between partners in networked learning.
- Focusing on infrastructure: problems originating in the infrastructure around the use of networked learning in one or more of the scenarios. For instance differences in bandwidth between partners in networked learning.
- Focusing on procedures: problems originating in activities being carried out during design and delivery of networked learning. For instance differences in learning and instructional methods between partners in networked learning.

From theory to practice: the 'Groupware' pilot

Rationale: Within workpackage 3 of the NetCampus project a number of pilot courses are set up to illustrate practice of networked learning representing the three scenarios that were developed in workpackage 2. A second goal of the pilots is to validate the problem framework and the possible solutions from workpackage 2. One of the pilot courses is a course on 'Groupware'. This course is delivered in the master of science programme 'Telematics Applications in Education and Training' at the Faculty of Educational Science and Technology' of the University of Twente.

The 'Groupware' course is provided for on-site students who come from a variety of countries such as China, Vietnam and Germany. Also students from partners in the NetCampus project such as Helsinki, Ljubljana and Kosice were in the course. The course is delivered such that both on-campus students and students at a distance could participate. In such the course can be said to be representing scenario 1 of the framework.

Goals were focused on both the acquisition of knowledge about characteristics of groupware systems and how they are used and on the design and evaluation of groupware systems.

Methods and Resources: The 'Groupware' course is based on 6 meetings that were held on-campus in Twente, a reader, 3 (small) formative assignments, a final project and a course website. As most students attend the course online, at a distance, communication via the website plays an important role. Also submitting assignments will happen via the website.

Four of the six meetings were centered around topics such as design, evaluation, social and cultural aspects and features and functionalities of groupware. The first meeting was an introduction to the course and in the last meeting students have presented their experience during the final assignment until so far.

The study load of the course was 120 hours. Students had the flexibility to spend time on course activities as they preferred. Almost half of the study load was assigned to the final project and also a majority of hours was assigned to reading and studying course material.

Collaborative activities were a major part of the course. Around the meetings three assignments were integrated in which students had to elaborate on the readings. In these assignments students also had to look after groupware applications and analyze them with links to the literature. Thus theory and practice had to be combined. This method is based on a pedagogical model as presented in Collis & Moonen (2001).

A reader has been constructed for the course (v.d.Veen, Wetterling, 2002). This reader contained study texts on a variety of issues related to groupware that were discussed during the course. Table 1 provides an overview of the content of the reader.

Table 1: Content of the reader for the 'Groupware' pilot course.

<ul style="list-style-type: none"> • Hogarth, A. (2001). Managing the social and cultural consequences of introducing groupware technology into the group learning environment. <i>Education and information technologies</i>, 6(3), 193-204. • Johnson, D.W., & Johnson, R.T. Cooperation and the use of technology. In: D.H.Jonassen (ed.) <i>Handbook of research for educational communications and technology</i>. 1996. McMillan. Pp.1017-1044. • G.C. van der Veer, M. van Welie. Groupware Task Analysis, Tutorial Notes for the CHI99 workshop "Task Analysis Meets Prototyping: Towards seamless UI Development", 16th May 1999, Pittsburgh PA, USA. • Macaulay, L., Shaikh, A.N., & Young, R. (1998). Groupware and software engineering criteria for success. In: R.Hazemi e.a. (eds.) <i>The digital university: reinventing the academy</i>. Pp. 245-265. • Palloff, R.m., & Pratt, K. (1999). Building learning communities in cyberspace: effective strategies for the online classroom. Chapter 8 & 9. Pp.110-143. • Jonassen, D.H., Land, S.M. (2000). Theoretical foundations of learning environments. Chapter 4, pp.89-121. • Veen, v.d., J. (2001). Telematic support for group-based learning. Doctoral dissertation. Enschede: University of Twente. Chapter 3, pp.49-67.
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In the course the TeleTOP course management system is used. This is a system that has been developed at the University of Twente. In the site that has been built for the course the following features were used:

- 'News' section for providing information to students about ongoing activities, deadlines etc. related to the course
- 'Info' section for general information about course material, instructors, assignments, learning goals
- 'Roster' section for information about course activities (such as links to slides that were used in face-to-face meetings but also for providing opportunity to submit assignments
- 'Mail' section providing all mailaddresses of students and instructors are provided including opportunities for students to provide information about themselves and their background. This was considered important because there were students that usually do not work together and are from different cultures and locations.
- 'Discussion' section: here students could discuss with each other asynchronously about issues in the course
- 'Chat' section for synchronous discussion. However the chat functionality of TeleTOP has not been used much in the course. During the course some of the students switched to other, more dedicated chat applications.
- 'Workspace' areas for students to store products and resources to be used in the course. These areas had only access for students or staff authorized to be there.
- Also areas were designated for web links related to the course, slides that were used in the meetings and archives for course resources, assignment products and other material considered relevant for the course.

A screen dump of the 'course info' area for the 'Groupware' course is presented in figure 1. The area on the left shows the features of the TeleTOP system that were used for the 'Groupware' course.

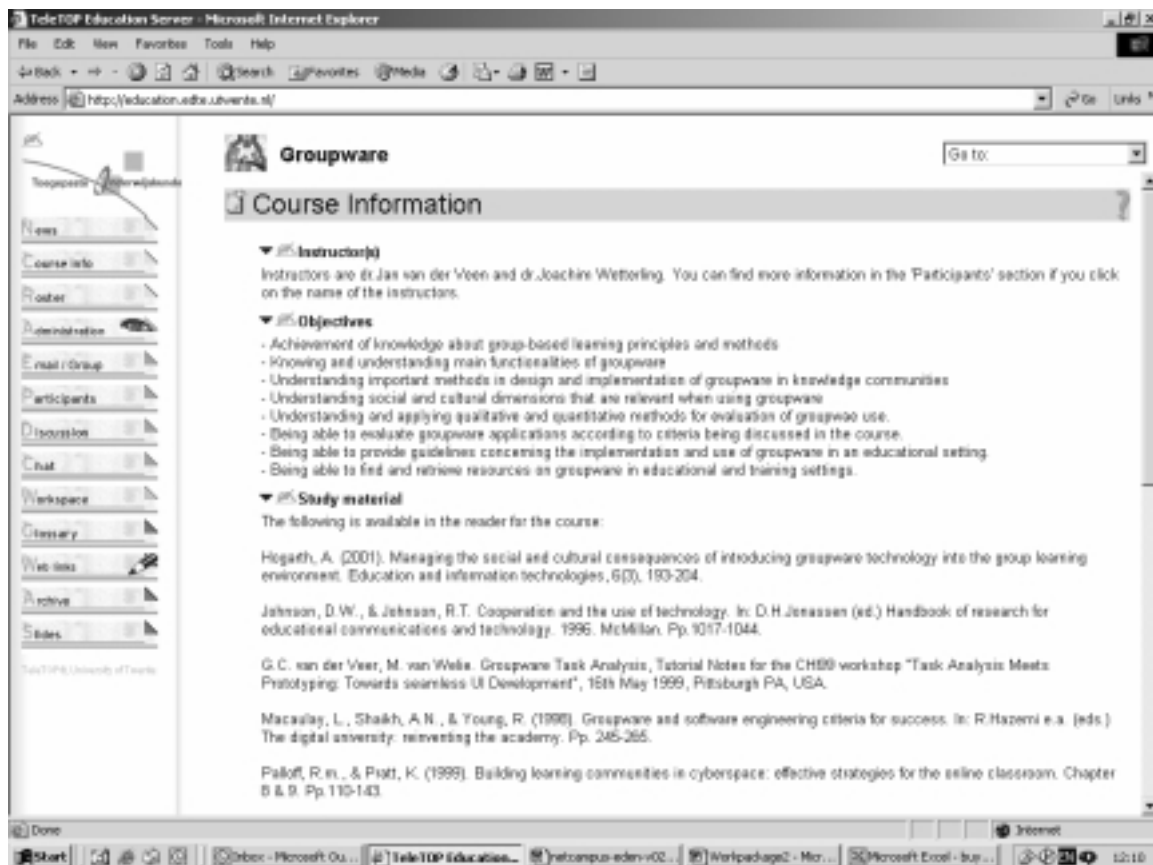


Figure 1: Screen dump of the course website for the ‘Groupware’ course in the TeleTOP course management system.

The assessment of the ‘Groupware’ course is based on two parts:

- During the course three formative assignments were used to let students integrate what they have read in the reader and their experiences in working with real groupware applications. These assignments covered each a different topic in the course such as functions and features of groupware, social and cultural issues and evaluation of groupware.
- A final project in which students have to analyze and/or evaluate a groupware application in a practical situation. In this project students had to work in groups to either make a design for a groupware application in a specific educational situation or to evaluate an existing groupware application that already has been in use. The design groups did not produce a ‘real’ application but they had to provide a functional design.

Further, all students have been kindly asked to submit a short profile of themselves to the course site. The majority of the students attend the course online so this would be a good way to learn about fellow students.

Problems: This section discusses the experiences in the ‘Groupware’ course in the context of the framework that has been presented in the first part of this paper. Thus problems that occurred in the course are differentiated in attitudinal and practical origins and types of problems were differentiated in pedagogical, technological and organisational problems. Table 2 provides a selection of experiences in the ‘Groupware’ course according to this framework.

Table 2: Categorization of experiences in the ‘Groupware’ pilot course.

	Attitudinal	Practical
Pedagogical	<p>Less collaboration than expected.</p> <p>Different learning styles.</p> <p>Steering students in assignments proves difficult when background is unknown.</p> <p>Not all students are used to student-centred approach.</p>	<p>Differences in prior knowledge, expectations, goals and culture.</p> <p>Differences in study skills for studying at a distance.</p> <p>More time-consuming for learners and students</p> <p>Selection of course material.</p> <p>Determining course goals for unknown student group.</p>
Technological	<p>Students not being experienced with the TeleTOP course environment.</p>	<p>Students in the four sites do not have the same infrastructure, which leads to frustrations.</p> <p>Students are used to file formats, platforms.</p>
Organisational	<p>Different communication styles and curriculum lead to problems in workflow.</p> <p>Different working habits limits collaboration at a distance.</p> <p>Roles of stakeholders during the course.</p>	<p>Some sites have f2f meetings and some don’t.</p> <p>Differences between sites as coaching of students is concerned.</p> <p>Rostering course activities.</p> <p>What business model to use for course credits and costs.</p>

Problems as given in table 2 are not the only problems that were encountered during course delivery. To solve these and other problems in general an ad-hoc approach is used. That means when problems occurred the instructors discussed these problems with students and / or staff members to see what could be done. Communication with students and staff abroad usually was via e-mail. E-mail also was the usual communication line between instructors and on-campus students in Twente but these students also could easily walk along the office of the instructors to discuss problems.

A few solutions to problems during delivery of the ‘Groupware’ course are:

- Students were given the opportunity to form their own groups or if they wish to work individually on assignments.
- After difficulties with understanding the first assignment a more detailed description of the second and third assignment was provided.
- Students were encouraged to suggest alternatives for collaboration tools, which led to the Finnish students arranging a chat channel for the course on IRC (Internet Relay chat).
- To improve the course quality for students abroad instructors on their sites are given instructor rights for the course website in the TeleTOP environment.
- Flexibility in deadlines as submission of assignments is increased during the course.

Conclusions

The objectives of the NetCampus project are as follows defined in the project plan:

- To promote the understanding of qualities and characteristics of online and distance learning developed in a network of universities (“networked learning”)
- To clearly demonstrate the potential of networked learning
- To remove the barriers that obstruct a successful implementation of this kind of learning in mainstream education

To what extent did the ‘Groupware’ course as a pilot contribute to these objectives? As the first objective is concerned the course certainly provided a better insight in how students learn when they are in a learning environment with fellow learners from a variety of cultures, countries and levels of expertise. Qualities are there not only in efficiency (larger numbers of students can do the same course thus reducing per student costs) and effectiveness (collaboration among students with different backgrounds providing a higher quality of learning experience for all learners) but also for instructors because the course provided valuable insight in how networked learning can add to teaching and learning strategies when possible. As the second objective is concerned the course on one hand showed that networked learning has a great potential within Europe because of the motivation with which both students and staff participated in the course. This is not only for those on-campus in Twente but also those in the other three locations, Helsinki, Kosice and Ljubljana. Also the course showed that systems such as the TeleTOP system could be used in networked learning just as good as in campus-based learning at the university of Twente. And as the third objective is concerned the course has shown that it is practically possible to deliver the same course to students of different locations, different levels of expertise and different professional background. Even tough reservations have to be made because problems were encountered caused by the diversity of students, work forms, delivery methods and infrastructures. See the previous section and in particular table 2 for more information.

As a final conclusion it can be stated that networked learning as has been realized in the ‘Groupware’ course can add to quality improvement both for students and for instructors. All involved however have to keep in mind that it is not the same as teaching for a group of students who are in your seminar room and who can visit you in your office throughout the course. Different communication as well as the need for adaptation in level, background, learning methods and culture are main reasons for a careful implementation of networked learning. Problems should nevertheless not be seen as a barrier to innovations in this area but rather as a challenge.

Acknowledgement

The NetCampus project has been carried out with the support of the European Community in the framework of the SOCRATES programme.

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UNIPHORM – OPEN EDUCATIONAL SERVICES ON OPEN GIS

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Introduction

Geographical Information Systems (GIS) have become important elements of information strategies in local government, utilities, national government, non-government agencies, environmental agencies and consultancies, mapping agencies and many sectors of business. They represent the fast growing sector of the information technology market with European sales of software alone now exceeding 200 million € per year.

GIS are important for two main reasons. First, the use of geographic referencing of data for mapping provides a common referencing system for multiple data sets. This means that disparate data sets can be used easily together and the benefits of combining data thus realised effectively. Secondly, the map is a powerful visualisation tool for complex or multiple data sets. GIS thus open up data usage to wider audiences, enable dissemination of information and stimulate ideas.

These benefits of GIS have led to their growing importance in many sectors and their widespread adoption in the information age. As in most areas of information technology, there are rapid changes in the nature and capabilities of GIS. These changes present problems for agencies wishing to adopt GIS because of the shortness of product cycles in relation to development cycles. Dealing with such problems is commonplace in the information sectors.

At the present time, however, the GIS industry is undergoing a major shift of emphasis to what are called open systems. The term open systems means a situation in which different GIS software products can be made to work together from a single interface and in which data in different formats from different systems can be used in combination within a single software product. Open GIS development involves new types of software products which provide links between database and GIS software and allow users to access both without problems of incompatible data format. These developments are designed to derive benefit from the setting up of networks, from local networks to the internet.

The benefits of network working and Open GIS are likely to be considerable. The Open GIS idea extends the potential for combining data, for dissemination of data and for new ventures which require disparate data sets from several types of system. Because of these potential benefits the idea of Open GIS is being championed by all the major vendors of GIS, by the National Government Agencies.

As well as benefits there are risks to these developments. The major risks come from the capacity of organisations to adopt open systems. A number of factors determine this capacity and principally they are:

- adoption of open GIS ideas by management
- capacity for rapid change in organisations
- skills level of engineers and technicians.

Improving skills levels amongst professionals comes up against the universal problem of educating and training people in work. The most effective solution is part time distance learning. The UNIPHORM course is a distance education programme for engineers/technicians on use of open GIS.

International links are important in such a programme not only because of the social, economic and political benefits of linkage between the two areas but also because of the technical demands of open systems. Effective use of open systems demands common international standards for data storage and transfer. Additionally the benefits of open systems are most likely to be achieved with common interface design principles and working practices for task analysis, data maintenance and visualisation.

The course was developed by the UNIPHORM consortium, which includes 4 UNIGIS sites (Austria, Hungary, Romania and UK), 2 PHARE Study Centres (Miskolc, Hungary - Bucharest, Romania) and GISIG. UNIGIS is a virtual university in GIS formed by 18 universities around the world. GISIG is the largest European network of GIS educators and users having more than 100 member institutions (Márkus and Petch, 1998).

Educational level and target groups

The educational level of the proposed course is at the equivalent of honours degree at UK universities and Higher National Diploma. This recognises the professional status of the proposed market who will be qualified engineers or senior technicians.

Additionally a course at this level complements the existing courses provided by UNIGIS and GISIG, which are aimed at managerial level. These courses are already very successful in addressing market needs in GIS Distance Education in different countries.

Example of the target groups are:

- Engineers, needing education and training in information technology developments
- Adult professionals, needing short intensive retraining and skills updating courses
- University graduates, requiring specific skills for entering the labour market

The educational needs shown by independent market research by UNIGIS are for focused technical training and support. Research also shows that delivery should be in brief intense packages which require minimum time away from work. There should be small incremental costs. Training should be directly applicable at work.

Impacts and benefits

A number of benefits will follow from the adoption of open systems:

- Open Systems (OS) ensure interoperability i.e. no barriers to sharing software and data resources and capabilities.
- Adopting OS accelerates business process re-engineering and ensures adoption of standards.
- Adopting OS has significant benefits for IS project implementation suited to Rapid Application Development (RAD) environments.
- Use of OS improves decision making through information access and favours public access to data.

In addition, the proposed course will bring a number of specific benefits:

- The course will provide a pool of skilled engineers/technicians with good transferable skills
- It will ensure capacity of GIS operations in the transition to the information society to benefit from coming technological developments
- It will help to ensure integration of international working practices and adoption of standards
- It will stimulate IS market for open systems
- It will link and strengthen ODL network
- It will provide stimulus to IT in ODL centres

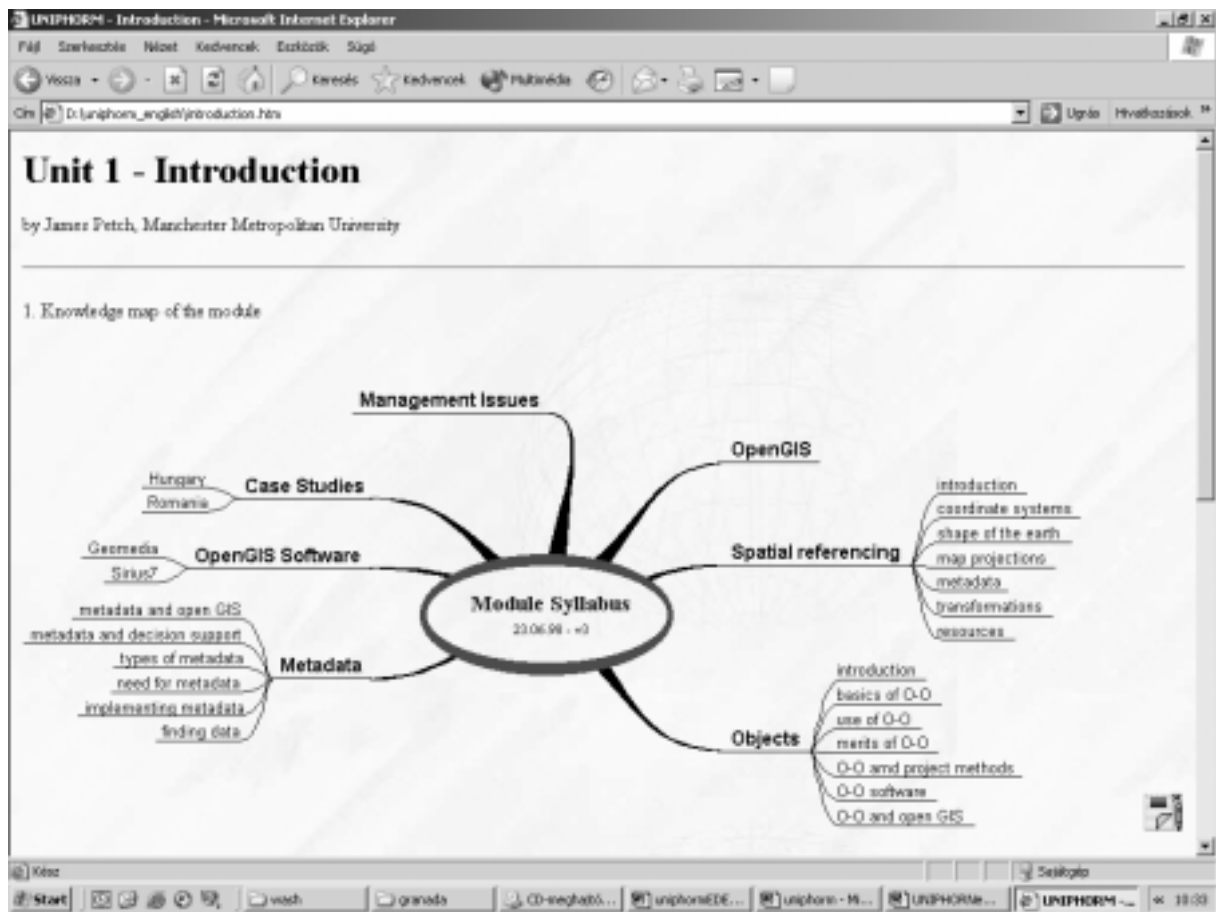
Course development methods

The development was based initially on existing materials being made available from UNIGIS. The development methodology was a Rapid Application Development (RAD) using prototyping initially to:

- assess user needs
- assess trainer needs
- specify course content
- design and test delivery mechanisms

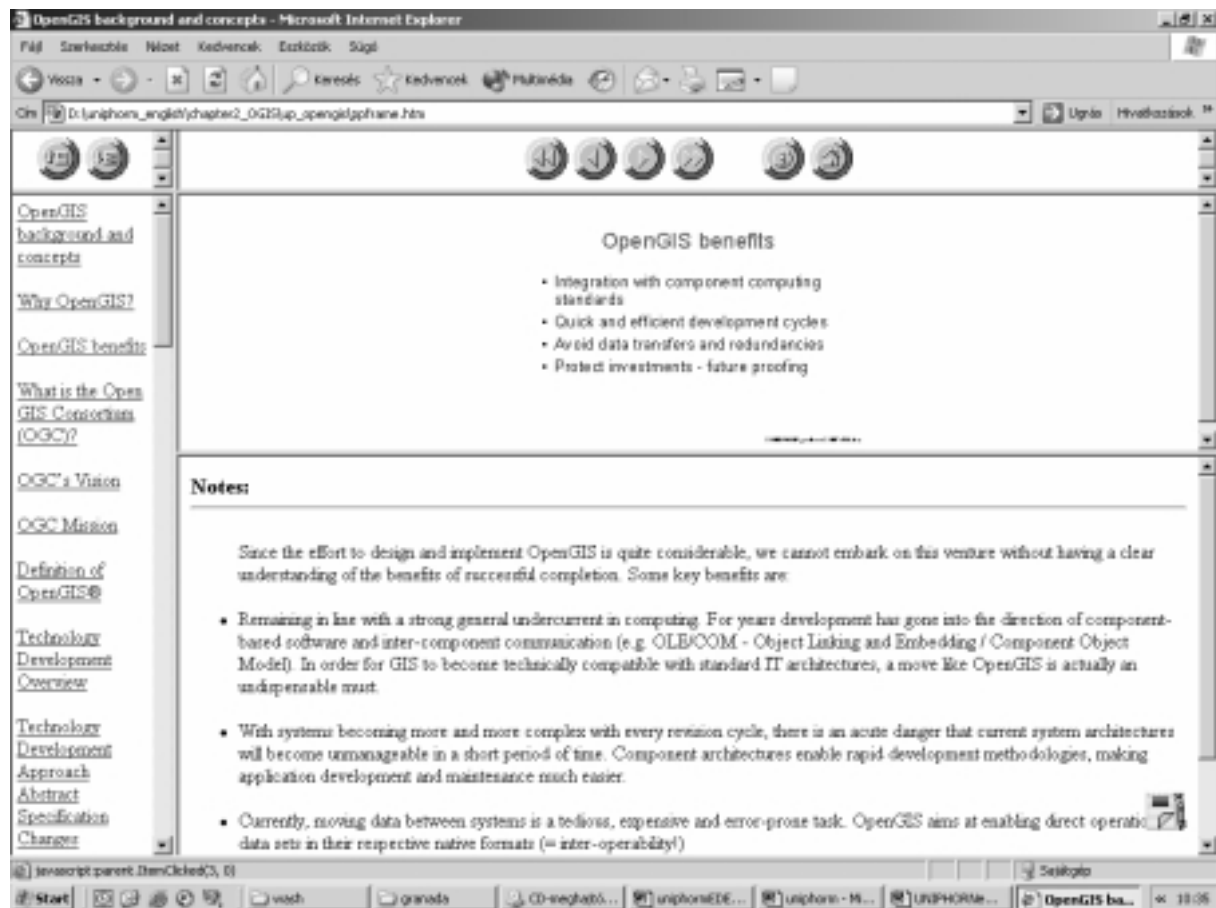
Prototyping used in this way replaced the usual project stage of specifying user requirements and scoping a project. It ensured user participation in these crucial stages of the project. The existing materials from UNIGIS allow this novel approach and help to ensure success within a very tight time frame.

The principal tool for course design and organisation of the resources is a mindmap created using Mindman software. The mindmap is also used as a presentation tool since students and staff can use it to see the course structure and logic as well as the links to and meaning of resources. This is an important pedagogic element, which is difficult to achieve in other ways.



MindMap of Unit 1

Building the mindmap is actually the first stage in course design. The course author uses Mindman to lay out the structure of the lesson on which the PowerPoint show is based. Resources are then collected to satisfy the demands of the course. Resources held as local files or on the web are connected via hyperlinks on any of the mindmap branches. The branches are highly configurable in terms of their location as well as easily edited. This means that authors can easily engineer or modify the structure and the resource links according to particular needs or in response to new or changing resources. Mindmaps can be exported as active images for use on web sites or as java applets of pages, which can substitute for PowerPoint shows.



PowerPoint demonstration with notes in HTML

Curriculum

Complete and full presentation of a curriculum at this time is not possible. This is because of the state of flux in Open GIS development. Nor is it desirable in this project because there is no possibility within a short time frame of delivering a complete curriculum. It is possible, however, to set out the main components of a curriculum. This covers software, systems support, transferable skills and hardware support. In each area there are implications in the move to open systems which will impact on engineer/technician roles and responsibilities.

A list of topic areas in a Draft curriculum is given below:

Modules

Software

Open GIS concepts
Interoperability concepts
GIS in embedded systems
Data models, data capture, data transfer
Geo Transfer protocols

System Design

Databases, design, open database systems, data dictionaries
Geo transfer formats
Interface design - VB
CGIs
Metadata

<i>System Support</i>	System maintenance
	Operating systems
	Networks, Internets and intranets
	Tuning systems
<i>Transferable Skills</i>	Quality assurance and control
	Documentation
	Writing and working to specifications
	Project stage management
<i>Hardware Support</i>	Peripherals
	Networks
	Platforms

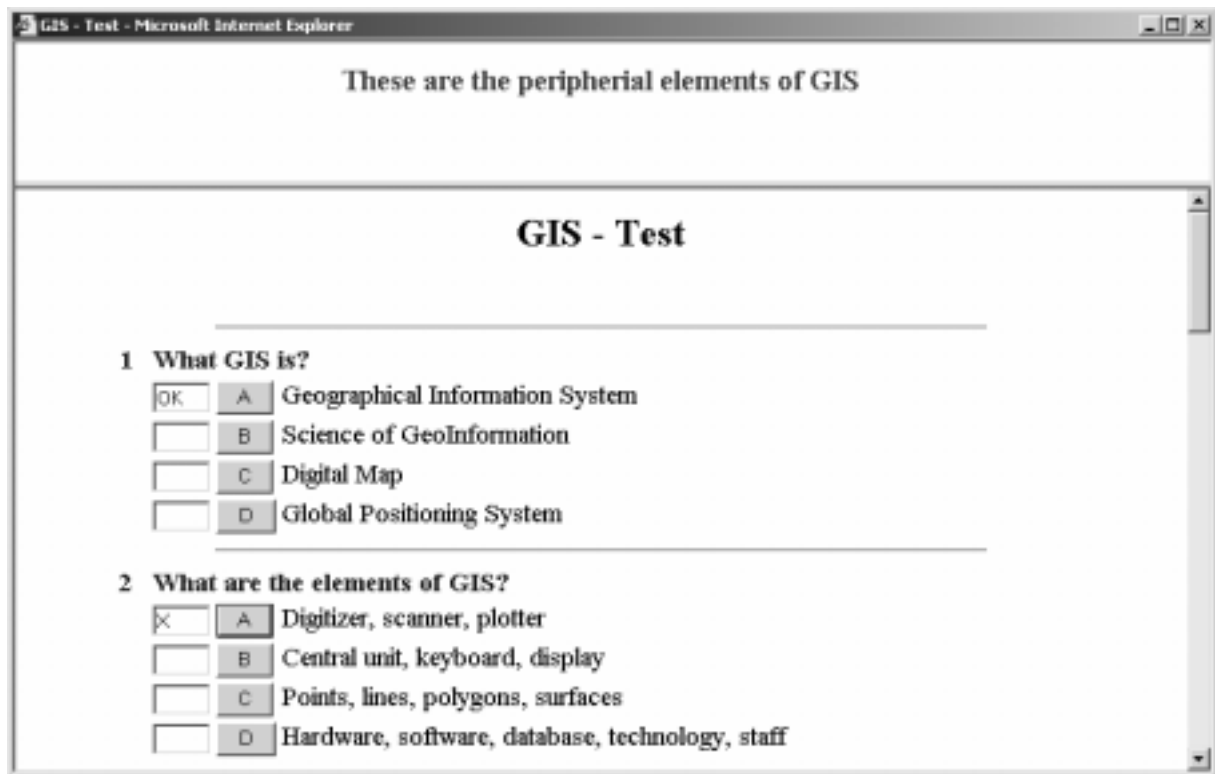
It is important to note that the assumption behind a curriculum for this area of information technology *must not be* to set out a complete and structured framework for study. On the contrary, the problem of a curriculum is to meet the immediate, short-term demands of the market, which can access limited areas effectively. The focus of curriculum design therefore is on effective structuring and updating.

This course will concentrate on a number of key areas for Open Systems and deliver only part of this curriculum. Also, the UNIPHORM Consortium will have as continuing task, the refinement and update of a curriculum in this rapidly changing area.

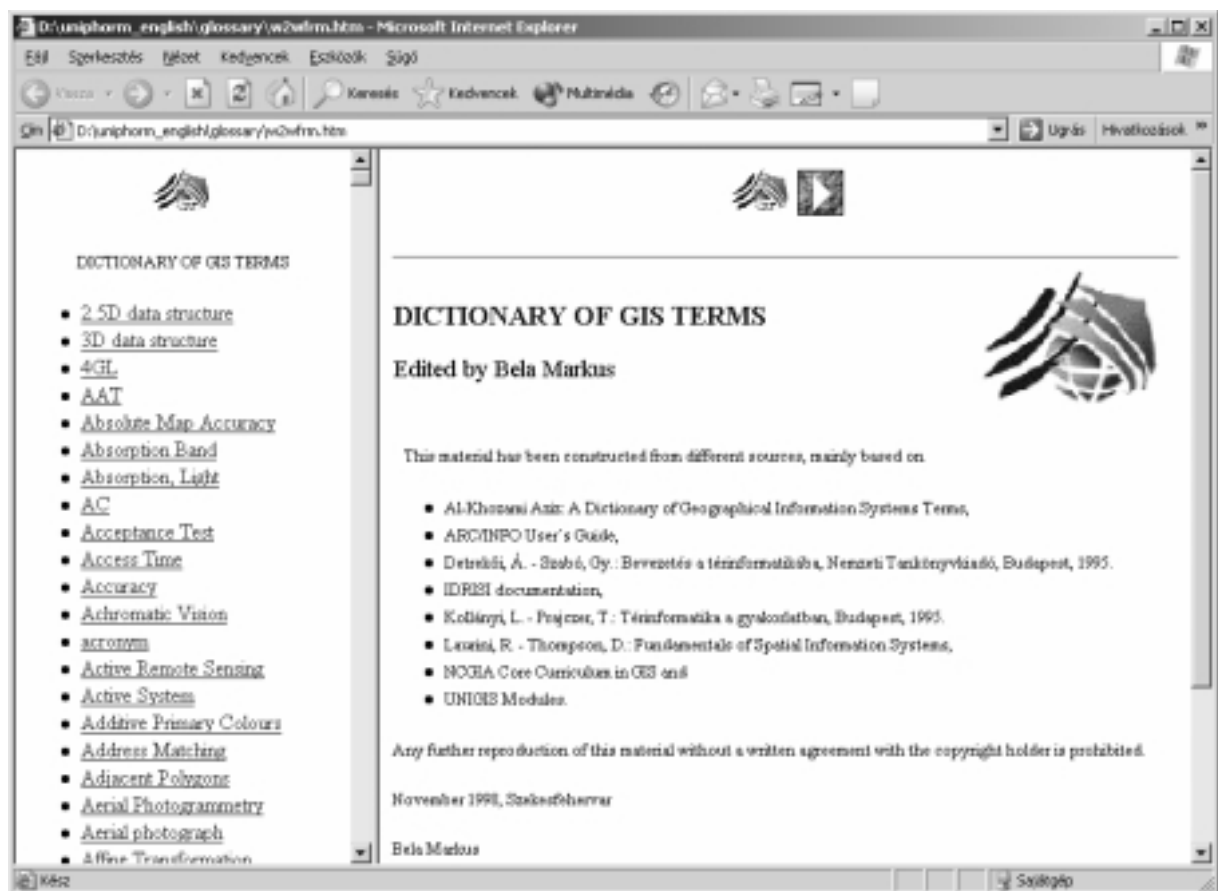
Course content

The course materials are in HTML form on a Web-site and CD-ROM, which has the following main units (Márkus, 1998):

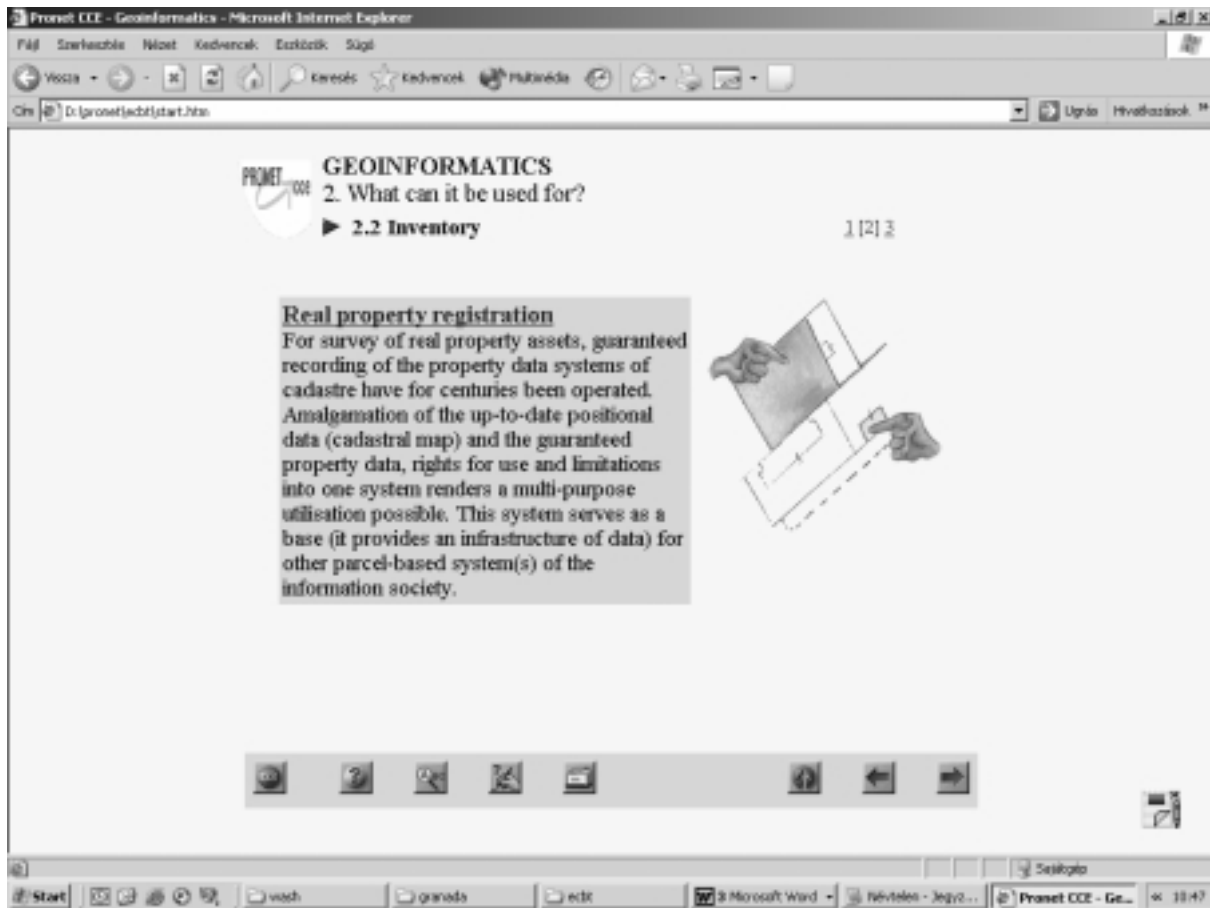
- Introduction
- OpenGIS concepts
- Object oriented systems
- Spatial referencing
- Metadata
- Management
- Software
- Resources
- Case studies



Each unit includes structured sequential self assessment.



The learner is supported by a GIS Dictionary



GIS for beginners – an introductory learning unit

Course delivery

The original course duration is 8 - 18 weeks with an equivalent of 120 hours of distance study, followed by a face-to-face training session (40 hours), which will expand the participants' understanding and knowledge of the subject through case studies and group work using a market leading OpenGIS software package. The static learning resources are amended by a Web-site (<http://uniphorm.cslm.hu>). The tutors can be selected from the world-wide network of GIS experts. The course is recognised by a certificate of UNIPHORM Course Board, the ODL Study Centre and UNIGIS International.

The learning units are supported by selected literature in the form of Web links. To help GIS beginners there is special unit - GIS for beginners. The UNIPHORM Web-site contains many valuable other learning resources and support. A Dictionary of GIS terms is also available containing around 1000 specific terms.

There is an advanced element of the course, which deals with Guidelines for Best Practice in User Interface for GIS, intended to help GIS users to achieve Best Practice in using GIS for their job and hence to achieve added value from their systems. The Guidelines deals with needs and requirements of end-user organisations. This process can be facilitated by adopting the user-centred design (UCD) paradigm, commonly applied in several engineering fields but not very well-known in the GIS domain.

The course contains the following elements:

- 1-day introductory workshop,
- 10-week (120 hours) distance learning with self assessed exercises and continuous Web and other support, 3 tutor assessed assignments
- two 1-day intermediate workshops for consultancy

- 3-day face-to-face final training session
- The course will be finished with an exam.

UNIPHORM as a NetCampus pilot

The general objectives of the NetCampus project are:

- to promote the understanding of the qualities and characteristics of ODL developed in a network of universities (“networked learning”)
- to clearly demonstrate the potential of networked learning, and
- to remove the barriers that obstruct a successful implementation of this kind of learning in mainstream education

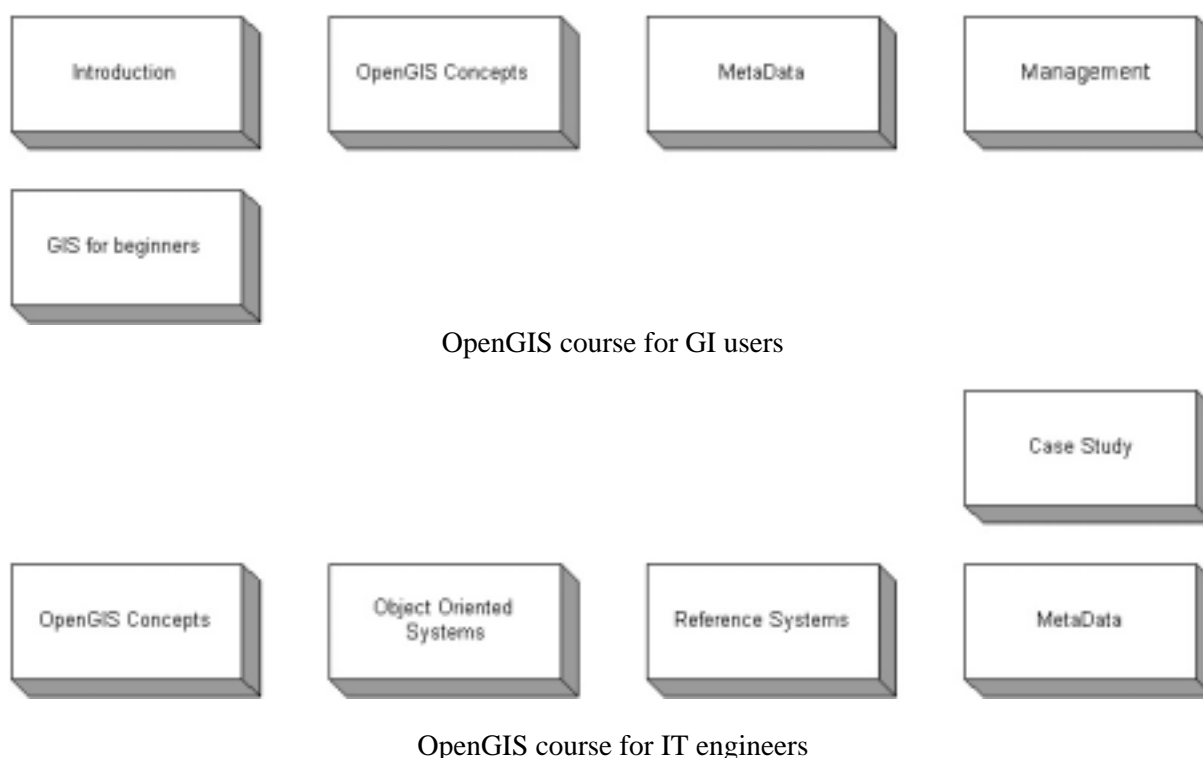
UNIPHORM is aiming East-West collaboration – This pilot will investigate how a course on GIS, developed specifically for the national context in Eastern Europe, can be transferred to other countries in Europe.

The NetCampus partners as potential disseminators have very different background, GI needs and experiences.

There are 3 proposed short courses:

1. OpenGIS course for GI users – this is a fully internet based course without contact hours. If needed a GIS for beginners multimedia course is available. 2 tutor assessed assignments are required.
2. OpenGIS course for IT engineers – the course is provided by software and data. A 3-day workshop is recommended at the end of the course. 2 tutor assessed assignments and completion of a final GIS project are required.
3. OpenGIS course for managers - this is a fully internet based course without contact hours. 2 tutor assessed assignments are required.

University of West Hungary, College of Geoinformatics will provide Internet services and UNIPHORM Consortium will give tutoring support if necessary.





OpenGIS course for IT managers

Conclusion

Due to advances in digitisation, processing speed, storage and communications, we are living in a networking revolution. Higher education will have a crucial role in developing these capabilities as well as educating the people who will use them. New job opportunities will be created in the processing, organizing, packaging and disseminating of spatial information. The networked world is changing the way we create products and provide services. All around us we find new tailored products, targeted marketing and customisation. Consumer demand for more choice, higher quality, lower cost, better service and convenient access is a dominant force affecting all industries, including higher education (Oblinger – Verville, 1999).

The NetCampus project is based on a successful previous UNIPHORM project but created an even more flexible and widely applicable staff development service that can be used by individuals from many civil service disciplines. The provision of such a resource is essential for adequate staff development to support those preparing for the global information society.

We must transform all traditional institutions of learning in order to prepare students for their future, not for our past. In addition to basic professional skills, every learner should master communication, collaboration, and creative problem solving. These very important skills and attitudes are needed in the new information age and hopefully strengthened by the introduced UNIPHORM services.

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EVALUATION OF EXPERIENCE WITH A WEB BASED MULTI-CAMPUS E-LEARNING COURSE AT THE UNIVERSITY OF BOLOGNA

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1. Introduction

The University of Bologna, with more than 100.000 students, is one of the largest Italian Universities and has been one of the first European Universities to promote the development and continuous upgrade of a capillary internal network (Almanet). The first educational use of Almanet dates back to 1995 when the appearance of the first Internet providers in Italy allowed testing Web servers as auxiliary tools in the context of traditional courses accessible to students also outside the academic environment [1]-[3].

The subsequent step, i.e. the distribution of a whole course on the Internet has been performed in 1997 not in a distance learning context but to test alternate asynchronous multicampus distribution channels for optional specialization courses usually selected by a limited number of students.

This paper describes the structure of the course *Dynamic System Identification* that has been officially tested at the Universities of Bologna and Ferrara from the academic year 1997/98 and the opinions of the students that have followed this course; this evaluation has been carried out in the context of the NetCampus project coordinated by the EuroPACE consortium. Section 2 describes the design philosophy of the course, Section 3 the tools used for its realization while Section 4 reports the opinion of the users on some of the course features. Some comments and concluding remarks are finally reported in Section 5.

2. Design of a multi-campus pilot course

The main purpose of this experiment does not concern distance learning in the traditional sense, where distance is intended in the Euclidean sense and not, for instance, in terms of channel bandwidth. The focus was, instead, concentrated on the possibility of offering the whole learning path of courses usually followed by a reduced number of students in a more flexible and geographically extended environment suitable also for evaluations in terms of economic and pedagogic efficiency [4]-[5].

The selection of the typology of the course for this experiment has thus been restricted to specialization courses, usually followed by a reduced number of students inside single faculties or single universities and thus penalized by reduced economic efficiencies. These courses are however often characterized by strong connections with research and their elimination would lead to dispersions of cultural resources not compatible with high qualitative standards. Moreover specialization courses are often rich of professionally relevant contents. For these reasons they constitute, more than basic courses, interesting targets for experimenting solutions alternative to traditional ones.

Other considerations that have oriented the structure of the course toward an asynchronous choice were based on the fact that traditional synchronous courses, based on the unity of place and time, leave to the teacher the control on the time left for learning. In these contexts students must adapt to prefixed schemes and also non-presential courses relying on real-time distribution channels like TV transmissions or videoconference are often unsuitable for continuing education purposes because of the activities in which many students are engaged.

Another aspect that has been considered of paramount importance for the overall quality of the course regarded the level of interaction between teacher and students and between students and contents of the course since it plays a fundamental role in the whole learning process. Also the practical application (in the laboratory or on the field) of the notions acquired by the students has been considered as an important design factor.

The final goals were eventually defined as follows:

- Contents suitable for both degree curricula and continuing education contexts. Possibility of inserting the course in more curricula.
- Modular structure allowing extracting learning paths suitable for courses at different levels, from diploma to Ph.D.
- Asynchronous delivery and interaction channels to transfer the control on learning times from teachers to students.
- Access to effective tools allowing the application of the acquired knowledge to real situations.

3. The pilot course: Dynamic System Identification

One of the courses suitable for the experiment has been individuated in the area of the identification of dynamical processes. Identification consists in constructing mathematical models for dynamical processes on the only basis of measures, affected by errors, performed on the process to be modeled. This approach, differently from classical modeling procedures, does not require any information on the physical nature of the process to be modeled or on the laws governing its evolution. For this reason identification techniques can be applied to many processes (chemical, electrical, mechanical, petrochemical etc.) in several fields (biology, economy, medicine, meteorology etc.). The course, designed to rely on Internet for its delivery, is essentially constituted by the following elements [6]-[7]:

- PDF (Portable Document Format) hypertexts with the contents of the course modules. Because of the substantial mathematical contents the texts have been composed using TeX and subsequently transformed to PDF hypertexts by means of Adobe Acrobat.
- Remote tutoring, implemented by means of specific forms and taking advantage of the possibilities of Web servers in two-way communication.
- A database of measures performed on several real processes. These data can be downloaded or accessed from the identification laboratory.
- Interactive identification laboratories allowing students to face the problems associated with the modeling of processes that fulfill only in part the assumptions at the basis of the procedures described in the course. The use of Java for the development of this laboratory assures its complete platform-independence. Every ambient of the laboratories is endowed with tools for performing the identification of a process according to one of the procedures described in the course and for testing the validity of the obtained models.

The availability of graphic tools greatly improves the possibility of performing fast but reliable evaluations and comparisons, particularly in the first steps of the identification of a process.

An important aspect of the development of this laboratory, which is completely self-contained, concerns its efficiency that could have been a critical factor in on-line identification of complex systems, particularly when long sequences are available. To deal with this aspect an accurate analysis of the time required by every step of the algorithms has been carried out and a subsequent optimization performed.

The course, whose initial kernel has been developed in the context of the European Project VirtUE (Virtual University for Europe) is at present inserted in the five-year curriculum for a degree in Computer Science, Electronic and Communication Engineering at the University of Bologna and in the curriculum for a degree in Electronic Engineering at the University of Ferrara, the universities targeted for carrying out a multicampus experiment. Parts of this course like some of the identification laboratories are also used inside other courses or in specialization post-graduate paths.

4. The information collected from the users

Part of the information collected from the users after completing the learning path and sustaining the final exam is described by the percent response to the following questions:

What's your evaluation (independently from this course) of the possibilities offered by the use of Web servers in learning processes?

Not relevant (0%)
Of modest relevance (0%)
Useful (33.3%)
Very useful (55.6%)
Fundamental (11.1%)

How many courses that you have followed relied in an effective way on the possibilities of Web servers?

None (33.3%)
One (33.3%)
Two (22.2%)
Three (11.1%)
More than three (0%)

How many times have you connected to the Course Web server?

From the Engineering School	< 10 (22.2%)	10-20 (11.1%)	> 20 (55.6%)
From your house in Bologna	< 10 (11.1%)	10-20 (11.1%)	> 20 (22.2%)
From your house outside Bologna	< 10 (0%)	10-20 (22.2%)	> 20 (22.2%)
From other places	< 10 (22.2%)	10-20 (0%)	> 20 (0%)

Which characteristics of the PDF format do you think are more interesting for mathematically oriented hypertexts?

The capability to properly represent symbols, formulae and expressions (77.8%)
The possibility to enlarge or reduce any element (11.1%)
The capability to include graphics (44.4%)
The possibility to include links to other kinds of hypertext (e.g. HTML) (44.4%)

The graphical and computational tools available inside the course have been developed using the JAVA language. Which are, in your opinion, the more interesting characteristics of JAVA?

The possibility of realizing software modules (Applets) independent from the user's hardware (66.7%)
The possibility of realizing software modules (Applets) independent from the user's operating system (55.6%)
The possibility for the user to download not only data but also specific computing environments (22.2%)
The possibility of developing software running on the client instead of the server (55.6%)

What's your evaluation of the user interface implemented on the course server?

Ugly (0%)
Smart (44.4%)
Rationale (88.9%)
Not clear (0%)

What's your evaluation of the operative features of the user interface implemented on the course server?

Easy and intuitive (100%)
Scarcely intuitive (0%)
Rationally structured into homogeneous sections (77.8%)
Not navigation-oriented (0%)

The course is in English. What's your evaluation of this choice in a European environment?

An Italian version would have been more comprehensible (0%)
Useful because based on a language necessary for an engineer (88.9%)
I didn't have any problems because I have a good knowledge of technical English (100%)
Globally useful even if I had remarkable comprehension problems (0%)

What's your technical evaluation of the tutor-student interaction?

Not adequate (0%)
Adequate (11.1%)
Efficient (33.3%)
Very efficient (55.6%)

The whole tutor-student interaction environment is based on the capabilities of Web servers as bi-directional communication tools in order to achieve results not obtainable by using standard e-mail. How do you evaluate this choice?

Without real advantages (22.2%)
 More advantageous than e-mail (44.4%)
 Remarkably superior, from an educational viewpoint, with respect to e-mail (33.3%)
 More reliable than e-mail because of the real-time reception confirmation (33.3%)

One of the key features of the course project concerns a tutoring that follows every student from the beginning of the learning path to the final examination. How do you compare this approach with the on-request assistance present in traditional courses?

Without real advantages (0%)
 Effective (33.3%)
 Very effective (44.4%)
 Capable of eliminating the uncertainties associated with traditional final exams (77.8%)

What's your evaluation of your tutoring experience?

I have not used this service (0%)
 I have used this service but its relevance has been quite modest (0%)
 Tutoring helped me on a psychological basis (22.2%)
 Tutoring has had a positive effect in the learning process (100%)

Evaluate, giving a mark between 1 and 5, the following characteristics of the process database available on the course server:

Significance of the available processes	1 (0%)	2 (0%)	3 (0%)	4 (33.3%)	5 (66.6%)
Process information adequacy	1 (11.1%)	2 (11.1%)	3 (33.3%)	4 (22.2%)	5 (22.2%)
Easy access to data	1 (0%)	2 (0%)	3 (0%)	4 (33.3%)	5 (66.6%)
Adequacy of visualization facilities	1 (0%)	2 (0%)	3 (22.2%)	4 (44.4%)	5 (33.3%)

Evaluate, giving a mark between 1 and 5, the following characteristics of the virtual identification laboratories:

Easy use	1 (0%)	2 (0%)	3 (0%)	4 (22.2%)	5 (77.7%)
User interface	1 (0%)	2 (0%)	3 (0%)	4 (22.2%)	5 (77.7%)
Interaction with process data base	1 (0%)	2 (0%)	3 (22.2%)	4 (33.3%)	5 (44.4%)
Efficiency of the implemented algorithms	1 (0%)	2 (0%)	3 (11.1%)	4 (66.6%)	5 (22.2%)
Robustness of the algorithms	1 (0%)	2 (0%)	3 (22.2%)	4 (44.4%)	5 (33.3%)

Which role plays the use of virtual laboratories operating on real processes in the comprehension of the theoretical aspects of identification?

Inessential (0%)
 Modest (0%)
 Useful (11.1%)
 Very useful (11.1%)
 Essential (77.8%)

How do you evaluate the professional capabilities deriving from working with real data in the operative contexts available in the virtual laboratories?

Inessential (0%)
 Modest (0%)
 Useful (11.1%)
 Very useful (11.1%)
 Essential (77.8%)

The admission to the final exam requires the identification of a real process. Which are the main difficulties that you have met in this preliminary test?

The choice of the model class to be used to describe the selected process (44.4%)
The evaluation of the correct model order (33.3%)
The estimation of model parameters (0%)
Model validation (55.6%)

How do you compare the contents of this course with those of other specialization courses?

Poorer (11.1%)
At the same level (33.3%)
More application-oriented (66.7%)
Less application-oriented (11.1%)
Less profession-oriented (11.1%)
More profession-oriented (66.7%)

How do you compare the difficulties that you have met in this course with those associated with other specialization courses?

No significant differences (22.2%)
The learning path has been easier because of the available tools (44.4%)
The learning path has been less easy (0%)
The learning path has been easier because of tutoring (66.7%)

How do you evaluate the absence of traditional lectures in this course?

A feature not properly balanced by other features (0%)
A feature suitably balanced by tutoring (77.8%)
A feature with a negative influence on the whole learning path (11.1%)
A feature without negative influence on the whole learning path (77.8%)

A feature of paramount importance of this course is its asynchronous design that does not rely on the unity of place and time associated with traditional teaching environments. How do you evaluate this feature?

Inessential (0%)
Very relevant but negative (0%)
Very relevant and positive because of the associated flexibility (88.9%)
Relevant only for limited categories like working students and handicapped persons (0%)
Of general interest and more relevant for specific categories like previous ones (44.4%)

Tutoring has offered an in itinere evaluation that has preceded the final exam. This has led, from a psychological point of view, to face the final exam:

In the same condition as in other courses (11.1%)
In a more relaxed condition (77.8%)
In a more stressed condition (11.1%)

How compares the evaluation that you have obtained in this course with those obtained in other courses?

At the same level (11.1%)
At a slightly higher level (22.2%)
At a slightly lower level (0%)
At a remarkably higher level (66.7%)
At a remarkably lower level (0%)

Would you choose other courses based on the same architecture of this course?

I don't know (0%)
Yes (100%)
No (0%)

Defining as “merit factor” of this course the ratio between the acquired knowledge and the necessary effort and time when compared with other courses, your evaluation is (0.5=double effort, 1=same effort, 2=half effort):

0.5 (0%)
0.75 (0%)
1 (0%)
1.25 (44.4%)
1.5 (55.6%)
2 (0%)

Concluding remarks

A first general consideration that can be deduced from the opinions formulated by the students concerns their positive evaluation of the roles that Web servers can play in education, in contrast with the limited impact of the significant applications that they have seen in their curriculum.

The subsequent questions refer to the specific experience of this course. The mean number of connections to the server is significant and denotes a proper use of the implemented facilities; the fact that most connections have been made from the Engineering School underlines the relevance of the availability of Internet connections inside this structure. The use of PDF, instead than HTML, hypertexts to distribute contents has not created, as expected, any problem and the reasons of this choice (without practical alternatives because of the extended mathematical contents) have been properly perceived. The same can be repeated for the use of the Java language in the development of the virtual laboratories whose platform-independence has been evaluated in a positive way. Positive evaluations have been formulated also for the user interface and for the use of the English language whose knowledge is considered as necessary inside engineering curricula.

Remote asynchronous and personalized tutoring is an essential feature of this course; this service has been used by all students who evaluate its role as very effective and capable of eliminating the uncertainties associated with traditional final exams. It is interesting to note also that the presence of a tutoring service has been considered as sufficient to balance the absence of presential lectures. By contrast, the advantages associated with a management of tutoring services based on the communication capabilities of Web servers have not been completely understood by a part of the students who do not see significant differences between this solution and the use of traditional e-mail; probably they refer more to the similarity of the user interface than to the subsequent management of the information.

The database concerning real processes available to perform identification experiments has been considered as very significant and easily accessible. The available description of some processes has, however, been considered as limited; while some processes could, in fact, be endowed with more detailed descriptions, this is not possible for plants whose details are purposely protected by the owners.

The virtual laboratories constitute an essential part of this specific course and they have been evaluated as easy to use, endowed with efficient and robust algorithms and properly interfaced with the process database. It is very interesting to note the high appreciation for the role of laboratory activities in the comprehension of the various aspects of identification theory on one side and in acquiring professional abilities in the field of identification on the other. The comparison with other specialization courses sees this course as more application-oriented and richer of profession-oriented contents. The absence of presential lectures is considered, as already observed, adequately balanced by the presence of tutoring; the flexibility of the asynchronous design of the whole learning process is highly appreciated.

The global appreciation for this specific course is confirmed by the fact that all students declare that they would select it again while the appreciation for its architecture is confirmed by the unanimous declaration that they would select other courses based on the same design.

Finally, the “merit factor” of the course, defined as the ratio between the effort necessary to acquire a certain amount of knowledge and the time necessary to achieve this goal has been evaluated as remarkably higher (between 25 and 50%) than in traditional courses; this evaluation is probably associated with the asynchronous fruition of the course.

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OCTOPUS¹ – TRANSNATIONAL *ON-LINE* RESOURCE CENTRE A PROPOSAL IN THE DOMAIN OF ENVIRONMENTAL EDUCATION

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Introduction

The emergency of new realities in what concerns the diversity of databases supported by technology which require high technological literacy (Norman, 1993) implies the assumption of an attitude of continuous reflection and the creation of mechanisms of access to information. This principle gave us the basis to the project, in the intention of developing a website which allows the access of users from different regions, with common interests, to sources in the domain of environmental education. This was considered an exploratory area, because, for its transversal characteristics, seemed adequate to test the model, but it doesn't exclude the multidisciplinary possibilities of the resource centre.

This Resource Centre is called so, because it functions as the tentacles of an octopus, both internally, by providing access to several databases inter-connected (in the prototype only the one related to environmental education will be created), and externally, through the effective contribution of each partner, so as allow the users a broader search.

The data base will comprise two components: a browser to select the information needed at different levels of depth, and a section with learning sequences to allow for self-study. On the other hand, the construction of the graphic interface will have into account the possible users of the resource centre, offering them visual metaphors which will facilitate their access.

In terms of concrete results to get, its possible identify the basis body of orienting goals:

- To create a resource centre of didactics features online;
- To create and to customize a database in transnational environmental education;
- To identify and to characterize the potencial users of the centre, with the intention to produce an adequate interface to the profile of the users;
- To search and to evaluate existing media resources in the thematic area.

1. The logic and characteristic of the project

1.1 General Principles

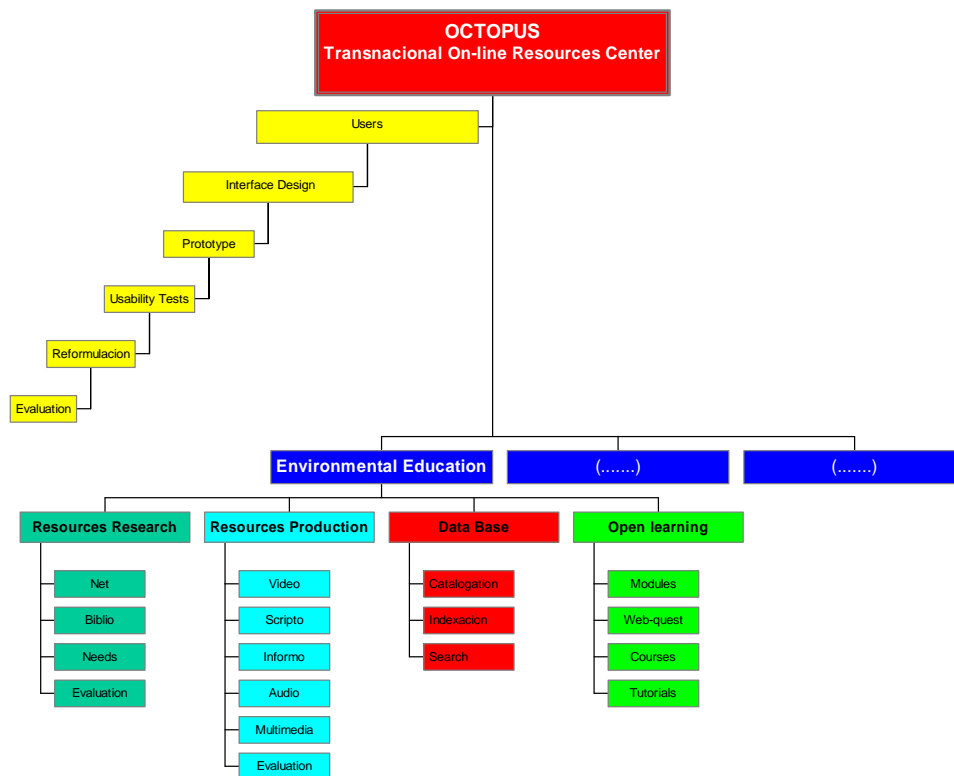
The development of the project essentially consists in the design and administration of a "Transnational On-line Resource Centre", through a Web Site that may help the users to do their tasks faster and with more efficacy, transforming their computer into a truly "cognitive artefact", in the words of Norman (1993).

It is assumed, therefore, that, in the information and knowledge society we live in, it is urgent for the schools to find new ways to integrate in their practices methods to access to the multidimensional net of digital data which is provided by the *Internet*. The enormous growth of the Internet in general and of the World Wide Web in particular made available the digital data situated in basic information units (knots) in form of texts, pictures, videos, among others, connected by links, which are educational resources available to schools in order to foster learning. This possibility implies that the school must integrate

¹ This project was implemented with the financial support of the European Community, within the Socrates Program.

these resources in their practices, through the development of hypermedia applications which have into account the level of technological literacy of the learners, the validation practices, the classification and indexation of this type of educational resources, the paradigms and principles of usability (Dix et al., 1997: 141-177). It also implies the use of the heuristics of usability (Nielsen, 1993:115-155) so as to detect the problems a user might have when using those applications.

This global logic assumes, in the specific context of this project, the following framework:



1.2 Databases for on-line resources and web-based self assessment

1.2.1 Using databases for dynamic presentation of web resources

One of the hottest topics in Internet development community in the past years is web-based databases. Even there are a lot of tools for traditional database tasks, such as data entry and retrieval, these tools also provide opportunities to fundamentally change the way web sites are produced, managed and delivered. There are a number of advantages that result from using databases to generate dynamic information: (re)using existing electronic resources, the content of the interface and the navigational structure can be stored as data objects in order to make easier the administration, to modify and to customise the content, to address specific educational tasks both in and out of the classroom, etc. (Spitzer, 1997). Dynamic and user adapted web content is clearly useful particularly for educational sites, places where the information is changed many times. The design components of a web site are the perfect candidate for automatic management tool, too. Page headers and footers as well as navigation bars are common page elements that need frequent updating (Spitzer, 1997; Smeaton and Neilson, 1997).

When a web site, as OCTOPUS will be, contains media components: pictures, videos, audios, then the databases are an excellent way to manage these components. OCTOPUS project envisages to develop a large database in order to create an intelligent support for uploading and retrieval of different types of information and also dedicated tools to allow a high level of interactivity with the core centre and among the users. We are planning the creation of a specific model in which different types of information are going to be categorised by the same criteria and attributes in order to create a common framework for information uploading, maintaining and updating. This information is going to be presented to the users on different levels of scientific and computer literacy (Buchberger and Berghmmmer, 2001).

The structured material collected by the scientific people in the first phase of the project will be uploaded into the database skeleton created by the software engineers. The consortium will decide on the electronic format of the material, but in any case this will be accompanied by useful information such as: title, short description, keywords, content (text, video, audio), if demonstrations are available, scientific level of the material, who mounted the material, who scientifically approved the material, useful links, etc. This information will be explored by the search engine in order to create the dynamic and interactive content.

Considering recent research in the area of e-Learning, it was discovered that communication among learners and with the tutors and emotional attitude with respect to scientific content and educational environment are very important factors in knowledge acquisition. For this reason, we will introduce ICT tools which will allow different ways of communication and interaction: synchronous (on-line chat for registered users, forum discussions, possibly video-conferencing) or asynchronous (E-mail, newsgroup, etc).

All these will foster co-operation, decrease the isolation between users and will allow for greater reflection time (Bloothoof, 1998; Buchberger and Berghmmer, 2001). Special considerations such as: the computer literacy of the targeted audience, the needed infrastructure, the fonts, the availability of the content, the multilinguality, the re-usability of the material, etc., will be taken into consideration during the technological development.

1.2.2 Web-based assessment tool

Considering the large amount of material which will be mounted on the OCTOPUS site, one can figure out the necessity of an on-line evaluation and assessment tool. This facility can be seen as a complementary one, for people that would like to assess themselves over the web in order to evaluate their knowledge according to specialised questionnaires developed by experienced scientific professors. The user will get a feed-back about his actual level of competencies in some specific fields which are parts of the resource centre.

We have experimented an interesting use of the Web for both formative and summative assessment in Technical University of Cluj-Napoca. A dedicated tool has been designed and experimentally implemented. This assessment environment is based on a secure database which is administered by a super-user. The block diagram of this application is presented in Figure 1, where the web-server acts as a front-end for information presentation and the database is a secure back-end resource which stores the registered users and the available questionnaires. The questionnaires can be active (available for student delivery) or not (they exist in the database, but they can not be seen by the normal users). The professor can access via the Internet the database as an administrator with the rights to change the existing information or to add new items (Figure 2). The professor can publish or activate some specific tests. The administrator is allowed to: edit/delete student data, create/edit/delete a test/problem. (Figures 3 and 4).

The introduction of the tests is very easy as there is a wizard which guides the professor through the whole process. For the student part, there is available a registration form to register as a new user (personal data, login name, password, E-mail, web-address, etc). After the registration, the student can start to solve one of the activated tests. For this, a random subset of questions is given for a specific discipline only one time and in a given time limit (Figures 5 and 6). Re-examination is possible only with the professor's agreement. Common concerns about web-assessment are issues of student identification and plagiarism. Near future work in OCTOPUS, from technological point of view, will be to focus on understanding the topic tree provided by the specialists in environment education, to specify the functionalities of the site, to design the interface and navigational structure and further to develop tools for information presentation in an interactive manner.

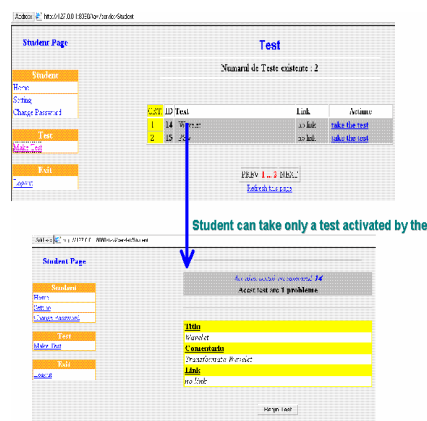
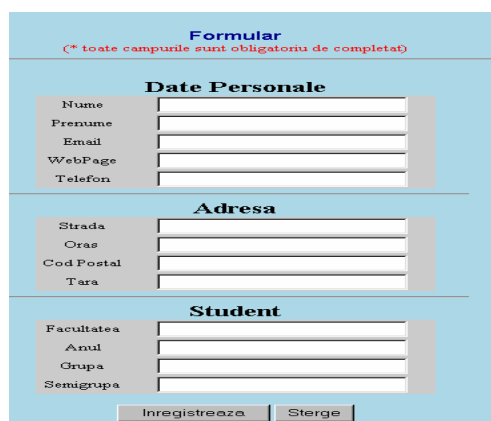
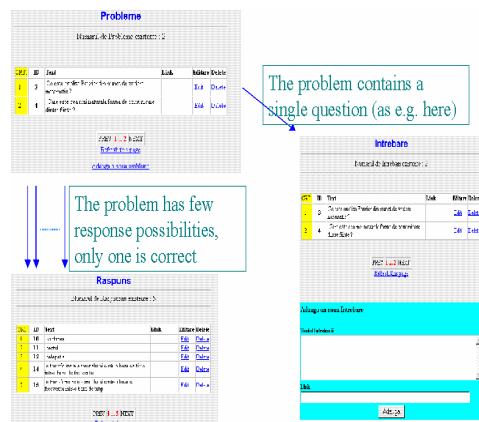
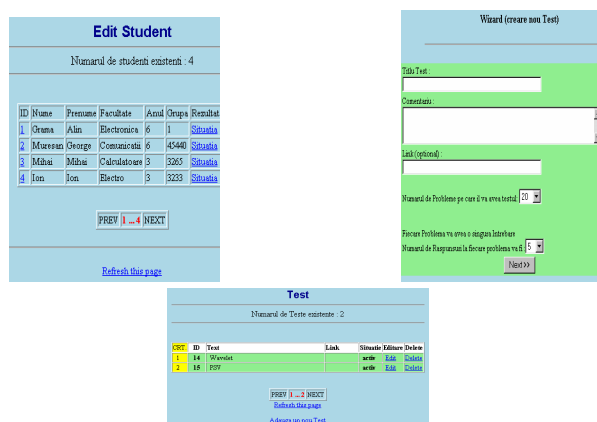
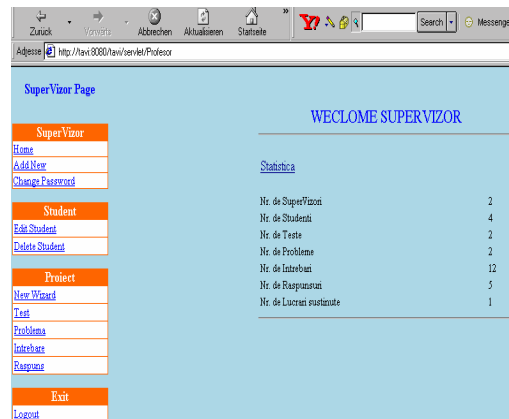
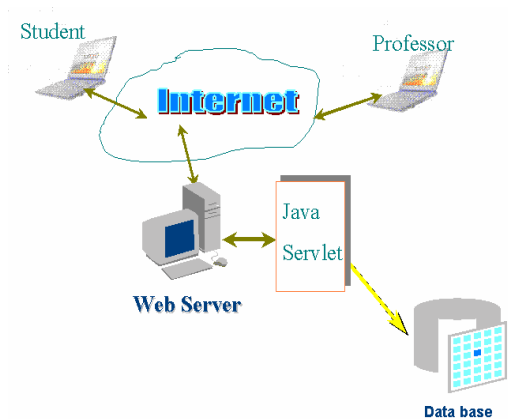


Figure 5. The form for student registration

Figure 6. Selection of the test

2. The development of the project: main steps

With a varied partnership and great experience in the areas of intervention, the project, with a duration of two years, began in October 2001. The first year was mainly dedicated to the construction of the Resource Centre, and the second to its application in the Net and consequent evaluation. Picture number 1 specifies the different steps:

CHRONOGRAM

[illegible]

In the context of the validation and evaluation of the Project, it is essential to publish scientific articles on the results, in magazines in the areas of the ICT, the Educational Sciences and Environmental Education. Besides this, we will present papers in congresses and conferences. We also admit the possibility of publishing more in-depth studies in the research area of the Project. We will also try to widen the areas of the Resource Centre to other national and European institutions, trying to improve the database, both in quantity and in quality, aiming to appeal to the potential users.

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DISTANCE LEARNING AND VIRTUAL LABORATORIES FOR CONTROL EDUCATION

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Abstract

This paper addresses the needs for an integrated teaching system that will take advantage of the internet facilities to achieve multimedia presentation of the underlying theory and also provide virtual laboratories where experiments and simulation studies can be carried on to learn the various subjects in control engineering and system automation, areas which are considered very important for industrial applications, particularly in developing countries.

1. Introduction

Industrial process control is a traditional area for automatic control technology to develop cost- and labor effective systems and the demand for high quality and high technology industrial products broaden the spectrum of conventional or advanced automatic control applications. Many of those applications involve the utilization of modern control methods like digital control, event driven dynamics, fuzzy decision and control, neural network based control, fault tolerant control, adaptive control, knowledge based control etc. This large variety of subjects which apparently need to be included at least in the graduate level control education curriculum magnify the everpresent concern about the “theory – practice gap.”

This gap seems to be widening in the case of automatic control, process control, robotics and system engineering due to the increased complexity of the systems employed in industry.

It is apparent that there is a need to have an integrated teaching system that will balance theory and practice and it is also apparent that there is a role to be played by education and training for control engineering students both in the undergraduate and graduate levels by utilizing novel educational technologies, as well as by designing programs like continuing education, re-training courses, workshops etc. for practicing control engineers.

Turkish universities for example have a well established tradition in control education and have developed control engineering curricula in the departments of electrical, mechanical, chemical, industrial and control & systems engineering as reported in (Istefanopulos, 1996). Most of these programs are supported by conventional control laboratories or by Computer Aided Laboratories (CAL) utilizing Matlab, Simulink, LabView, special simulators and various other tools. Similarly some universities, among them Bogazici University – the home university of the author – have established centers for continuing education or lifelong education but they certainly lack at present the facilities and the materials for distance education.

2. The Role of Information Technologies

Almost all control educators would agree that conventional lectures and laboratories have limitations in giving realistic examples of complex dynamical systems. Particularly developing countries face the difficult task of acquiring expensive laboratory equipment and experimental set-ups with their limited budgets. One solution is the development of “Computer Aided Learning” facilities using either custom made software products or commercial software tools like Matlab and its various toolboxes to provide the theory and the mathematical background as well as a simulated laboratory: Such schemes are reported in (Mansour, M. and W. Schaufelberger, 1989) and in (Kozura, J., et al., 1996).

The ARIADNE (Alliance of Remote Instructional Authoring and Development Networks for Europe) project in the framework of its first pedagogical experiments has produced an application for control instruction installed on a Web server to be used by students and teachers in a university environment (Muntenu, D., et al., 1997).

However there are many educators who believe that using such software tools simply to complement or facilitate the existing control education curriculum is not enough but instead as stated in (Bissel, C. C., 1997) the challenge is to build the Information Technology tools intelligently and sensibly into a modified control curriculum that will enable distance education and provide flexibility in the modelling and design of control systems, no matter how complicated the system is and what control strategy is to be employed.

The advances in IT and the evolution of Web servers carry today all the attributes necessary for distance education: easy access and intuitive use, bidirectional secure communication, facility of diffusion of information at low cost, and multimedia integration. Successful applications have already been reported. In (Bohus et al. 1996) a special purpose remote lab user interface is reported, allowing a telerobotic approach enabling students to conduct real experiments by telepresence with full audio and visual feedback.

3. Designing New Control Engineering Curriculum

The need of designing a new control engineering curriculum in view of the opportunities offered by Web servers and Information Technologies is apparent even from the brief “state of the art” evaluation presented here. The current curriculum must be modified in such a way as to include intelligent control approaches like fuzzy control at an early stage, since it is based on a set of easily understood rules and sets of observations of input-output data which may be used effectively to control complex dynamic systems without requiring any detailed mathematical models but only some feeling about the range of magnitudes of the system parameters. When such a control strategy is applied to either a virtual system simulated properly and available at the Web or to a real set-up accessed by telepresence through the Internet the user will develop a better understanding of real life control problems encountered in industrial environments. It is reported in (Yurkovitch and Passino, 1999) that a sequence of a theoretical course and a laboratory course on fuzzy control has been implemented with great success in the Ohio State University since the mid-nineties and that students who had completed the laboratory course had first hand experience at implementing real time intelligent control and that they were well situated for placement in the job market.

It must be pointed out here that distance education and virtual laboratories are not expected at the present stage to replace conventional control engineering education which requires that theoretical knowledge is taught during regular lectures and illustrated by textbook examples, but to complement it by offering wider opportunities for self learning.

Distance education however seems very suitable for continuing education, whereby practicing control engineers can get re-training and acquire learning in the recently developed control methodologies by telepresence both in the case of theoretical knowledge offered in virtual lectures as well as for simulation studies in virtual laboratories.

4. Transnational Programs for Distance Learning

It is probably unnecessary to point out that development of educational materials for distance learning and virtual laboratories to supplement the subject is a costly and time consuming task.

The desire of developing countries like Turkey, which are applying for membership to the European Union, is to be able to participate in the international collaboration for the design and development of e-Learning courses in general and in the creation of virtual teaching laboratories in particular. Turkish scholars from Bogazici University, one of the leading universities in Turkey with all six departments of its School of Engineering having ABET equivalent accreditation and where English is used as the language of instruction, all of them with vast experience in teaching and research are eager to participate in academic co-operation for Open and Distance Learning, expecting of course to be able to have access

to the products of such an international effort. The IT and multimedia facilities being available in Turkey are very suitable for such co-operation which aims at using talents of people working in places which are geographically far from each other for the achievement of a common goal by creating virtual teaming.

Acknowledgement

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ON THE USE OF TELE-EXPERIMENTS IN HIGHER EDUCATION: REQUIREMENTS AND FORMS

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Keywords: Curricular information, didactics, learning and teaching modules, teaching processes, learning processes, media competence, practical orientation, use of resources, tele-service, tele-maintenance, target groups.

The aim of the presentation is to describe the requirements for the employment of tele-experiments by various users in the field of higher education from a didactic point of view and the forms it can take, and to clarify these with the help of examples. The basis for the account is provided by the results of a four-year project of the “Virtual Laboratory” (www.vvl.de) of the Universities of Applied Sciences in Aalen, Heilbronn, Konstanz, Reutlingen, Weingarten and the University of Tübingen, which was financed as part of the Virtual University of Baden-Württemberg (www.virtuelle-hochschule.de), in which tele-experiments were first employed. As the project developed, however, experience was made which had to be taken into account in the didactic and methodological implementation of the project, particularly in regard to the different target groups. In order to work on the didactic implementation in a learner-oriented fashion a description of the target groups was undertaken according to the criterion “Closeness to the Real Laboratory”, which included a treatment of familiarity with laboratory conditions.

This led to the following distinctions:

1. Students and teachers of the individual universities of applied sciences implementing specific tele-experiments of the Projects of the Virtual Laboratory
2. Students and teachers of the partner universities co-operating on the Projects of the Virtual Laboratory
3. Students and teachers of other partner universities in Germany and abroad
4. Independent users

The laboratory experiments and exercises chosen by the Virtual University to be dealt with here are taken from the fields of automatisisation technology, image processing, information science, communications technology, robots and machine tools and illustrate various learning levels, i.e. there are tele-experiments for beginners, advanced students and specialists.

The starting point for the considerations of the Virtual University was the desire to offer the students and teachers at universities and other colleges of further education particular laboratory exercises which

- permitted as broad an employment as possible of the experiments, the production of which involved high costs, and an effective use of resources;
- encouraged practically oriented teaching and learning, concentrating on the application of what was learnt and taught;
- furthered the development of the media competence of students in regard to autonomous learning via the Internet with particular reference to the combination of theory and practice;
- developed and ensured the media competence of students as a preparation for subsequent professional activities such as, for example, tele-service and tele-maintenance.

In order to achieve these aims two specific tasks had to be performed from a didactic point of view:

1. It was necessary to ensure that the user, whether a learner or a teacher, could find the learning/teaching module which suited his needs or those of his clientele, which he could work on successfully by applying his specialist knowledge, his previous experience, his methodological competence and his learning habits in general, and his experience with the medium of the Internet in particular.

2. Although the specific features of the fields of study mentioned above, their habits of mind, their didactics and their specialist language had to be taken into account, the teaching/learning modules had nonetheless to be based on a common underlying conception in regard to structure, progression, speed of progression, design, including symbols, types etc. suitable for the media, and in regard to language, concepts, intelligibility of texts, adequacy of text types and their form, personal forms of address etc.

Ad 1:

For each of the teaching/learning units the curricular information was carefully collected and prepared to meet the needs of the various users and target groups in accordance with the following criteria:

- search categories;
- position of the teaching/learning module within the teaching programme of the university;
- contents, aims and preconditions for learning.

Ad 2:

The comparability of the individual teaching/learning modules is guaranteed by a common structure and progression which continually reminds the user of the phase of the learning process he is in and the demands which this phase makes upon him. If a second teaching/learning module is studied or a whole series of laboratory experiments, for example as part of a basic practical course, the comparability of the structures, the design and the language results in a synergy which permits the learner/teacher to concentrate on the new material and improves motivation as a result of a degree of familiarity with the presentation.

These factors permit the employment of the individual teaching/learning modules in the existing curricula of universities which require attendance and in those offering correspondence courses.

The specific character of the products of the Virtual Laboratory rests on the one hand upon the user-oriented preparation and presentation of the curricular data, which permits an individual approach to the various experiments and hence their integration into different educational and training concepts. On the other hand – as evaluation to date has shown – the strictly controlled didactic presentation of all the learning and teaching modules ensures the successful implementation of the laboratory experiments by the user in regard to the expansion and deepening of his knowledge, his specific practically oriented experience and, last not least, his competence in dealing with the media.

GIO-UPM. AN INTERNATIONAL POSTGRADUATE ADVANCED FORMATION EXPERIENCE

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Introduction

Higher Education has been changing dramatically in last years. Diverse factors have driven to a new status in this area: globalization, technology, new political considerations and so on. Today it is possible for people in almost any country participate in educational programs around the world. The Universidad Politécnica de Madrid (UPM) has been offering graduate programs since 1971. Specially, the Superior Technical School of Telecommunication Engineers (Escuela Técnica Superior de Ingenieros de Telecomunicación) and the Organizational Engineering Group (GIO) have integrated an e-learning postgraduate advanced formation program. The program's approach is aimed to prepare professionals able to obtain sustainable competitive advantages from their improved information technology based capabilities in organizational direction and management. Currently, the offering includes six master degree programs over Internet, ten promotions and participants from ten countries. This program is supported in open and adaptable environment making possible an individual and collective learning experience. Three fundamental elements provide a strong structure for the program:

- A methodological development with an strong pedagogical emphasis
- An e-learning architecture
- An international professionals network

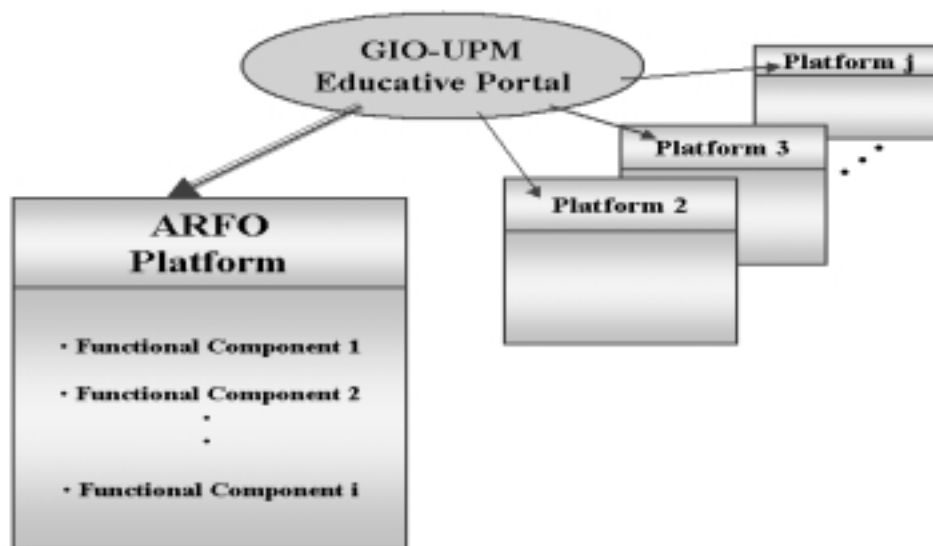


Figure 1. ARFO in Educative Portal Structure

All activities in distance education are integrated in an Educative Portal, which holds the e-learning platform designed by the Organizational Engineering Group (Figure 1). This platform is denominated ARFO (from the Spanish words ARquitectura de FORMacion). These elements are described below, and prospective work to be developed in future with special emphasis in international collaborative work and incorporation of new technologies are described.

Methodological development

ARFO is a distance education platform that was conceived at interior of GIO-UPM. It was designed with a methodological focus from a pedagogic perspective as well as product software. Indeed, the ARFO development is based on a structured phases group that were thought in function of current educational models (Grundy 1997). In a graphic way, it is possible appreciate the succession of phases in the way that is indicated in Figure 2.

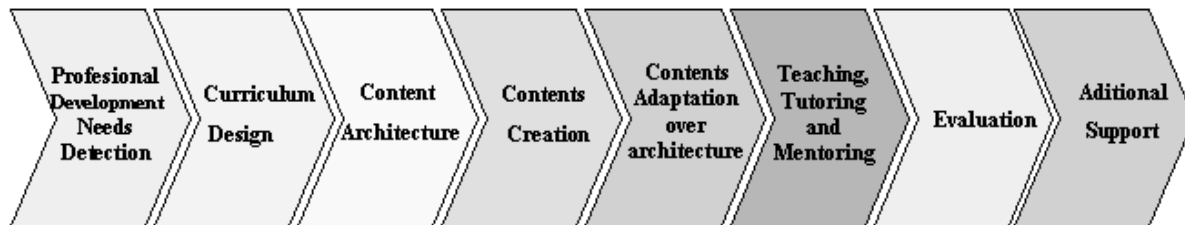


Figure 2. Methodological base for ARFO development

ARFO learner centered approach responds satisfactorily to the educational pattern delineated by Comenio in the XVII century, and the active school educative model developed starting in the XIX century (Román and Díez, 1994). The basic model premise is that learning responsibility rests on students instead the professor like in the previous classic school model. Evidently, this is an essential consideration when carrying out education experiences at distance or mixed (part in face to face and part at distance) as those that ARFO hosts. In post-graduate experiences, like this case, is the student who decides how, how much advance, and content deepening grade on each unit didactic proposal. This must occur in a framework defined in a standard way and without any risk to the learner. This learning centered in the student is materialized mainly in ARFO through a series of services available to agents participating in learning process (just as it will be seen in the following section).

The developed model, instrumented through ARFO, have allowed an interaction of the different process users in a highly flexible and dynamic way, which has not been unaware to external technical problems out of control from the platform (energy failure, maintenance, configuration troubles, etc.). Still under these conditions, administrative and technical support have been able to solve the problems and presented conflicts.

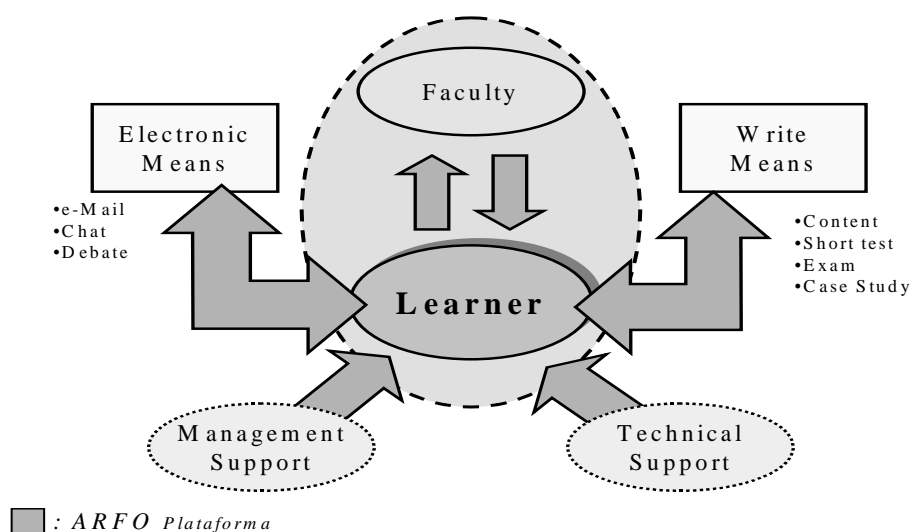


Figure 3 . ARFO from users point of view

In a simple way, it is possible to explain the methodological behaviour of ARFO like it is shown in the Figure 3. From a didactic or curricular point of view, ARFO provides characteristics as flexibility and adaptability for designers of courses, program managers, learners and faculty. It allows that each didactic

unit could be built over a proposed model (objectives, contents, summarize, formative and summative evaluation mechanisms). This can be supplemented with the development of diverse aided activities and planned by the professor, and students or faculty could define these.

Learners receive contents through electronic and writing means, which are located at the interior of the distance education platform. The fundamental interaction takes place between learner and faculty (or vice versa) either to make suggestions, respond doubts, generate and develop associate topics, etc. through means like debate, e-mail, cases of study, among others. By a rigorously program registered in the platform is controlled in automatic way the assignments in student-course, student-content and student-evaluations. In same way is established the schedule over which the users can interact. The ARFO academic component is supported by administrative and technical components. The first one manages delivery of general information to master programs, student's records, payment control and records, payroll to human resources, and others. The technical component keep in working conditions all year the platform, 365 days at year and 24 hours a day both hardware and software. Also these components are thought to solve extraordinary conditions in ongoing operations.

e-Learning architecture

As it was described before, the e-learning platform is denominated ARFO. The ARFO's objective is: using internet, not only to make possible teacher-learner contact, but to develop a true cooperation network where added value is incorporated to educative community in a continued way.

With this objective in mind, the e-learning architecture was developed as a fully open environment. It was designated to be ready to transfer and share of knowledge in academic and business environments different from the Universidad Politécnica de Madrid.

The platform e-learning has diverse functional modules (Figure 4) that support the services for the diverse agents interveners. In their group the functional modules support, thanks to the diverse services that integrate them, the creation processes, storage, transfer and diffusion of knowledge, all them constituent of a correct knowledge management.

ARFO Platform														
CREATION Module				TEACHING Module			EDITION Module		FOLLOW THROUGH Module		MANAGEMENT Module			
Course Structure	Faculty responsibility assignation			Courses teaching	Tutorials		Study material creation and edition	Forum and news creation		Learner progress follow through	Students learning evaluation		Students addition	Courses addition
	Work group creation				Work group environment			Cases and test creation and edition			Teachers management			
			
													..	

Figure 4. ARFO platform functions

Knowledge Transfer Module (Teaching Module). The interaction between knowledge originator and receiver is possible by this module. This is the platform heart, and it provides the end outcome: knowledge received for the learner. It is the communication channel with the creator and transmitter of

knowledge in the course. Different functionalities are provided to learners: documentation, cases solve, different evaluation and auto evaluation tests, debate topics, feedback possibility from knowledge transmitters in a team working environment, correction and qualifications of the different evaluation tests, the possibility to confront results with other course students, and of course an interaction road not only with the professor but also with the rest of individuals that are integrated in the same program of knowledge acquisition.

Administrative Support Module (Management Module). This module provide necessary tools to manage agents (users in general, students, professors, coordinators, promoters, events agents, content and structures creators, etc.), times, activities sequence in the processes of knowledge transfer, evaluation and measure mechanisms, etc.

Creation of Knowledge Structures Module (Creation Module). In this module knowledge architects should find tools to design and build structures (for example courses). In this structures will reside knowledge modules integrating knowledge transfer units.

Knowledge Edition and Transfer Process Module (Edition Module). It should provide necessary tools so that professors, monitors, tutor, mentors, etc. can incorporate or modify knowledge transfer units, evaluation measurement unit, participation, etc. in the previously created structures.

Evaluation and Measure of Knowledge Transfer Module (Follow Through). It should provide the necessary tools so that the implied agents can measure, evaluate, and in consequence act (varying the process of knowledge transfer). The agents will be students, professors, mentors, tutors, knowledge agents, etc.

International Professionals Network

A distance education program rests in two main dimensions. Both of them are associated with learner-centered process where constraints of time and location are eliminated.

Obviously, the first one refers to learners group. This program is oriented to postgraduate students (masters degrees) from different countries and with different professional profiles. People participating in the program have a big deal of experience in their own business or professional environments, so quite different from the background to the rest participants. These characteristics make a rich learning experience, but a difficult one too. The environment where the program takes place must provide student with capabilities to ensure the program success. In this sense, when one promotion begins the objective is integrate a learning network where independent study could be complemented with virtual groups. The virtual group is a vital way to reinforce personal development, and where learners find feedback for their activity. In many cases absence of feedback is the main failure cause in distance learning. A learning networking is the group of participants in the program that interact no only between them, but with the other agents in the process.

The second dimension is faculty. In this case, faculty includes not only the conventional teaching or instructional element, but all the people involved in support learners in their activities Distance Education imply a new paradigm in instructional process. The process is now learner centered, and teacher roll have changed from one person to a group of complex activities. Its means people from content creation to evaluators, all of them collaborating in a distributed environment.

The distributed condition is especially important in GIO programs because their international approach. Under this approach, the program not only includes students from a wide range of countries, but also faculty from some of these countries. Actually the program has physical presence with offices in three sites (Mexico, Argentina and Spain), and virtual presence in seven additional countries. The program must provide all participants, learners and faculty, with means to make feasible their act ivies anywhere and anyplace.

Current developments

GIO-UPM is working in platform empowerment. There is a continuous effort to find new alternatives to improve performance, not only under technical performance but a permanent search in order to get a better learning teaching process. Current work is oriented to aspects as collaborative work and mobility under contextual and cultural conditions.

Collaborative Work

ARFO has developed some collaborative work tools like virtual groups creation, discussion lists, debates, chat, etc. There is new approach to methodological special interest to develop a collaborative environment. In fact, under the premise that there is the possibility of students group management guided by a teacher, ARFO offers a working environment called “meeting rooms”. In this place, virtual teams can interact in autonomous way. These tools permit to obtain multiple objectives. Some of them are academic, contents learning, skills acquisition, etc. The final idea is how the get a better experience from independent study enriched by teams o group in collaborative o cooperative environment.

Cultural and Contextual Considerations

Distance Education, facilitated primarily by the technological advances, represents one of the main contributions in educational environment. Based primarily on their reach possibilities, flexibility and adaptability. Integrating an effective solution to the problem of the cost implied in the traditional educational offer.

The problem is that Distance Education growth is being exponential, maybe based on the speed of the technological development. In many cases, it is only an adaptation of the traditional educational systems. The promise of offering novel and effective educational products that revolutionize the way they arrive to the potential users is still in an indefinable space.

As it is observed, a great quantity of aspects should be studied and solved before the Virtual Education is completely functional and successful. Obviously among the key aspects to consider in this sense, services provided to the users and participants of the learning process. The objective is clear, at least in a wide sense, a quality guarantee in the process when considering that expected results (measured in the terms of the specific sector: economic, knowledge generation and transmission, social improvement, etc.).

Theses aspects have an important impact in program planning. With the multinational approach in mind (like GIO programs), it is necessary to consider the multicultural background of participants. In this way, contents must incorporate this diversity in a specific and contextual condition. It is only possible with a framework focused in local and global environments. ARFO’s activity will be oriented to find some alternatives in this sense. The objective is incorporate tools where participants (faculty and learners) could adapt contents to own profiles, by example from one country to other one. To make it possible, some considerations are required. Efforts will be focused into creation and adaptation of contents in workgroup in different countries. Other alternative is to improve synchronic and asynchronic collaborative work. Not only with technological tools, but techniques oriented to improve people skills in this sense. The idea is flexible contents dependent from specific conditions in the environment.

Mobility Learning (m-learning)

The new trend in Distance Education is m-learning, which main idea is incorporate the learning process to new ways of access it (mobile computational devices, mobile phones, PDAs, etc). m-learning can be seen as e-learning independent of location in time or space (an old concept for Distance Education). Where people go the learning possibility goes with them. m-learning has several attributes: portability (including wearable), full connectivity, interactivity and capacity. There is a big deal of research to develop technologies in this sense. GIO is working to develop an m-learning platform based in two aspects: networking technologies (delivery methods) and contents adaptation.

Until now there is a WAP portal where some features from ARFO are available. Current efforts are oriented to create virtual communities of knowledge share and transfer based in GPRS, but at the same time exploring the coming technologies as UMTS.

Content adaptation implies the possibility of access them from multiple platforms according with personal preferences or necessities. PDAs offer different characteristics in relation to those offered by a Notebook computer, or a Mobil Phone. Each one needs special considerations in format, size, interface, etc. A learner, as user, can take one course and he will do some activities in home, others in office, others while travelling, and whatever other situation. The GIO objective is a multi-platform solution as solution to specific needs.

Conclusions

- The current educational trends toward mixed education or completely at distance justify the efforts thoroughly development and use of elearning platforms. It is not only valid to graduate degree programs like this case, but also for all educational level.
- ARFO is a highly flexible elearning platform from a pedagogic perspective. This is demonstrable, since ARFO is able to support multiple learning strategies like: study of cases, project focus, team work, etc. besides other conventional ones.
- ARFO requires of a bigger effort in learning of abilities and skills from students and faculty participating in the process. They correspond to abilities and skills absent in classic methodology of teaching. They will be incorporated in future generations, but today is necessary to develop them.
- ARFO is a robust platform from the technological point of view, concretely, from the perspective of software engineering, since it allows the addition of functionalities to existent modules, creation of other modules (if was the case) and in general, the adaptation of its functions to future requirements.
- In agreement with the above, we can affirm that ARFO is a platform in permanent evolution. ARFO could be adapted to all type of necessities from the point of view of anyone of the users that interact through it.

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CARE FOR THE OLDER PEOPLE IN A MULTI-PROFESSIONAL PERSPECTIVE

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An Open and Distance Course in Health and Social Care for the elderly with an European perspective

Introduction

The ageing population in the Western societies will create greater demands on health and social care on the related informal systems. The problem for the old population encompasses complex needs, which are often related to medical, nursing and social care and to rehabilitation as well. While the needs for the elderly are complex, the health and social care education today mostly focuses on a specific perspective of knowledge. The educational programs are organised towards different professions.

The course presented here is a web-based, multi-professional and international course. The intention of the course was to create a bridge between different professions and nationalities thereby forming a platform for a more comprehensive and holistic care for the elderly. This course can serve as a module for institutes who would like to join the path of distance learning and multi-professional education within health and social care.

General principles

The course is offered on distance learning. It allows students to work individual on the – anytime, anywhere principle – and to organise their own study work.

The course is offered on an e-learning platform, located at the University in Jönköping, Sweden. Contacts with other students in the different partner institutions are possible through video-conferencing, the website of the course, chatting and e-mail. In each institute local groups will be organised to have an interdisciplinary discussion about the different issues in the care of elderly.

Aims

The course has an international dimension aimed at broadening the experience and the knowledge of students. It gives students the possibility to contact other students from different countries and cultures, in different professional fields within health care and to exchange ideas.

The course offers the opportunity for non-mobile students to be involved in an international exchange programme.

The course attaches a lot of importance to interdisciplinary work. More and more professionalism and team-work are becoming extremely important. Nevertheless training programmes are separated in different professions and specialisation. One of the main assumptions in this project is the use of an interdisciplinary approach that reflects on a co-operation between the different professions in health care.

The course enhances the skills and experience in the use of ICT and the acknowledge of innovative technologies.

The accreditation of the Course is based on the principles of the European Credit Transfer System (ECTS), which has become the standard in European student exchange. It allows the home institution to incorporate the credits and grades of the students in their curriculum.

Outline

The Course has been divided into two parts.

The first part has four sections. This part has been developed during the pilot project during three years between four different Universities and University Colleges in Belgium, the Netherlands, Finland and Sweden.

Each section is presented on the central e-learning platform and documented by texts, articles, lectures, hyperlinks, video and audio material and CD-ROM. Each section is linked with an assignment, resulting in a report and to be presented on the report board of the central platform.

The first focuses on ageing and demographic development (Hälsöhogskolan, Jönköping, Sweden).

The second concentrates around attitudes towards the elderly and their living conditions (Kajaanin ammattikorkeakoulu, Kajaani, Finland).

The third is about well-being and comfort care (Arteveldehogeschool, Gent, Belgium).

The fourth about ageing and gender (Hogeschool van Arnhem en Nijmegen, Nijmegen, the Netherlands).

The second part is related to the so-called examination paper. The intention of this part is to learn more about a specific area within the care for the elderly in Europe and to compare and share this knowledge with the other students in the course. Students choose a theme, discuss this in their international group, present a project plan and work on a final paper. This examination paper will be marked according to the following parts: project plan, definition of the subject, used methods of research, lay out of the field studies, conclusion and references. The paper will also be assessed in relation to how the different parts of it are integrated with respect to multi-professionality, nationality, literature and lectures. Themes suggested for the examination paper: elderly nutrition, spiritual needs, integrity and respectfulness in relation to care of the elderly, approach to activity and passivity of the elderly, attitudes to older people among the student professionals, philosophy and the implementation of it in some homes for the elderly, identity of (characteristics for) older people in a historical perspective, historical aspects on ageing, to be old in the near future, awareness of supporting systems among older people, home care for the elderly, informal care for old people, community services for older people, networks around older people, values among older people compared to values among younger people, living conditions for the elderly focus on e.g. economy or housing or social life or life style.

The findings and experiences are well-structured and scientific methods are used. The students present the results in a final paper on the report board

E-learning platform

The central e-learning platform is located on the Web of the University of Jönköping, Sweden. All the information of the course: participants, staff, itinerary, outline, course material and library is multi-media based. All the communication goes by chatting, e-mailing and added video-conferences. All the new produced materials are stored on the announcement and report board and through discussion forums.

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LANGUAGE EXPRESSED BY SIGNS AS THE MEANS FOR COMMUNICATION WITHOUT BORDERS. CAN IT UNITE THE WORLD?

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Introduction

There are some communities without an access to the phonic world. The following questions are worth of considering in order to solve the problems of deaf-mute people to communicate them with the phonic/hearing world:

- Can hearing student feel being abroad as a deaf-mute?
- Does a deaf-mute has to be isolated from hearing communities?
- Can be the use of signs speech treated as natural?
- How and why one should teach signs language especially to hearing people, because for the deaf it is the only way to communicate with their environment?
- Can the signs language be the second international language after English?
- Imagine everyone speaks his/her own native language and signs language to be understood by deaf-mute group – would not those people feel more comfortable?
- Let us reflect over this to start introducing the signs language into life?

Revealing of the problem

Phonic languages used by people all over the world are very diverse both with regard to pronounced speech sounds, and to the grammar. For example, capture using some African languages for European is very difficult. It should be noted, that even if somebody knows a strange foreign language, then the manner he/she pronounces of words may render it difficult to understand the entire meaning of remittance.

In avoidance of such a situation, it is worth to consider, whether introduction of expressed by signs language simultaneously with phonic language would help in solving the problem. Surely everyone of us prefers to see interlocutor during conversations, because much more may be understood from movements of his body, much more, when the exact meaning is assigned to these movements. An additional aspect of this solution is introduction to college of deaf-mute people, to whom the barrier/threshold of phonic lectures is impossible to cross over.

A characteristic feature of all national expressed by signs languages is utilization in remittance of information the optical-gesture channel, instead of, as it is in sound languages, the phonic-aural channel. Expressed by signs languages do not have morphological systems, what in practice means there are no conjugation, no declension and gender. That results inconsequence with the usage of positional type of grammar, where the arrangement of words decides about substance of a sentence. Other features of expressed by signs languages are identical as the features of sound languages. There are more than 200 different expressed by signs languages used all over the world. However, their common feature as opposed to sound languages is, that there is more analogy to reality than in sound languages. In these former ones we have sometimes to deal with when the form of word imitates its content, eg. in the words such as: noise, whistle, crack. Regarding the words, it is self-evident there are very few of them. On the other hand, in the language expressed by signs it is very often the shape defining an object or the movement executed by definite acts are imitated by signs. Such signs (iconic) determine over 33% of signs number given/expressed by signs language. Thanks to high coefficient of iconicity the signs languages of different countries are very similar to each other approximately like languages of one

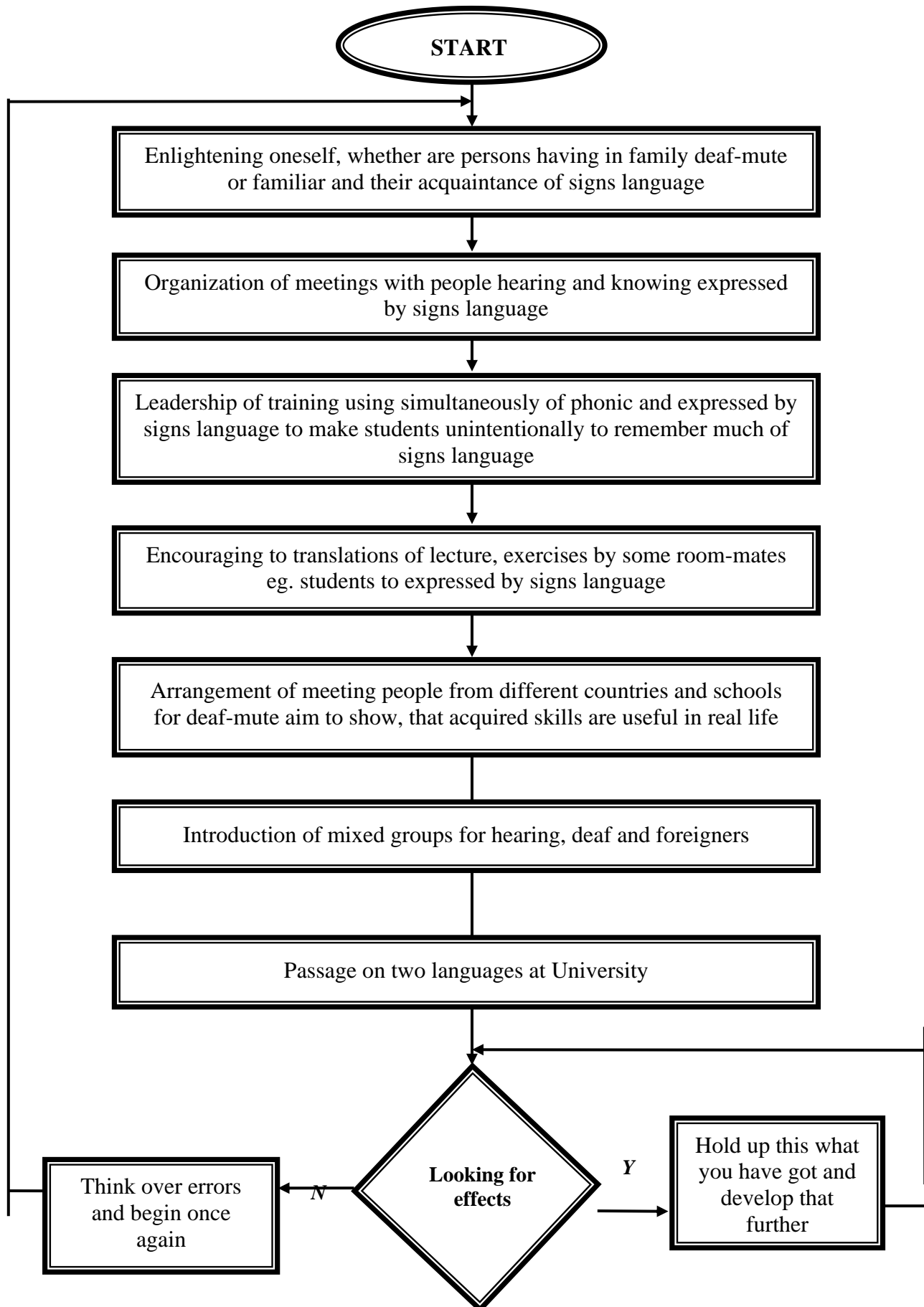
family: eg. Polish, Slovak, Ukrainian. That similarity makes it possible for more easily linking of contacts by persons using their own expressed by signs languages.

Ways to solution

One may imagine the introduction of the expressed by signs language in college, and/or school with the following advantages:

- Deaf people would be able to freely receive education in every academic centre. There are not many colleges readily adapted to accept deaf-mute students. The basic reason is a high cost of translators-academic teachers prepared to lecture by signs language, which would be able to teach/lecture a proper course.
- Enlargement of tolerance among young people. It is well known of practice that every social isolation creates some insinuations and misapprehension, which in a short time may lead into baseless aggression. If one creates the opportunities for the young people to be able to make each other's acquaintant and see, that their deaf boys and girls of the same age do not differ much apart from that deficiency, this may be a big step forward to unite of societies even though of the same country.
- Somebody could try to find an objection, that such a chance/situation very seldom takes place in reality and it is not proper to analyse it. However, in practice students can go for the study period abroad, in our chance to China. Of course there may be some lectures provided in English, or French, but a greater choice of courses is available for students knowing Chinese. Is not that those who do not know Chinese are deaf-mute? Some of them could resign of that effort, others might be kept on trying to understand some of pictures and drawings. Even basic knowledge of a strange language, permitting to cope in everyday life, does not warrant understanding fully of lecture. If, however, those students knew expressed by signs language, they would be able to understand full substance of lecture and, what should be underlined herewith, could better unite/connect phrases of a strange language simultaneously flashing.
- Audiovisual facilities with translation of expressed by signs language would be able to be for example in the form of files *.avi placed in Internet. For a hearing user, little picture of a translator/interpreter expressing by signs language would not hinder/interfere considerably, whereas for a deaf person would be the only form for describing of a lecture.
- Foregoing arguments show the need of teaching and usage of expressed by signs language. Surely everyone could notice, that in order to quiet down/silence him/her one applies the finger to mouth. That simple example proves that in spite of expressing our minds by speaking people make lots of gesture and motion by signs/finger language without of which our life would be much poorer in spirit and/or artificial. In our opinion only "connection – data exchange" between computers may be devoid of verbal elements. However, in case of human being these verbal elements play a significant part in communication between people.

Algorithm of introducing signs language to the advance of studies



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CASE STUDY: EDUCATIONAL NETWORK WINFOLINE

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Case Study Educational Network WINFOLine

This abstract provides an overview of experiences that have been made with the establishment of an inter-universitarian german e-learning network. First experiences with the extension of the project as well as its development into a self-contained, efficient and open network are being presented. The presentation is conceived as a „state-of-the-art“ lecture on the subject „Case Studies: Higher Education Institutions and Universities“.

Abstract

Since 1997 the „Education Network WINFOLine“ has been operating in the field of higher education. The focus is on internet-based training in the field of information systems/business informatics through a range of high-quality educational products. A pool of web-based trainings was created for an open network. For the extension of the pool new educational products are being created in cooperation with academic partners.¹ Furthermore, existing web-based trainings and content are being acquired. These web-based trainings can be combined with several support services, in order to create customized web-based trainings.

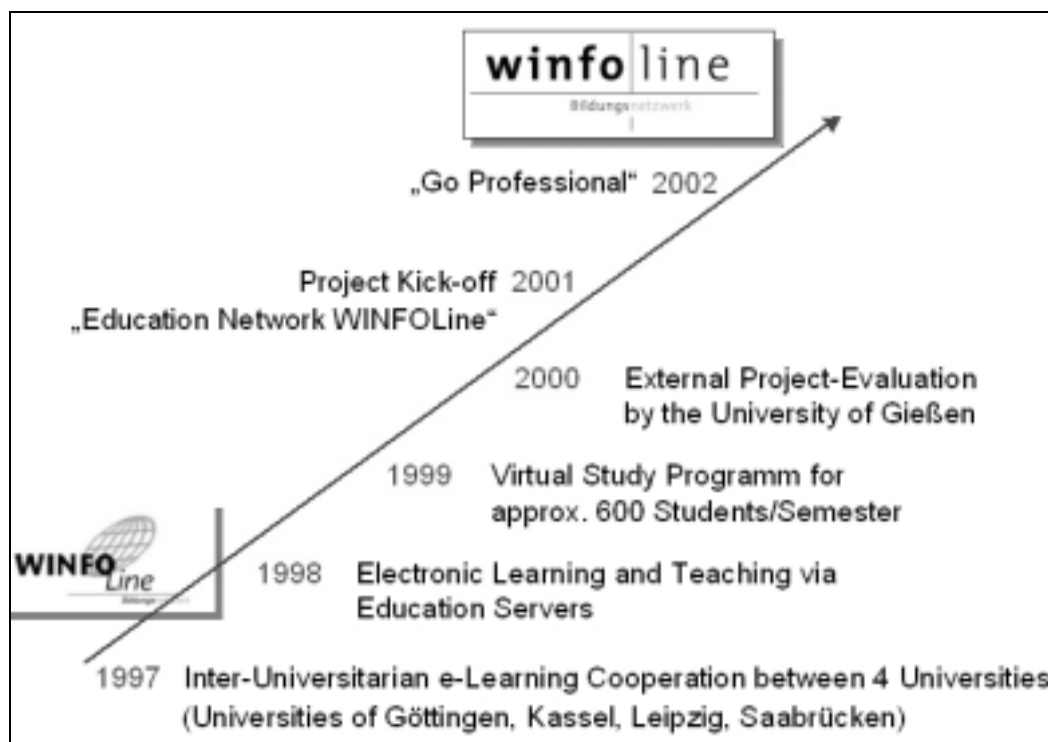


Fig. 1: WINFOLine's History – from the e-Learning Cooperation to the Education Network

Suppliers of content can choose from the pool and create individual trainings, in order to integrate these contents into their virtual lectures or to create completely new web-based trainings. The co-operation

¹ WINFOLine produces web based trainings (WBT) using a variety of authoring-tools. Multi-media contents are realized in the form of animations, audio- and video sequences. For the administration of the web-based trainings WINFOLine employs the learning-management-system CLIX (imc Inc.).

between the Universities of Göttingen, Kassel, Leipzig and Saarbrücken (WINFOLine) contributes to the reformation of university structures.

The Educational Network WINFOLine increases the choice for other suppliers of web-based trainings. The wider range of content, even of previously inaccessible content, can also create immediate benefit for the students, university graduates or employees.

WINFOLine focuses on a vast number of clients:

- Educational institutions with the focus on business informatics: as completion or enlargement.
- Other educational institutions: as a completion of already existing trainings as well as for the creation of new courses of study.
- Graduates, who are interested in further training in the field of business informatics. The offer can consist in a single WBT or in a complete course of study. In addition the network offers a Master Degree Program for Information Systems. This course of study is directed at working people and graduates.
- Corporations / enterprises can obtain contents from the network for the creation of their own special trainings in the field of business informatics. The contents can be used for single training or within a Corporate University.

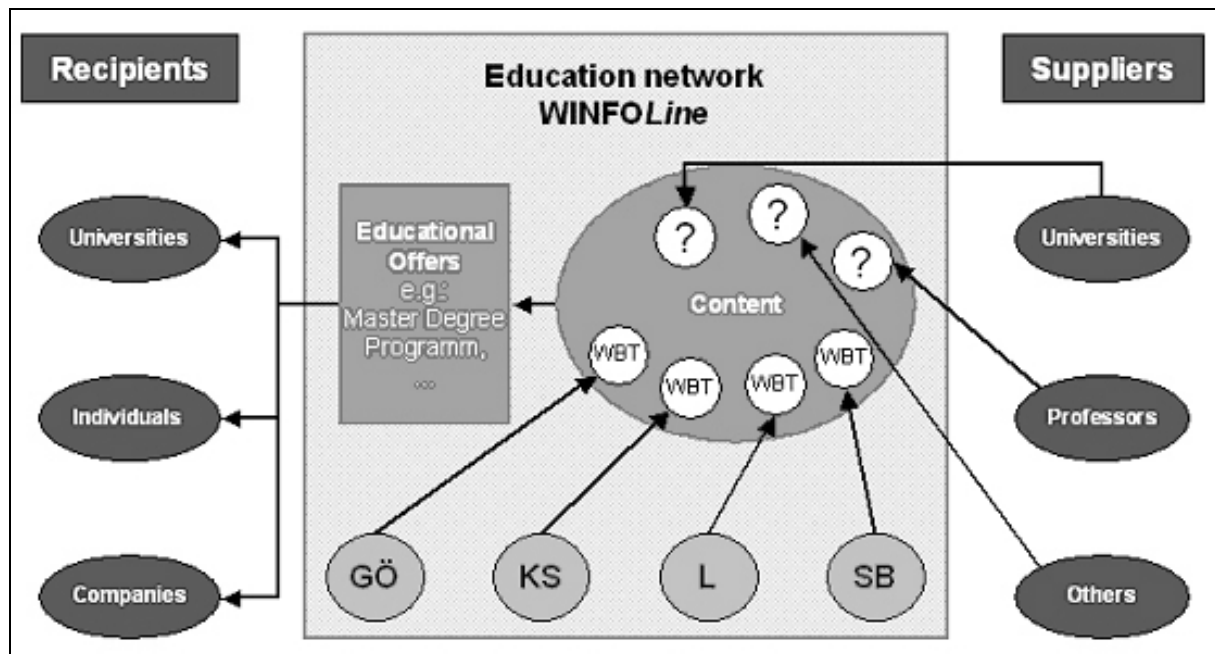


Fig. 2: Structure of the Education Network WINFOLine

The network is a leader among universities in the research concerning e-learning. Constructed as an open network it realizes an organizational structure that guarantees the highest possible flexibility for all participants. New partners can be affiliated anytime as well as leaving the network is possible for present partners. Therefore the range of web-based trainings is flexible and various. New topic areas can be covered at any time by affiliating new partners. To ensure a high quality of the offered trainings at any time, a concept for quality assurance is required to guarantee a minimum standard with regard to formal and qualitative aspects. The network follows international standardization efforts in e-learning. Partners have direct access to an extensive know-how network to support their efforts. This know-how network is supposed to encourage the knowledge exchange within the whole community.

The basis is the idea of a network that enables profits for its partners. Through the co-operation every partner shares specific professional competence. The student profits by the competences of renowned partners (best-of-peer). Due to important experiences during the implementation of the open network, the technical, pedagogical and didactical creation of web-based trainings, the support service, organization and administration of learning processes the educational network WINFOLine can be considered as a reference model for virtual studies.

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E-LEARNING FOR COMMUNITY OUTREACH AND ADULT EDUCATION

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European Lifelong Learning Memorandum is referring to ICT-based facilities as a good option for providing lifelong learning opportunities to learners in their own communities. Making lifelong learning accessible to everyone is one of the three major aims of the detailed working plan in education, set up by European Commission in Barcelona in March 2002. The other aims are improving quality and effectiveness of education and training systems and making education and training systems more outward-looking as regards the rest of the world. Besides accessibility ICT can also contribute to the effectiveness and outward-looking attitude of the educational systems.

Although ICT is seen as one of the major tools in making education accessible and bringing together learners and learning opportunities, current practice from many universities shows, however, that major users of ICT-based teaching opportunities are traditional students in university campuses. Adults still face several obstacles that hinder their participation in ICT-based education.

One of the aims of the Grundtvig project ALPINE (Adults Learning and Participating in Education. Higher Education project) that started in 2001 is to examine and present the state of play of various issues affecting community outreach, ICT and adult learning. During the project the current policies in place for ICT and community outreach across European Universities will be outlined. Approaches to enhancing access and use of ICT in adult education will be investigated and reported. Models of good practices will be explored while encouraging collaboration and exchange of resources for improved access and use of ICT in the development and delivery of adult education in different universities in Europe. During the project universities have outlined their strengths, weaknesses, opportunities and threats in connection to delivering ICT-based learning to adults. Some examples of best practices are described by universities that use ICT for adult education.

The presentation intends to introduce the general outline of the project, current results, and future issues and arose questions about what are the major obstacles that adults face in ICT-based learning and what are the possible solutions for using more ICT-based education for community outreach and adult learning.

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ACCE - APPLIED COMPUTING IN CIVIL ENGINEERING VIRTUAL STUDY COURSE REALIZED!

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Introduction

Alongside the step into the 21st century, the step into “lifelong learning” has also been taken. By virtue of these changes the population structure has transformed from a purely information society into a knowledge society.

The master degree course *Applied Computing in Civil Engineering* (ACCE) is aimed at making knowledge available to students independent of time and location via the Internet and to transfer information and exercise teaching tasks on an online basis. The high demand for this facility and the application profiles of graduates bear testimony to the fact that effective and high-quality teaching is attainable by this method.

For many students from sparsely populated regions or regions with a poor infrastructure the availability of e-learning provides a unique opportunity for education or further education, thus enabling contact to be maintained with educational institutes and universities.

Motives for virtualization

The expectations of students regarding the implementation of new media in universities are certain to rise in the future. This generation – also referred to as the “net generation” – has a far wider range of experience in handling new media than any other previous generation. Whereas previous generations are accustomed to one-way communication in the form of television, adopting a more or less consumer attitude, the net generation is well versed in interactive communication processes, the search for information and knowledge in the Internet as well as information exchange and discussion via Email or Chat facilities.

Owing to the fact that studying is now possible, irrespective of time and location, universities are being increasingly forced into a situation of world-wide educational competition. It is clearly evident that education is no longer a local matter. In physical terms it is nowadays possible to be in New York within six hours; in virtual terms, however, it is possible to be in South Africa within seconds.

Universities with high-ranking names such as Stanford, Berkeley, Harvard or Oxford are confronted with this market. This transparent, international educational market strongly suggests that only the “best” universities will be able to survive and constitute educational oligopolies in the near future. This means that universities that have focussed their attention on the education of a limited number of elite students in the past will suddenly become mass educational centres for the entire world and thus lose their brand name. Each university must thus pose the question as to how the world-wide educational market is likely to develop. The markets must be analysed, individual shares of the market defined, and niches sought. In this respect, German universities must ask themselves how they intend to position their internationally-recognized engineering study courses in America, Arabia or Africa. Without the Internet-supported transferral of a considerable proportion of teaching material it will no longer be possible to realize the international flair and quality of German teaching expertise.

An additional motive for virtual teaching is the ability to cope with an increasing number of students while at the same time maintaining standards and quality. A question that repeatedly arises in this connection is how the quality of teaching may be improved with the same financial resources and staffing

capacities and how teaching may be suitably matched to the individual needs of students. In this respect the new media plays an important role in the improvement of quality.

Under the catch-phrase “lifelong learning“ it will be necessary to consider a new relationship between work and education, for a strict subdivision into sequential educational, working and retirement phases no longer appears appropriate under modern-day conditions. Universities must readjust to a new method of communicating teaching material and attending to students’ needs, and not only seek answers to their students’ changing time schedules and career planning concepts. Their attention should be focused more on the general question as to whether new concepts should be applied to the term “education”.

Concept and success of the Master Degree Course ACCE (*Applied Computing in Civil Engineering*)

Within the framework of the project approved by the European Social Trust (ESF) the “Fachhochschule Nordostniedersachsen” (FH NON, *North East Lower Saxony University of Applied Sciences*) intends to contribute towards the transfer of knowledge and technology in Northern Germany. It is evident, however, that rural areas in particular are especially affected by the departure of young people, even though an incentive to remain in their respective regions has been established by way of future-oriented IT technology. By initiating the study course *Applied Computing in Civil Engineering*, the intended aim was to prepare engineers for these new task areas and to make computer technology beneficial to this target group.

In conjunction with the launching of the study course *Applied Computing in Civil Engineering* on 1 November 1997, the study programme was put into immediate effect and 41 students participated in the study course. Following completion of the prior winter semester the ninth semester was staged with a total of approx. 120 active students.

In order to realize the further education project “e-learning” a network was established between the Northeast Lower Saxony University of Applied Sciences, the University of Hannover and the Technical University of Darmstadt. The basis for this teamwork are cooperation agreements, which regulate virtual communication within the network. The subject matter of this cooperation is the exchange of information via the university scientific network (WIN).

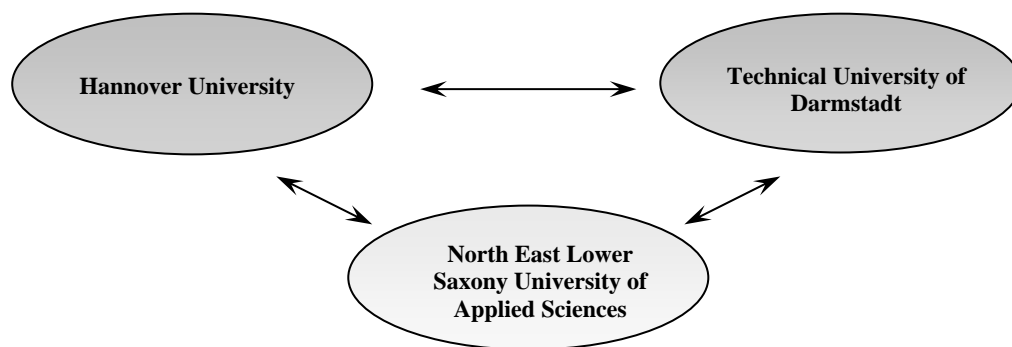


Figure 1: Cooperation network of the FH NON

Thematic planning

The course of study is intended to accompany professional training, so that one course may be generally completed per semester. This offers the opportunity of sitting all the necessary examinations within five semesters, thus permitting completion of the study course in six semesters, with the inclusion of the final thesis.

The study courses are subdivided into nine different modules. These include four compulsory courses and five optional courses.

Compulsory courses

P1	Programming Techniques
P2	Communication Technology
P3	Visualization Methods
P4	Data Technology

Optional courses

W1	Information and Communication Systems
W2	Graphic and Multimedia Systems
W3	Geographic Information Systems
W4	Numerical Methods
W5	Facility Management

Final thesis

Master Degree Project

By this means, the aim is to organize a course students as far as possible, and at the same time, permit a certain degree of student guidance so that they may complete their course of studies more quickly. In accordance with the examination regulations the student is free to select three of the four main subjects in the compulsory courses (whereby *programming techniques* is compulsory) and two of the five main optional courses such as e.g. groundwater simulation from the optional module “Geographic Information Systems” (see Fig. 3). In compliance with the selected study courses, the student is obliged to complete a final master degree project based on a free-choice problem derived from practice. On successful completion of his study course the student is awarded the degree of “*Master of Engineering in Applied Computing*”.

Figure 2: Modular structure of study

courses

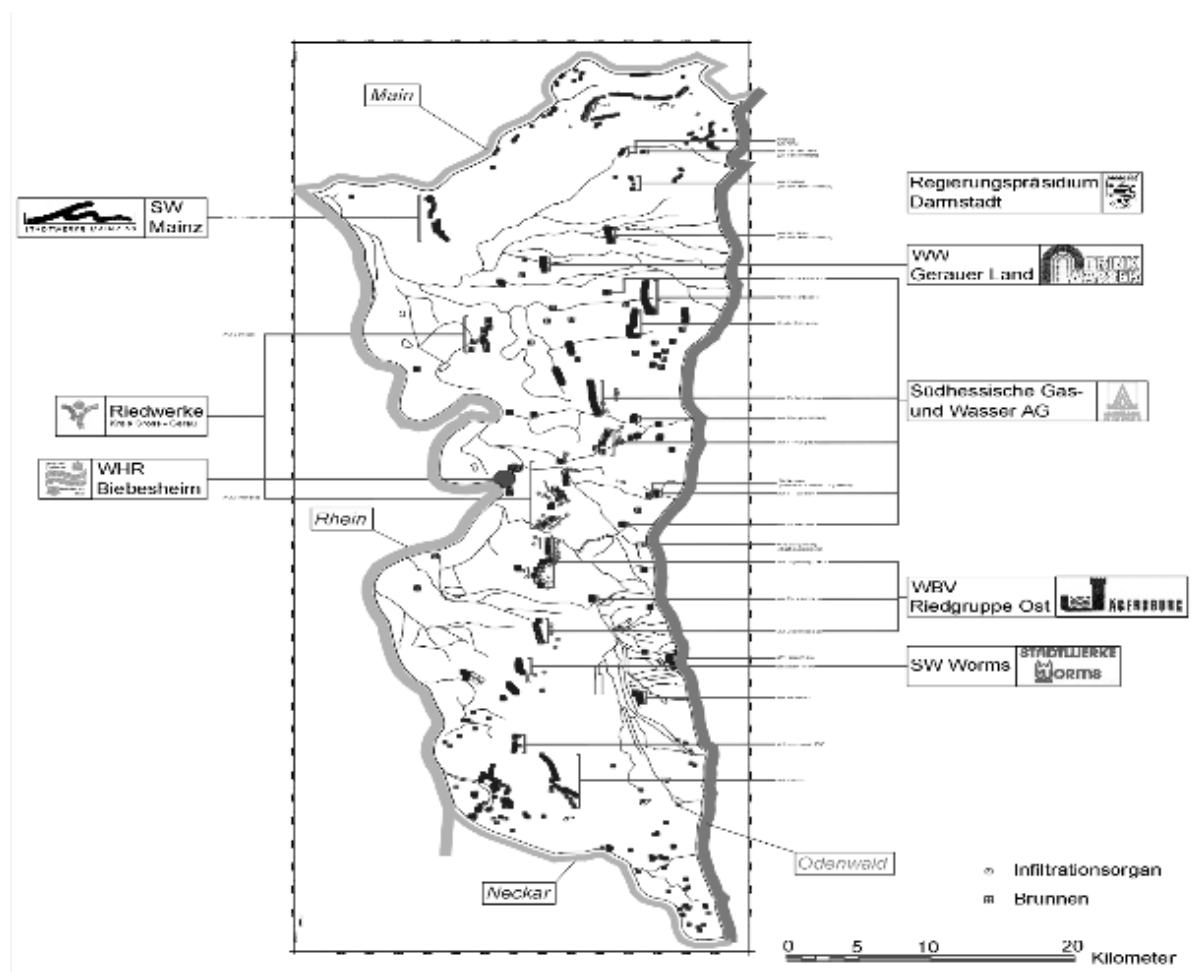


Figure 3: Groundwater simulation of the “Hessian Marshland”

Demand

The study course is in high demand and admission to the course is restricted to “*numerus clausus*” (attainment of specific A-level grades). Approx. 120 students are currently registered for the study course. This represents an over-capacity of approx. 200 % at the present time. The technical contents anchored in the study course are oriented to the needs of professional practice. The predominant aspect of the study course is the application of Internet technology. Besides the fields of application of informatics, the implementation of geographic information systems is of major importance. Computer programming, which is currently based on Java, is stipulated as a compulsory course. The overall study course is modularized. Students must successfully complete five modules from the compulsory and optional subjects and complete their course of studies by way of a 200-hour master degree project.

The establishment of a virtual study course has been successfully accomplished under the participation of the Universities of Hannover and Darmstadt. During the course of teaching activities a total of nine modules relating to the theme of applied informatics have been developed and made available *online* via the Internet. The overall study course extends over approx. 70 SWS (*semester week hours*), whereas the respective semester courses extend over 35 to 40 SWS.

The first master degrees were awarded in October 2000. On a yearly basis about 10 students attain their master degree. The intention to partially study was cast into the background by virtue of the possible target of achieving the title of “*Master of Engineering in Applied Computing*” following completion of their study course. The major proportion of students already have their sights set on the master degree award at the commencement of their course of studies.

Technical implementation and student guidance

In order to provide students with the correct teaching material from different locations, the study course ACCE has developed a teaching platform on the basis of the open-source Content Management System “ZOPE” (Z Object Publishing Environment). Via this portal (see Fig. 4), access control is regulated with regard to students as well as teachers via personalized passwords, so that the contents may be accessed by any particular browser, independent of location.

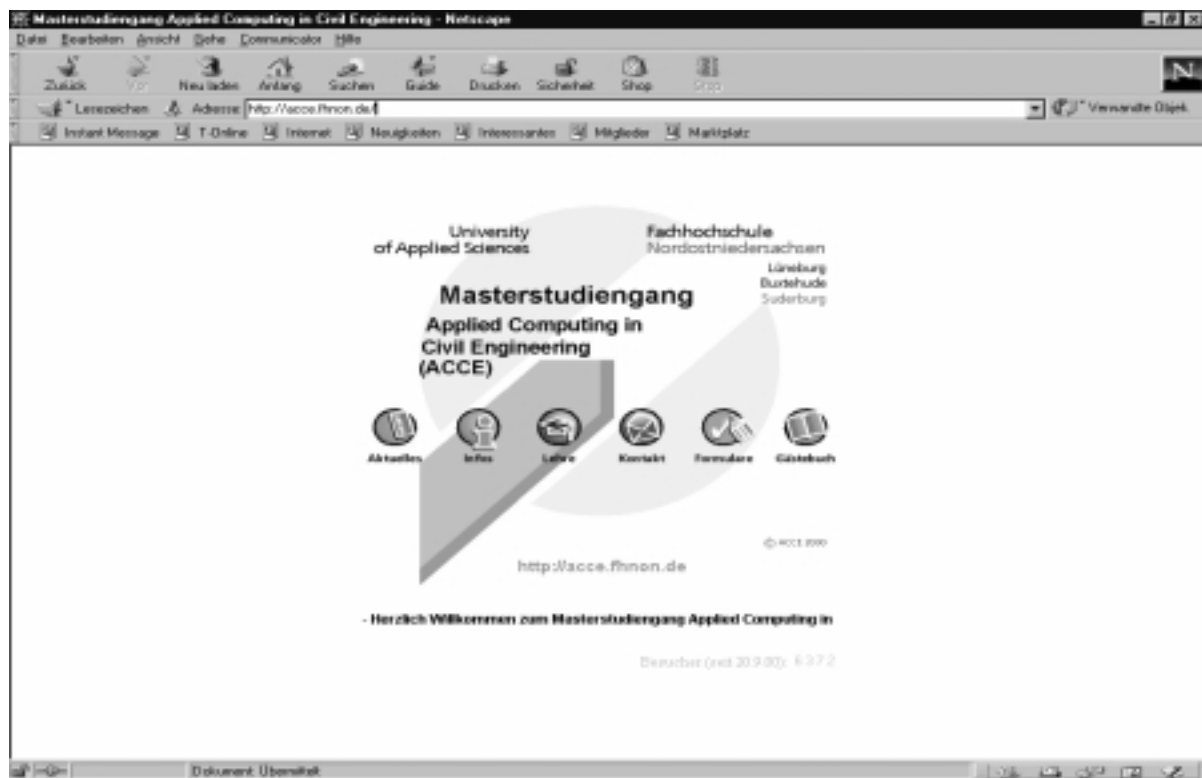


Figure 4: Input portal to the ACCE study course

By this means it is ensured that members of staff at the respective cooperation locations publish the course contents directly via access to the learning platform and thus come into contact with students. This also offers the opportunity to fellow students to directly discuss problems via the established chat room or simply exchange ideas and experiences. Despite this network cooperation, students are obliged to participate in two attendance phases on average as well as the final examination at the university in question in order to maintain personal contact with lecturers and sit the necessary examinations.

Résumé

In overall terms it may be concluded that the realization of this project by the State of Lower Saxony and the EU has played a major role in improving the infrastructure of rural areas and that the planned project target has been attained. In particular, Internet technology is expected to smooth out the disadvantages of particular locations in the future. The educational preconditions have already been created in the Internet by virtue of the initial modules. The technical preconditions in the form of an optimum Internet link to the university location (at least 34 Mbps) guarantee effective access.

There is also a high demand for the study courses offered outside the areas directly served. This may be explained on the one hand by graduates of the basic study course in civil engineering, who have taken up employment at locations spread over the entire country, and on the other hand via search engines, which provide information on the study course in the Internet. For example, requests to study in the Internet have been received from a variety of countries including China, Sweden, South America and Africa. An important question to be dealt with in the future is to make learning material available in English and/or Spanish.

Considered in overall terms, the study course in *Applied Computing in Civil Engineering* has given rise to a “virtual course of study” by the implementation of e-learning on the basis of blended learning.

Why is cooperation necessary?

Due to the close cooperation between the University of Hannover, the Technical University of Darmstadt and the North East Lower Saxony University of Applied Sciences it is possible to coordinate and manage the teaching material in a competent and subject-oriented manner by the respective universities. Only by way of this cooperation is it possible to continuously develop the study course in accordance with the needs of industry, thereby permitting continuous evaluation and quality assurance of the teaching material. The establishment of keynote areas and profiles in individual subjects and disciplines as well as an intensification of the profile and competitiveness of universities in conjunction with a consolidation of scientific expertise and transfer performance for the respective regions are all important factors for imparting momentum to and defining targets for this cooperation.

The experience already gained during the five-year cooperation period between the participating universities has shown that the joint Internet-supported teamwork has steadily improved in terms of quality, thereby enabling teaching material to be continuously matched to the needs of students. This aspect of teamwork at a distance will also raise the attractiveness of cooperations in the future and thus offer students the opportunity to study in an appealing and future-oriented manner. Experience has shown that education requires Internet-supported cooperation.

Advantages and dangers of e-Learning

In an information and knowledge transfer society, continuous learning paves the way to success. Learning in the future will be oriented towards a concrete demand for knowledge, as required to deal with problems encountered in everyday work tasks. The advantages of e-learning may be ideally put to use for basic and further training as well as to quench a personal “thirst for knowledge”. Via the Internet, knowledge is available online 24 hours a day, which means that every student is able to independently cover his knowledge requirements in accordance with his learning capabilities and at the same time, e.g. avoid waiting times until the next seminar meeting. By way of e-learning, teaching units may be incorporated

into work processes at any time with no interruption of these processes. The boundaries between working and learning will eventually disappear. This will reduce costs and at the same time improve the efficiency of learning at a distance or in companies. In conjunction with the application of new media and the Internet the media competence of students and members of teaching staff will gradually improve, thereby enabling students to study in a team without group pressure.

Moreover, e-learning will remove cultural and cartographic boundaries. By way of the new media, students all over the world will be offered the opportunity to study at different universities (also in countries outside their home countries) and gain access to international knowledge. Every student, regardless of where he dials into the World Wide Web, receives the same information and may access all teaching and learning material offered by individual providers conveniently from his own home.

Although graduates of virtual study courses are already available on the job market, there are others who are still rather cautious about the new media and forms of learning. There is a fear of being isolated or helpless when confronted with technical and thematic problems. An additional negative aspect is certainly the fact that students sit anonymously at their computers, are unable to meet new people, and find it difficult to develop a group feeling with his “cyberspace fellow students” on the *virtual campus*. This leads to a feeling of social isolation, which must be overcome before embarking on a study course. Moreover, problems may arise in connection with technical equipment, e.g. the transfer of teaching material via a modem may lead to high costs due to a slow connection and thus drastically reduce the motivation of students.

Although the majority of students are in favour of the implementation of new media, they in no way wish to dispense with the personal contacts with fellow students and professors. For this reason, attendance phases at the respective universities are absolutely essential.

Summary and future perspectives

A certain fact is that the topic of virtualization has attracted more attention than any other topic at German and European universities. This is due on the one hand to the obligation of universities to provide high quality teaching material and on the other hand to the continuously rising standard of education. Especially in an era of globalization and digitalization, it is naive to think that with Internet and e-business the work involved in teaching is reduced by the implementation of new media. This aspect is fatal for the further development of our universities, for without proper student guidance by lecturers and without elementary didactical concepts, as has been publicized for a long time by the Open University of Hagen, it is not possible to practise good teaching.

The concept of *blended learning* practised so far by the ACCE – a combination of on-the-spot and remote teaching – has proved its worth in practice for more than five years. In contrast to other online courses of study, special attention is given to ensuring appropriate online times. The individual modules are conceived in such a way that the teaching material itself is of primary importance. These are provided with interactive modules to ensure a better understanding, which are integrated into the text in such a way that a printout of the required modules is possible. Particularly in relation to foreign students, the effectiveness of this teaching method depends on the interplay between the three C’s – Culture, Context and Content. In fact, a decisive factor for the success of the practised e-learning method is cultural acceptance, the relationship between teaching material and form and the teaching content itself.

It will no doubt take a long time before technology has been developed to such a degree that even sceptical onlookers are fully convinced of the meaningfulness of new media and e-learning. The intention is not to replace learning forms, but rather to supplement new and old forms of teaching in order to develop new teaching possibilities. It is therefore not expected that personal contacts between teaching staff and students in universities will be replaced by virtual contact but that both forms of learning – *blended learning* – will instead complement each other and combine together in a diverse manner.

A question still to be answered is whether the virtual university in its entirety and complexity is suitable for basic study courses.

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NATIONAL AND INTERNATIONAL CHALLENGES IN BUILDING A NET-BASED TRAINING OF TRAINERS PROGRAM

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NOTIS – a pilot project

NOTIS is a pilot project developing a net based training of trainers program. Users are people responsible for **training apprentices** in Norwegian companies both in the private and public sector. NTNU¹ is the project owner, and the program is developed in close cooperation with companies and potential users.

Background

A lot of people are involved in the training of apprentices. Close cooperation is necessary both in the job performance and training. A successful training system in a company claims descriptions and understanding of different roles and functions. The responsible in this coaching system must have sufficient knowledge and skills, time for apprentices, feedback from managers and impact on a continuous improvement of the company training system.

A further education and training programme must be developed in close cooperation with the users and in respect to existing routines and cultures in various companies.

Development

NOTIS is developed in cooperation with 4 companies in 3 branches; energy industry, textile industry and ambulance services. We have chosen not to use a specific e-learning tool or LMS (Learning Management System) as we want the process to be as open as possible for new design and learning methods.

Evaluation

A system for evaluation of NOTIS is developed in cooperation with LABIL (the Laboratory for ICT and learning) at NTNU. Logging is a central part of the evaluation process. The Social Partners will be involved in the evaluation as they play an important role in the Norwegian Vocational training system².

International interest?

The main issue for bringing this project to the EDEN conference is 2 topics for discussion:

- Challenges for vendors of net based training to be used and measured in the workplaces. Best ways of organising the development process.
- Means and methods in net based training offers for business and industry.

The target group of NOTIS

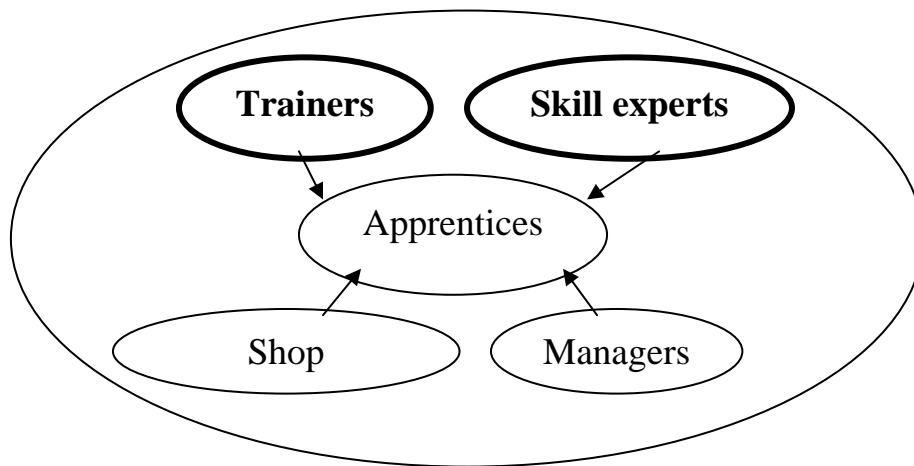
As mentioned above a considerable number of people are involved in the training of apprentices in Norwegian companies. NOTIS will offer training mainly for the trainers and skill experts.

Trainers are skilled and unskilled workers who follow up and help the apprentices in practical work. Trainers train specific tasks and methods, routines and procedures.

¹ NTNU Norwegian University of Science and Technology. The Department for Further and Continuing Education.

² Apprenticeship is incorporated in the upper secondary school educational system. Introduction takes place through a combination of school attendance and work. In the first two years, instruction is given at school, while the final specialized phase is given as on-the-job training (lasting up to two years).

Skill experts have the overall responsibility for the apprenticeship training according to national laws and regulations.



Attention will always be on the apprentices and their learning processes – even though they are not part of the training program. Managers and shop stewards will be part of internal discussions in each workplace.

NOTIS – the development process

Traditionally in vocational training learning was based on a master-apprentice relation. The master learned from experience with new assignments and the apprentice may travel from one master to another.

This is still the case, but limited assignment is gradually fading out. Employees work project based with strong emphasis on process and quality. On addition, teamwork and communication competences are regarded as vital to carry out the job, and great emphasis is put on the responsibility for on the job training. Learning through participation in work is described in Vygotskian³ derived socio-cultural theories of learning and development. This is an inter-psychological process between the individual and social partner, artefact, symbols and the physical environment.

NOTIS benefits from new skills among the workforce. When designing a net portal it is essential that users contribute to the content. To make a good concept we need collaborators who:

- are good achievers
- gives us relevant working problems and challenges
- gives constructive feedback
- helps us reformulate our questions
- gives us input on the WEB-design
- writes logs regularly during the process

The recent development with project organization and emphasis on quality management, have brought the learning activity into a new track. Quality assurance includes qualification of manpower for the task to be carried out. Companies have gained much from the recent development. In most companies the quality management has been a system for learning to focus on knowledge development and skill on all levels of the company. This is on the individual level, and more and more emphasis on TEAMS and a DYNAMIC GROUP PROCESS in competence development. In the beneath figure, inspired by Shiba⁴ and H. Lenchow⁵ a dynamic group process is sketched in a development project. Learning is taking place in the communication channel between two levels and integration of the process over time. The level of

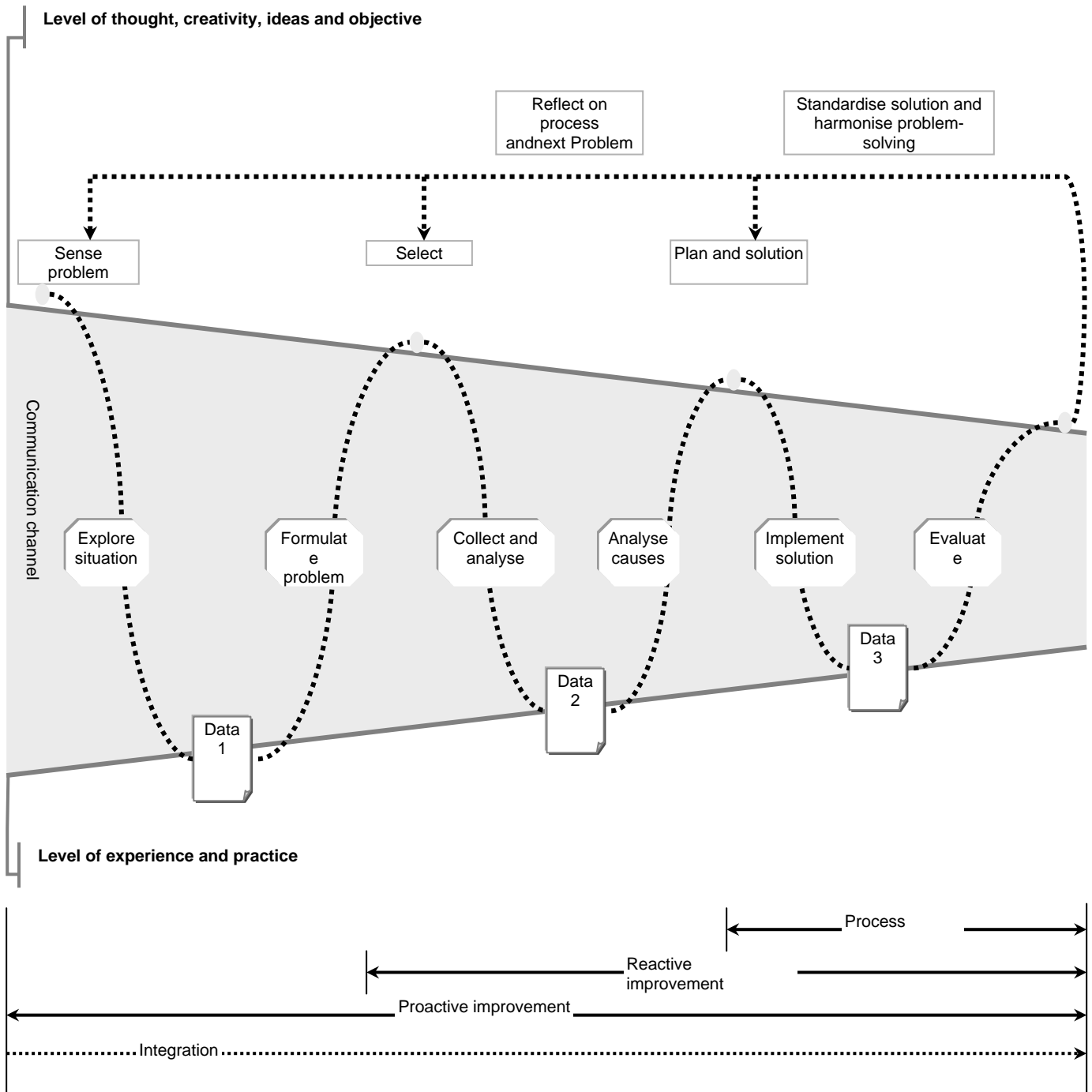
³ See References

⁴ See References

⁵ See References

thoughts, includes ideas, creativity, concepts, research and theory. The other level, the level of experience, includes practice, experiment and validation.

In the communication channel there are well known elements as observation, reflection, conceptualisation, design and experiment.



This model describes the NOTIS development process. The development of NOTIS is based on long experience and systematizing designing traditional courses, internal training in private companies, telecommunication, design of computer programs and LMS's and written materiel, authors of books and the making of videos for the same purpose. Together with the making of resources on the Internet and being process-oriented, we feel like "pilots of chaos" capable designing NOTIS.

In the making the product NOTIS we are process designers and approach to the problem by asking questions connected to the job and role of performance. Feedback from the users makes us reformulate and redesign the whole concept until all users involved are satisfied. That includes the user interface of

the WEB-design and the subject content. A key characteristic of the content is that the learning is based on working problems from one's own work situation. In other words: practical problems are central and we push the participants to be creative. This work is done on the net or we gather at neutral places withdrawn from hustle and bustle.

As process people we need to be humble, tolerant, active listeners, interpreters, accept testing, accept corrections, testing alternatives, - again and again. It is a challenge for us to convert workplace participation into pedagogical practice on the net.

The methods in NOTIS as a training program

We are aiming to build an Internet based training program different from traditional training or books. We are building new training resources along with testing and experimenting on how to use existing resources. The main challenge is how to support individual and organizational development in a wide range of workplaces like Power plants, Ambulance Services, Hairdressers, Hotels, Fishing Industry etc.

Task performance is the most common way adults deal with competence development. Discussing problem solving and continuous improvements with colleagues, customers, management – and apprentices.



Hence NOTIS resources are built on the following principles:

- Task orientation (PBL)
- Process orientation
- Involvement and anchoring
- Result orientation

These are all principles corresponding to quality development and standards (ISO 9004).

Content and challenges in NOTIS are linked to performance of different roles and functions. The tasks can vary for apprentices/trainers within different companies. NOTIS will give users a possibility to tailor their training according to needs. Even though some of the roles are described according to national regulations, each company needs to design roles and functions suitable for their own organization.

The tailoring is based upon a list of well-known challenges for people supporting and training apprentices. Cases to be solved or discussed within the company, frequently asked questions, examples of best practice, links to national laws and regulations. Users need to check and adjust suggested routines and systems according to the quality system in their own company as part of a continuous process.

As for all other quality improvement activities, management has to be committed and requirements must be communicated. NOTIS has to be aware of this.

Mentoring and coaching is vital for apprentices development. Teamwork and communication are necessary skills, but difficult to teach or learn by net based solutions. NOTIS assume that actual problems are discussed and solved at the workplace in cooperation with management, colleagues and/or apprentices. The role of the organisation, the role of the trainer and the trainer as a learner will all be new. Alistar Rylat.⁶

Even though there are about 40.000 trainers in Norwegian apprentice companies, most of them lack discussions and meeting places. NOTIS will offer networks and counsellors. Both with professionals and exchange of experience across companies and branches.

NOTIS expects actions and concrete results in the workplaces. Better routines, better communication, better feedback and counselling, better performance, less complaints, less drop-outs, more apprentices...

Unless NOTIS manages to explain how to use the resources, how to involve the workplace and how results can be identified and measured both at an organisational and individual level, the training program will fail.

International cooperation

The target group for NOTIS is skilled workers, Norwegian speaking people with a lot of tacit knowledge. The apprentice companies are committed to Norwegian laws and regulations. The apprenticeship system is different from other countries. Workplace cultures and values are different. It was formerly referred to as the Nordic Workplace Model with a strong emphasis on the role of the social partners.

When most components, such as:

- the educational systems
- the educational means
- the company cultures
- the languages

are different, we can not use the same content in our training programs, not the same examples or cases, not the same language.

Important issues may be listed for international cooperation

- learning methods (brave experimentations!)
- program-design
- models for work based training (blended learning)
- specification of requirements to e-learning vendors and tools
- trend analyses

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TEACHER TRAINING AND E-LEARNING: WHICH MODEL IS POSSIBLE?

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Introduction

The Faculty of Educational Sciences of the University of Padova is undertaking a path in institutionalisation of university teaching models inside the transformation of the European educational policies. It is a process whose guidelines are evident within the idea of e-Society carried out by the European Union and the consequent strategic policy in e-Learning [1]. In this scenario our Faculty is developing some lines in research relating three different territorial systems: a regional, a national and an European one (Odette Project, Comenius Project and national Research).

These projects and researches can answer the question about how an ODL System contributes to internationalization of teacher training. We are dealing with a subject that handles with the essence of the basis of the different educational systems in the European Countries and therefore we have to define a specific field from the very beginning, by characterising approach and practices.

The two fundamental strategic approaches can be “a policy of action based on a prearranged and official [...] knowledge and a political action, “more curious” and opened, using symbols in much freedom, also without giving up practising silence and meditation, that fosters experiences in life without prearranging results, that mobilises new technologies without celebrating the myth, in short that looks for a real-life and not only intellectualistically for the traces of homologation, of cultural lack, of unsolvable complexity” [2]. The acting way inside the Faculty prefers a bottom-up rather than a top-down approach. It means to go on in an open and flexible way towards a guided exploration of the themes regarded as essential to reach a model for training interventions. At the end of the path the future European Teachers should have well-established “best” practices to compare with, in order to face up to their profession not only in a national context but also more generally in an European one.

Two are the principal lines through which we try to give an institutional answer and not an occasional, or additional at the first question:

- the role of ODL models in the university environment to go over the difference between distance education and traditional education (face-to-face);
- the comparison among the learning practices developed in Europe for the initial teacher training.

In this way it could be interesting to present the different projects to discuss how they correspond to an articulate and unitary design.

The Odette Project [3]

Odette (Open and Distance Education for Teacher Training in Europe) is a Minerva project oriented to give a substantial contribution to train teachers having ICT abilities to make them fully ready to perform the important task of training the young European citizens to leave, work and grow up in a world that is more and more invaded by new technologies. In addition to better their training, the use of the results of the project will give to teachers the European meaning of their teaching abilities.

The principal aim of Odette is to develop, apply and evaluate a tutoring method (protocol) supported by information and communication technologies (distance tutoring) for student training at school (primary and secondary school), that includes the possibility for students to share experiences with other students. This method is expected to result from the permeation of pedagogical reflections and technological ICT potentials. Actually an electronic central platform is under develop to test the characteristics, the limits

and the critical points of the distance training. Besides, the design of a specific database to record the most significant didactic practices on European scale is under consideration to support teacher training.

Our Faculty takes actively part in the project, yet starting up an educational training to realise a strategic and pragmatic interaction between theory and practice. It is provided since the first year and is equivalent to 20% of the curriculum (about 500 hours activity). Its organisation on line (T-net) follows the widening of knowledge and competence (basic, transversal, theoretical, technical and practical) provided for students during lessons and laboratories and is also developed in relation to the training targets concerning observation, design, realisation and evaluation of training. It is an experience of contextualized learning: the *direct training* performed at school (observation-surveying, testing and realisation of performances) is related to the *indirect training* (processing, reflection, design and evaluation of performances) performed individually or in a group, outside learning environments, through the mediation of a tutor.

Direct Training in T-net [4] preserves the characteristics of an experience of real-life in a real environment, its develop takes place through a professional action or through an aimed introduction of trainee into schools operating in partnership. The indirect training takes place on line a part from three face-to-face meetings. The basis for the training system develop is the design realised by the student in accordance with the targets of curricula given by university and in relation to his (her) own personal focus and educational and learning interests. In this connection, the on line training model assumes a particular value than, using ICTs, it links to a comparison/contact among a variety of contexts and experiences, where the original, evolutionary and structural specific differences allow the processing of articulated cooperative learning systems.

In on line training the quality of training is assured by tutoring performed by experts that take students along different paths: supervisor, tutor, mentor.

The supervisor, full time working teacher or school manager, moved to the university, will answer for the compliance of the personal projects with the guidelines of a standard training model given by the university itself. He answers and controls for the worked up levels of the pedagogical-organising training paths to join to the university curriculum.

The tutor, part-time working teacher in school, moved to the university, is a decisive presence to qualify learning experiences, during its developing through design, application, evaluation, revision and deliberation. He plays a critical role, mediating on two sides: on one side tutoring towards a vocational contextual learning; on the other supporting the use of technological instruments. So we can affirm that a tutor is that figure whose *expertise* include either competences in using learning technologies and competences about environments in which the profession of a teacher is really practised.

The mentor, receiving teacher, working full-time in a partnership school, brings the trainee into the dynamics of the vocational practice, and supports the insertion of the student in an educational, organisational and didactic system, in relation with the project: his function is to exercise a mediation “revealing” to the trainee the nature and peculiarities of performing the profession of teacher. At the same time he offers himself as image of a teacher that will support the trainee by building his further vocational identity.

Every figure, by operating, contributes to define a learning picture of the system, where training outlines “learning” as a result of a complex path that matches theoretical, procedural, strategical and contextual knowledges.

The Comenius project [5]

It is a 2.1 Action for teacher training entitled: “Training on net: Learning modules in initial teacher training” that links to:

1. starting up an European network within an initial training for teachers of primary school;
2. sharing media and methods for Learning modules;

3. publishing of a book and a CD-Rom about the “best” practices carried out by the educational Institutes involved in the project;
4. using new Information and Communication Technologies, and/or Open and Distance Learning within the project or within activities disseminating outputs.

The triennial exchange programme will segments into the following three most important activities:

- designing, implementing and evaluating of three kind of modules (a thematic module, a methodological module and a module related to the basis knowledge of the primary school)
- planning, management and evaluating of an experimental laboratory for the initial teacher training with a combined presence of teachers’, tutors’ and social-cultural promoters’ competences in the courses;
- conduction of a seminar meetings-yearly workshop in the three institutes involved with the project for monitoring the developing of the planning during the path, evaluating the states of proceeding and verifying the possible changes;
- using of video-conference for the activity of open teaching-learning on a distance for tutors, supervisors, teachers during the initial training and teachers of the courses for the distribution of results;
- publishing of the produced materials and of the activated processes during the project.

Envisaged outputs:

1. co-building of methodological models for didactic research and dissemination of outputs;
2. reinforcement of an European dimension of trainers and teachers and building of a network to allow a wider access to transnational educational resources;
3. quantitative and qualitative promotion of the less distributed and taught languages of the European Union (French, Catalan; Castilian; Italian);

The concrete aims and the objectives of the project are:

- the collaboration among institutes in partnership to improve the training of trainers and future teachers pointing out strategies to better the quality of didactic activity and of learning in a class;
- the adaptation, development, testing and implementation of curricula, courses and materials for the initial training of teachers;
- the adaptation, development, testing, implementation and dissemination of didactical methodologies and pedagogical strategies to use in classroom, included the realisation of materials to be used by students (future teachers) and by pupils of the primary school.

The national research

The impact of new Information and Communication Technologies (ICT) [6], on university teaching methods and on learning experiences by the different typology of students (in Italy: degrees, specialized degrees, masters, higher training courses), involves a complexity going over the scientific knowledge and the good practices consolidated during the courses at a distance also Web-based: designing Learning modules, development of multimedia materials off and on line, individualised assessment of learning, CMC and learning communities on line with the tutoring, net expertises and individualised project-work or in situated groups, etc.

Introducing e-Learning in universities and in faculties as a systemic modality of training on site-on line, means a strategic change, not only of the traditional didactical model face-to-face but also of that more advanced one characterising teaching face-to-face and distance teaching for not attending students, for whom it provides alternative/original training modalities.

The pedagogical-didactical question advanced by e-Learning – meant as a systemic integration of nets (Intranet and Internet) in the teaching-learning university process [7] – is radical: there is an advantage, but how can we define and evaluate it in comparison with the aims of university teaching? Actually it is not possible to consider the question only as a managerial and economic one through a costs/benefits analysis coming out from a higher investment into equipment and specialised human resources but we

must consider also the pedagogical question and evaluate the effective improvement in knowledge, in ability and in competence by the students that use Web-based materials and learning methods based on Web.

The added value of the open distance and flexible learning can be found especially in the planning, implementation and evaluation methodologies of e-Learning with specific reference to six basic questions:

1. architecture and design of the educational sites and the technological-communicative platforms;
2. wired organisation of the scientific contents through integrated modules of teaching-learning on site-on line;
3. representation and semantic of the knowledge and guided research of the informations on net;
4. methods of communication on net and constructivism and situated learning in relation to different training aims;
5. self-assessment and monitoring on line of learning with the training feed-back and records of portfolios and final evaluation;
6. training of the students using ICT (at least: European Computers Driving Licence) and of university teachers (CMC practices) managing Web-based Instruction [8].

Currently in Italy ODL experiences that use sistematically e-Learning – Web-based Learning modules in ordinary curricula as obliged or optional integration to frontal teaching or as continuous stand-alone training, and naturally the basis components of the courses on a distance – are not numerous and however almost always promoted by the enterprise of single teachers or by small groups of researchers. Instead degree courses or masters for the initial or in-service Teacher Training, entirely on line, begins to be present and have been started up with the effectiveness of the university reform.

Conclusion

We have seen the pedagogical-didactical and technological guidelines linked to a training model that could be used effectively on European scale. Odette and Comenius projects are giving some indications about distance training, electronic portfolio and ICTs used in the educational institutions. We will point out two critical points: the standardisation implied in every project that involve ICTs and the difficult balance between the national and regional cultural context and the European educational dimension.

We must keep much attention to the experimentations and the studies being carried out, so that the model for professionalization and internationalisation of teacher training will not mean a cultural and technological rift between the almost consolidated practices and a future to be designed.

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PROJECT MANAGEMENT COLLABORATIVE TRAINING IN ENGINEERING SIMULATION

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Introduction

Active and cooperative learning methods represent a paradigm shift in the delivery of engineering education. These techniques recognize that the passive model of the typical university lecture does not work for many students. Instead, active and cooperative learning focuses on the premise that the students can learn best by doing and working with each other in modular teams. In the typical university classroom it is likely that professors are most actively engaged during the class time because they are walking about, expressing ideas in their own words, organizing, justifying, elaborating, and asking questions. The principles of cooperative learning are designed to get the student involved by transferring some of these activities to the student. Cooperative learning strategies are designed to motivate the students' interest and help their retention of key ideas by encouraging them to participate in discussions. In this model of teaching, the teacher serves as a facilitator and resource, the students interactively learn from each other, from the teacher, and from the process itself.

This paper presents background material on active and cooperative learning techniques and discusses why simulation educators may want to incorporate these techniques into the simulation educational experience. We highlight key techniques that allow students and engineers to work together in small groups throughout the class period to discover and explore the concepts for themselves in integrated informational structures (figure 1).

As the subject matter difficulty increases it becomes important to break the task down into smaller steps. For example, on the activity cycle diagram exercise, there are two steps to the task. A further refinement would be to have the students first list out either individually or as a group the resources, entities, queues, and attributes. Then, the students can begin the project. The instructor circulates to clarify the symbols or any misconceptions about the system.

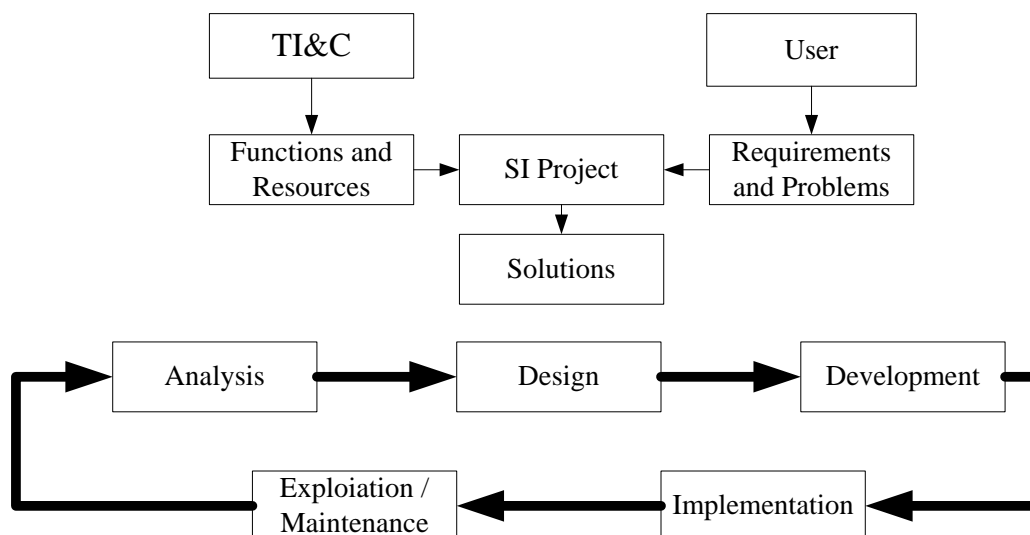


Figure 1. Virtual classrooms collaborative project management training

Learning how to choose business process simulation tools for cooperative learning

The more common manufacturing applications include the testing of existing processes to identify: bottlenecks (where they are and where they shift to if cleared); resource utilization (including all staff, plant and material handling resources); production philosophies (JIT vs. MRP for example); plant layouts; distribution facilities and systems; scheduling; effects of changes to existing systems; volume changes; new plants or layouts.

There are three types of tools, which relate to business process simulation. On the lowest end is flow diagramming, which allows the calculation of only simple sets of parameters and variables, however, rarely with any more computation capabilities than that of a spreadsheet.

Mid-tier are System Dynamic-based tools, which operate on the idea that processes cannot be accurately represented by a serial string of tasks, but only as a set of independently functioning subprocesses. The benefit to using these over flow diagramming tools is the ability to define and simultaneously simulate interprocess relationships. Neither type, however, is powerful enough or complex enough to perform true event-driven simulation. This requires the third and most powerful type, discrete-event simulation tools.

Many factors influence the choice of simulation tools, including; the type of process to be analyzed, the objective of the simulation, and the skills and background of the user. Evaluators should be aware of two caveats. First, realize that the user's ability to understand and articulate each piece of the process is the greatest coefficient for producing accurate simulation results. Tools that require strong analytic and programming skills may exclude end users, whose perspective is critical for accurately defining a process.

The second is the requirement for expertise in the statistical methods used by the simulation models. In order for the simulation results to be reliable, the user must understand when and why to choose specific probability models (e.g., Normal, Poisson, etc.) The alternative is to use data analysis tools that allow probability models to be created automatically from existing data; however, these features are rarely integrated with simulation tools.

In both cases, graphical development environments, animation and flexible reporting are highly desirable. They encourage user/developer collaboration, foster visualization and real time interaction, and allow gaming (e.g., 'what-if' analysis), all of which facilitate the capturing of process knowledge, and ultimately lead to process improvement.

Process Simulation helps effective process improvement as it assists students to understand the process, analyze the process, find problems and/or opportunities for improvement, incorporate solutions and finally implement the reengineered process.

Simulation products help students through each and every step of students process improvement efforts. With those products, students can model student's processes, which enable students to understand the process in-depth and be assured that students are looking at all significant aspects of the process. Process Simulation gives students important statistical information that students can use to analyze the performance of the process. The information is available in formats that lend themselves to easy analysis: pie charts, bar graphs, line graphs, etc.

By analyzing output information from process simulation runs, students can identify problems and opportunities for improvement. For example, students might discover the location of bottlenecks or understand the impact of scheduling policies. Students can then modify students model to solve any process issues and take advantage of improvement opportunities students have identified. Analyzing the new output information tells students how effectively students have tackled the problem and capitalized on available improvement opportunities. This 'what-if' analysis capability of Promodel process models help students validate the effect of changes to the process before jumping in and making changes in real-life. Without this capability, students are making assumptions about the effect of students proposed changes and in some cases a change could produce a negative impact. Promodel products help students avoid such pitfalls by providing a test-bed to validate ideas.

Generically, process modeling involves the solution of equations of balance of mass, energy, and linear momentum in addition to those listed above.

Process modeling and process simulation modeling can be used to enhance the quality and accuracy of decisions made by individuals and groups as part of Operational Process Improvement (Business Process Reengineering), Strategic Planning, and other types of decision-making. Process modeling provides decision-makers with a simple, graphical representation of a complex process. Process simulation modeling adds the dimensions of time and probability (uncertainty) to the analysis of organizational processes. The information is provided for managers and technical experts who are contemplating or are currently involved in a process modeling or simulation-modeling project.

Real world tools into the virtual classroom

It is necessary to provide simulation systems to major manufacturers for over 15 years. Simulation systems are used by industry to design and test manufacturing systems before one capital dollar is spent. That's why we find very important for our students to manage these powerful tools. We think that each of them must have the possibility to be connected from home to the laboratory and to take part at the applications we are doing on-line.

This technology aided by open distance learning should be available to schools to help bring practical, real world simulation applications to the class room – from robotic and manufacturing laboratories designed for university students through a School-to-Work project, to teaching robotic processing and machining concepts and programming at Colleges and Universities.

Simulation can impact classrooms in many ways. Simulation can be used as an extension of the blackboard to help students three dimensionally visualizes the concept. Unlimited what-if scenarios can be experienced to foster "out-of-the-box" thinking. Simulation provides a virtual world where there is no limit to the range and number of interactive projects and lab exercises that can be experienced. Able to conduct collaborative sessions over the network, virtual classrooms are possible for students' spread across town or the globe according to new collaborative project management paradigm.

We have found that simulation has provided them with the right solution at the right time, so we must: provide students for a career in today's fast growing area of virtual design and digital manufacturing, improve classroom instruction with hands-on practical learning activities, improve students' interest and performance in complex math, science and technology concepts and upgrade technology labs with the latest in manufacturing, and design technology at a fraction of the cost of other alternatives.

Towards World Class with Simulation with the Theory of Constraints

Computer Simulation is essentially a world-class decision support technology. We have always had the traditional arsenal of quantitative techniques to assist in the decision-making process, but they have always been static and deterministic in nature and therefore inadequate for application in dynamic and complex systems. Simulation is dynamic in that it runs through time, and non-deterministic in that it incorporates randomness into every event in the system. The impact of randomness in a system is staggering to the uninitiated.

The simplest definition is that simulation is the art and science of constructing a model of a system and performing tests on it to determine system performance.

Dr Eli M. Goldratt first introduced the Theory of Constraints (TOC) in 1984 in his book *The Goal*. Since then almost a million copies have been sold, several books have followed and manufacturing thinking is being revolutionized.

TOC is essentially a management philosophy that treats the corporation not as a collection of independent processes but as a complete system. The complexity in the system is as a result of dependent events recurring in the system with random or fluctuating process times. It is this that accounts for a lot of the

chaos and inefficiency that inexplicably happens when a well designed and well balanced plant is running anywhere near its design capacity.

TOC is often not committed to as a result of inertia: the traditional cost accounting based measures are so deeply entrenched (probably the cost accountant is too) that it is hard to convince people to let them go; all our Industrial Engineering techniques for measuring efficiency are suddenly questioned; scientifically calculated and proven Economic Batch Sizes are tossed aside; this is not easy to initiate.

Most discrete-event simulation tools base modeling functions on having objects or 'entities' pass through the system or process model. The simulated process begins with the first entity passing through the first task, and ends with the last entity passing through the last task. This metaphor is a legacy of these tools manufacturing origins, where it is adequate to model static entities moving along a 'virtual conveyer belt'. When modeling business processes, however, static entities are inadequate. Some simulation tools supports smart entities, which may be associated with specific values or states. For example, when customers wait in line for an hour they are not in the same state as those, which wait only five minutes (in fact they may be gone altogether). Smart entities allow customers to be defined as likely to leave if left in a queue too long.

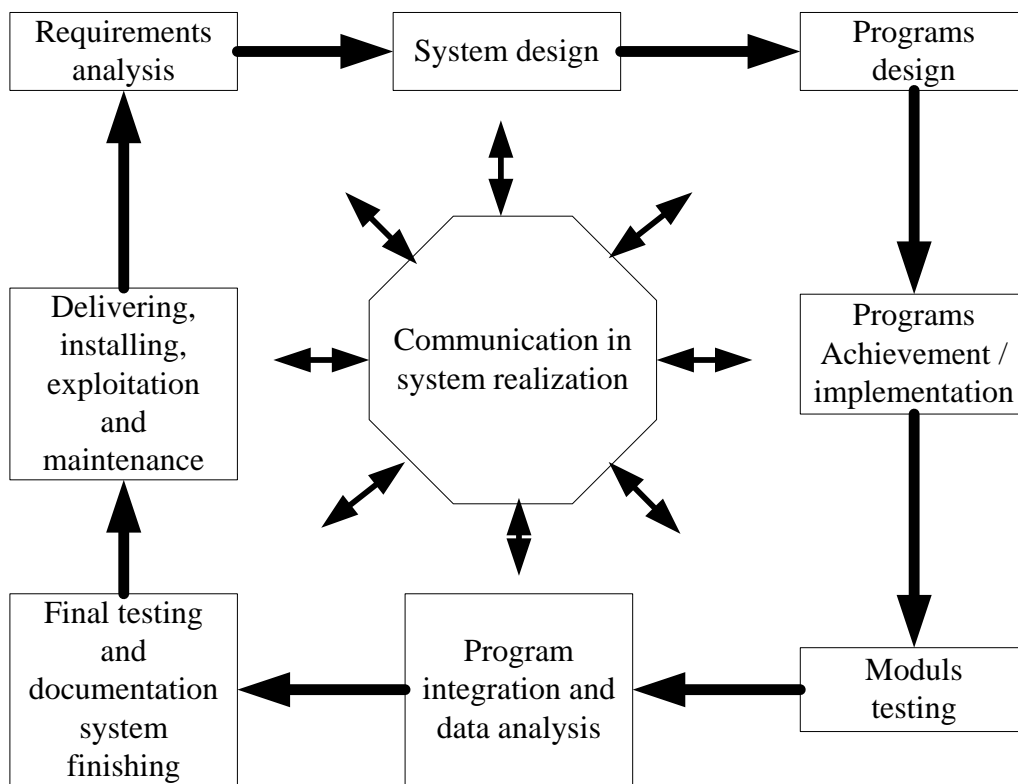


Figure 2. Informational flows on-line simulation

Simulation is also a powerful communication aid with compelling animation of the system that runs live while the simulation is running giving the opportunity to integrate informational flows (figure 2). By viewing the animation an understanding of the system under review and it's dynamics can be gained by a wide audience, from the boardroom right down to the shop floor. The animation makes decision motivation or support infinitely easier than screeds of numbers in a report.

Once a design has been completed, after optimization or some tradeoff decisions, the design evaluation phase begins. Prototypes may be built for this purpose. The new technology called rapid prototyping is becoming popular for constructing prototypes. This technology enables the construction of a prototype by depositing layers from the bottom to the top. Thus it enables the construction of the prototype directly from its design because it requires basically the cross-sectional data of the product. If the design evaluation on the prototype indicates that the design is unsatisfactory, the process described is repeated with a new design.

The manufacturing process begins with process planning, using the drawings from the design process, and it ends with the actual products. Process planning is a function that establishes which processes – and the proper parameters for the processes – are to be used. It also selects the machines that will perform the processes, such as a process to convert a piece part from a rough billet to a final form specified in the drawing. The outcome of process planning is a production plan, a materials order, and machine programming. Other special requirements, such as design of jigs and fixtures, are also handled at this stage. The relationship of process planning to the manufacturing process is analogous to that of synthesis to the design process: It involves considerable human experience and qualitative decisions. This description implies that it would be difficult to computerize process planning. Once process planning has been completed, the actual product is produced and inspected against quality requirements. Parts that pass the quality control inspection are assembled, functionally tested, packaged, labeled, and shipped to customers.

Many software tools are also available for design optimization. Although design optimization tools may be regarded as CAE tools, they are commonly classified separately. Several research activities are under way to determine design shape automatically by integrating design optimization and analysis. In these approaches, the initial design shape is assumed to be a simple shape, such as a rectangular shape for a two-dimensional item composed of small elements of different densities. Then the optimization procedure is carried out to calculate the optimal values of these densities to meet a certain goal while satisfying the stress constraint. The goal often will be achieving minimum weight. Based on the optimal values of the densities, the optimal shape of the design is derived by eliminating the elements of low densities.

When the outcome of the design evaluation is satisfactory, the design documentation is prepared. This includes the preparation of drawings, reports, and bills of materials.

Simulation takes advantage of the latest product development strategies such as Integrated Process & Product Development and Concurrent Engineering. This approach gives the flexibility to seriously consider a wide variety of options prior to making an investment in tooling or machinery. Simulation allows our engineers and programmers to test equipment, evaluate processing methods, and analyze costs without using valuable production time or risking equipment damage (figure 3).

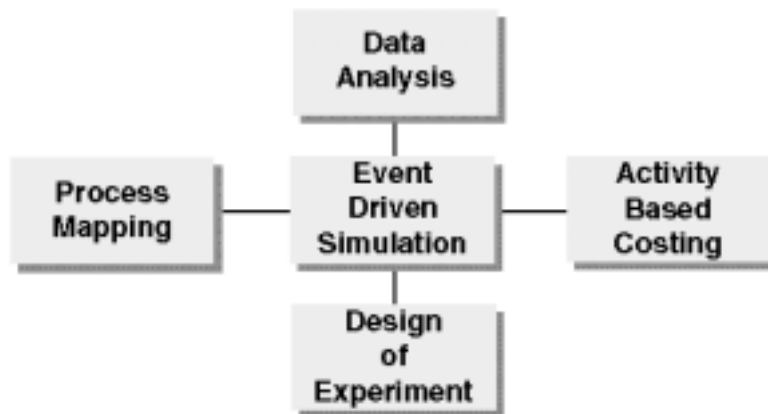


Figure 3. Concurrent Engineering in open distance learning

Virtual simulation allows inspection of the following: Cycle Times, Tooling Fixtures, Reach Studies, Robot Paths, Machine Interference Zones, Machine Placement, Human Factors Engineering & Workplace Assessment, System Throughput/Line Flow, Informational Flow.

Optimizing human-machine interaction is an integral part of verifying the manufacturing process. One can examine the human element of your manufacturing process—ergonomics and human factors engineering. It creates a computer environment in which a range of postures and their effects on humans can be visually and numerically analyzed for task performance. Workplace assessment simulation can create a safer, more productive working environment.

WITNESS Virtual Reality (VR) offers the best in high quality 3D modeling on the PC. This WITNESS module combines the power of simulation with state-of-the-art 3D graphics. As a result it is an excellent tool for the visualization of any planned, new or existing business operation.

WITNESS VR is widely used not only internally to facilitate a teamwork approach to problem solving, but also to enhance communication and buy-in to proposals across the whole organization. This is the software we are using in our laboratory.

Traditionally structured class periods imply that students listen to a professor lecture for about an hour. Cooperative open distance learning can replace some of that lecture time with methods designed to get students actively involved during the class period. This paper presents the use of active and cooperative open distance learning techniques applied to simulation engineering. Tips and examples for how to transform a standard lecture into a lecture based on cooperative exercises were given and the authors' experiences with these techniques were detailed.

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DISTANCE EDUCATION IN THE CZECH REPUBLIC – DIRECTIONS AND TENDENCIES OF ITS DEVELOPMENT, PROBLEMS AND ACCOMPLISHMENTS IN ITS IMPLEMENTATION

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Summary

This paper evaluates activities in the area of implementation and development of distance education in the Czech Republic within last 10 years. In this period there have been done first steps on the way towards promotion of the distance form of education and towards continuous system solution of this problem in the framework of long-term plans of national educational policy and also within particular objectives of various educational organizations. It was decided that the educational system of the Czech Republic, mainly its tertiary sphere, would implement distance education technology in the optimal extent, responding to current needs. All of this requires not only big financial input, but also a considerable change in development of school pedagogical resources and in informing of public.

External form of studies have quite a rich past in the Czech Republic, mainly in secondary schools and universities. There was always a big interest in obtaining higher qualification and people interested in extramural studies were big in number. However studies were designed as condensed presence studies organized in the evenings or at weekends. Despite undoubtedly great effort of both students and pedagogues as well as support provided by employers and the state, success of this form of studies was relatively small. Accomplishments of graduates were low especially in demanding university studies and these studies were considered as of low-quality and financially unprofitable. However the interest in studies at the full economic activity is still growing and this trend will certainly continue. Therefore even in the beginning of the 90's some universities and more often individual pedagogical personalities started to bring information to the Czech Republic on distance studies, on open distance universities and on experiences with implementation of modern technologies in education.

There was a wider discussion related to this topic in the years 1994-96 when the Czech Republic entered extensive programme Phare "Multi-country Co-operation in Distance Education". Due to this fact it was necessary to make a lot of system decisions and consequent steps. First of all it was decided that the Czech Republic would not establish an independent distance university, as it was in many countries in Europe, Asia and America. There was supported so called dual model, i.e. when a university or an institution providing presence education organizes some courses and study programmes also in distance form. The state does not influence decisions at public and private universities – the school has to decide itself whether it would like to develop and implement distance studies, or not. The current Higher Education Act (1998) was designed in this sense – it allows to accredit a study programme in presence or distance form. Another form of studies, which is allowed by this Act, is so called combined form of studies.

In practice it means that part of study programme is prepared in the form of the controlled independent studies (DE), however the great part of studies requires participation in presence education. Majority of universities did not succeed to accredit fully a distance study programme. The reasons are as follows:

- First of all it is the lack of financial means, since development of a 3 to 5 year closed university study programme in a full distance form requires high input costs, which are hardly obtainable for schools (both from state or grant resources).
- Another reason is a lack of human resources. The potential of university workers is limited and also very unstable as for the age structure. Elderly and very conservative pedagogues strongly prevail. They very often do not support development of new pedagogical approaches and utilisation of educational technologies, and in addition they frequently have contempt for such activities.

- Last but not least it is also matter of training of pedagogues in a specific problems and skills necessary for development and implementation of distance studies.

The combined courses offered in many cases do not represent a final version and there is no doubt that the share of presence studies will continually decrease and will be replaced by a top-quality distance studies. The reasons are clear. High proportion of obligatory presence education considerably restricts possibilities of these studies at full economic, social and family activity of a student.

Adopting the new High Education Act was a principal step on the way towards supporting a development of the distance education at universities, since it put different forms of studies on the same level – presence, distance and combined form.

Another important step was establishing the National Centre for Distance Education (1995), which is a part of the Centre for Higher Education Studies in Prague. This institution is under the straight patronage of the Ministry of Education of the Czech Republic and is fully financed by the Ministry. The National Centre for Distance Education (NCDE) was established resulting from the unambiguous request of the Phare programme, first as the National Coordination Point for administration of this programme in the Czech Republic. Its task was to coordinate foundation and equipping of four local centres of distance education, which were established based on the financial support by the Phare programme. These centres are situated in Prague (J. A. Komenský Academy), in Liberec (Technical University), in Olomouc (Palacký University) and in Brno (University of Technology) and together with the NCDE they form an axis of continually developed National Network of Distance Education in the Czech Republic. This Network has been continually joined by newly appearing units at other Czech universities.

By the end of 1999 the NCDE activities had been financially supported by the Phare programme. After its termination it is fully under the auspices of the Ministry of Education. Our aims and objectives are still very clearly defined towards the support of development of distance education and promotion of ICT in the pedagogical practice of tertiary sphere schools. Main direction of our activities result from actual current needs of the existing educational system:

- Expert and informative seminars for school workers
- Training of workers preparing and implementing distance form of education
- Coordination of activities coming into existence at various universities
- Creating and continuous administration of distance education databases – database of experts in this technology, database of distance study programmes and courses offers, database of distance study texts and multimedia supports, database of trained distance education tutors
- Distribution of information for the public on possibilities of distance education, on advantages and disadvantages of this form of studies for students, on educational institutions providing distance or combined study programmes
- Aimed support in utilisation of ICT for distance education and support of *e*Learning development as a new, prospective didactic method

The practice shows that mainly all informative activities organized for pedagogical workers and especially for academic officers from universities are of a great importance. If academic officers are familiar with the problems, they mostly support development of distance education at their schools and appreciate work of teachers, who deal with new educational technologies.

Particular training for workers, who would like to focus on development of distance education, are even of a greater importance. NCDE organizes educational course consisting of three independent parts – training in principles of distance education and training of DE tutors, training for authors of distance study texts and of other multimedia aids and training for organizers and administrators of distance studies. Successful leavers of the whole course are awarded by the NCDE certificate. There were 145 leavers by the spring of 2002 and there is another course running in the year 2002. Although this number might look relatively big, it by far does not correspond to real needs of trained workers needed in practice.

Interest of the public plays an important role in development of distance education. People potentially interested in studies mostly do not know the difference between the distance and presence form of studies. They often believe that it is a low-quality form of studies, and therefore less appreciated by the society and experts. Many of them think that it is some kind of quickened and simplified studies, which allows them to reach easily a university degree. Therefore we make a lot of steps to improve this situation, we communicate with media, and we edit information brochures and guides.

The national educational policy definitely aims to the high increase of people with university degree. In last 10 years the number of university students in the Czech Republic has increased by 84,768 i.e. by 76.6 %. Strategic plans consider that the whole half of 19-year old people would enter university studies in 2006. This daring plan cannot be implemented only by expansive-based development of universities. Majority of them is nowadays on the edge of their objective potential as for capacity of buildings, classrooms, student dormitories etc. Therefore the support to development of distance form of degree university studies is one of the aimed steps, which might ensure higher availability of university education to citizens of the Czech Republic.

Besides in strategic plans the stress is laid on lifelong learning and implementation of distance form of education in this area. In practice it means a support to development of variously long and contentually differentiated educational courses for further education of adults, who need to enlarge their competence, need to requalify or just to enlarge existing skills and knowledge, no matter if related to current need of professional growth or to personal interest.

Requests of this type of education still grow – language courses, courses for gaining ICT skills, courses for education of public administration staff relating to preparation of the Czech Republic to admission to the EU, qualification courses for women, who would like to return to the economic process after their maternal leave, courses for continuing education of teachers at all types of schools and many others. The Czech Republic joined supporters of the European Commission's Memorandum on Lifelong Learning. When discussing this document not only politicians and representatives of the key ministries, but also representatives of universities and other educators got to an agreement. Stressing development and support of lifelong learning is now one of priorities of educational policy in the Czech Republic.

Educators in the area of lifelong learning are generally of two types. Various private educational institutions came into existence based on requirements of various educational courses, which appeared in the market. These educational institutions can very flexibly adapt to current needs not only in content, but also in form of studies, which would meet requirements of their students. Therefore they attempt to transform quickly their study activities to distance form, invest their human and financial resources to development of distance education and actively cooperate with the NCDE.

The second important provider of lifelong learning courses are universities. They are encouraged by the Higher Education Act, which classifies this educational activity as fee-based studies (university degree studies are free of charge in the Czech Republic). However in this instance considerable inelasticity of universities and their conservatism represent a problem. Mainly so-called brick and stone universities with a long tradition and a high expert potential do not display any interest to provide other than very specific degree studies. In better case they develop these courses for further enlargement of expertise of their graduates who are in practice. They consider implementation of these courses in distance form as too expensive and they manage to meet current requirements with the presence form of studies.

Smaller regional universities and small private universities seem to be much more flexible in this area. They try to make their best of dominant position within the region where they represent a top educational institution. Their approach to new forms of studies and using of new educational technologies is generally much more positive.

Despite all of these objective phenomena and problems we can say that distance studies have already implanted themselves within the educational system of the Czech Republic, stroke roots in both the private and public educational institutions. Politicians and public administration bodies become continually aware of it. Interest of the public in this form of education is so high that it still has not been sufficiently met. This undoubtedly represents one of the main stimuli for systematic and system support of further development in this area.

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THE EXPERIENCES OF ÚDARÁS NA GAELTACHTA IN THE IMPLEMENTATION OF ODL ACTIVITIES IN THE GAELTACHT REGIONS OF IRELAND

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Background to the implementation of ODL activities

Since the late 1980's Udaras na Gaeltachta has promoted the use and availability of technology and telecommunications networking as a necessary element in the integrated development of the Gaeltacht Regions of Ireland. As a geographically dispersed rural region located on the western edge of the European Union, it has traditionally suffered all of the disadvantages of remoteness and isolation. With no urban centres of population, the development of the telecommunications infrastructure was dependent of the demand that was created by the local population and industrial companies working in the region. An important element of this integrated development has been access to 'Continuing Education' at all levels of the community.

As a Regional Development Authority, Udaras na Gaeltachta promotes and supports the development of new enterprises. To support these developments, associated activities such as access to on-going training have been integrated into the strategy of the organisation. Through the use of Information Society Technologies, Udaras has implemented a programme of Open & Distance Learning (ODL) at a number of different levels within the community. Through the integrated use of the Internet, the WWW, video conferencing and audio conferencing a series of programmes have been implemented with SMEs, Second Level Schools, Vocational Training Groups and the General Community by endeavouring to create the 'Virtual Classroom'. The target approach in all cases has been to '*Bring training to the learner*' instead of '*Bringing the learner to the training*'.

The Gaeltacht Regions have benefited significantly from the implementation of these projects, many of which received support from the European Commission under various EU Development Programmes. These have included the TAP, the Leonardo Da Vinci, Socrates, Youthstart Programmes, Minerva and Grundtvig programmes. The improvement of the telecommunications infrastructure in the regions over the past ten years has been come about primarily as a result of these types of activity.

All of the transnational projects in which Údarás na Gaeltachta has been involved have highlighted difficulties that arise in the implementation of ODL activities in the areas of language, regulations, scheduling and access. These issues can cause problems for effective transnational co-operation.

All of the transnational projects in which Údarás na Gaeltachta has participated have included organisations, community groups, vocational groups, SMEs and schools in remote regions. These would typically be at the lower end of the scale as regards size where particular difficulties can be experienced in joining transnational project activities.

Udaras na Gaeltachta co-operates with the Education Authorities and other Educational Institutions in whose catchment areas the Gaeltacht regions are located.

ODL Activities

Examples of ODL projects in which Údarás na Gaeltachta has been involved are:

- COINS (1996 – 1998) - Supported under the Telematics Applications Programme
- EUROTRAIN (1996 – 1998) - Supported under the YOUTHSTART Programme
- MILTON (1997 – 1998) - Supported under the COMENIUS Programme
- DISTILLS (1997 – 2000) - Supported under the Leonardo da Vinci Programme

- TeleLearn (1998 – 2000) - Supported under the SOCRATES Programme
- STENED (2000 – 2002) - Supported under the MINERVA Programme
- TENT (2000 – 2002) - Supported under the GRUNDTVIG Programme

Experiences and Evaluation

Many valuable lessons have been learned during the implementation of the projects detailed. Examples of these are:

- When the first projects were proposed there were no models or guidelines that could be adopted as a basic structure for the work programmes. Consequently a provisional structure had to be designed and implemented for validation and verification.
- There were no teachers or trainers experienced in the techniques necessary for teaching over a multi-point live interactive teaching network with two-way video and audio. The proposed structure had to incorporate a self-learning course for the proposed tutors.
- The behaviour protocols that were necessary for managing the tutor/learner interaction over a multi-point video conference network were unknown at the start of the projects. These structures had to be established, tested and refined during the project programmes. These protocols applied equally to both the tutors and the learners.
- The ideal configuration of the technology in the classrooms and training rooms also had to be established with particular reference to the audio quality. Many of the classrooms and training rooms were unsuitable for use as centres for ODL teaching activities, however few if any other options were available. The projects had to make use of the facilities that were available and to configure the technology in such a way as to maximise the equality of video and audio in the 'Virtual Classroom'.
- The projects had to depend on the use of basic technology as none of the project partners were in a position to invest large amounts of money in installing elaborate systems that would provide for extensive functionality and improved quality. Additional components, purchased locally, were added to the basic systems to provide the necessary additional functionality – these included wide-angle lenses, hi-fi speakers, additional camcorders, document stands etc.
- Many of the trainers and teachers required training in the use of computers before training in the use of the ODL technologies could be undertaken.
- When the first projects were proposed there were no models or guidelines for the design of ODL teaching and training courses or any support materials. Consequently a provisional structure had to be designed and implemented for validation and verification. It was also necessary to look at different structures depending on the learner group. Adult learners require a different structure to students in Second Level Schools. The materials also have to take account of the self-motivation of the learning group. This is an area where additional work has to be undertaken to refine the design and development of the course materials. The different combinations and functionality of the ODL teaching technologies must also be taken in designing any course materials for each specific course.
- 'Training the Trainers' is a very important element of implementing ODL activities. First steps must include training Trainers who will then train other Trainers. This training should be carried out through an ODL network so that the 'Trainer Trainees' can experience the difficulties and techniques. The experience of the 'Virtual Classroom' must be a central element of this training.
- There are a number of methods for managing and administering course registration and monitoring for remote students. A suitable structure must be incorporated in the design of all systems.
- The submission of projects, exercises, activities and after-class contact that are included in a course syllabus must be handled effectively to ensure that student and learners have on-going support from the teacher/trainer. This can be handled in many ways. A suitable structure must be incorporated in the design of all systems.

Summary of transnational ODL Projects

COINS

Supported by the EU Telematics Applications Programme, COINS involved the development of an in-service training programme for SME's in remote regions using paper based and World Wide Web self learning course materials that were be supported by face to face training sessions over a multi-point video conferencing network. The project involved a five country consortium with partners located in Ireland, Austria, Germany, Spain and Wales and included three SME's in each country who were the primary validation sites for evaluation of the project effectiveness. Údarás na Gaeltachta was responsible for the Transnational Manager for the project.

MILTON

The MILTON project, which was supported by the COMENIUS Programme, involved the development of an ODL teaching course for foreign language teachers. The teaching of the languages was based on the use of ODL techniques. The project involved a three country consortium with partners located in Ireland, Sweden and Wales. The course was subsequently taught to a number of language teachers in other EU Member States.

EUROTRAIN

The EUROTRAIN project, which was supported by the YOUTHSTART, involved the development and provision of a 'Career Counselling Course' to Vocational Training groups using ODL learning techniques. The teaching of the course was based on the use of video conferencing, the Internet and Email technologies. The project involved a four country consortium with partners located in Ireland, Sweden, Austria and Wales. Údarás na Gaeltachta is responsible for the Transnational Manager for the project.

DISTILLS

The DISTILLS project, which was supported by the Leonardo da Vinci Programme, involved the development and provision of foreign language learning courses to SMEs who are involved in the tourist industry using ODL learning techniques. The teaching of the languages was based on the use of video conferencing, the Internet and Email technologies. The project involved a five country consortium with partners located in Ireland, Sweden, Portugal, The Netherlands and Wales and included a number of SME's in each country who were the primary validation sites for evaluation of the project effectiveness.

TeleLearn

The TeleLearn project, which was supported by the Socrates Programme, was completed. The project involved the networking of three second level schools to work jointly on the development of a web site and to evaluate the benefits of ODL teaching techniques as part of the transnational contacts which are carried out using point-to-point and multi-point video conferencing. The project included a three country consortium with a school in Ireland located on an off-shore island and schools in Moers in Germany and Brest in France. Údarás na Gaeltachta was responsible for the Transnational Manager for the project.

STENED

The STENED project, which is being supported under the MINERVA Programme involves the development and delivery of an 'Enterprise Development Course' for 15 to 16 year students in Secondary Schools. The project includes the course development and the teaching which will be delivered to three schools simultaneously using ODL teaching techniques incorporating the WWW and multi-point video conferencing. The project involves a three country consortium with partners located in Ireland, Germany and Spain and includes three second level schools in each country who were the primary validation sites for evaluation of the project effectiveness. Údarás na Gaeltachta is responsible for the Transnational Manager for the project.

TENT

The TENT project, which is being supported under the GRUNDTVIG Programme involves the development and delivery of a 'Train the Trainers' using ODL teaching techniques for Adult Educators. The project involved a six country consortium with partners located in Ireland, Austria, Denmark, Hungary, Norway and Spain and includes three second level schools in each country who were the primary validation sites for evaluation of the project effectiveness.

Other activities - ECDL & Schools Training Courses

Údarás na Gaeltachta provides and manages a comprehensive technology training programme for all Second Level Schools in the Gaeltacht region. This programme includes ECDL training and qualification for all teachers and students.

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APPROACHES TO CREATING GLOBAL EDUCATIONAL ENVIRONMENT (EXPERIENCE OF MIIEIFL)

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There are tendencies of globalization modern world observes and internationalizations in the sphere of education, which with active development of information and telecommunication technologies stimulate the increase students' academic mobility.

Exterritorial organizations are the main suppliers of educational services. Specific (state) educational system of these organizations becomes relevant only at the stage of the diploma. According to his own needs and interests a student can choose freely study modules, educational programs, courses developed by different educational institutions throughout the world. An arrangement between these educational institutions on the system of test credits will act as a guarantor of his knowledge credibility.

These days Russian Universities have no legally approved system of test credits. According to the concept of modernization the Russian educational system for the purpose of creating a universal educational space and Russia's participation in the all-European integration of education and science approaches are formed for introduction of a system of test credits in practical activities of universities.

Nevertheless, a number of Russian Universities undertake certain steps to develop this sphere. First of all, they carry out various research of the issue and also approve methods and technologies of their practical realization.

Research shows, that in practice there are various approaches to form credit points: European System ECTS in accordance with Bologna's Declaration, American system USCS, British, Asian. Besides there are differences in technological approaches, shells and the toolkit used for the organizing and accompanying students training with the use of distance technologies.

However, the international level principles of academic mobility can be realized only in the conditions of uniform technological approaches for creation of study materials, training courses and organization of training in various educational institutions; application of uniform principles of educational content formation and uniform standards of its delivery.

These principles can be realized by means of applying standards and specifications, developed by Corporation IMS (Instruction Management System). These standards provide a unified technological approach to formation of the education contents at very different levels (from the module to education program as a whole).

If all suppliers of educational services follow the model of learning technology system architecture (LTSA) this will enable to integrate under the uniform scheme formalized parts of the contents into specific educational modules which will be accessible geographically - separate users by means of telecommunication technologies due to observance of the uniform technological standard.

The final purpose of standardization of the informational – educational environment is to reach mobility, interoperability, stability and effectiveness of educational process. This is a necessary condition for realization of educational programs of distance and e-learning.

On the basis of the IMS standards Moscow International Institute of Econometrics, Informatics, Finance and Law (MIIEIFL) experts have developed a system that forms educational content of existing Russian programs of higher education. The content of the program is presented as a scheme of Structural-logic Interrelation (SLS) among educational modules.

A list of basic and terminal modules is formed on the basis of the analysis of interrelations between didactic units for each module (course). The common scheme is developed on the basis of requirements of educational standards and individual preferences of a student. This scheme represents the structure of each education program as a graph that reflects basic connections between elements. The analysis of the graph allows to optimize an individual educational trajectory of the students, to trace and correct easily contents and connections of modules. The analysis of such a graph allows:

- Visually as a scheme to present an individual educational trajectory of each pupil (or groups);
- It is easy to optimize and correct the given scheme with a change of individual preferences of pupils;
- It is easy enough to actualize substantial interrelations of modules according to the development of subject domains.
- On the basis of the created SLS experts MIIEIFL carries out the development of integrated training courses. The architecture of model LTSA is taken into account through the development of integrated courses.

On the basis of the created Structural Logical Schemes we have developed integrated training courses. When developing integrated training courses we took into consideration the architecture of the LTSA models.

These courses represent systematically presented study material with elements of interactivity a regularly stated the study material with elements covering the content of a number of context depending training models of one level and presented in the form reflecting standards accepted by the international study international educational community for textbooks on electronic data carriers. Development of courses is carried out by groups of authors working together with teachers, engineers and managers the experts estimating the quality of integration of education material at the interdisciplinary level.

Videofragments are used in courses, the system of testing, allowing students to carry out regular self-checking of knowledge, is built in.

Application of similar integrated courses which are designed in the unified technological environment on the basis of common standards, raises the efficiency of the educational process. Experience of use of integrated training courses in the system of distance training MIIEIFL including a network of educational centers located in various regions of the Russian Federations and the CIS countries, specifies a number of such advantages:

- Students while studying each module have precise understanding of its place and role in the general scheme of training. They can trace interrelations with other subject domains and perceive a teaching material as a complex. At the same time the student's skills and competence are formed within the bounds of a subject domain of the concrete module;
- By means of telecommunication technologies we supply the students living in small towns, high quality educational services;
- Integration of process of training at an interethnic level has been reached: the students training in Kazakhstan use the same teaching materials, as students in the Baltic countries.

In our opinion, the integrated courses can smooth existing distinctions in approaches to formation of credit tests systems that appreciably will raise the academic mobility of students.

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HOW TO IMPROVE THE ODL EDUCATION WITH A MATURE TECHNOLOGY, THE E-MAIL

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Society is changing and there is a key element and dominant in this change, the information. In front of these change, people who has a relevant position in education has to take care of the change as users, value transmitter, guides and facilitators in the growing up of the channels for the information transmission. The reasonable steps to know if one channel is good for ODL should be:

- Knowledge about TIC
- Analysing TIC functionality
- Evaluation of TIC applied to the learning processes
- Analysing the previous knowledge about TIC that the learners should have
- Analysing the possibility to adapt a subject to the media
- Design activities and learning processes depending on the previous analysis and evaluations

In TIC we can see a big set of tools as Telnet, FTP, WWW, Email, Distribution Lists, IRC, Chat, News... This work talks about the email, and it's going to expose the functionality and attributes which this tool can contribute to the ODL based on the experiences developed in the Universidad Politécnica de Valencia from 1996.

To manage more detailed the work we will focus the study in the tutoring and the interactivity because of the manager of the education can think about the possibility to develop a pre-selection of the actors (teachers, learners, help people...). But as responsible of the education could we decide who is going to be out of the education depending on the knowledge about TIC?

In the Universidad Politécnica de Valencia, we decided educate teachers and learners in the using TIC. For this task we design a model including of assistants. Teachers and learners which never before had used Internet tools nowadays work confident with them so we want to show how we develop this task by email, how we achieve an optimal learning process in the subject course and in TIC at the same time with a good quality.

After the use of our system with about two thousand students we obtain the 90% of satisfaction, and we cover the key success characteristics of ODL declared by Fundesco in 1998:

- Flexibility
- Active Teachers/educators
- Synchronous and Asynchronous interactions
- Experiences exchange
- Standard and mature technologies

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E-LEARNING TO ACQUIRE THE BASIC ICT SKILLS FOR FIRST-YEAR UNIVERSITY STUDENTS

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Introduction

Based on our experience as professors in the first year's course in "Computer Science" of the Faculty of Economics and Business Administration at the University of Bergamo, we intend to discuss the following problem: *the introduction of the e-learning framework in the university courses implies the knowledge of basic ICT (Information and Communication Technologies) concepts and, conversely, the project of a basic course in ICT has to provide the use of e-learning tools.*

Furthermore the use of e-learning activities in education and the diffusion of the web services are strictly connected with the definition of standard skills in the European university's basic education.

The purpose of the paper is to present a proposal for a common project among different countries on the definition of basic skills necessary for using an e-learning platform in the learning process. The paper is organized in the following sections:

- Section 1: The e-learning experience
- Section 2: E-learning as basic competence
- Section 3: Proposal of contents for a Computer Science basic knowledge
- Section 4: A common project.

1. The e-learning experience

In the Faculty of Economics and Business Administration at the University of Bergamo the project "**eLearning.unibg.it**" has been working to support the projection and realization of e-learning activities in most of the courses.

The platform used is *LearningSpace* with *Domino* server and *Lotus Notes* client. It allows combining the face-to-face interaction between teachers and students and a virtual classroom on an online learning environment. The choice was supported by the idea of defining a standard for e-learning activities starting from the use of a collaborative working tool by the teachers. The project, started since the academic year 1999-2000, is growing rapidly involving most of the courses and at least 900 students for each year.

The course in "Computer Science" is a basic first year course in the Faculty and Business Administration. We have chosen to use the e-learning support in this course because such a framework is homogeneous with the main objectives of the course. To access the contents of the online course the students have to know how to use the console, the mouse, the basic features of the operating system as well as the browser for Internet navigation. The main objective of this course consists on above-mentioned points, that is using of the computer as basic instrument for learning and researching in economic and business areas.

The experience was very positive both for the massive use from the students and for the improvement of the continuity of the learning process witnessed by an increased participation to the final exams.

The on-line course is reserved to the students of our Faculty, this enhance the possibility to obtain information examining the log files of the accesses:

¹ The work has been supported by MIUR grant 60% "Utilizzo di strumenti informatici per l'e-learning nell'ambito dell'insegnamento universitario"

- The course has been used most in a distributive mode and with a low interactivity level, because of a high number of students
- The students look at the on-line course as a real support for preparing for exams
- The students ask for a strengthening of the e-learning activities with an increase of contents and tests
- The service is used both by full time and part-time students.

2. Use of e-learning as basic skill

The use of an e-learning environment should become a basic skill in ICT for the students who begin the university studies. Therefore this skill has to be acquired during the first year and takes on an introductory role for the subsequent years.

It is possible to introduce the software environment for the e-learning after having introduced the initial modules, corresponding to the Modules 1 and 2 of the ECDL, related to the basic concepts and the knowledge of the operating system, and the Module 7 about the networks and Internet topics that must be anticipated, because they supplies the basic elements of the Web technologies.

The Module 7 is very important for students not only for using the e-learning environment, but also for using the Internet resources as support to the other ICT Modules and to the other courses of the university studies.

The use of the software tools for e-learning is a skill for all the courses because we think that all the courses of university in next years will be supported by (or completely converted in) online activities.

In the e-learning technology there is no standard, neither a software product more spread over than other ones.

However, there are some common aspects in different software products:

- the course organization in modules and learning units
- the interaction with the teacher and the other students
- the profitable participation to the course, not only by reading of documents or download of files
- the access to evaluation tests and self evaluation.

The presence of those aspects in any e-learning environment should be guaranteed to allow the students to switch easily from an environment to another one. With this guarantee, the student can achieve some “cultural” changes in the way to learn and in the way to study, that is a different approach to the university studies.

- Students are urged to interact with teachers: this interaction is absent or weaker in traditional teaching.
- The participant acquires a collaborative mentality, he receives positive contributions from the teacher and from the other participants, he intervenes and supplies its contribution to the course.
- On-line learning reduces distances: distance between student and teacher and distance among students. The e-learning environment creates a virtual class and, in this way, the interaction among persons which is usually lost in large classes.
- Virtual class means to know each other: students can ask questions and learn form others’ answers.

Online teaching changes both the learning processes and the teaching style: the active participation of the students directs the teaching and learning activities.

The development of online learning creates in the students also the “cultural” habit to consider the Internet as a resource of materials and documents, useful to understand or to make their studies deeper.

The students learn also to search for other online courses in Internet and at the end of their studies they spontaneously will use Internet to access to courses for continuous professional education.

Moreover, the student learns to evaluate the Internet resources and to carry out a selection of the available contents.

3. Proposal of contents for the basic skills in information technology

What can we teach to the first year's students in order to create basic information technology skills?

Our reference can be surely the model of the European Computer Driving License (ECDL), with its seven Modules. The order of the Modules, for the mentioned reason (anticipation of the Module 7), should be:

1, 2, 7, 3, 4, 5, 6

After Module 7 we can introduce the environment for online learning.

Beyond ECDL, we can create three additional modules, here named Module A, B, C.

ECDL Modules

1. Basic Concepts of Information Technology
2. Using the Computer and Managing Files
7. Information and Communication

Module A – Boolean algebra and internal representation
Module B – Problems' formalization, algorithms, elements of programming
Module C – Data modeling, database, SQL

**e-learning
environment** +

3. Word Processing
4. Spreadsheets
5. Database
6. Presentation

The skills that the students should develop for each module have to be defined likewise in ECDL Modules.

Here we summarize the skills for each module:

- Module A
 - Fundamental concepts of logic, logical operators, logical equivalence, properties, Boolean functions
 - Numerical systems, number conversion, internal representation of numbers and strings
- Module B
 - Algorithms: flow diagrams (symbols and semantics)
 - Control structures (sequence, binary selection, loop)
 - Elements of programming in VBA for Excel
- Module C
 - Data modeling, conceptual model (Entity-Relationship)
 - Database Relational model, relational algebra, normalizations
 - SQL language: simple queries (Select, aggregating functions, Group by, Having)

Through Module A the students learn how to manage the basic concepts of the Boolean logic useful to work in all software environments: spreadsheet, criteria in the database query, use of the search engines in Internet, etc.

In Module B the students acquire a habit to the problems' formalization and resolving procedures. We have chosen Excel software, already known by the students from the Module 4, rather than a specific programming language. Using the VBA language the students get the opportunity to program simple examples with graphical interface. This activity allows the students to understand the meaning of software procedure and the code that "is under" the functions of the applicative programs (for example the Excel functions).

The Module C, concerning the data modeling, allows the students to point-out how to characterize the problem's data, data specifications and the relationships between them. An elementary introduction to the SQL language allows the students to understand better the file management and data search.

4. Proposal for a common project

The question is how to build, through European Universities, a standard of the basic information technology skills for the first year's students and provide collaboratively an online course on it.

We cannot hide some obstacles and difficulties for this project: the existence of scheduling of already consolidated courses, the large engagement of teachers asked for the creation of online courses, the variety of the used software platforms, the presence of different teaching styles, the high number of students that can hinder a good interactivity. Even if the tools and the software environments for e-learning are different, the common platform is represented by the consolidated Web technologies and the student's access via browser. The agreement between many people used to work in different ways, with different methodologies and tools, needs a lot of time. For the above-mentioned reasons the creation of standards and implementation of online course can be realized through growing levels of common planning and gradual steps.

Some possible steps:

Step 1: agreement on the project of the contents and modules of the course

The proposal here described (Seven ECDL Modules + Modules A, B, C) can be a good base of discussion.

Step 2: collaborative creation of materials to support the course

In the final perspective of the creation of a standard online course, we can begin with the development of materials with special attention to the multimedia (animations, video), to the creation of discussion forum, self-handled by the students, to the publication of FAQ pages.

The materials can become an integration and a multimedia-area with respect to already existing online or locally used courses. In this step the personal experience and the specific skills of the teachers have to be exploited.

Step 3: creation of self-evaluation tests and of intermediate and final tests

This can be surely an area of common search and of production of materials. Build a common project starting from the end can be unusual, but is an effectiveness way, because, reflecting on the final test of a course, means also pondering on the expected skills of the students.

Step 4: creation of an online standard course

This is the project purpose and the final objective of the work: an available online course for teachers and students of different universities. The online standard course will not become a rigid schema for the teachers, but can exploit the creativity and the teaching methods of each one.

Going into production it does not mean necessarily to fully complete each steps: it is better to build the steps on the road during the development of the course, proceeding with refinements in progress.

From the operating point of view, the project can be realized in Internet with the creation of a web site for planning and development (with FTP access) reserved to the teachers and a web site of production for the students' access.

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TRANSNATIONAL COOPERATION IN E-LEARNING FROM TRAVELLING TO TEOMED

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Introduction

The last decade has seen a social transformation encouraged by the technological development of Information and Communication Technologies, related to the so called "society of information and knowledge". This transformation is affecting several aspects of everyday life, among which we can mention the educational one, as a consequence of the impact of the new Information and Communication Technologies (ICT), above all at university and postgraduate levels.

The Association TATIANA (Transeuropean Association for Training and Image Analysis), which belongs to the European Programme COMETT, was started in 1992 as an answer to the above mentioned technological development, and it is coordinated by Professor Andrés Sampedro (University of Oviedo), with the aim of fostering continuous studies and distance learning in the field of Biomedicine. Among the activities carried out by TATIANA we can mention the European project TRAVELLING (Training Virtual Environment for Life-Long Learning in Biomedicine)¹ (1998-2001), within the European programme Leonardo Da Vinci. This project has allowed for the consolidation of a net of transnational cooperation among different countries not only from the EU but from Eastern-European² ones as well.

The objectives set up by TRAVELLING were:

- To identify the human, technological and institutional factors that influence the incorporation of ICTs at university level.
- To build a Virtual Learning Environment which allows the different member states to share learning processes.
- To create a team of highly qualified professionals able to create suitable multimedia educational materials.
- To have access to multimedia educational materials which enable the people involved in the project to use it for their initial and life-long learning.
- To deliver training programmes so that teachers and students can become familiarised with the use of new technologies.

In this report, we describe the actions carried out to reach the above mentioned objectives, which have consolidated transnational cooperation among European countries to foster learning in virtual environments. The actions carried out have been accepted within the European programme Socrates-Minerva as a Transeuropean E-Learning Observatory in Medicine (TEOMED).

¹ E-98/2/06187/PI/II.1.1.C/CONT.

² Partnership: Universidad Miguel Hernández. Alicante. (E), Universitat Oberta de Catalunya. Barcelona. (E), Universidad de Oviedo. Oviedo (E), University Medical School of Pécs. Pécs. (HU), University of Medicine and Pharmacy of Cluj-Napoca. Cluj-Napoca (RO), Jagiellonian University. Krakow. (PL), University of Fernando Pessoa. Porto (PT), University of Cyprus. Nicosia (CY), IPATIMUP. Porto (PT), University of Minho. Braga (PT), University of Sheffield. Sheffield. (UK), Catholic University of Lille. Lille (FR), University of Nottingham. Nottingham (UK), Training Center for Medical Biotechnology – TMB. Etten-Leur (NL).

Planning and Results

In order to reach the objectives already mentioned, we have:

- evaluated the needs for the incorporation of ITCs at university level, paying special attention to human, technological and institutional factors,
- designed and developed a Virtual Learning Management System,
- trained professionals in the elaboration of Multimedia Educational Materials (MEMs),
- designed and developed Multimedia Educational Materials,
- trained students and teachers in the use of MEMs,
- evaluated the whole process and its outcomes.

Evaluation of the needs for the incorporation of ICTs in the learning process at university level, paying special attention to human, technological and institutional factors.

The study of the needs was carried out by means of a questionnaire and discussion groups, which enabled us to conclude that:

- it is necessary to provide universities with the adequate infrastructure which makes it possible for teachers and students to use ICTs,
- it is necessary to train and stimulate university teaching staff to use these tools,
- it is necessary to provide students with the multimedia educational resources that can facilitate learning.

These conclusions were presented to the coordinators from the universities taking part in this project, so that they bear them in mind when implementing ICTs at their universities.

Design and development of a management system based on a Virtual Learning Environment

The Image Processing and Multimedia Technology Service (IPMTS) from the University of Oviedo has designed and developed a management system of virtual learning environment called WELLCOM (Welcoming Environment for Lifelong Learning and Communication).

From the start, the objective of WELLCOM was to become a management system for learning-teaching on the net with the following characteristics:

- Be able to manage several virtual environments simultaneously.
- Enable the publication and design of learning contents.
- Create a database capable of quick entry and search, and content display, together with access to the courses on line offered.
- Follow-up and be able to evaluate the students' progress.
- Provide communication tools between teachers and students or among students and foster the learning process by means of synchronous (chats and messages) and asynchronous (e-mail and discussion forums) communication.
- Foster the design of multimedia educational material capable of being inserted lesson per lesson and of being retrieved for further development/change before being reinserted.

WELLCOM has covered the needs of professionals in Medicine and it has provided them with an amicable and easy to use virtual learning environment.

WELLCOM has also allowed the participation in congresses on line, such as:

- III Congreso Virtual Hispanoamericano de Anatomía Patológica. February-April 2000 (<http://conganat.uniovi.es>).
- International Advance Workshop on Analytical Cytology and Bioenergetics, Braga, September-October 2000 (<http://www.10.uniovi.es/sic/workshop>).
- XIV International Congress of ISDQP, Oviedo, September 2001 (<http://wellpath.uniovi.es/index.htm>).

Design and Development of Multimedia Educational Material

The scientific excellence of the partners from the different biomedical fields was the starting point for the design and elaboration of MEMs, taking both pedagogical and technological criteria into consideration. Special attention was given to: meaningfulness, coherence, interactivity and connection. A student-centred constructivist learning perspective was followed.

MEMs are available to all the partners involved in the project through the mentioned virtual learning environment WELLPATH (<http://wellpath.uniovi.es/index.htm/>).

The materials developed were:

- University of Oviedo (Spain)
 - Pathological Anatomy
 - Pediatrics
 - Image Processing
- University of Nottingham (UK)
 - Breast Pathology
- University of Jagiellonian (Kraccow, Poland)
 - Fluorescence and Confocal Microscopy
- Pécs University Medical School, Hungary, and the University of Oviedo, Spain
 - Practical Interventional Radiology (WELLLRAD)

These materials have been positively valued by teachers and students, from whom an opinion was asked on the quality of the hypermedia incorporated (texts, graphs, images, etc.). Their comments and suggestions have been very useful for their improvement.

Training of teachers and students in the use of ICTs

Together with the training activities aimed at the designers of MEMs, the other members have also enrolled in on line courses leading to their qualification as future teachers in on line courses.

These activities were:

- Training of trainers, aimed at university teachers wishing to incorporate ICTs to their learning strategies,
- Training of students, so that they become competent in the use of ICTs.

The above mentioned activities have helped us to identify the effective teaching-learning procedures in e-Learning, following a student-centred constructivist approach.

Evaluation

At the end of the project, the following aspects were subjected to evaluation: 1) the management system (WELLCOM), 2) the design and development of MEMs, 3) WELLPATH on-line training courses. Pedagogical assessment enabled us to give the adequate answer to the training processes throughout the project. Other aspects that were taken into consideration were: 1) partners' involvement in the activities, 2) follow-up, 3) partners' interaction, 4) degree of satisfaction with goals and achievements. The information gathering procedures used to carry out the evaluation process were: observation, task analysis and frequency of communication among partners.

The whole project was subjected to a final evaluation, paying close attention to the following aspects: 1) technological improvements in use, 2) quality of the final output (management system, MEMs, on-line training courses, 3) results, 4) objectives achieved. A follow-up of activities, questionnaires and reports from the partners involved in the project were used to gather the necessary information for the final evaluation.

Conclusions

It cannot be denied that Internet has encouraged transnational communication and the development of transeuropean cooperation teams. In this way, the association TATIANA has been able to gather a group of institutions interested in the promotion of the incorporation of ICTs to learning processes at university level.

The projects developed by TATIANA have allowed to reach results under the shape of real products (management system, educational materials, etc) or as "hidden" ones, which have not been quantified (i.e. "know how", experience an work in transeuropean teams, etc.).

TRAVELLING has allowed to foresee the factors that contribute to the incorporation of ICTs to the learning processes. The final evaluation of the project showed that the factors that prevent the implementation of ICTs are: 1) lack of technological infrastructure, 2) ambivalent attitudes among teachers and students towards ICTs, 3) the need to train teachers and students in the use of these new tools. The MEMs designed within the project excel for their scientific quality both in a technical and a pedagogical way. Also, the on-line training courses done by teachers and students have enabled us to see into the aspects that play a key role in the incorporation of ICTs to the learning process. Finally, the evaluation of the whole process was of vital importance for the identification of the achievements and limitations of the project on the whole.

As regards the last point mentioned, we shall state that the project had a transnational dimension, which contributed to the integration of different perspectives on e-Learning in the different countries. This has enriched the process and the partners that were involved in this e-Learning experience as well.

The activities carried out by TATIANA have encouraged the promotion of a Transeuropean E-Learning Observatory in Medicine (TEOMED), which, on principle, has been accepted within the European proposal Socrates-Minerva.

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NEW INITIATIVES AT COLLEGE OF NYÍREGYHÁZA

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Introduction

The College of Nyíregyháza is one of the biggest colleges in Hungary but definitely the biggest in the Eastern part of the country. This college is situated in multinational surroundings that has cross border connections within nearly a 50 km circle with Rumania, Ukraine and Slovakia. This part of the country is regarded as the poorest region of Hungary despite of its natural resources and beauties. The strongest driving force of this region is its human resource, people who live here who love their locality having great enthusiasms and patriotism.

The new technology and the new challenges of our society made the college think over its educational policy. They heard the message of EU and they experienced the actions of the Hungarian government in changing educational paradigm.

“The e-Learning initiative of the European Commission seeks to mobilise the educational and cultural communities, as well as the economic and social players in Europe, in order to speed up changes in the education and training systems for Europe's move to a knowledge-based society.

eEurope is a roadmap to modernise our economy. At the same time, through its eLearning component, it offers everyone, but particularly young people, the skills and tools they need to succeed in the new knowledge based economy. (Romano Prodi, President of the European Commission)

“The Member States of the European Union have decided to work together to harmonise their policies in the field of educational technology and share their experience. eLearning aims to support and coordinate their efforts and to accelerate the adaptation of education and training systems in Europe.” (Viviane Reding, Commissioner for Education and Culture)

It is clear that these declarations given by the top leaders of EC reflect the newest trends in the world of education.

The expansive growth of the speed of spreading the information, the big steps achieved in easing of accessing to the facts and figures have had a great pressure not only on the business world but on other civil sphere such as education, to exploit the new facilities and possibilities of the new information technology.

Education can be regarded as a kind of civil service. Actually, it has already had some kind of services that looks nearly indiscernible from the services of the media market. On the other side education has an indisputable role in the production, development and application of information technology by teaching, by practicing it and by teachers' training.

The Higher Education and Research Council (HERC), as the main advisory body of the Minister of education in Hungary, always keeps its attention on the latest results and trends in the world of higher education and research. This body have experienced a new paradigm in education particularly in ODL. The new, virtual world excited of the development of e-learning and multimedia applications in education.

Digitalization made the information more accessible and controllable even for those who are not computer specialist or programmer one can say it became more user friendly. HERC aspires to show good lessons for the education sector supporting those initiatives which can lead to the more accessible, transparent and ambitious educational system in Hungary.

Generally one can say that the wide spread of open and distance learning (ODL) based on new information (e-) technology in the Hungarian higher education is mostly effected by:

- restructuring of the labour market,
- growing demand for mass education,
- the growing importance of decreasing of the educational costs,
- increasing popularity of new information technology.

It's easy to admit that these factors have similar effects in the international scale.

A City for Studying in Hungary: Nyíregyháza

Nyíregyháza is a town for schools of great tradition. More than 30,000 students are enrolled in its 24 elementary schools, 19 intermediate and 3 higher education institutions. It is unique that the faculty of the Szent István University in Gödöllő also graduates aircraft engineers here. The population's civic spirit and acculturation is promoted by 56 cultural associations and special interest groups, 59 non-government organizations, 22 foundations and 12 public high schools with tuition-free courses open to all age groups. Cultural life is rich and varied. Nyíregyháza has a theatre with its own repertory company, and an open-air theatre, many cultural centres, libraries, museums, and science cinema. A free museum village can be visited all year round by local and foreign tourists and student as well.

The College

Considering the ambitious investment and development program in informatics launched in 2000 at College of Nyíregyháza, and the aims of the middle range Institutional Development Plan of the institution it is relevant, moreover urgent to "upgrade" its distance learning programs making steps to introduce e-Learning and virtual education. For that purpose the College decided to create a Virtual Campus organization in order to give an institutional basis of this project. The Campus focuses its activity to the application of new technology in the field of distance education, and in addition to that in the field of dissemination of scientific knowledges.

The main line of the work started in this project could be summarized as follows:

- The effective realization of educational programs, information service, scientific and cultural disseminations in the form of electronic distance learning.
- To propagate education forms based on the latest achievements of informatics and their application in the field of different level accredited courses in Hungary and abroad.
- To ease the accessibility of lifelong learning type programs, and generally to help individuals to evolve their own educational, informational and cultural development.

There are some restraining facts in Hungary (especially amongst colleges) today which make open and distance learning hard to spread widely. These are followings:

- The unclear professional and legal background of ODL.
- The conservatism, the contradiction, the conflict of interests and the inflexibility of the educational system and sphere.
- The limited use of modern communication and information tools.
- Low level financial sources.
- The unexploited network possibilities.
- The lack of knowledge of the types of open and distance learning education.

These difficulties mean more complicated problems in introduction and dissemination of the offline/online/e-learning educational form.

E-Conception in the IDP of College of Nyíregyháza

The e-conception of College of Nyíregyháza is laid down in its Institutional Development Plan as follows:

Fulfilling the educational, teaching tasks and operating the training forms planned requires broadening of the pedagogical environment with new elements. In this area, beyond the classic use of AV equipment the project is going to use:

- Internet and Intranet,
- multimedia systems,
- student support service,
- consultation centres connected in conference mode.

*"The Computer Centre is the centre of the monitoring system serving the whole complex. The standardized managerial information system using the communication system as a foundation includes the different levels of network communication of the integrated institutions, as well as a standardized administrative system. Another obvious advantage of the new system is that by applying it the employees (clerks, administrators) can be reallocated to other important tasks, such as the administrative work of the faculties, to perform the increased and newer educational and research job, for example technical staff of department, assistants, assistant jobs in the **Learning Centre** etc. This means that apart from the teaching positions, jobs of the created new units in the integrated institute can be filled without hiring new employees, but simply by rational and effective use of the present number of employees."*

Considering the technical and educational background of the College of Nyíregyháza it is an actual and relevant moment to establish Virtual Campus.

Virtual Campus

Mission

The realization of educational trainings and programs, information services, scientific and cultural disseminations by means of the use of Internet.

To propagate and promote e-learning on Internet in Hungary and abroad (mainly for cross border education) by carrying accredited higher level certificate courses, college and university undergraduate training, adult education and further professional training courses.

To ease the accessibility of lifelong learning type programs, and generally to help individuals to blossom out their own educational, informational and cultural development.

Basic Function

The realization of educational programs, information service, scientific and cultural disseminations by means of digital media.

Objectives

The main objectives of our Virtual Campus in Nyíregyháza are as follows:

- broadening the facilities of the accredited higher level certificate courses, college and university undergraduate training, adult education and further professional training;
- development of ODL system for the accredited higher level certificate courses, college and university undergraduate training, adult education and further professional training by exploitation of new and accessible information technology;
- harmonization of the new programs initiated by this Virtual Campus with the educational practice at the gestor institution (College of Nyíregyháza);

- realization of trainings and educational programs in Hungarian language for the Hungarians and their communities living abroad and in cross border situation;
- to promote the labour-market positions of the employees by means of „e-learning”, improving their chances;
- to contribute the improvement of working-culture;
- realization of the quality assurance tasks in open and distance learning concentrating to the e-learning methods;
- to run ODL network in institutional framework,

by using the internet technology accessible all around the world.

Tasks

- to learn and adopt the progressive practice of ODL, especially from the EU;
- to build up and develop an internet base ODL system exploiting the existing information and communication network of the gestor institution, taking in consider the continuous change of social and economical situations;
- the contribution in development of educational and cultural programs;
- the application of new educational/skill technologies;
- electronic editorial activities;
- the development and the test of new „on-line” internet tools.

A group – as a directorate – has been formed in College of Nyíregyháza with aiming three basic major objectives:

- to realize on-line ODL courses and dissemination of scientific knowledges;
- to set up the range of facilities necessary for ODL e-learning and dissemination of scientific knowledges, in the meaning of human resources and hardver and softver background;
- to launch and run ODL e-learning programs.

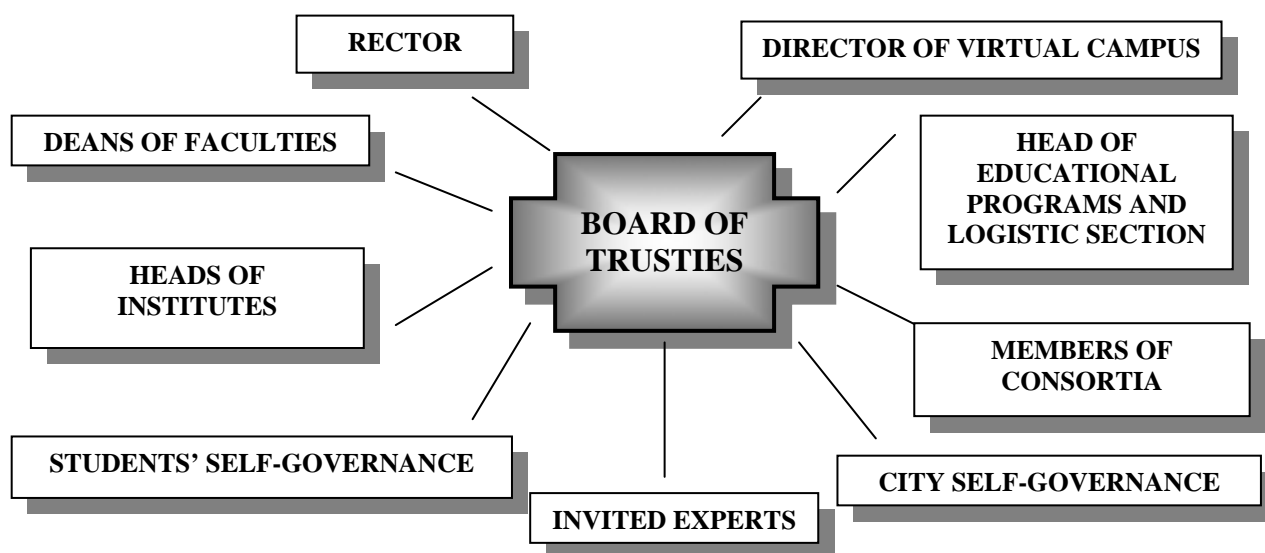


Fig.1. The plan of the directing board of the Virtual Campus in College of Nyíregyháza

Since the activities of the Virtual Campus is to be leaning through the overall structure of the whole college it is advisable to form a directing board for a better and effective operation of this kind of organization.

New Possibilities in Hungary

One should admit, that the development in ODL has enforced by support of different sources for promoting open and distance learning particularly e-learning.

The most important sources in Hungary are the different competitions at local, domestic and international (EU) level.

The main sources in Hungary concerning ODL are the different PHARE educational programs and the "APERTUS" fund that supports the local initiatives. The "APERTUS" public fund was established by the Government of Republic of Hungary for the support of development of educational programs for ODL. The latest (4th) competition was advertised by APERTUS in the beginning of this year.

The Advisory Board of "APERTUS", considering the world wide use of new information and communication technologies has decided to use its sources mainly for working out of e-learning programs and courses that could be disseminated through computer network systems.

The first run was launched in March 2001 giving a total amount 650 mHUF (2,6 mEUR). It is very instructive to have a look at some details: there were 276 applicants with total 4.546 mHUF (18 mEUR), that is seven times of the advertised source. The applicants were state educational institution, private firms and different kind of organizations.

The College of Nyíregyháza has von 6 mHUF (24.000 EUR) for support of the development of e-learning courses in EU studies. On the basis of this support the College decided to broad this idea – contributing its own sources – and established a Virtual Campus for ODL in e-learning – see above.

Considering the activities already done it is real that to the summer of 2002 there will be suitable circumstances and backgrounds to open the Virtual Campus on the home page of College of Nyíregyháza (www.nyf.hu) and in some subjects the trainings could be started.

Sum Up

Thinking of the domestic and international (EU) trends knowing the possibilities and actions taken during the close past we can say that the year of 2002 could be a very important moment in the life of the College of Nyíregyháza in the meaning of further expansion.

One of the main factors of this expansion is the introduction and operation of digital, internet based ODL. With this facility, the College could reach further groups of interest, overtaking their handicap in age, profession, sex, (language), distance and time.

To come up to requirements of these tasks needs continuous and progressive development effectively exploiting the new sources in these fields not forgetting the openness for others and newcomers.

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BUILDING A VIRTUAL LEARNING ENVIRONMENT AT A SMALL INSTITUTION OF HIGHER EDUCATION - CASE STUDY

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Abstract

This contribution represents an approach to the development of a virtual learning environment at the Faculty of Management and Economics of the Tomas Bata University in Zlín, which can be considered as an approach of a small institution of higher education to the implementation of this new educational method. The partial goals, the final objective, the original and current states, the individual progress steps, the time schedule and the responsibilities of the faculty staff and departments are all described herein.

The Faculty of Management and Economics has been pursuing this issue for about two years now. Views on support provided through information technology, especially the Internet, for teaching and learning, have been developing and changing step by step from e-textbooks and voiced over presentations through to complex multimedia learning materials on CD-ROMs for CBL (Computer-Based Learning), and right up to the Virtual Learning Environment developed within the framework of an LMS (Learning Management System) and accessible via the Internet. A project team has been working on the testing and selection of suitable LMS. Faculty teaching staff will be fully responsible for the content and didactical standards of the content of the courses, partially responsible for all technological processing and its inclusion into the LMS and fully responsible for the execution of distance learning studies.

1. Introduction

At the beginning of 2000, it was decided to embark on a project entitled "DIGITALISATION", at the Faculty of Management and Economics in Zlín. The programme became the cornerstone of the IT/IS strategies of the faculty. The pivotal project was the creation of the faculty-wide, and respectively, university-wide Intranet, which would ensure the supporting of communications between all levels and parties of the institutions involved (i.e. the teaching staff, students, institutes, and departments or other such bodies) on a qualitatively higher level.

A sub-aspect of the project within the framework of the DIGITALISATION programme, was the area of self-tuition and studies is the creation of a Virtual Learning Environment with a wide spread support for all forms of studies, but above all of the Distance (Learning) or Combined Studies programmes and Life-long Learning. Support of such educational processes will rest upon assuring access through the medium of the Internet to basic information about the studies programme(s) and the individual courses on offer; on the accessibility of study materials in the form of study texts, presentations, or even multi-media presentations; the solving of examples; discussions held regarding the issues and problems encountered; tests; in making accessible internet-based informational resources; and the provision of resources (means) enabling communication between directly involved participants of the course, i.e. the students and teachers, and between the students themselves.

2. Virtual Learning Environment

VLE - Virtual Learning Environment, in a wider sense is understood to mean the creation of propitious conditions for studies with limited direct participation of the teacher/tutor on the basis of the exploitation of information technologies; and in a narrower sense, on the basis of exploiting Internet-based technologies.

The introduction and implementation of virtual education is still in its infancy here in the Czech Republic. For the time being, here and there, individual courses within the framework of Re-qualification or Life-long Learning courses have begun to appear on the Internet, and in some cases as a support mechanism for students of Combined Studies programmes. Earnest efforts by Czech universities to come to terms with these new trends in educational technologies, and to exploit them to their advantage are clearly visible, and can be documented at domestic conferences such as ICTE in Rožnov pod Radhošt, organised by Ostrava University or BELCOM in Prague, organised by the ČVUT (Czech Technical University) in Prague.

The following text will describe the approach adopted by the Faculty of Management and Economics, Tomas Bata University in Zlin, to this issue.

3. The Faculty of Management and Economics Virtual Learning Environment Project

3.1 Project Goals

The aim of the project is to create a Virtual Learning Environment at the Faculty of Management and Economics in Zlin that will progressively provide support to all forms of studies that are offered there. First in line is the Combined form of studies programme, which will – with the support of the virtual learning environment still remain combined, but will fundamentally alter the structure of the tuition of studies through decreasing direct tuition within the school and by strengthening self-studies through the Internet. The learning environment developed for the Combined form of studies may – without substantial change be equally useful for the full-time, daily attendance form of studies, e.g. electronic scripts (teaching texts), the repetition of lectures through audio-assisted presentations; the solving of control examples, questions, tasks and so on. This will be followed by the Life-long Learning programme, commercially motivated distance learning courses designed for the industrial, commercial and entrepreneurial spheres as well as for the general public – for whom the distance form of studies is already envisaged. The last studies programme that will feel the benefit and support of the virtual learning environment is the planned MBA Studies.

3.2 Progressive Steps

What does the creation of virtual learning environments represent? The response to this question is delimited in the individual stages necessary for the realisation of the project.

1. **The theoretical preparation of the project** – the collection of basic information about the given issue, the setting of goals, the analysis of the initial situation, the flagging of progressive steps, and the identification of the key factors for the success of the project. (January 2000-April 2001).
2. **The selection of the appropriate software products** supporting virtual learning environments, (Learning/Course Management Systems) - through analysis of the market for such products, analysis of the faculty's means and needs, and the in-situ testing of "final contender" products. (December 2000 - December 2001).
3. **The purchase of the software products and appropriate hardware selected.** (May 2002).
4. **The theoretical preparation of teachers/tutors** in the issues associated with virtual learning environments – the technical and pedagogical specifics of the environment, the creation of e-forms of study texts, presentations, tests and other supporting materials, and their grounding in the individual functions of the environment. (March 2001-June 2002).
5. **The theoretical preparation of teachers/tutors** in the issues associated with the didactics of distance learning - the methodology of the creation of instructional support for distance learning, and the methodology of leading (tutoring) distance-learning courses. (December 2001 - April 2002).
6. **The creation of course content** – software non-dependent course building blocks (basic information about the course, the syllabus, study texts, presentations, tasks), and elements dependent upon the software environment (tests).

7. **The “filling out” of the virtual learning environment with course content.** (June 2002 - September 2002).
8. **The running of the Pilot Courses** and their evaluation. (October 2002 - February 2003).

3.3 The theoretical preparation of the project

The basic orientation in the given problem area was achieved during the initial phases predominantly through consulting foreign, Internet-based resources, proceedings of domestic and foreign conferences, personal discussions and consultations with our European partners, and passive participation in professionally oriented conferences. The aims and goals of the project were formulated concurrently with our increasing learning curve regarding these issues – from the original objective (January-April 2000) of creating off-line support mechanisms for studies, founded on the exploitation of multi-media study materials on CD ROM platforms, we moved on (November/December 2000) to the current aim of creating on-line support mechanisms (without excluding the possibilities offered by off-line additional or “top up” support). We then started to concentrate our interest on the analysis of software environments specifically designed to support virtual learning. Once again, we began with comparison studies of those products available on the Internet and of the technical documentation of each individual product; we sought the observations and experiences of academic institutions with greater hands-on experience in this domain, and of our own eventual experiments and tests of trial versions of the products. We also attempted to map out the actual state of affairs and objectives in the given problem area of other universities in the Czech Republic within the framework of set Bachelor’s Degree Dissertational Topics during the academic year of 2000/2001.

The current project, as formulated in this contribution, dates back to April 2001.

3.4 The initial situation and approach to the course content

The fundamental cornerstone of courses in the virtual learning environment will be formed of study texts and presentations. At the present time, about 70% of the courses presented within the framework of the full-time, daily attendance form of studies is covered by study texts prepared by teachers of the faculty. These are published not only in the classical printed format, but also in an e-format as PDF files on CD ROM platforms (for the time being only as an alternative medium). Should these study texts consistently contain overviews, summaries, control questions, solved as well as unsolved examples, tasks and suggestions for further thought, they might well be deemed suitable study materials for courses offered in the virtual environment. Presentations in e-format (exclusively in PPT format) are already used in about 25% of the courses presented. For virtual environment courses, we have thought of adding sound to these PPT presentations through the spoken accompaniment of the lecturer and to thereby induce the sensation of actually being present at the lecture itself. Of course, the basic information about the studies programme and individual courses themselves (annotations, lists of lectures, syllabi, etc) are already available for students of the full-time daily attendance form of studies.

It is expected that with the passage of time, and one hopes with the collaboration of other university-level workplaces, a multi-media thematical library of texts, pictures, video sequences, references, URLs, etc. will be created that are commonly available through educational portals on the Internet. With the assistance of such resources, it will be possible to upgrade and modernise the course content of such e-courses on a regular basis.

3.5 The selection of the software products

There currently exist a minimum of 40 products within the category of LMS/CMS (upon which our undivided attention is concentrated), and which contain all the requisite characteristics and functions to assure the full support of on-line virtual learning whether in a-synchronous or synchronous regimes. The differences are to be found in the simplicity of use for students as well as for those actually charged with creating the courses, in the wealth of document formats used, in their licensing and pricing policies, and so on. It is precisely these characteristics as described that form the main criteria when deciding on the most suitable choice. In order to evaluate them, a great variety of informational resources were consulted including comparison studies, product documentation, DEMO courses conducted within

the environment of each individual product, the experiences and expertise of Czech university workplaces, as well as experiences gained through the creation of courses using some of the products on offer.

3.6 The preparation of the teachers

There are many ways how to create on-line courses. The relatively most professional is to collect a team of experts – course development manager, graphic designer, animation specialist, etc. A teacher or guarantor is responsible for the content, and their roles cannot be supplied. This “team of experts” approach is quite definitively the right one, fully professional, but very expensive because many IT specialist are involved.

The second possible approach is from the opposite side of the spectrum, and is as follows: that the teachers themselves will create their on-line courses. What will they use for that? First of all, “to be in ICT”, which means upgrading their basic ICT skills. For this matter we approached ECDL. Further, to become familiar with the LMS/CMS and mainly to familiarise themselves with methodological and didactical standards for distance learning. And it is just this second way that our institution has chosen to proceed along.

For that reason, about 25% of the faculty teaching staff is participating in a distance-delivered course, whose main aim is “how to prepare study materials for distance learning and how to teach in distance courses”. The course-providing institutions are the Regional Centre for Distance Education based at the Palacky University in Olomouc (Czech Rep.) and the National Centre for Distance Education in Prague. The course is approximately 5 months long, with four one-day tutorials. Other mentioned topics are economy, management, marketing and logistics of distance education. We presuppose continuing or expanding this course for other faculty teachers.

3.7 Support for the project and key success factors

The project to create a virtual learning environment was born under the generally well-known existential circumstances of universities in the Czech Republic, characterised especially by a hampering due to chronic lack of financial resources. Despite this, (or perhaps precisely due to this), it is necessary to specify the conditions and key factors for the successful realisation of the project. The project’s success depends in part upon the efforts of the project team (i.e. the theoretical preparations, selection of the SW products, the guidance and preparation of the teaching staff, management of the project, etc.), and in part upon the efforts of all the teaching staff in the faculty (i.e. participation in the creation of the course, the creation of the subsidiary courses, the “filling” of the virtual learning environment with the course content, etc). The management of the faculty must support all participants in the project both declaratively (i.e. being anchored in the long-term objectives of the faculty), as well as financially (i.e. the remuneration of the project team and teaching staff for the preparation of the course). Such a clearly formulated and openly declared support from the faculty management’s side, may create the pre-assumptions for the self-identification of all those participants in the afore-mentioned project and its importance and absolute necessity for the future development of the faculty. For the time being, the declarative support is crystal clear, but the realisation of financial support is through seeking alternative ways and means (e.g. grant agencies) to financing within the framework of state contributions (i.e. dotations).

4. Conclusion

Within the confines of this contribution, it has been our intention to publicise the basic objectives, approaches adopted, and the current state of affairs, including the description of partial goals and results achieved in the overall solution of creating a virtual learning environment at the Faculty of Management and Economics, Tomas Bata University in Zlin.

We are fully aware of the fact that, while we are no longer at the absolute beginning of the journey, we still have a long way to go to get to the goal we have set for ourselves. But set out we have, and we are convinced that it is in the correct direction. Should this prove to be true, we would be delighted to be confronted with more advanced workplaces than ourselves at all levels and at all possible forums devoted to the theme in question, such as are for instance the previously mentioned domestically organised

conferences ICTE and BELCOM, or else EDEN's activities in the international domain. Within the framework of a general advance, we are open to being approached to engage in a wide range of collaborative ventures, both within the context of Czech university workplaces, or without – i.e. together with other interested parties on European projects.

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E-LEARNING AS A POSSIBLE SOLUTION FOR DISTANCE EDUCATION THE EXPERIENCE OF THE OSTRAVA UNIVERSITY

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Programme

- How do we perceive distance education and what role can eLearning play
- Motivation: why we implemented eLearning
- Study programme characteristics
- A little bit about teaching technology
- Evaluation of current experience with the Learning Management System (LMS)
- Conclusion

1. How do we perceive distance education and what role can eLearning play

Distance education represents a form of education which supplements and expands the offer of education possibilities. The advantages of distance learning lie in the fact that it attempts to solve problems related to the inaccessibility of traditional forms of learning which stem from students' distant residences from the place of education, time specification of traditional education forms and also the limited accessibility of traditional education forms for handicapped people. Therefore, distance learning enables the acquisition of new knowledge and skills for those who have personal, health, social or financial problems and cannot attend present courses and who are sufficiently motivated to independent study.

Distance education is becoming ever more topical and important with the development of IT (particularly development of Internet and the ISDN network), especially by using various communication methods (electronic mail, electronic conference, videoconference, etc.), forms and means for creation and publishing of study materials (multimedia data stored on CD ROM, web servers), as well as possible organisation of distance education using specialised software products (Learning Space, Top class, WebCT, etc.). Distance education is a demonstration of the democratisation of education and a specific gauge for a society's economic, social and technical standards. Its key advantages are its territorial, age and social accessibility, possible simultaneous economic activity, study individualisation, flexibility and possible interactive procedures and, last but not least, advanced service for students which includes consultations, guidance, distribution of materials and aids, etc. Its drawbacks include higher prices of aids and therewith-related higher course, respectively study programme, prices, and the isolation of students from lecturers and fellow students. Distance learning presumes that the institute offering a given study programme in distance form has a high standard of processed study materials with great emphasis on the pedagogical and didactical aspects so that learning does not require personal attendance of the tutor. Besides the basic material which we could label as study text (hypertext), the tuition set must be supplemented by a great number of solved problems, problems for exercise, example applications, demonstrations, tests, autotests, etc. Learning (using not only DiV) usually takes place in three stages: looking up information, consolidation of information by own activity (application to specific problems) and formalising of information (the student can generalise knowledge and concisely formulate it).

Education by Internet has given rise to a new phenomenon called Virtual University. Virtual University (VU) is a server with a software environment providing multifaceted tuition support. By means of the Internet or Intranet VU distributes tuition materials in such a way that students can access them from anywhere by simple using a web browser. Tuition modules can be in hypermedia form, i.e. they can contain texts, images, photographs, video clips, audio sequences, references to Internet information sources, etc. VU supports the individual hierarchy of tuition module arrangement, best suiting the

objectives of given teaching. Individual tuition module pages are usually arranged in uniform fashion and each has an icon for simple control of all VU functions and services. The VU also includes a database, which besides tuition modules, contains all essential data on VU users. The most significant service of VU is support of intensive communication by electronic mail not only between students and tutors but also between students themselves, so that they can discuss problems and learn to collaborate on joint projects. VU also supports elaboration of assignments, their commentary or evaluation by tutors and registration of results from tests. VU can evaluate tests automatically. Furthermore, VU can also automatically advise tutors of a student's insufficient results, it can, based on such results, allocate extra tuition modules, etc. Enrolled students are divided into groups, where each group is allocated a certain composition of tuition modules. Each group has at least one tutor. However, tutors can adopt an individual approach in allocation of modules. Moreover, VU allows tutors to answer students' questions inspire and monitor or even moderate their discussions evaluate homework and tests results and publish them. VU also supports comfortable reparation of tuition materials and tests by reducing them to filling out of electronic forms. Besides allocating students access rights, the VU administrator also takes care of the overall arrangement and specific modifications of the VU.

However, one must be conscious of the fact that the organisation of distance learning is very complicated and therefore we cannot imagine its implementation without automated tools such as specialised software for creation, maintenance, teaching and management of courses (tuition programmes). The most renowned software is Learning Space, TopClass, WebCT, etc. Besides these existing products, there is an ever growing demand for developing of special "proprietary" environments, suitable for a given education institute. Numerous education institutes approach development of "proprietary" software for distance learning, as well as for expanding educational programmes by so-called on-line courses. However, participation in a distance course also requires sufficient material-technical facilities on the student's side (PC with CD ROM, fax, telephone, Internet access, electronic mail, and web browsers). This goes hand in hand with necessary knowledge of PC work and software handling, particularly orientation in using Internet services, as well as increased financial demands.

2. Motivation: why we implemented eLearning

The idea of introducing distance education in the graduate study programme Application of Informatics at University of Ostrava, Faculty of Science came about in 1998 as a reaction to the request of the Institute for the Deaf and Dumb, which was trying to find possibilities of higher education for students of specialised secondary schools for the deaf and dumb. Thus far, these students could not study any programme at high schools because all programmes were set up as present study programmes, which is incompatible with their handicap. Many students from specialised schools for the deaf and dumb wish to continue studying at universities. Moreover, many are not only positively motivated for such studies but have the right intellectual prerequisites. As many secondary school students attended schools focusing on information technology, Application of Informatics seemed to be the most suitable graduate programme for transformation into a distance form.

Preparation and implementation of a distance course is very demanding organisationally and technically wise, particularly preparation of tuition materials. As we decided to offer the transformed study programme Application of Informatics mainly to deaf and dumb students we decided to base communication with and between students on IT and communication technologies. Transmission of information is done mainly using the Internet; students at home are connected to the Internet and have permitted access to special distance education directories in the university's computer network. This overcomes the communication barrier, which stems from the fact that tutors do not have command of sign language. Tutors store lectures, practical works and tests in the network, and students communicate with their tutors by e-mail. Besides this form of material distribution students can also use a special computer classroom at the faculty, which is reserved for distance course students. Certain subjects are already prepared as on-line courses in the LearningSpace environment. Their number is continuously increasing. In future we want to implement all subjects uniformly in a virtual environment LearningSpace as so-called on-line courses. A sign language interpreter is used at all essential personal meetings - exams, consultations, tutorials, as well as socially educational events.

In academic year 1998/99, when we offered the distance course exclusively to deaf and dumb students, 12 students (students from specialised secondary schools for the deaf) have been enrolled from various regions of the Czech Republic. In the subsequent years the distance programme Application of Informatics was offered to secondary school students, 18 students were enrolled (3 from them were deaf and dumb). It showed that the distance form of study is quite demanding for all students. Some of them did not pass to the second and further years. Problems faced by deaf and dumb students and their tutors are various and in many cases tutors have to solve them without any previous experience. Through all these complications, three handicapped students are preparing this year to complete the final exam.

In future we plan to continue offering distance education for deaf and dumb students and we strive to improve communication and tuition by transferring all subjects to on-line courses, so that the entire study programme Application of Informatics is implemented in a common virtual environment. After transferring all subjects of this study programme to on-line courses, we wish to offer this programme to other handicapped students too.

Currently we are working on:

- Processing of on-line courses of all distance bachelor programmes subjects of Application of Informatics according to the distance study supports methodology.
- Improvement of technical facilities for the virtual environment for education management.
- Proposal of distance education for lifelong education of in-service primary and secondary school teachers (Information Science and Technology).

3. Study programme characteristics

The field concentrates especially on the acquisition of practical knowledge and skills of using computer technology in various applications. Theoretical courses are not too frequent. This study programme should result in immediate assertion in practice. From a technical aspect the course concentrates on basics of computer architecture and hardware. In terms of operating systems it focuses on Windows, UNIX a network operating systems. Further, it includes programming methods, database modelling and development of database applications, development of graphic applications, data analysis and utilisation and creation of specialised application software.

4. Something about teaching technology

The subject offered as a distance course is prepared in the LearningSpace system with the following structure.

Schedule

This section is used to create individual subject modules (a module always corresponds to a relatively independent problem), where each module consists of tuition texts, elaborated problems, assignments and tests. Tuition modules are created for all subjects of distance learning individually according to the methodology elaborated by the National Centre for Distance Education in Prague. Each tuition module chapter contains the objectives and key words at the beginning of each chapter. Then the text follows, using numerous demonstration examples. Each chapter is concluded by a summary of the most important information, control questions, which can be answered from the text and motivational questions, which inspire students to apply knowledge gained from the chapter.

CourseRoom

Serves as a virtual classroom where a tutor can communicate with students and students can communicate with each other. The tutor is the group discussion moderator, he/she gives the topic which is to be discussed and makes a commentary. Students can also be active in the virtual class by starting a new topic, or commenting on a topic given by another student. The CourseRoom is also a platform for locating assignments; tasks arising from individual modules of subjects mentioned in the Schedule. All activities required from students are time limited and students are obligated to adhere to the deadlines. The tutor manages the assignments, assignments can be private (between a student and tutor), or public. The tutor can publish the elaboration and evaluation of an assignment.

Evaluation of assignments can vary. From a commentary to traditional school marks. Each module should finish by either a distance assignment or test (both are also possible). This is very important feedback; students verify their knowledge and skills.

Tests

Tests are part of almost every module and serve mainly as so-called autotests, i.e. self control, so that students can verify how they are getting on with a given module. Tests can be solved variously, just like evaluation can take on many different forms. This depends on the nature of the module and on the pedagogical and didactical aspects.

Profiles

After the enrolment of a student for a certain subject and in a virtual class, his/her first duty is to create his/her own profile, where he/she publishes information about study and work activities, and possibly information on his/her interests and hobbies. Further, he/she will enter personal contact information (address, telephone, e-mail) and a photograph. Profiles serve for better acquaintance with students and tutors. This must not be underestimated and the tutor should motivate students to pay careful attention to their profiles. Profiles also serve to “personify” virtual classes.

Portfolio

LearningSpace keeps a portfolio of each student. This portfolio includes results of tests and assignments. It is a great helper for tutors who can find out whether students have fulfilled all their duties required by a given subject and then can allow a student to take the final exam. Tutors can, of course, monitor student's progress and take appropriate measures.

Exam

Exams in the distance form of Application of Informatics are in principle taken in person. They are usually organised for distance and present students together, the main objective being that students from both types of courses should have the same level of knowledge.

Tutorials

Tutorials as a personal meeting of distance students are very important moment in a subject's entire organisation. Their main objective is the valuation of student's results from their studies (tests, assignments) and it should focus mainly on discussing the most frequent mistakes, etc. The tutorial has also social aspects that because it is rarely opportunity to contact face to face. Many students welcome the opportunity to personally meet their colleagues, some do not make use of this opportunity. We must realise that most students are employed, have families or another study at other universities simultaneously. Some students use this form of study because of their handicap.

5. Evaluation of current experience with the Learning Management System (LMS) LearningSpace

Evaluation of current experience with distance learning in the LearningSpace environment has been divided into the following 14 points.

- ***Suitability of LMS (Learning Management System) for course preparation***
Tools for creating the structure of the course are good. But the editing abilities of the LearningSpace are not up to standard, inc comparison to, for example, text editors they are very poor (e.g. symbols, equations, etc.), not to mention multimedia components. Also, transfer of written texts is also unsatisfactory.
- ***Structure and didactical flexibility of the LMS***
Arrangement of the course into modules and further into individual sections (chapters) allows for logical, systematic and didactical presentation of the material to students. The overall vision of the course, its structure, arising duties, time data, contact with colleagues or tutors, and overview of current results is satisfactory.

- ***Ease of LMS use for tutors***
System control is not easy, tutors without IT experience will have problems. Tutors without training cannot be used extensively.
- ***Graphics, audio and video, moving image***
The actual development of graphics is very limited, but materials created in other environments can be integrated. However, even this poses numerous problems.
- ***Evaluation, testing, homework (distance assignments)***
Testing is satisfactory. A test question data base can be created from which questions can be selected for individual tests (however, only within one course). Answers, as well as methods of evaluation, can vary widely. Time parameters can also be set.
- ***LMS for interconnection of students***
A virtual classroom allows discussion of topics. All course students and tutors can participate.
- ***Online student communication***
The LearningSpace which we use enables only asynchronous communication. Even though communication is only asynchronous, it is active 24 a day. It has two formats. The virtual classroom enables discussions on any topic, as well as allocation of students assignment which the tutor comments; discussions of these assignments are also possible. Assignments can be private (only one student and tutor) or public. Tutors evaluate assignments.
- ***Resources, libraries, references***
The MediaCenter, which is part of the system, enables distribution of all electronic resources. References to other Internet resources are also used, particularly to the University of Ostrava website. Further, students also have at their disposal a specialised multimedia classroom, study and university library, where all necessary resources are available.
- ***Feedback***
From this point of view the LearningSpace system is very good. It has feedback on so-called assignments. Assignment status can be set to “in progress”, “request for review”, “sent for grading”. Furthermore, the private or public mode of the assignment solution can be changed by tutor dynamically. All student's contributions, including submitted work easily accessible, being sorted according to topic, students, date.
- ***Tools for student group management***
The group is always defined at course commencement. A group forms a virtual class, in which individual student profiles and their portfolios are managed.
- ***Preparation of assignments, questions and tests***
The allocation of questions is done in special modules where questions are located. Students elaborate a given questions and submit it for review or for grading as an assignment.
- ***Planning activities***
Students can view the course structure in schedule or calendar mode. In both modes the student's activities are marked by date. Activities can be limited by a certain date, or by a time interval or they can remain without any time limitation.
- ***Test records***
Each student has a portfolio of results. This basically includes test results and assignment evaluations. This forms a foundation for an oral exam which is always conducted in person.
- ***Training of tutors, students and system users***
Each tutor starting to work with the LS is trained in two types of courses. One is for training distance education tutors (distance course author) and the other is for LS system administration. The first training course is a distance course, while LS administration is trained in present form.

Overall evaluation

For the given application of the system in practice (approx. 100 students, 20 tutors) the system is satisfactory. However, greater numbers of students and tutors will pose problems. The system has fairly good tools for tuition management, but course development tools are poor. These tools have many problems stemming from a poor offer of editing tools, including graphic and audiovisual outputs. Database administration with a great number of students would be very demanding and ineffective. The system does not arrange the student – education institute relationship. All communication concentrates solely on the course. Communication with, for example, the students department and the entire study agenda is solved by another school information system (IS Student), which is implemented throughout the entire university. The IS Student and LS relation is not automated.

Which elements would we like to implement in the future

- Support for creation of multimedia tuition materials.
- Improved comfort of completed tuition support from other environments.
- Synchronous communication.
- Study agenda integrated in the LMS or automatically linked to IS Student.
- More intuitive environment for students and tutors.
- Czech localisation.
- Possible enrolment and payment of fees within the system. We would like to use this form to offer paid courses for lifelong education mainly for in/service teachers.

6. Conclusion

We would like to emphasise the main problems which we have experienced during the introduction of distance education and whose resolution we regard as fundamental. Some of these problems have already been solved, others are being worked on. The successful implementation of distance education at the university requires the fulfilment of the following conditions:

- A distance education centre must be active throughout the university. Individual faculties can establish faculty centres, which will be subject to the university centre of distance education, and these centres will ensure the professional level of education.
- Solve the funding of distance education. The increased financial demands of distance course design and development must be considered together with necessary technical facilities and organisation. Technical facilities (purchase of LMS) were obtained through a grant, as well as the development of certain on-line courses. However, the initial investment will have to be further valued.
- Ensure qualified personnel for distance tuition (tutors, distance support authors, pedagogy, organisers, implementers, managerial personnel). As the distance form of education exists very shortly, there isn't enough information on specific elements, conditions and presumptions. Therefore authors of courses, tutors as well as organisers need to undergo training courses in this area. At present, 10 workers from the Faculty of Science, University of Ostrava, have been trained in distance learning and obtained qualification. Courses on creation of on-line courses and implementation of courses using LMS are also held.
- Due to the high financial demand of creating distance courses (on-line courses), their repetitive use must be ensured. Therefore, attention must be paid to the offer of already existing courses as part of lifelong education of people. That is why surveys aimed at the demand for courses of life education (distance form) and increase of public awareness of such forms of learning must be conducted.

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AN EXAMPLE OF IN-SERVICE-TRAINING IN ORDER TO ACHIEVE CONTINUITY IN FLEXIBLE LEARNING IN SANDVIKENS SCHOOLS

Kåre Skantz, Sandvikens kommun, Sweden

Flexible learning, an in-service-training model to become an e-learner

1999 the city of Sandviken started a project called “Flexible learning” in a mixed group of students aged 11-12, attending 5th and 6th grade in the Swedish compulsory school. The project meant that the children worked from home one or two days a week. The project worked out well and the teachers and students at this school still carry this out.

The project idea rapidly spread around the community and presently almost 20 groups of students in primary school, secondary school and upper secondary are working with a day or two of distance education. More schools are planning to integrate this way of working on a regular basis.

Also, this way of working are not comparable with traditional school activity.

In my paper from last years EDEN-conference I pointed out that distance education demands other competences and skills both from the teachers and the students.

The students must have early experience of problembased learning and the teachers must early on give their students influence on their study situation.

They must be given this responsibility every day they attend school, not only the day they work from home. This means the teachers will have let go of the same “measure” of responsibility as they expect their students to take on. The students influence are pointed out in our national curriculum but we do have a history of not being able to interpret these documents very well.

The rapid development of new knowledges and the massive flood of information we are exposed to must get the effect that our mission must be transformed from distribution of traditional knowledges to give the students tools for learning – to learn to learn!

As the projectleader I’m of course pleased that the idea has spread but it can often be very long steps between getting familiar with an idea and make it useful in your own practice. To be able to change your own actions you have to;

- Take in new information, understand the information and accept that it is practically useful for yourself.
- You will then have to use your newly won knowledge in your every-day practice. You will have to practice this with endurance and of course get feedback on the way.
- Finally, you will have to practice your new way of acting, in this case how you teach, over a long period of time.

One of the measures I suggested in order to secure continuity for our students in this way of relating to education was a genuine educational effort concerning the teachers distance learning competences. Teachers must enhance their comprehension of the consequences this will have, pedagogically and socially.

Flexible learning, in-service-training for pilot educationers in Sandviken

“There are two aspects there that are more important to look into than anything else. The first is what kind of tools, strategies, techniques and attitudes the teachers need to be able to create fruitful learning. The second aspect are the same question from the students perspective.”

The statement above (authors EDEN-paper 2001) I had in mind when I last spring wrote a suggestion to an in-service-training for educationers in Sandviken.

The reasons the training got started were these:

1. Teachers, principals, parents, students and politicians from the schools that got started early on put a certain pressure at schools at a higher level in order to see to that the children could work in the same way when they went from primary school to secondary school.
2. Sandvikens upper secondary schools will in just a couple of years have more students than they can host in the present facilities. If we instead use the local schools around Sandviken as local learningcenters and let the students work from there or from home two days a week and at the upper secondary school in Sandviken three days a week we will solve that problem. This demands of course that the teachers and students are used to the way of working since before.
3. Flexible learning are promoted by the city council and there are acceptance and believes that this really is a good way of working and learning. The schooldepartment of Sandviken also understood that this way of learning you have to learn! I would say the earlier the better, with certain limitations of course. You first need the tools before you can start to work this way. By experience I would say that a few children could manage at around 10 and most of our students are capable of taking the responsibility at the age of twelve, in 6th grade.
4. As there were an acceptance for the above statement that this have to be learned there were also possible to get the funds needed to carry out the in-service-training. 1994-1999 Sandviken had a major project called Kunskapsstöd i Undervisningen, KiU, (Knowledge support in Education) which aimed to introduce the ICT as an educational tool in schools. We spent a total of app. 7,000,000 euros at this. We are now following this up by the project KiU2.0 which focuses the principals role as a pedagogical leader with support from ICT-tools. It is within this project, with a budget of 250,000 euros a year, the in-service-training takes place.
5. It hasn't been easy to reach agreements about the conditions for the participating staff but we have finally got that part settled as well. School executives, principals, teachers and unions had a lot to say before we could start. The settlement meant this will be a part of the participants competence development time which for Swedish teachers are 104 hours a year. We estimate that about half of that time is needed for the in-service-training described in this paper.

Aims and goals of the Flexible learning in-service-training

Lars-Erik Nilsson, University of Kristianstad, defines flexible learning in this way;

“Flexible learning is built on the insight that we are all different and therefor have to be able to take own decisions about where, when, how and what we learn” and “...flexible learning demands new forms of course planning, organisation and use of media and therefor also new learning environments.”

Flexible learning is much more than distance education – it's about learning on the learners premises and from the learners situation. Learning is not focused on the technique but is about giving all our students a solid ground for lifelong learning.

What we are aiming for in Sandviken is through the in-service-training give the staff att our schools the necessary conditions to carry out flexible learning, with or without distance education. We want to find out what tools, strategies, ways to relate to students and knowledge and what kind of techniques this form of education demands from the teacher and the student.

Our goal is that all the educational staff before 2006 shall have participated in the training programme.

The education is given through a mix of meetings in the basic group and work through our intranet. The pilots participating in this first round that started January 7th 2002 will be those leading the training during next year. The pilots are 2 librarians, 16 teachers and five principals. They come from different schools

and work in primary, secondary as well as in Upper secondary schools. They are divided into four basic groups, mixed from all school forms, where they carry out both their individual tasks as well as group tasks. They will next year work in pairs and each pair will lead the training for app. 14 educationers from two different schools, a total of about 120 educationers. The pilots will not work with colleagues from their own schools. If this works out well these 120 educationers will go on educating the rest of our pedagogical staff.

Contents of the flexible learning in-service-training

The education is really a modified course in distance education methodology and contains the following parts;

- Points of views on how we relate to knowledge.

What kind of relation do you have to your students, what they should learn or how that can be achieved? Are there other views and opinions than your own and what happens when people with different point of views meet and shall work together?

Example of task; Describe your concept of the words “learning” and “knowledge”. Write down what according to your opinion are the schools three most important tasks and motivate your opinions. Send your answers to your basegroups conference on the intranet. Also comment on the others contributions. Prepare for a discussion on our first seminar.

- Distance education and e-learning.

Basic concepts and pedagogical backgrounds.

- Problem based learning.

Questionbased learning as a foundation for work. Should school be a place where you go to get answers to questions you never asked or should it be a place where you learn to find out the answers on questions based on your own curiosity? How do you organize work and what kind of organisation do a school need to be able to have a mix of traditional work and distance education? How can you work with themes covering multiple subjects and at the same time with a specific subject? What can we find in our organisational structures, schedule positions and educational patterns that supports or prevents this?

- The teachers role.

How will the teachers work be effected compared to the present situation? What specific competences do you need to have and how do you get them?

- The students role

What do our students need to have in their backpack to manage this often very independent and responsible way of work?

- ICT

What are the possibilities in modern information and communication technology that can be used in education? What does the educationer need to be able to choose the right learning environment at the right occasion? What are the ethical aspects, possibilities and problems with using ICT as an educational tool?

- Project

The basegroup shall build an education/course/theme that can be applicable in one of the student groups of any of the educationers participating in the group.

Each part of the education has an aim but the goals are “floating”. By this I mean that the individual participant as well as the groups must set their own goals in order to reach the over all aims. An interesting way of working and we don’t know yet how this will work out. The pilots training will end in August and then we’ll make a thoroughly evaluation. They also have, for each part of the training, the

task to find out what don't belong in the course as well as to suggest what should be there and how to change and improve the education.

What this in-service-training will mean to school development in Sandviken is yet to see.

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KARLSTAD UNIVERSITY AND ODL

Olle Osterling, Karlstad University, Sweden

Karlstad is situated in the southwestern part of Sweden near the Norwegian border on the north side of lake Vaner which is the second largest lake in Europe. Our province, Varmland, is neighbouring Norway and there are close links to it from many perspectives. Stockholm is 320 km east, Oslo 250 km west and Gothenburg 250 km south of Karlstad.

History

- 1843 Teacher training
- 1907 Nursing education
- 1967 College affiliated to Gothenburg University
- 1974 One building houses the affiliated college and teacher training
- 1977 Karlstad University College
- 1987 Karlstad research model
- 1989 Development programme: "Karlstad University"
- 1993 Master's degrees in 13 subjects
- 1995 Appointment of professors
- 1997 Permanent research resources Interim faculty organisation
- 1998 University College of Health Science integrated into the University

College

- 1999 Karlstad University founded
- 2000 Master's degrees in 24 subjects. Doctorates in 18 subjects.

Apart from training teachers, a tradition that dates back 150 years, the university offers programmes and courses in the humanities, social and economic sciences, natural sciences, engineering and technology. New, expanding areas are media studies and innovation management. From 1998 its programmes also include professional education and training for the paramedical professions.

At present Karlstad University has about 10,000 undergraduate students and 100 postgraduate students. Furthermore, a similar number of postgraduate students are pursuing the major part of their doctoral studies in Karlstad although they are formally enrolled at other universities in Sweden. There are just over 900 staff, 70 % of which are lecturers and researchers. 200 have a doctorate and 40 are professors. The university's budget is approximately SEK 550 million a year, 70 % of which is spent on undergraduate education. The university offers 36 programmes and 600 courses. It offers master's degrees in 27 disciplines and PhDs in 18. It has two postgraduate schools, one for research in the natural sciences and technology and the other for the humanities and social sciences. All postgraduate and undergraduate education is gathered together under one faculty.

Unlike many traditional universities, Karlstad University is a one-campus university, characterised by integration and multidisciplinary. This creates the ideal conditions for a way of working which promotes considerable openness across disciplines, between lecturers and students and between research and undergraduate students. This has led to the development of several unique study programmes, which have attracted applicants from the whole country: chemical and administrative sciences; business administration, economics and mathematics; tourism geography; chemistry/biology with communication studies or law - to name but a few.

The university functions as a hub in the development of the region and as a national and international centre for the generation of knowledge. The use of information technology in distance education has made it possible to bring higher education to every part of the region. The establishment of an external liaison office has strengthened the university's contacts with industry and the community.

Education

Courses are offered in the humanities, health science, the natural sciences, social science, technology and teaching. Students can choose between 36 programmes of study and 600 courses in around 60 disciplines. Approximately 60% of the students have chosen a particular study programme. These last at least three years and lead to a bachelor's degree, a master's degree or a professional qualification. Professional qualifications include upper secondary school teacher, engineer and nurse. As from the autumn of 2001 Karlstad University also offers a Master of Science in engineering.

Co-operation within the region

An important part of the university's activity is to co-operate with the local community and industry in the region to develop expertise for mutual benefit. The university offers open programmes for the public and offers companies in the region training, advice and consultation services. For the general public there are a large number of open lectures and programmes, many of them within Core Curriculum, a series of open lectures which spans a wide range of subjects varying from the Swedish folk song to black holes.

Contact Networks

There are several opportunities available for companies, organisations and administrations seeking to establish contact with Karlstad University. Centrum för Näringslivsservice - CENS is the university's business reception with offices around the region and primarily acts for small and medium-sized companies. Its aim is to transmit expertise and new technology from the university to the business community in the region through training and development projects. Furthermore, knowledge is obtained from companies to be systematically catalogued and made available for research and undergraduate work. The university runs five local offices linked to the municipalities with a half time employee paid by the university. These local persons have good knowledge about the university. Hereby they can inform the companies about the possibilities to use the knowledge and research within the university. These various partnership arrangements also enable students to spend time in companies, schools and other placements for work experience and to prepare their final dissertation.

"Vägvalet" (Choosing the road) is a meeting place for students and companies. Here contacts are passed on concerning degree projects, mentorships and recruitment. HotSpot is a one-day job fair where each year about 130 companies and organisations meet students.

Partners

Besides the university's own connections we also work with a number of partners. Karlstad's Student Union is an independent organisation representing students and research students on committees, boards and working groups. It monitors the interests of undergraduate and postgraduate students.

RUC - Regional Development Centre for Schools - is a network between local authorities and Karlstad University for development and learning. It acts as a meeting place for employees in the field of schools and pre-schools, teacher trainers and researchers. The office is situated in the university with a full time project leader. A lot of various activities for new competencies from one day conferences to longer courses.

Inova is a foundation, which represents the business community and the university and works to develop co-operation in research. One example is the Forest Industry Research Centre where the university and approximately 20 of the industry's major companies work together. Ericsson, Telia, the State Telecom company, partly privatized and the Swedish-Finnish multinational company, Stora Enso are members of Inova.

TIPPS - technology in products, processes and systems - acts as a science and technology consultant for small and medium-sized companies.

"Drivhuset" (the Greenhouse) is a separate foundation started in 1993 by the university, the student body and representatives of the business community. The aim is to support and encourage young entrepreneurs.

Distance Learning Courses and Programmes

One option in undergraduate programmes of study is distance learning as a means for in-service training or further education as well as regular undergraduate studies. Today around 50 courses are held through distance learning where non-resident students study via video or computer at home or at one of the university's learning centres. Programs are also offered as distance education often via learning centres. Supervision is often by e-mail or in a computer conference. More than 1500 students take part in the ODL courses or programmes.

The board for lifelong learning in the university organisation plans and organises in cooperation with the nine departments of the university which courses and programmes the university will offer in ODL. The technical support of video- and computer conferences is rapidly growing and a student can get First Class support the whole week except Sunday. What we now can see is that some students choose Karlstad because of good quality in support.

Most municipalities in Sweden have opened Learning Centres, equipped for video- and computer conferencing to receive distance learning courses. These learning centres receive courses and programs from many universities.

The learning centres are organised in networks, often in the near region and become pressure groups towards the universities to promote the courses and programs they need the most. The biggest and strongest nationwide network NITUS consists of nearly one hundred municipalities and arrange conferences on important issues as technology, pedagogics and research on ODL and has become a strong pressure group towards universities and the ministry of education. In our region, the south western part of Sweden, there is a strong network organised through the regional authority.

The universities and university colleges in the same region have formed a network for cooperation and development within ODL. Our university communicates with some fifty municipality learning centres in the region and the dialogue is an important part of which area of education is interesting and necessary for the area. The university sends out next year's course catalogue in November to all our cooperating learning centres so they can choose which courses and programmes they want.

Local municipality boards communicate with the university discussing programmes, especially teacher and health care. After two years of discussions between local authorities and the university the university board for teacher education, decided to give a full teacher programme in mathematics and science to start in 2001. Seven groups of municipalities around lake Vaner, situated between 60-200 kilometers from the university, were invited to cooperate. The university in its turn should offer inset courses for the teachers involved in the school practice. A fully-accredited teacher-training programme in maths and science started in Jan 2001. This program takes a full-time student 3,5-4,5 years to complete, but the whole course is delivered via ICT and video conferences distance learning enabling students to learn partly according to their own time-scale. The students are based in eight learning centres in the municipalities around the region, and there are between five and ten students in each study group, in total 50 students. Teaching and learning is composed of videoconference lectures once a week, school teaching practice one day per week plus practice periods of longer duration with a base for each student in a local partner school, group-studying and computer conferencing. There are some meetings on campus. The teacher training program is of particular significance, as there is a shortage of trained teachers in Sweden, especially in the less urbanised areas such as the municipalities where the course is being delivered.

Each study group has a mentor from the university who continuously in in contact with the students and the partner school as well as the study center. This program is being followed up and evaluated and a first report is planned at the end of 2001.

An academic year in Sweden consists of 40 weeks studies. The program consists of 60 weeks pedagogical studies including 20 weeks practice, 10 week special needs and a final report of 10 weeks. 30 weeks mathematics and 50 weeks science. This program gives a diploma for teaching lower classes from grade 1 to grade 7. Those who want can add another 40 weeks course within science or mathematics. Then you have a diploma for the upper classes, grade 7-9.

The reasons why the students have chosen ODL before campus:

Distance to campus	16
Family	16
Children	7
Economy	4
Other reasons	8

Students' work experience:

Child care/ school	15	4 men	11 women
Health care	6	1	5
Industrial work	14	5	9
Business/ office	11	1	10
Kitchen/restaurant	3	-	3
Forestry/farming	5	1	4
Own enterprise	1	-	1
Others	8	1	7

This initiative from Karlstad university is followed up by a new start in January 2002. More than one hundred new students have applied so there is a big interest.

Funding the programme

The university funds the distance learning scheme, and funding for students is drawn down from the national funding body. More funding is needed for this programme in order to develop and promote it. Furthermore, there is currently a difficulty regarding the receipt of payment from the funding council. 50% of funding per student is paid for delivering the course, and the second payment is made if the student successfully undertakes the assessment. There is, however, a pattern emerging in the distance learning programme: a significant number of students study the course, but opt not to be assessed, which therefore has negative financial implications for the university. The reasons for non-participation in the assessment seem to relate to the academic confidence of the students and/or their instrumental requirements. Non-traditional students are unused to academic assessment, and often lack confidence in their own ability to perform well, and thus study for interest and other reasons, rather than certification. As a corollary, or in addition, some students do not need to participate in the course assessment; for example students in some employment situations do not require certification, but the course does provide them with knowledge and skills to assist them in their work. Some students are not used to academic ways of assessing. Sometimes they are not interested in the points because they have a job and they do it for being better in their job. They are not interested in the certificate.

Why was this approach to widening participation chosen? This approach to widening participation was chosen primarily in response to a government directive that places responsibilities on universities to become more regional. Swedish universities traditionally have had to undertake two core functions, teaching and research. A third task has been added to these responsibilities, which is 'networking with the region'. It is for this reason that the University decided to prioritise the development of distance learning programmes, in partnership with learning centres in the province of Värmland and the region around the lake Vaner.

In addition, the municipalities are very keen for universities to provide higher education courses in their learning centres for local people. In September the Swedish government launched a proposal for a

Swedish Net University with a national web site for ODL courses. This includes a far better payment for this type of education and right now the discussion is vivid within each university how to respond to this generous offer from the government.

Networking

Karlstad university is involved in several networks in ODL. The West Swedish Consortium on Flexible Learning which consists of a dozen universities and university colleges in the western part of Sweden started as a project in the mid nineties with some state grants for developing distance courses together. Karlstad was very active in this project and the courses developed constituted the base on which the university built its present system. These five courses are now some sixty.

UNISKA

A Swedish-Norwegian Network with Karlstad university, the university college of Dalarna and four Norwegian university colleges mainly in the county of Hedmark. With Interreg grants from EU a dozen short courses, each of them four weeks long, have been developed by teams each consisting of teachers from the different institutions. Municipalities from both sides of the border are also involved. A new platform has been developed for this and one of the goals is that the platform should work with problem based learning. An introductory two week course, "ICT and learning" was offered to the students. A pilot version was launched last year and evaluated.

A few examples:

- Strategic development for industry.
- Management development.
- Project development.
- Stress and stress management.
- Hosting and destination development in the tourism industry, culture and communication.
- Creating and maintaining personal networks.
- Distance working and flexible methods using new technology.
- Ethical issues in caring for the elderly.
- Development and change in the care sector.

Lifelong learning for engineers.

A network for the universities providing engineering programs on a national base.

The goal is to upgrade the engineers with new competencies by giving them opportunities to fill empty places in regular courses as well as tailor made inset courses.

The network for further education for teachers.

Consisting of a group of universities nationwide where courses are offered to teachers with an old teacher exam to get a new exam. Especially teachers with one subject only such as art, sport a o can take a second subject and get the new exam for secondary or upper secondary school. These courses are run by at least two and up to six partners with one university as coordinator. Karlstad is coordinating English and gives courses up to D-level which means two years full time study. This network is mainly run through computer conferencing (First Class). We are also involved in maths, Swedish and computer science.

Internal management

The new technologies need new strategies and networks within the university. Our university is in many respects a matrix organisation. When new ideas are being developed information is needed because so many initiatives are taken around the university and we need a joint arena for information and discussion.

The board for lifelong learning has to decide on ODL development and therefore is an important arena. The director for buildings and maintenance has important decisions in her hand. The University Pedagogical Group handles inset courses. The library develops new types of literature services for ODL students. The information office is constantly developing new ideas. The University Board has decided on the ICT-Policy of Karlstad University and it says that a joint arena for ODL management and administration and development of support of technology and pedagogics, a learning lab should be created as a project from Jan 2002.

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SYSTEM OF DISTANCE EDUCATION ON THE BASIS OF INTER-REGIONAL ACADEMY OF PERSONNEL MANAGEMENT

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Now Ukraine is in a great need of mass training and retraining of the qualified staff capable to work effectively in market economy conditions. In the same area there is a problem of proficiency level of the available staff. Information and knowledge become more and more dynamical, necessity of constant education and improving professional skills get increasing urgent.

The traditional forms of educational services are not capable to satisfy the growing demand for training of qualified experts. It's only possible to solving this problem through active introduction of progressive information technologies in the educational process.

A very important role in creation of new forms of training in Ukraine is played by private institutions of higher education, which are less inert educational structures. The ability of flexible and rapid response to quickly changing needs of a society in the field of education distinguishes them from traditional state institutions of higher education.

Relying on rich international experience many educational institutions of Ukraine have begun development and introduction of a system of personnel training and retraining, essentially new to our country – distance education with the use of Internet-technologies.

One of them is the Interregional Academy of personnel management established in 1989, in Kyiv. Within it's 12-years' history the Academy has become the largest private institution of higher education in Ukraine, where 21 thousand students are taught.

The experts of the Academy are now working on the project of creation of the distributed distance education system of modern information and communication technologies.

The given project provides formation of educational environment ensuring three basic modes of education organization: synchronous co-education, asynchronous co-education and self-education.

The mode of synchronous education gives trainees an opportunity to work with the same materials, at the same time, in virtual classes, and also to carry out a feed forward and feedback with the teacher, to unite in groups and to communicate.

The asynchronous co-education supposes an easy access of the trainees to educational process in convenient time, in any place on globally distributed basis.

The mode of self-education provides wide use of educational materials through the Internet, realization of self-testing, granting of access to world information resources.

The system of the distributed distance education, created in the Academy, is based on software, which meets the requirements of the educational process, ranging from development of courses, carrying out of education in virtual environment to processes of the accounting and administration. This software is LOTUS Learning Space 3.01, working on the basis of Domino 5.

The Academy is one of the first educational institutions in Ukraine, which today offers students complete programs of master's degree training in: "Management of organizations", "Personnel management" and "Marketing".

Systems implementation of the distributed distance education enables the Academy to carry out training students, who are distant from the educational institution, to give them an opportunity of information interchange with foreign educational and scientific centres.

A close integration in the world system of education guarantees not only direct improvement of educational process, but also up-grading the professional level of teaching staff through participation in the Internet-conferences, educational forums and so on.

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INTERNET AND COMPUTER-BASED MODEL OF HIGHER DISTANCE EDUCATION DEVELOPED BY WARSAW UNIVERSITY OF TECHNOLOGY

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Abstract

The article gives a brief introduction to the basic assumptions of the new model of engineering studies using distance learning technology. The article presents a structure of the academic year and types of the didactic courses offered. That is followed by a description of an academic textbook model and its role in the process of education. Finally, a description of the newly-opened faculties and specializations is presented.

Keywords – open and distance learning, e-learning, web-based education

1. Introduction

In the 1990's, Warsaw University of Technology WUT initiated a series of programs and actions whose objectives were to reform and modernize available forms of education. The WUT introduced a three-degree model of studying (B.Sc., M.Sc., Ph.D.), extended the Continuing Education system by adding new post-diploma courses dealing with information and communication technology, and contributed to the improvement of multimedia literacy needed in the production of new didactic materials.

Two years ago, the university authorities agreed it was high-time the WUT developed and introduced a new model of studies using distance learning technology. This model of studies is aimed at people living outside Warsaw, the disabled, working group or Poles living abroad. The Internet and multimedia have become the basic tools of a new model of education – known as SPRINT (in Polish: **Studia PRzez INternet**). The new model was introduced and first students enrolled for the academic year 2001/02. The present paper offers a short description of the new model of education developed by WUT.

2. Choice of the model and tools

In the process of development of a new model of studies two educational models were taken into account: synchronous and asynchronous. Eventually, after a thorough analysis of the two models, the asynchronous model was chosen as the basic one.

In 1985-95 a synchronous model of distance learning, using satellite television and feed-back for asking the lecturer, was developed very intensively. This model is used with pleasure for employee training by corporations, as it gives considerable savings of travel and accommodation (hotels) costs. However, for the individual student synchronous model seems to be too expensive.

The asynchronous model of distance learning, being originally a mail-based model used in contacts between student and its tutor, is historically prior to the synchronous model. The development of the Internet has offered new, incredible possibilities. It's unique features, often described in short as: any time, any where, any pace, have made it a perfect tool for individual learning. The Internet enables also to introduce elements of synchronous model in the form of online meetings and discussions as well as creation of scheduled virtual classrooms. Apart from that, the Internet is a tool, which is still developing, and its potential along with the rise of telecommunication transmission speed is still to be learnt [1, 2, 3].

We have analyzed a problem of proportion between Web-based education (eLearning), including the use of didactic materials based in portal and contacts between tutors, and a CD-ROM-based education, which is very well suited for self-motivated and self-paced students. We have taken into account a fact that in the next few years a connection with portal via telecommunication net will be, in many regions of Poland, time-consuming and expensive. In that situation, we have decided to prepare didactic materials of each lecture on CD-ROM. We are working on multimedia textbooks of the courses [2, 4]. These materials will be available also on the Internet.

It is assumed, that computer with access to the Internet is an essential tool of the student. This tool enables e.g.:

- access to Internet,
- e-mail correspondence/communication,
- work with didactic materials stored on CD-ROM,
- solve tasks and problems,
- write reports and projects, etc.,
- online meetings, discussion with lecturers and other students.

Although direct, face-to-face contacts between student and teacher are very rare in the SPRINT model, they are considered as important and essential elements of education. Three types of face-to-face contacts were introduced:

- Every year students have an opportunity to meet with tutors during one-week laboratory and research meetings. During that time students are instructed how to use measuring apparatus, conduct scientific research (computation and simulation) with the use of advanced software.
- Consultations between students and lecturers in the University buildings, organized shortly before examinations.
- The final examinations, organized at the university (in the form of meetings or sessions).

Another basic element of SPRINT model is the division of the academic year into four half-semester. For each year eight courses are offered, thus students study no more than two subjects at a given semester. A detailed description of the pace of studies in the SPRINT model is given below.

3. The academic year in the SPRINT model

The academic year is divided into four half-semester: autumn, winter, spring and summer, a system practiced in the FernUniversität Hagen. Each semester lasts 8 weeks and finishes with two-week examination sessions. Fig.1 shows the structure of the four-year studies. The division of the academic year into four and not two parts, enables students to study no more than two subjects at the same time.

The SPRINT model offers three types of subjects:

- **Major** subject, worth 8 cps, which ends up with an exam,
- **Minor** subject, 5 cps, which also ends with an exam,
- **Laboratory session** (one week long), 5 cps.

The problem of foreign language teaching will be discussed in a separate publication.

The grading of the subjects is based on the credit points system (cps), established by and used in the university teaching system in the majority of European countries. The credit system gives students the opportunity to gain credit points (credits). The total number of credits for the subjects is 248.

According to the requirements of the program of studies every student should credit at least one Major and one Minor course per half-semester, and during summer semester gain credit for the laboratory session.

The pace of individual learning and gaining credits is student dependent. However, to keep the status of a 'regular' student one should not have less than 50% of required points. At least once in a year, progress of 'regular' students is verified.

If the student is not registered for the next year, he still has a chance to continue his education. He keeps all his credits and has the opportunity to gain further credits and short before the last year of studies the student is enrolled once again.

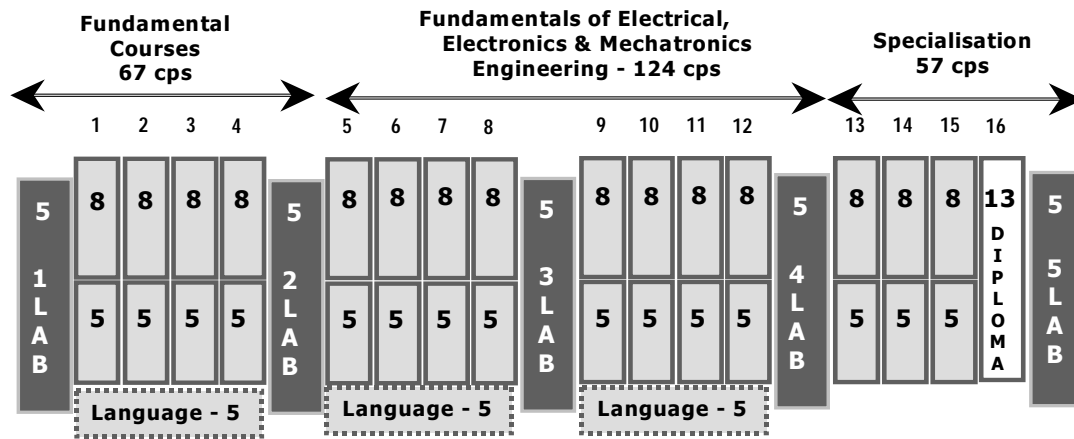


Fig.1 The structure of the four year studies

There is a three-level system of study:

- Fundamental courses, 1 year, whose program is fairly universal and basic; within the course student is required to credit 4 Major courses, 4 Minor courses and 2 Laboratory sessions, which gives minimum 67 cps.
- Faculty courses, 2 years, whose program is dependent on the faculty chosen; student is required to credit 8 Major courses, 8 Minor courses, 2 Laboratory sessions, and finish language course, which gives 124 cps.
- Specialization courses, 1 year, one faculty can offer more than one specialization; student is required to credit 3 Major courses, 3 Minor courses and finish a diploma thesis, which gives 57 cps.

4. Structure and elements of electronic course

It was assumed that the course material would be provided in an electronic form on CD-ROM. The material in electronic form should be transferable between many system platforms. CD-ROM containing lecture and auxiliary materials would be provided with HTML browsers (Netscape Navigator and Internet Explorer), Acrobat Reader and, according to the possibilities and needs, applications for reproduction of multimedia files.

For the production of the material the DynamicHTML technology was used, including: HTML, Cascading Style Sheets, Java Script and FrontPage tools. Thus the navigation system is based on HTML and dynamic Web page processing by Java Script.

The material of an electronic book is divided into two main parts:

A. Introductory part, which includes:

- Authors' note, which describes course objectives.
- Requirements for computer – includes description of requirements for computer.
- How to use an electronic book – it is a clear, step-by-step instruction of how to use the material stored on the CD-ROM.

- What to know to understand? – the authors explain conditions for understanding the didactic materials.
- Examination requirements, this element is included only if the given course ends with an examination.

B. Learning Units and Exam requirements which includes:

- Introduction, objectives, which presents the aim of the particular Learning Unit.
- Knowledge segments, which includes basic didactic material required from the students.
- Problems, this part includes examples of partly solved problems and tasks to be finished by the student himself.
- Glossary – includes new terms and definitions.
- Bibliography – a list of important publications for further reading.

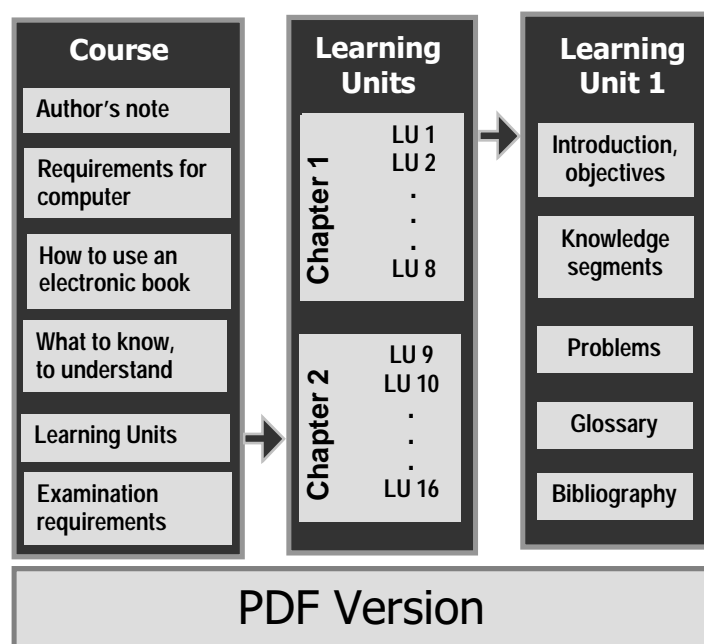


Figure 2. Structure of the electronic book

Lecture material would be enriched, according to the possibilities, using pictures, animations, video and audio clips with explanations and comments, multimedia presentations, questions and tasks with keys or without key. Beside basic lecture material, according to the possibilities, auxiliary materials in the PDF documents form (review possible by the use of free Acrobat Reader Program) would be provided.

Such material after preparation has been published by the use WWW service accessible through educational portal.

5. Faculties and specializations

The three faculties of the WUT, Electrical Faculty, Faculty of Electronics and Information Technology and Faculty of Mechatronics, offer courses in the following specializations:

- Industrial Informatics (Electrical Faculty),
- Computer Engineering (Faculty of Electronics and Information Technology),
- Multimedia (Faculty of Electronics and Information and Faculty of Mechatronics),
- Mechatronics (Faculty of Mechatronics).

The Fig.3 presents the structure of the studies program offered by particular faculties.

The Fundamental Courses, offered during the first year of studies (Mathematics, Physics, Fundamentals of Informatics), are universal courses that can be adopted by every faculty of the WUT.

Fundamentals of Electrical, Electronics and Mechanical Engineering offer a set of courses for the second and third year of studies. The number of common courses for each specialization is relatively big. As a result, students have the opportunity to attend the majority of the offered courses.

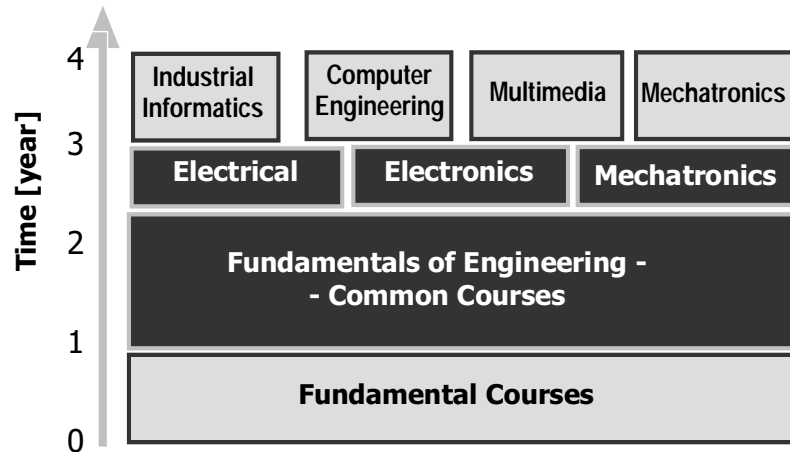


Figure 3. Program of studies structure

During the fourth year of studies students attend only courses of their specialization and work on their final thesis that leads to a diploma. Every year students have the choice between several courses, whose number increases with the progress of introduction of new didactic materials.

6. Conclusions

The Distance Learning model introduced and developed by the Warsaw University of Technology is based on two very important tools: multimedia textbook on CD-ROM and the Internet. Television, as means of course lecture transmission, has not been taken into account. We have also decided to maintain weekly meetings at the university during which students have the opportunity to conduct laboratory experiments as well as projects with the use of modern and advanced software. This model is being put into practice and 200 newly enrolled students are given a chance to start education in a new model of studies.

The majority of students, as it turned out, finished their secondary education several years ago. As a result, some students seem to have difficulties with understanding of certain aspects in such subjects like Mathematics and Physics. That situation led to introduction of specially written textbooks referring to the secondary school material.

Although multimedia textbooks have been prepared for the SPRINT model students, many regular students as well as the tutors found the new textbooks to be very useful in their studies and work.

The next few months will show how far we have come and the results shall be reflected in forthcoming publications.

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