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

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New Challenges and Partnerships in an Enlarged European Union

Open, Distance and E-Learning in Support of Modernisation, Capacity Building and Regional Development

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on behalf of the European Distance and E-Learning Network

European Distance and E-Learning Network

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A conference at the right time, at a special place, in good company

EDEN is continuing its series of conferences, following the professional development and policy mainstream in the European distance and e-learning with a dedicated event in 2004, the year earmarking a development of great significance in the European Union: the ever-largest extension of the EU, resulting in the accession of ten new Member Countries.

The integrating Europe should benefit from solutions which support the even more active modernisation of the continent. Enhanced by information and communication technologies and by the further development and deployment of e-learning in all sectors, innovative education is centrally positioned for contributing to this process. The EDEN conference addresses the core questions of how distance and e-learning can best play a role in capacity building and support modernisation.

Since its establishment in 1990-91, in another historical period of the European development, EDEN has been dealing with the issues of European integration and East-West collaboration with special attention. The 2004 conference is organised in the spirit of welcoming the new Member States and also for continuing, in a renewed context, the East-West co-operation and pan-European dialogue.

It has been a long way from the first mention of distance education in the Maastricht Treaty in 1992 to the current e-learning programme achievements. The unique moment in 2004 offers also an opportunity to evaluate this far-reaching process, in which technology-supported learning has become mainstream. The EU eLearning Initiative Action Plan has already provided essential momentum for the modernisation process of education. The EU eLearning Programme will now face further challenges in the transforming situation. This leads to the need of rethinking how ICTs and e-learning can be best used for supporting modernisation and capacity building. On the other hand, it is worth assessing, according to our latest knowledge, what e-learning is worthwhile using for - and what not.

In order to support a really efficient and beneficial European integration in the years to come, it is most timely and relevant to survey and evaluate the experience available, with the analysis of achievements of the numerous EU projects from the perspective of the joining countries and also, in a broader sense, in the context of the East-West collaboration and assistance.

The conference themes covered in the papers include the link between e-learning and the modernisation process in the new Europe, the state of the art in technology and methodology, the new challenges created by the EU enlargement for the human resource development, the consolidation and "maturing" process – the evolution of discourse about distance and e-learning throughout the last decade, further the ways how new markets, interests, collaborations help establish new kinds of partnership, and the success stories of distance and e-learning in the context of regional development, capacity building and European co-operation.

We started to organise the conference in the autumn of 2003 in the expectant atmosphere of approaching the enlargement date. The EDEN 2004 Conference is already being held in an EU member state in Budapest – the large celebrations are just over, the EDEN community looks forward to meet the new challenges and opportunities.

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Secretary General, EDEN

Ingeborg Bø
EDEN President

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TABLE OF CONTENTS

COLLABORATION, KNOWLEDGE TRANSFER AND CAPACITY BUILDING THROUGH E-LEARNING IN THE NEW EU MEMBER STATES AND EASTERN EUROPE

E-LEARNING IN CORPORATE ENVIRONMENTS: DEVELOPMENT, IMPLEMENTATION AND ACADEMIC PARTNERSHIPS

E-LEARNING AND THE LEGAL ENVIRONMENT

INNOVATIVE E-LEARNING SOLUTIONS IN SCHOOLS: CONCEPT AND EXPERIENCE

MEASURING AND IMPROVING QUALITY AND EFFECTIVENESS OF ELECTRONIC DISTANCE EDUCATION

THE LINGUISTIC ASPECTS OF E-LEARNING

STRUCTURING DIGITAL KNOWLEDGE – LEARNING OBJECTS AND CONTENT MANAGEMENT

APPLICATIONS OF NEW MULTIMEDIA TECHNOLOGIES IN E-LEARNING

DEVELOPMENT, IMPLEMENTATION AND EVALUATION OF VIRTUAL ENVIRONMENTS AND LABORATORIES

SHORT PAPERS

CONFERENCE PAPERS

PRESENT AND NEW EMERGING TECHNOLOGIES; CHALLENGES AND OPPORTUNITIES FOR EUROPEAN DISTANCE EDUCATION AND E-LEARNING

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Abstract

This paper discusses the present and future impact on distance education and e-learning (DE&E-learning) of presently available and new emerging technologies. It argues that DE&E-learning practitioners, teachers and learners alike, should strive to improve their individual skills, and thus the practical application of presently available information and communication technologies (ICT), and that centralized attempts at industrializing teaching and learning should be countered by a more individual entrepreneurial and teacher/learner/technology approach to DE&E-learning. The impact of the extremely rapid emergence of truly incredibly powerful new technologies will not only result in continuing and rampant change in DE&E-learning, but also change many learning institutions as we now know them, as well as our present concept of social values in a new Europe.

Introduction

Leading practitioners [1] in the DE&E-learning community argues that "…we do not need a detailed understanding of computers, software and networks…" This view have contributed to a peculiar detached estrangement in many DE&E-learning practitioners relationship to presently available ICT, and it prevents many from realizing the revolutionary potential of new emerging technologies. It has also inspired many failed or failing government supported attempts by large prestigious international teaching institutions at "industrializing teaching and learning" [2] on a large centrally controlled scale.

A basic theme in this paper is that the full potential of present day, well known, off the shelf technologies and softwares, are not even being fully understood, nor are they being used [3] to their full extent by the individual practitioners in the DE&E-learning community. It argues for a better and more intimate insight into, knowledge of, and familiarity with these technologies among individual teachers and educators. The paper also encourages a more individual entrepreneurial and teacher/learner/technology centric approach to DE&E-learning, and argues that a personal familiarity with new technologies enables an increased awareness of the value, scale, scope and reach of individually owned intellectual capital as the ultimate "means of production" in the new information society.

Another important, and for some an even more intimidating and frightening theme, is that the extremely rapid emergence of truly incredibly powerful new technologies [4, 5] will not only have a potential for continuing and rampant change in DE&E-learning, but also for a radical change of universities and learning institutions as we know them, and perhaps even for our present concept of and framework for social values in a new Europe.

The paper also comments briefly on the unused potential of some of the very many advanced technologies that are available today as off the shelf products, and outlines how they can be used to greatly enhance and advance the power, scope and reach of DE&E-learning [5]. It then goes on to a brief discussion of some of the most revolutionary emerging technologies, and envisions the repetitive shocks of paradigm change these technologies will come to be inflicted upon the European, and on the global, learning community, as the 21st century matures into a new technological, social, and cultural reality.

Presently Available Technologies

Peter Cochrane, previous head of the Research Department at British Telecom Laboratories, and author of the famous book "Tips for time Travellers" [6], stressed in his keynote [3] on Communications Technology at the 2003 World Technology Summit in San Francisco last June, that even well known, off the shelf technologies, were not being used today to their full extent. This view was reiterated by keynote speakers at the Emerging Technologies Conference at MIT in September 2003 [4].

Many experienced, skilled, but traditional educators do not have sufficient skills and familiarity with ICTs to exploit these to their full extent in DE&E-learning. Most universities and very many businesses have, or can make available, ISDN and/or IP-based video conferencing equipment. Such equipment have the power to bring any teacher "live" into any classroom independent of time and space, and without the cost and time restraints of physical travel. Inexpensive web casting technology and free software, combined with currently available broad band Internet access, have the power to distribute this type of video teaching globally and real time via Internet to any broad band web-connected student in the world. Free recording software have the potential to capture such live video/web-casts for upload to a web site and later study by students world wide at their leisure, virtually independent of time and space. Present state of IP based video conferencing and commercially available band width enables live video interaction real time, with any student and between any teacher and any number of students world vide. The same is true for any digital medium: written text, sound, picture, video recordings, and/or any combination of two or more of these.

We have, since 1999, experimented with the practical application of a host of presently available, off the shelf ICTs. The aim has been to gain familiarity, increase individual skills, and explore the potential of such technologies in DE&E-learning for both teachers and learners. This experiment resulted in the development of a series of rather unique course, built around online live digital access to a national and international network of teachers, researchers, consultants and industry executives as virtual guest lecturers. Traditionally, guest lecturers would have to be physically present in the class room. However, the application of presently available ICT made all guest lecturers available real time, via video conference exclusively for the students in the class room, or via web cast for a global audience with the proper access to the course web. In addition, recordings of all lectures were made available on the course web as streaming video synchronized with slides and accompanying multimedia demos for later perusal at the students' leisure. Supplementing this main core of live and recorded digital knowledge products were the traditional reading assignments, all of whom were made available or accessible as digital full text documents or books via the course web. Many science journals now offer online copies of their articles for teaching purposes, and while online bookstores make it possible to purchase most traditional books online, many are now offering an increasing number of e-books for purchase and download online. Most university libraries offer online access to a large number of digital full text documents and books. The traditional reading assignments normally constitute the bulk of the knowledge transfer in a traditional course-based learning experience. However, the new multimedia technologies makes it possible to substitute much of the traditional written text with rich and powerful multimedia demos offered online as streaming video. These courses used online multimedia demos from a global network of suppliers as a test for this new concept. Multimedia demos can be short recordings edited and cast especially for teaching, communication and demonstration purposes, or they can be ad hoc recordings illustrating real life processes and occurrences, much like TV reports and feature stories.

All in all, these courses illustrate the power of individual teacher/learner skills, and the concept of so called "virtual learning enterprises" [7]. Operating almost exclusively in "marketspace" [8], and built around a "virtual value chain" [9] characteristic of the knowledge economy [10], they use ad hoc or permanent knowledge networks for their incoming and outgoing logistics. Based on initially unstructured information and unrefined knowledge components [11] as their basic resource and raw material, they can easily be viewed as the first modest precursors of virtual learning enterprises.

Emerging New Technologies

“The future is already here, it’s just unevenly distributed”. This famous quote from the science fiction writer William Gibson [12] rings as true today as when it was first published in 1984. New technologies emerge [4] and become realities [13] and science fact long before they gain attention and wide application in business, industry, academia and among the individual teachers and learners. Some emerging technologies are science fact today, and the potential impact of these and other emerging technologies in DE&E-learning is truly awesome.

New breakthroughs in bandwidth-, transistor-, and network technologies [14], the three key technologies for further advances in ICT, are making present day capabilities obsolete before the general public and educators have managed to come to terms with “what is”, and much less so of “what will be”. Wireless networks of unimaginable bandwidth, and transistor capacity pushing Moor’s law towards its quantum limits and beyond, will shortly enable digital networking and global communication with holographic 3D video of close to real life quality and capacity. Mobile computing with flexible and even foldable screens as cheap and pervasive as is paper today, will enable high quality, real time communication truly independent of time and space, and economy of both scale and scope will work together to make these capabilities available to the entire world population.

Such capabilities, morphing into ubiquitous- and pervasive computing will revolutionize education and the dissemination of knowledge. Tomorrow, the traditional, as well as today’s advanced concepts of learning and education will be obsolete. Digital information, sourced in a global market, will increasingly serve as the ultimate raw material for the manufacturing of a vide variety of digitized knowledge products to be distributed and sold in a ubiquitous global knowledge market independent of time and space. Open learning and distance education will increasingly be organized as virtual and ubiquitous enterprises competing for the best knowledge resources in a global market “space” and developing, marketing, selling and distributing a host of advanced, high quality digital knowledge products tailored for different markets anywhere and anywhen. Universities and other learning institutions will seize to be the sole framework of teaching and learning, but will presumably be the new frameworks for a novel culture of direct physical and social contact, discourse and intercourse as the ultimate value and luxury in a networked an digitized world.

In the next five years, a number of powerful, miniaturized and cheap technologies will converge to gather and intelligently deploy vast amounts of information, enabling a world in which objects can sense, reason, communicate and act. Where for every physical entity or event, there will be a virtual collaborating double. Where the time between stimulus and response will approach zero. Where information, insight and knowledge will be bought and sold in a market that rewards those who build trust and harness the real-time economy.

Ray Kurzweil, one of the world’s leading authorities on artificial intelligence, reflects on the future in his 1999 book “The Age of Spiritual Machines” [5]. In this book he build powerful arguments for visions that in five years from now computers will be able to perform a trillion calculations per second, and will enable simultaneous translation of most language pairs. Fifteen years in the future computers will enable the memory capacity and computational ability of the human brain, and interaction with computers will involve gestures and two way spoken communication. Most learning will be conducted through “software-based teachers”. Twenty five years from now computers will have the capacity of 1.000 human brains, and the majority of communication does not involve a human. Computers will have read all available human- and machine-generated literature and will be learning on their own. Machines will claim to be conscious. Towards the end of this century he claims that there will no longer be a clear distinction between humans and computers, that most conscious entities will not have a permanent physical presence, and that the goal of education, and of intelligent beings, is discovering new knowledge to learn…!

Challenges and Opportunities

Strategy used to drive the use of technology, in business as well as in distance education. Today, and increasingly in the future, technology actually drives strategy by enabling totally new approaches to old and new business- and educational problems. This development demands new strategic approaches for DE&E-learning as virtual enterprises [7] beyond our traditional perspectives. No longer can we view technology as a constant [10]. It's an exponential variable in the equation of DE&E-learning. In this development, the dichotomy of autonomy vs. heteronomy [1] is irrelevant and the question of knowledge supply is equally important to that of knowledge demand, and vice versa.

While Otto Peters [2] fully embraces the importance and enormous potential of ICT in DE&E-learning, his earlier statements [15, 16] about the industrialization of teaching, learning, and distance education have, perhaps unintentionally, inspired many failed or failing government supported attempts, by large prestigious international teaching institutions, at "industrializing teaching and learning" on a large centralized scale.

In 1993 Hammer and Champy published the land mark book "Reengineering the Corporation; A manifesto for business revolution" [17] In this, sometimes controversial study, and in related papers, they express their logic in statements such as: "Don't Automate, Obliterate…", and: "Most companies use computers to speed up, not break away from, business processes and rules that are decades, if not centuries, out of date…", and finally: "But the power of computers can be released by 'reengineering' work: abandoning old ways of working and creating entirely new ones".

Similarly, Accenture (formerly Andersen Consulting), in their 1995 scenarios of "DaVinci Virtual Corporation" [18] used the sub title: "Challenging your assumptions". Today, in Accenture's updated vision of what they now call "Ubiquitous Corporation" [19], they have changed the subtitle to "Challenging your imagination".

As for business, so also for academia and universities in general and DE&E-learning in particular, the challenge today and for the future is to understand that harnessing the power and potential of the new ICTs in themselves demand entirely new strategies and new approaches. Organizing the new type of value chain required for the new "virtual learning enterprises" of today's knowledge economy, and yet again of the future "automaton, or alien intelligence economy" [20], requires both new assumptions of what is and what will be, as well as courage and imagination to see the endless, almost unimaginable opportunities that these technologies offer today and in the future.

Thus, an alternative way of reaching the goal of DE&E-learning as "virtual enterprises" [7] will require better personal skills, insight and familiarity with these technologies among practicing teachers, educators and learners, and a more individual entrepreneurial and teacher/learner/technology (TLT) centric approach to DE&E-learning. A personal familiarity with present and new technologies enables an increased awareness of the value, scale, scope and reach of individually owned intellectual capital as the ultimate "means of production" in the new information society. The old, useless and rather confrontational paradigm of polarization, of the teacher's role vis-à-vis the learner [1], would seize to be a valid concern in a TLT centric approach. This dichotomy, that seems to linger as a ghost from the past in many distance learning environments, will loose its relevance in a wired world much like the old political polarization and confrontation between capitalism and communism today becomes increasingly obsolete when new technology and insight enables new politics and realizing old Marxist social goals as a consequence of free individual access too, and private ownership of information and knowledge as the basic "means of production" in the emerging knowledge economy.

The new century will offer new and frightening challenges, for DE&E-learning in particular and for Europe and the World in general. In his 2000 book "After the Internet: Alien Intelligence" [21], James Martin defines the new concept of Alien Intelligence: "Machine intelligence that is used to think as humans cannot. Most computing today is used merely to emulate human thought processes. In the next economy, machine/alien intelligence will feed on itself and grow like a chain reaction, linked across the planet on a ubiquitous Internet. It will change virtually every aspect of our lives: business, investing, science, health care, entertainment, and more."

In a pending paper [20] by the present author and Martin Illsley the following table presents a framework for the evolutionary power of technology on economy, business and the resulting social and cultural realities.

Industrial Economy		Knowledge Economy		Automaton*/Alien Intelligence [5, 21] Economy	
Vertical Integration		Virtual Integration		Ubiquitous Integration	
Portfolio of products	Portfolio of businesses	Portfolio of capabilities	Portfolio of human relationships	Portfolio of online realities	Portfolio of automata* relationships
machine/structure metaphor		human resource metaphor	knowledge network metaphor	automata network metaphor	
Material/Monetary Corporation		DaVinci Virtual Corporation		UbiqCorp Ubiquitous Corporation	
Challenging disorder		Challenging assumptions		Challenging imagination	

*Automat(on/a): Software agents or device(e/s) that contains its own power source and can perform a complicated series of actions, including responses to external stimuli, without human intervention. RFID tags are the first primitive pre-cursors. Networks of automata are designed to mimic human behavior [22].

Figure 1. A framework for emerging technology, economies, business and a new social and cultural reality

This framework outlines a future where the industrial economy of the 20th century and the knowledge economy of the dawn of the 21st century will evolve into a new economy and a new social and cultural reality. We will propose the name Automaton or Alien Intelligence Economy for this next evolutionary step that will be dominated by pervasive computing and ubiquitous technologies dominated by automata [22] relationships and alien intelligence [21]. Such a future is truly a challenge for anyone's imagination, and will probably be perceived by most "humans" as extremely challenging, threatening and intimidating. But the opportunities for human growth and development are exiting and staggering.

References

1. Fred Lockwood (2003) Foreword in: Distance Education in Transition
2. Otto Peters (2003) *Distance Education in Transition; New Trends and Challenges*, 3rd edition, Studien und Berichte der Arbeitsstelle Fernstudienforschung der Carl von Ossietzky Universität oldenburg volume 5, Bibliotheks- und Informationssystem der Universität Oldenburg, p. 235
3. Peter Cochrane (2003) *Communications Technology Keynote*, World Technology Summit, San Francisco, June 2003. See streaming video of keynote presentation at: http://wtn.net/webcast/summit/2003/day1/d1h0940b.html
4. Emerging Technologies Conference at MIT, September 2003. http://www.etc2003.com/index2.shtml
5. Ray Kurzweil (1999) *The Age of Spiritual Machines: How We Will Live, Work, And Think In The New Age Of Intelligent Machines.* Orion, p. 388
6. Peter Cochrane (1998) *Tips for time Travellers,* McGraw-Hill, p. 225
7. Per R. Stokke (2004) *Open Learning and Distance Education as Virtual Enterprises;* 21st ICDE World Conference on Open Learning & Distance Education, Hong Kong, February 2004 http://www.apertura.ntnu.no/prs/pdf/ICDE03%20manus.pdf see animated Web-based ppt presentation at: http://www.apertura.ntnu.no/prs/ICDEx/ICDE%20slides.pps (click "browse" in the top line menu, and then "full screen")
8. Jeff. F. Rayport and John J. Sviokla (1994) *Managing in the Marketspace.* Harvard Business Review, November-December 1994

9. JEFF. F. RAYPORT AND JOHN J. SVIOKLA (1995) *Exploiting the Virtual Value Chain.* Harvard Business Review, November-December 1995

10. PAUL ROMER (1986) *Increasing Returns and Long Run Growth,* Journal of Political Economy, v. 94, pp. 1002-1037

11. PER R. STOKKE & BERNT BREMDAL (1994) *Information Refineries and the Manufacturing of Industrial and Corporate Knowledge.* Proceedings, International Seminar on the Management of Industrial and Corporate Knowledge, ISMICK'94, pp. 45-60 http://www.apertura.ntnu.no/prs/pdf/ismick94.pdf

12. WILLIAM GIBSON (1984) Neuromancer, HarperCollins, p. 317

13. ACCENTURE (2002) *Reality Online; The business impact of a virtual world.* Outlook Special Edition, September 2003 http://www.accenture.com/xdoc/en/ideas/outlook/special2002_7/Reality_online.pdf

14. WADE ROUSH (2003) *The Internet Reborn,* Technology Review, October 2003, pp. 28-37

15. OTTO PETERS (1967) *Distance Education at Universities and Higher Education Institutions: Didactical Structure and Comparative Analysis – A Contribution to The Theory of Distance Education*

16. OTTO PETERS AND DESMOND KEEGAN (EDS) (1994) *Otto Peters on distance education*. The Industrialization of Teaching and Learning. Rutledge Studies in Distance Education

17. MICHAEL HAMMER AND JAMES CHAMPY (1993) *Reengineering the Corporation; A manifesto for business revolution,* Harper, p. 272

18. ANDERSEN CONSULTING (1995) *The Spirit of DaVinci.* Unpublished note by Joe Carter. http://www.apertura.ntnu.no/sos1008/diverse/pdf/ACDavinci.pdf

19. ACCENTURE (2000) UbiCorp: *A Vision of the Ubiquitous Corporation*. http://www.accenture.com/xd/xd.asp?it=enweb&xd=services%5Ctechnology%5Ctech_ubicorp.xml&xt=print.xslt

20. PER R. STOKKE & MARTIN ILLSLEY (in prep.) *Emerging Technologies, Organizational Challenges, and New Strategic Opportunities; How science and technology will revolutionize business in the 21st century.*

21. JAMES MARTIN (2000) After the Internet: Alien Intelligence. Regnery, p. 479

22. MICHIO KAKU (1998) *Visions; How Science Will Revolutionize the 21st Century and Beyond.* Oxford, p. 415

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CAN TECHNOLOGY MAKE LIFELONG LEARNING A REALITY?

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Abstract

"Technology can make lifelong learning a reality" is written in one of the listed references. Is this true? In the paper the connection between the e-learning and the lifelong learning is explored.

The term "lifelong learning", just like frequently used "university continuing education" are both not well defined and there is a substantial lack of statistical data on both. The concept of lifelong learning in the EU member states differ significantly and their efforts seem to be partly mismatched. More or less, one of the main common denominators is the inseparable connection with e-learning and/or open and distance learning. It seems that modern information technology support is going to be the foundation of the efficient and cost-effective lifelong learning. To come to this point the e-learning has still to become inexpensive, user friendly, actively motivating, multimedia supported and widely accessible.

Introduction

The related terms of »lifelong learning« and »university continuing education« both describe very broad ideas. They are consequently very expansive and not consistently defined. In fact the problem is that there are too many definitions of the terms including the ones from UNESCO, Council of Europe, European Commission, EUCEN (European Universities Continuing Education Network) etc.

In our context the most relevant definition for lifelong learning (LLL) is the one from European Commission [1] which says that it is »*all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective*«. This includes all forms of learning: formal (courses and examinations), non-formal (without examinations) and informal (without either courses or examinations). In this policy document the concept of "European lifelong learning area" (which mirrors the earlier one of a European research area) is the area where citizens can move freely to "learn, work and make the most of their knowledge and skills to meet the aims of the EU to be more prosperous, tolerant and democratic".

For the »continuing education« (CE) we will refer to EUCEN [2] which states that it *is »any form of education, both vocational or general, resumed after an interval following the continuous initial education*«. This includes: full-time and part-time programmes for older adults leading to qualifications; courses taken for vocational reasons or for love of the subject; courses leading (but not necessarily) to credits, diplomas and degrees; courses taken by graduates (but not always so). The definition is rather hazy, but it has been generally used by the authors describing the continuing education in Europe. On the other hand the term "university continuing education" (UCE) is not frequently used in the EU official documents where lifelong learning is used instead (in almost identical meaning). Synonyms for general understanding of continuing education are also "adult education" (used for example in Finland) or "permanent university education" (used in Spain) and also "post-experience education". Almost all agree that UCE is education for adults returning to university education after a break following their initial education but sometimes it is limited to vocational educational activities.

In fact lifelong learning in its definition covers the whole education area: initial education, basic continuing education and university continuing education. All the listed components are graphically represented in Fig. 1 (a slightly different form of which is presented in [2]). According to some writers, the usage of lifelong learning term is so all-encompassing that it is in danger of losing all meaning [3].

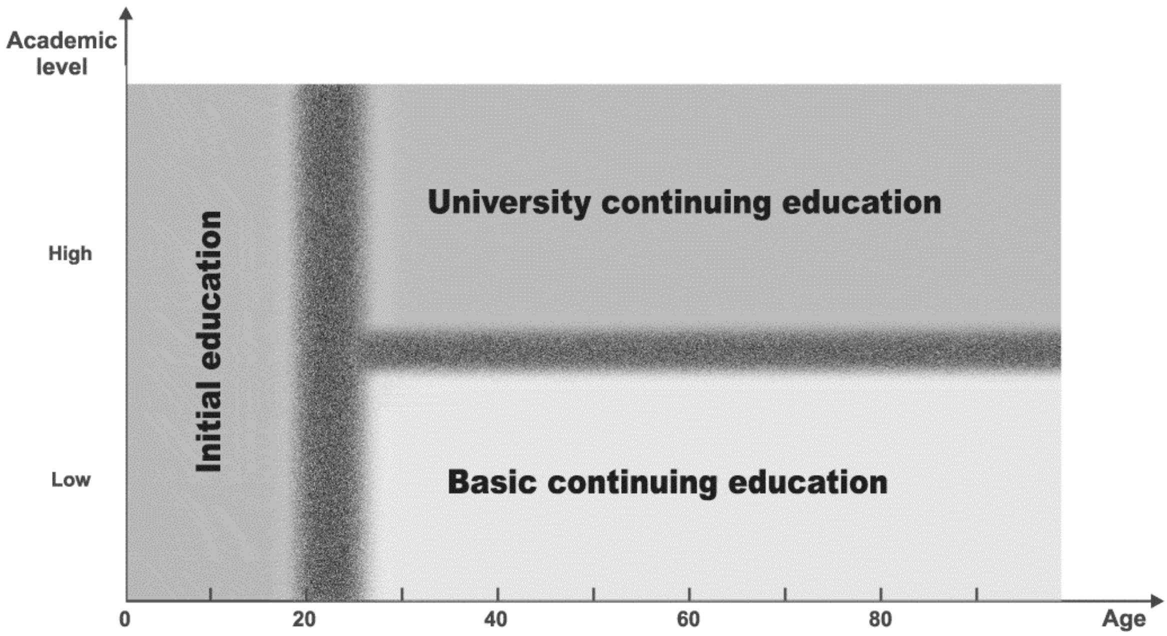

Fig. 1: Lifelong learning (the whole area) and university continuing education

Let us mention here that also the related terms like "adult student", "part-time student", "higher education" and "further education" are not understood in one universal way, but depend on the society, tradition and culture of the country.

The central concerns of the continuing education according to Taylor [4] are:

- individual and cultural education for personal growth and understanding,
- facilitating the pleasure of intellectual discovery and debate,
- civic and collective education to meet the needs of the community and to enhance democratic structures,
- developing adult students critical faculties,
- disseminating the core value of university education,
- awareness of scientific, environmental and social issues,
- developing effectiveness and capability through intellectual and specialized skills,
- generally bringing together the expertise and values of the university and the life experience and real life issues of the regional community.

Information technology and Lifelong learning

"Technology can make lifelong learning a reality" [5] is in a nutshell presented the North American point of view. With electronic tools, people can (theoretically) learn virtually anytime and anyplace they choose without obstacles in place, time and social status.

UNESCO's "Policy Paper for Change and Development in Higher Education" urges higher education institutions to make greater use of the advantages offered by the advancements of communication technologies so that »each university should become an open university offering possibilities for distance learning and learning in various points in time« [6]. E-learning is not seen as a shift from the traditional to open learning, but rather as a support to conventional learning processes with the use of modern information technology and distance educational methods. Modern implementation of e-learning in educational institutions can be considered as the result of the convergence process of distance and conventional education.

As recent reports demonstrate clearly, the pace of e-learning and ODL is accelerating, and it is likely to occupy a growing part of the landscape in higher education. According to the cited UNESCO report, [6] open and distance learning is one of the most rapidly growing fields of education, and its potential impact on all education delivery systems has been greatly accentuated through the development of Internet – based information technologies, and in particular the World Wide Web. E-learning at the tertiary levels shows a two-fold development pattern. On the one hand, numerous single model open universities have emerged to absorb large numbers of new learners, while, on the other hand, increasing numbers of traditional universities have begun to offer their programmes also through distance education. The development of new information and communication technologies has reinforced this trend.

In the book where the role of "Net Generation" is explored [7], the new ways of learning for the new generation are presented.

The new learning process brings up the following shifts:

- from linear to hypermedia learning,
- from instruction to construction and discovery,
- from teacher-centered to learner-centered education,
- from absorbing material to learning how to navigate and how to learn,
- from school to lifelong learning,
- from one-size-fits-all to customized learning,
- from learning as torture to learning as fun, and,
- from the teacher as transmitter to the teacher as facilitator.

Tapscott's research leads him to conclude that the "Net Generation" is a force for educational transformation. They process information differently than previous generations, learn best in highly customizable environments, and look to teachers to create and structure their learning experience. Furthermore, the importance of understanding the behavioral patterns of the network generation exceeds merely appreciating that they are comfortable working online. A crucial element for successfully delivering virtual courses entails transforming the educational experience so that it is meaningful to the information-age learner.

Due to the overall development and wide implementation of e-learning and because of high number of students that will participate in LLL it is evident that e-learning is going to be the foundation on which LLL will be built. Nevertheless, to come to this point, e-learning has still to become inexpensive, user-friendly, actively motivating, multimedia supported and widely accessible.

How can LLL benefit from technology and innovation in learning processes?

Users/learners of Lifelong learning services to be offered by universities and other educational institutions are expected to be mostly adults with different levels of background knowledge and different levels of ICT skills. Therefore it is crucial that LLL e-learning platforms are operating in friendly, easy to use and robust environment. On the other hand, the didactics will have to be designed in such a way that the learning process is motivating for the learner and that it supports the knowledge generation (constructivistic learning). As far as the high quality access is concerned there is a new technology coming up, namely the m(mobile)-learning which will make the learning possible practically anywhere and anytime.

In the majority of e-learning programs offered today, the burden for learning is placed entirely on the shoulders of the learner. When "e-students" go to a course web site, they enter a menu of activities: announcements, documents, assignments, external links, communications and tools. Students are expected to navigate this material on their own, without much support. They are generally offered email links to faculty and other students, but not much more. *"Collaborative learning"* is trying to solve this situation by creating a virtual social space that must be managed for the teaching and learning needs of the particular group of people inhabiting that space. Such a common space is very important for the motivation and effective learning of UCE students that lack the social component of traditional student's environment. Such a system also allows for something that is often overlooked in the e-classroom: recognizing and acknowledging the most valuable contributors. All these qualities are beneficial to the adult learner who is using the information technology as the means of interaction with the faculty, teachers and fellow students.

As far as technology aspect is concerned, the e-learning support is being upgraded with new features. We believe that the personalization of the e-learning services is going to play an important role in the friendliness and intimacy experience of the learners.

Personalization of e-learning services

The necessary technology development itself seems to make (some) learners feel uncomfortable. The variety of new technology features, services and functionalities may limit rather than stimulate the critical motivation in learners.

The personalization of the technology platform offers the learning organizations a method for enhancing the learners' intimacy through their web site, which is, without any doubt, an additional motivation factor for the learner to whom the computer represents a major learning media. The technology providers will be forced to offer both highly sophisticated and at the same time "simple to use" e-learning functionalities. One of the major solutions to combine these two directions is the personalization of the e-learning technology platform.

In February 1999, the Gartner Group stated that, "matching direct or inferred reader requests through content personalization will be the most dramatic development in the Internet (...) through 2002, and will help differentiate the Web as a new medium". Clearly, this is an important technology, and is being applied in many Internet systems in use today. Recent studies, for example [8], reports that relative advantage, compatibility, ease of use, and trialability significantly impacts the intended use of the personalization features on a web site. On the other hand visibility, image and result demonstrability were found not to have a significant impact on intent to use the personalization features on a web site. The study also found that the personalization features should be easy to use and should exhibit some advantage to the users to ensure adoption and use.

Three aspects of a Web site affect its utility in providing the intended service to its users. These are the content provided on the Web site, the layout of the individual pages, and the structure of the entire Web site itself [9]. The relevance of each of the objects comprising a Web page to the users' needs will clearly affect their level of satisfaction. The structure of the Web site, defined by the existence of links between the various pages, restricts the navigation performed by the user to predefined paths and therefore defines the ability of a user to access relevant pages with relative ease. However, the definition of relevance is subjective. It is here that there is a potential mismatch between the perception of what the user needs, on the part of the Web site designer, and the true needs of users. This may have a major impact on the effectiveness of a Web site.

Personalization technology involves software that learns patterns, habits, and preferences. Personalization is a toolbox of technologies and application features used in the design of an end-user experience. Features classified as "Personalization" are wide-ranging, from simple display of the end-user's name on a Web page, to complex catalog navigation and product customization based on deep models of users' needs and behaviors. Similarly, personalization technologies range from commonplace use of databases, cookies, and dynamic page generation, to esoteric pattern matching and machine-learning algorithms, rule-based inferencing, and data mining [10].

As far as the technological process is concerned, personalization can be considered a three-step process in which customer information (their preferences, behavior, and profile) is taken as input, business rules are evaluated, and customized content is generated as output [11].

When developing a complete e-learning technology solution (model, software and portal), presented in [12], we proposed and implemented some personalization features that are especially appropriate for e-learning systems. In details the personalization itself is presented in [13]. Some special features of the personalization of e-learning services are presented in [14].

The users of the e-learning portal can be more productive if the portal is following their needs and interests. There are several common "personalization" solutions. For instance, for the purpose of the role division, one is provided, after authentication, with specific content and outlook. This "personalization" is driven by fix role categories of the users (teacher, learner, administrator etc.). Basically, this is not a part of personalization but authentication, or better, security service. However, it raises a notion about user segmentation in general and personalization provision for them. Authentication is important but not required for identification of users. Personalization is performed according to some kind of profiles, whether aggregated or individual. We also have to distinguish between registered users and anonymous users and treat the latter as potential customers with triggering some special "program" to retain them. They should be offered by relevant content (and possibly presentation) as soon as possible. We have to take into account that the personalization ideal is constrained also by a today's hardware and a need to provide personalization in real-time. The goal should be to achieve personalization without or with little user intervention as possible with tracking their usage data.

Important trends and conclusion

Some important trends that impact (the growing of overall) adult education are:

- companies operate more and more in global markets,
- labor markets become world-wide and network based,
- Bologna process, Lisbon strategy, eEurope programmes, other EU-level policies,
- market driven higher education, stronger competition,
- complex systems become basis of top products and production,
- innovation and exploitation of technology is crucial,
- use of mobile information network and open information sources,
- ICT enables new ways of learning, info flow and profit and knowledge management,
- society emphasizes the citizens motivation to learn, people want to be challenged in new ways.

It is more or less evident that lifelong learning in general and the university continuing education will experience consistent expansion in the future. Lifelong learning has a very high priority in European policies and action plans. At the present time there is a lot of terminology differences and variety of concepts in Europe but on the other hand it seems that EU will solve problems in diversity of models and statistics data with common actions within the European area of lifelong learning. There is practically no doubt that the foundation of LLL provision is going to be the information technology and e-learning together with the emerging m(mobile)-learning technologies. Information technology supported learning is creating new means of communication between students and teachers and as a consequence new ways of knowledge transfer, such as collaborative learning are evolving. As several shifts of the learning process are identified, one can conclude that the influence of e-learning on education will be very extensive. New social relations are being born between the key players of e-learning (students, university/faculty, teachers/instructors, support staff and administrators). Some research works suggest that a driving force for educational transformation is actually the new generation of learners – the so-called "Network generation".

One of the most important new technology solutions in e-learning is going to be the personalization which makes the e-learning systems friendlier and can (when implemented properly) significantly diminish the technology barrier effect of the learner's access to the e-learning processes and e-educational institutions. Through the personalization, the learning organizations can help learners to become more familiar – and hence more comfortable with new technology features which is an important achievement in the lifelong learning provision.

References

1. EUROPEAN COMMISSION (2001) Making a European Area of Lifelong Learning a Reality, COM Brussels, Commission of European Communities, p. 9
2. OSBORNE, M. (ED), THOMA, E. (ED) (2003) Lifelong learning in a changing continent, NIACE, England and Wales, p. 4
3. COFFIELD, F. *Breaking the Consensus; Lifelong Learning as Social Control,* British Educational Research Journal, 25, 4, pp. 479-99, p. 487
4. TAYLOR, R. (1990) *University Liberal education; a "Great Tradition"?,* Adult Learning, Vol. 1, No. 9, pp. 243-245
5. REGAN, E. A. (1998) Lifelong *learning and performance: Linking academia and Business,* Office Systems Research Journal, Springfield Vol. 16, Iss. 2, p. 43
6. MOORE, M. M., TAIT, A. (2002) Open and Distance Learning – Trends, Policy and Strategy Considerations, UNESCO Division of Higher Education, Paris (p. 88)
7. TAPSCOTT D. Growing Up Digital: The Rise of the Net Generation, New York: McGraw-Hill, 1998
8. GREER T. H., MURTAZA M. B. (2003) *Web personalization: The impact of perceived innovation characteristics on the intention to use pesonalization,* The Journal of Computer Information Systems. Stillwater: Spring 2003. Vol. 43, Iss. 3; p. 50
9. MULVENNA M. D., ANAND S. S., BUCHNER A. G. (2000) *Personalization on the Net using Web mining,* Association for Computing Machinery. Communications of the ACM. New York. Vol. 43, Iss. 8; p. 122
10. KRAMER J., NORONHA S., VERGO J. (2000) *A user-centered design approach to personalization,*Association for Computing Machinery. Communications of the ACM. New York: Vol. 43, Iss. 8; p. 44
11. VOTCH V., LINDEN A. (2000) Do You Know What 'Personalization' Means? Gartner Group Research Note, May 18, 2000
12. DINEVSKI D., OJSTERŠEK M., PLENKOVIĆ M. (2003) *Information technology platform for e-learning implementation*. The 10th International Scientific Conference, Opatija, 28th-30th June 2003. Society and Technology 2003, Rijeka: Sveučilište, pp. 148-158
13. HORVAT B., ČAJIĆ Z., OJSTERŠEK M. (2002) *Personalizacija in spletno rudarjenje*. Conference ERK 2002, Ljubljana: IEEE Region 8, Slovene IEEE section, zv. B, pp. 229-232
14. DINEVSKI D. (2004) *Personalization of the e-learning systems in the service of the learner,* The proceedings of the Third EDEN Research Workshop, march 2004, Bibliotheks- und Informationssystem der Universitaet Oldenburg – Verlag, pp. 536-542

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MOVING FROM GOOD INTENTIONS TO REALITY IMPLEMENTING ICT IN TEACHER EDUCATION

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Why is it so difficult to introduce ICT in educational institutions? This article focuses on an ICT project (PLUTO) at Bergen University College, where we tried to implement ICT as a learning tool in teacher education. Our experiences show that teachers in both primary schools and higher education are sceptical regarding the use of ICT. I will here look at the arguments used for implementing, and some possible reasons for the hesitation to involve in our new, digital learning-environment. I will also shortly describe a couple of areas where we have experienced that ICT has opened qualitatively new learning processes. One of our findings is that teachers must see that ICT can contribute to the actual learning-process and can not just function as a practical, administrative tool or as some fancy varnish to sell already existing methods or projects.

Why do teachers have to attend expensive and fancy courses and conferences to be convinced that they will benefit from using ICT in their jobs?

Three years ago a physicist from one of our universities asked me this question. We were sitting on the train on our way back from a big national ICT-conference. And my travelling companion could not understand why teachers did not grasp the obvious opportunities which the new technology offered. In his field ICT was a natural and obvious tool they could not live without. Physicists simply could not do their job if they did not use ICT-tools.

Since 2001 we have now tried to implement ICT in teacher education, and the question is still just as relevant as when we returned from our conference three years ago. We have learned the hard way – lost 30% of the students in our first project class (30 students). The explanations were often the same: too much work and problems seeing the benefit of struggling with the ICT-tools. It will be too easy to brush aside the question simply by talking about personal, psychological defence-mechanisms, resistance-strategies or poor project-design/administration. But the clue from the physicist was more an indirect question: is an extended use of ICT necessary for teachers in their pedagogical situation? If ICT had been an important and vital tool, a necessity for managing their jobs, the teachers would surely have obtained the equipment and skills to handle it!

The approach can however be quite misleading. This is surely not a question whether or not teachers or students should use ICT in their work. With exceptions from a few final exams, all written work are already done digitally with Office-programmes like word, exel and power point. E-mail is well established as a communication tool. The question is therefore more whether it would be worth trying an increased use of new advanced programmes like "learning management systems" (LMS), web-based presentation tools and communication-programs (chat).

Our project was built upon a socio-cultural perspective on learning (Dysthe 2001, Gardner 1983, Lave & Wenger 1991) From this point of view, learning develops in a situated, social learning environment where oral communication is vital and ICT is an important mediating artefact. The teachers' job is to create active, meaningful learning- and developing-processes built upon the learners' earlier experiences and understanding. The argument for participating in ICT-projects has very often been that this will help to develop learning and the learning environment. But it is still very weakly documented that ICT has contributed to a qualitatively better learning in teacher education. I am not talking about reproducing simple, isolated technical facts or practical skills. Teacher training is a complex education, which includes the use and combination of insight and different practical skills – skills, which have to be handled with a high degree of autonomous and professional judgement (Schøn, 1983). These professional characteristics are surely valid for lots of other professional groups who deal with human beings. I therefore believe that our experiences could be of interest also for people outside the teacher training institutions.

When we invited teachers to participate in our project, we argued that we now would develop a new digital learning environment where we all should meet, share experiences, views, knowledge and new insight. Together we should build a common base of knowledge in a dynamic interaction between the involved partners. We should meet synchronic and asynchrony in a learning process where there were no limits in time or place. We had chosen a learning management system (LMS) called It's Learning as a digital platform for our project.

We had a lot of positive experiences during our project period. These experiences were mostly related to administrative and organisational challenges. The LMS functioned as a useful and efficient base of information. The teachers had a remarkable overview regarding to what the students had actually been working with and at what time. We got a common digital space where we could store students' assignments and notes from the teachers' lectures. Students who spend part of the semester abroad, could keep contact with their teachers and fellow students at their home university. It was easier to arrange response-groups between both the students and the teachers. It was easy to transport texts and different kinds of documents to the participants. And ICT seemed to stimulate different kinds of collaborative activities – mostly of technical character, but also with focus on the subjects in the teacher training programs. All these experiences correspond very well with findings from a lot of other international reports from digital projects – often in combination with digital portfolios. (McKinney 1998, Kankaanranta 2002, Kankaanranta &Linnakylä 1999, Piper 1999, Polonoli 2000, Springfield 2000, Yanzy 2000,)

Some of the students also tried to use digital, web-based texts with links other students' texts or external URL-addresses. We could also see some of the students who had made some magnificent digital project-reports using digital video, photos, sound and animations. We have used a few of these examples during presentations for colleges and teachers in primary school. But we also honestly have had to add that these examples were not the average kind of student work.

Challenges

But in spite these positive experiences, colleges outside the project just exceptionally seemed to be inspired in a way that lead them to start using the digital tools themselves. I will here shortly focus on two kinds of challenges we met: a) personal related resistance to change and b) a fundamental inquiring regarding the aim of using so many resources – time and money – on ICT as a learning tool. The first challenge with resistance to change was specially connected to developing technical skills and developing competence to be able to use different software. This was time-consuming. Many students and teachers felt that working with ICT took the focus and energy away from the content of the different subjects. Many of the participants regarded ICT not as a helping tool but as an extra burden, something that was added on top of their ordinary work with the curriculum. Outdated hardware and software was also a problem. But both technical training and problems with hardware and software seemed to be solved by it self. During the next year when the project doubled the number of students and teachers, these resistance problems almost totally vanished. Instead of investing a lot of money on ICT-courses, like we did in the beginning of the project, we just informed the students that ICT-skills was a basic competence all of them had the responsibility to learn. And if they needed any special help, they first had to ask their fellow students, and then in crises, they could ask the teachers to assist.

But the questions regarding resources, hardware and competence was gradually changing to questions concerning the learning outcome of the ICT-investments. The aim of the ICT-project was challenged. Everybody did agree that ICT was a useful administrative and organisational tool. But could ICT contribute to didactical competence or professional learning? Would working with ICT contribute to the teacher students' competence to counsel and communicate with children, to guide and organise learning activities? Would ICT help the students to develop empathy and a caring attitude? Shortly, was it possible that investing in ICT would contribute to develop better teachers? And, would investing in ICT contribute to developing a better learning-environment?

A better learning-environment?

The last question might seem to be the simplest to answer. But again, the answer surely depends on how we define "a good learning-environment". Most of us might agree that efficient communication- and information systems are important parts of a good learning-environment. So far, ICT could obviously contribute in a positive way. Though, it was interesting to see how the communication developed. In the beginning there was a fascination regarding the technical possibilities with chat- and discussion programs. But when it came to the daily work and as soon as there where matters of more than just short messages or simple technical questions, both students and the teachers preferred direct, physical face to face meetings. It also seemed like the physical meeting was a necessity in a building process to establish a more personal related platform for collaboration. As soon as this platform was established, the communication turned out to be more differentiated, and it developed a mix of physical and digital meetings. But the digital meetings continued to have the character of information more than dialog. Obligatory, teacher-instructed chat or discussion-groups turned out to be some sort of a "duty dance" that never really trigged the great enthusiasm. Communication in our digital learning-environment did obviously depend on how well the participants knew each other and the content of the communication. Efficient communication was obviously not the same as good communication. The appreciation of the mutual, relational aspect during the physical meeting never disappeared. Even the good old-fashioned telephone calls seemed to be preferred in stead of well prepared, high technology chat, discussion-groups or e-mail. No matter how fast they could write on the keyboard, it seemed like the variety of the physical and/or the oral message turned out to be more meaningful than the digital, written word. For technical reasons, we did not try video-meetings.

An important finding was, however, that both students and some of the teachers used quite a lot of digital communication through the SMS- and MSN-systems that was outside our organised learning management system (It's Learning). We tried to take advantage of this finding by establishing a discussion group that simply should be a social meeting arena. For a while this was the project-initiative that was most successful with different information and comments regarding social events and holiday "postcards". But even here, the activity turned over to SMS and MSN after a relatively short period.

The most positive experience with our LMS was that it functioned as an information bank. The LMS system we used was web-based, but only the involved students and teachers had access to the content. This reduced the threshold for students and the teachers to share information and working products they normally would hesitate to publish on the open web. In this way our learning-environment was extended from our local campus to all computers, which were connected to the web with opening hours twenty-four hours a day. This surely raises other questions regarding working-environment and the mix of professional and private time. But I will leave that discussion here. Still the same cardinal questions are left unanswered: Can ICT contribute to new qualities regarding the students learning? Will the use of ICT make better teachers?

A qualitative new or better learning?

Increased access to more information does not necessarily mean that the students can use this as knowledge in a professional way. I use the term knowledge when information is accommodated into the students' former cognitive structures and contribute to new insight and competence. There seems to be no limits of how much information students can get. The learning strategy number one now seems to be: first, how to choose the right information and secondly, how to use this information in a critical, relevant and analytic way. Fancy presentations or a huge number of web-links do not prove that the students have developed a reflective or deeper insight in their subjects or future role as a teacher. On the contrary, some teachers declared that the ICT-investment had a negative effect on the learning outcome. They document this by showing significant poor examination results and claimed that some students put too much work in dealing with technical problems and varnish instead of concentrating on the actual subjects. We still have too limited material to be definitive about this statement. But the tendencies are definitely alarming.

Other evaluation reports from similar ICT-projects (PLUTO) have concluded that the use of digital tools has contributed to more collaboration. Collaboration in our learning-perspective is a vital factor in the learning process. Our experience was, however, that the professional collaboration had to be initiated and structured by the teachers if it should take place. Only exceptionally did the students voluntarily use the LMS for collaboration. The collaboration that functioned best was compulsory response-work connected to texts or project-presentations. Even if the students had access to projects, texts and summaries written by fellow students, these resources were seldom used. An important variable in this situation is "focus-overcrowd". Norwegian teacher education consists of pedagogic and different school-subjects. The teachers naturally want the students to work hard with "their" specific themes. Lack of time is a problem. And the result on our campus is a fight to control the students' time and focus. In the primary schools where "our" students carry out their practical training, the teachers already had their hands full. Ideal intentions of meeting in a common, digital space stopped simply in the fight where they have to give priority to the daily tasks, which could not wait. Sitting with the computer was looked upon as a sort of time-consuming, luxury activity. Again: would extended use of ICT develop learning quantities or qualities that would justify dropping already existing parts of the curriculum or administrative activities?

In documents from the national department of education they now suggest that ICT-competence is going to be looked upon as a basic skill together with reading, writing an mathematics. The interesting question is then who are going to be responsible for developing these basic ICT-skills.

New learning processes

I will here shortly focus on two areas where we felt ICT contributed to some qualitatively new learning processes. These two areas were a) hypertext as a new genre and b) the use of digital tools for formative assessment.

a. Students who have been working with digital portfolios have shown that they can produce hypertexts in a way that is qualitatively different from linear, paper-based texts. The hypertexts were built up with different smaller text-parts, bound together in a web where the reader could navigate in width and depth, depending on what he or she wanted to study. These texts had links, illustrations, animations, sounds or short movies that made the descriptions or documentation more varied and vivid. The problem was that these texts demand a certain reading skill. Some other authors describe the positive situation where the reader actually have to collaborate with the writer to be able to interpret the text, and the role of the student and the teacher are forced to change (Blair & Tokayoshi 1994, Otnes 2001). It also turns out wrong if the hypertext is assessed by the same criteria as the paper-based, linear texts. (Gipps 1999, Moss 1998, Messic 1995) The conflict clearly comes into the open in assessing-situations where teachers demand to get the hypertext in paper-form. However, students are often familiar with these new web-based texts through surfing and working on the web. But again many teachers find this frustrating and accuse the new web-products to be simple and superficial.
b. Most LMS systems have technical functions which can handle surveys or tests. Here the students can give feedback as a multiple-choice answer or as open, written statements. We have used this formative assessment tool with great success. The students have been given fifteen minutes to find themselves a computer, answer the survey and return to the classroom or auditorium. The unique possibility is now that we have the results at the same moment the last student has finished the survey. And the participants can now meet immediately and interpret, analyse and discuss the results. This gives us quite new possibilities using quantitative surveys. Many of the objections towards quantitative methods are no longer relevant when we immediately can read the results, discuss possible misinterpretations, look at the general tendencies and discuss what adjustments which have to be done to proceed in a meaningful learning-process. The questions in the survey can naturally be related to both professional issues and/or issues concerning the administration of the learning-program. In this way we have solved the problem with a few, active students dominating the oral response in the classroom. A situation where we too often have returned, wondering how representative the student-response really was.

Summary

Our experience shows that ICT primarily has positive effects as an administrative tool. Our project still lack documentation that shows how ICT can contribute to a more efficient or qualitatively better learning in our teacher education. Contrary, we have seen that unrealistic expectation of learning-outcome can have a negative effect on projects that try to implement ICT as an administrative and pedagogical tool in educational institutions. We also experienced that ICT can be used as a scapegoat or excuse when students have problems handling their study/working-situation. We have learned the hard way to be balanced and humble trying to implement ICT as a tool for our colleges. Technical fascination must not make us lose sight for what is the essential focus in teacher education. Children are still made of feelings, flesh and blood.

It is surely not a question of using or not using ICT in teacher education.

The question is more how to find the balance between developing the necessary technology competence, and developing the teachers' complex competence to guide young humans towards a future world.

My friend the physicist, on the way back from our ICT-conference, at least gave me an impulse which has raised a wide range of new questions. One of the most important one is whether it was a mistake arguing that the ICT-tool could contribute to a new and better learning in teacher education?

After a three-year project-period, we are definitively more careful with our argumentation regarding implementing more ICT in our educational programs. Next year nearly 1500 students in teacher education in Bergen will use It's learning (LMS) as a compulsory learning platform. And the technology wheels run and run…

References

1. BARRET, H. (2000) *Create your own electronic portfolio. Using Off-the-Shelf Software to Showcase Your Own or Student* Work. Learning & Leading with Technology 27 (7), pp. 14-21
2. BLAIR, L. K. & TAKAYOSHI (1994) *Reflections on Reading and Evaluating Electronic Portfolios.* Black L. m.fl. ed. New Directions in Portfolio Assessment. Boynton/Cook Publishers Heinemann. Portsmouth, NH
3. CAMBRIDGE, B. L., KAHN, S., TOMPKINS D. P. & YANCY K. B (EDS.) (2001) *Electronic portfolios.* Emerging Practices in Student, Faculty and Institutional Learning. AAHE Washington
4. DYSTHE, OLGA (2001) *Sosiokulturelle teoriperspektiv på kunnskap og læring.* Dialog samspill og læring. abstrakt forlag. Oslo
5. LAVE, J. & WENGER (1991) Situated Learning. Legitimate peripherical participation. Cambridge University Press
6. GARDNER, H. (1983) Frames of mind. New York: Basic Books, Division of Harper Collins Publishers
7. GIPPS, C. (1999) *Socio-Cultural Aspects of Assessment.* Review of Research in Education. Volume 24, 1999 pp. 355-92. Washington
8. KANKAANRANTA, M. & LINNAKYLÄ, P. (1999) *Digital portfolios as a means to share and develop expertise.* Portfoliota verkossa. Portfolios on the web. (Linnakylä, P., Kankaanranta, M., & Bopry, J. (red.) pp. 210-242
9. KANKAANRANTA, M. (2002) Developing digital portfolios for childhood education. Jyväskylä
10. MCKINNEY M. (1998) *Preservice Teachers' Electronic Portfolios: Integrating Technology, Self-Assessment, and reflection.* Jones, A .J. ed. Teaching Portfolios in Teacher Education. Teacher Education Quarterly. Winter 1998, volume 25, nr.1. caddo Gap Press. San Francisco, California

11. MESSICK, S. (1995) *Standards of Validity and the Validity of Standards in Performance Assessment.* Educational measurement: Issues and Practies Volum 14, hefte nr. 4, pp. 5-8. Washington DC

12. MOSS, P. A. (1998) *Rethinking Validity for the Assessment of Teaching*. With Portfolio in Hand. Validating the new teacher professionalism. N. Lyons (red.) New York

13. OTNES, I. (2001) Digitale fellestekster. Hypertekst og nettkommunikasjon i kollektive læringsprosesser. Høgskolen i Vestfold

14. PIPER, C. H. 1999 *Electronic Portfolios in Teacher Education.* http://www.chapman.edu/soe/faculty/piper/EPWeb/abstract.html

15. POLONOLI, K. E. (2000) *Defining the Role of the Digital Portfolio in Teacher Education.* Presented at the WVNET 2000 Conference, November 14, 2000. Morgantown, WV

16. SCH∅N, D. A. (1983) The reflective Practitioner: How Professionals Think in Action. New York: Basic Books

17. SPRINGFIELD, E. (2000) *Comparing Electronic and Paper Portfolios.* Electronic portfolios. Emerging Practices in Student, Faculty, and Institutional Learning. Yancey m.fl. (red.)

18. YANCY, K. B. (2000) Digitized Student Portfolios. Electronic portfolios. Emerging Practices in Student, Faculty, and Institutional Learning Yancey m.fl. (red.)

THE "PROCESS OF MATURING": COMING OF AGE OF DISTANCE AND E-LEARNING PRACTICE AT ATHABASCA UNIVERSITY

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"No man is an island, entire of itself; every man is a piece of the continent, a part of the main. If a clod be washed away by the sea, Europe is the less (…)"
Meditation XVII
From *Devotions upon Emergent Occasions* by John Donne

Introduction

Athabasca University is not in Europe, but its experience can be very helpful for European Universities because it is facing similar issues. "Technology that is changing the landscape of society in general is also a catalyst for shifting the delivery of training and education" (Hawkins, 1999). The effect that the Internet is having in Europe is also being experienced by Athabasca University.

The field of distance education (DE) has undergone a paradigm shift to E-learning. This E-learning is "learning that is supported in some way by Internet technologies" (Graves, 2000, p.30). In addition to technology, socio-economic forces are promoting this shift, and on a global scale. Berge (2001) has tabled some major trends affecting training and education in the shift from the old economy to the new economy.

Table 1.1 Shifts in the Economy

Old Economy	New Economy
Individual skills required	Lifelong learning
Labor versus management	Teams
Business versus environment	Encourages ecologically sound growth
Security	Risk taking
Monopolies	Competition
Plant and equipment	Intellectual property
National	Global
Status quo	Speed, Change
Top-down	Distributed

Table 1.2 Shifts in Training and Education

Old Economy	New Economy
Four-year degree	Forty-year degree
Training as cost center	Training as competitive advantage
Learner mobility	Content mobility
Correspondence and video	High-tech multimedia centers
One size fits all	Tailored programs
Geographic institutions	Brand name university, celebrity professors
Just in case	Just in time
Isolated learning	Virtual learning communities

Basically, the New Economy is characterized by a move from product assets to knowledge assets. In fact, the term New Economy has become synonymous with Knowledge Economy. This radical shift in the environment has been the catalyst for an emerging new organizational model: the learning organization. Berge (2001) states: "The move to a learning organization is a move toward all organization members taking responsibility for their own learning" (p.7). Athabasca University (AU)'s mission, values and organizational design reflect the fact that it is a learning organization. It is based on a flattening of organizational hierarchical structures (horizontal structures) in order to promote widespread communication and collaboration so that every employee is engaged in identifying and solving problems, enabling the organization to continuously improve, and increase its capability as well as seize opportunities and handle crises (Daft, 2001). As Canada's Open University, AU specializes in the delivery of online and distance courses and programs. According to its mandate statement: "Athabasca University is a board-governed open university committed, through distance education, to increasing accessibility in Alberta, throughout Canada, and internationally to university-level study, and to meeting the educational needs of the workplace" (April 1999).

Athabasca University has undergone significant growth and change over the decade. The growth has been in student enrolment numbers, the number of courses and programs, the variety of technologies used, and the number of staff employed. The great majority of undergraduate courses are done in a self-paced, asynchronous and individualized study mode of DE delivery. Communication occurs mainly between students and their tutors and/or Course Coordinator. Moreover, Athabasca University has a unique niche in the field of Open and Distance Learning for it offers continuous enrollment, throughout the year According to *AU Annual Report 2002*, the percentage of individualized study registrations has increased from 77 percent of total registrations in 1997-98 to 87 percent in 2001-02. Grouped study registrations have shown a relative decline from 21 percent in 1997-98 to 11 percent in 2001-02. E-Class opened with 174 registrations in 2000-01 and totalled 361 in 2001-02. The Open University possesses a solid and long-established infrastructure of student support services.

The role of e-learning in the University's overall distance education effort is maturing from isolated pilot projects to an integral part of course delivery and support. The consolidation of e-learning practices has been an ongoing effort at all levels of the institution rather than one sweeping reform. At Athabasca University, consolidation is both a small and a large-scale effort (bottom up and a top down effort). Staff in every department actively research and experiment with new ideas, and take every opportunity to consolidate their practices – at least within their sphere of influence. Within departments, committees are formed for special purposes. For example, in the department of Educational Media Development an online course development committee formed to address the need for online course development guidelines. At the inter-departmental level, committees and subcommittees are set up to advise the vice president on current university-wide issues in course production or educational technology. In each case, the effort is to share findings and gain consensus on best practices.

The consolidation efforts of each special interest group, department, and committee are periodically communicated to the University at Lunch and Learn sessions, Course Development Process workshops, and teaching practice lectures. Representatives of special interest groups form committees which advise representatives of the University governing bodies. These higher governing bodies, once informed are able to see a more panoramic view of trends in the institution and in the student market, and are able to draft appropriate changes to the Strategic University Plan and the Education Plan. These plans are shared openly with the University community with as much advance notice as possible to invite suggestions for minor modifications, to give a sense of ownership of the plans to the University community, and to lessen the shock of the implications for change. The Strategic University Plan (2002-2006) currently establishes Athabasca University's vision of expansion plans at the provincial, national as well as at the international levels for the near future. Because of the consensus building in smaller interest groups, many of the practices prescribed in the new plans were already the general consensus, but some are choices between competing organizational, technological or pedagogical philosophies and approaches. Staff in special interest groups that do not already conform with the new University plans, are required to inform themselves of the new official practices, determine the steps to phase out the old practices and implement the new ones.

Department of Educational Media Development: Consolidation of Core Processes

This paper will focus on the department of Educational Media Development (EMD) and how it has experienced consolidation of e-learning in distance education at Athabasca University.

Educational Media Development (formerly known as the department of Educational Technology) was established in 1995 as part of a strategy to maintain AU's leadership in the design, development, and deployment of print and digital technologies for academic purposes. Currently, the mandate of the EMD is to provide the university community with the administrative, creative, and technical infrastructure to:

- Design and develop high-quality courseware
- Enhance delivery of courses and services to students

EMD is responsible for undergraduate course production at the University as well as for providing instructional design and technology advice and support for experiments with new technologies and practices. The department also plays a key role in the implementation of the course copyright, and other relevant policies and standards, and provides central coordination of the course development process.

EMD is composed of editors, visual designers, instructional Web designers, instructional media analysts, copyright officers, and digital media technologists (typesetters), and has existed in its present form for almost five years, but a number of its staff have been performing the similar roles through several organizational and infrastructural changes. Some of our editors, visual designers, and typesetters have been working on course design and production since the 80s before any form of online delivery occurred. They have witnessed the implementation of e-mail, discussion boards, and the Web. The Instructional Web designers are a more recent addition to the EMD group, and it is largely their explorations and findings that have informed the consolidation of e-learning in distance education in EMD.

Athabasca University has been online in some form since the 1980s. Academic Centres, known elsewhere as faculties, were the first to set up Web servers and to experiment with the online delivery of course components. EMD as a central support department assigned representatives to these centres to help ensure design quality and to pool their findings. EMD also set up its own Web server to give the University an official Web presence both in the form of administrative information and courses for those academic centres without a Web server. Each part of the University involved in online delivery gave periodic presentations to update the University community about online developments.

By 1998, Athabasca University's online activities were significant and diverse. It was a time for a major infrastructural consolidation. One major consolidation was the localization of all Web servers under the systems administrative care of Computing Services. Another was the division of maintenance of University Web pages between public information and course learning material. EMD continued support for course-related Web pages, and Public Affairs assumed the coordination of support for the more public and administrative side of the University Web space. A survey and review of the top 50 enrolment courses was performed, which included an assessment of their onlinedness and quality.

By 1999, EMD's organization and focus stabilized sufficiently for the group to collectively assess the effects of institutional growth, and online growth on course development practice. What followed was a more concerted departmental effort to update and disseminate EMD's practices to University staff – especially the many new academic staff being hired. EMD drafted new editions of a Course Author Guide, and a Course Coordinator Guide, which included new sections for the implications of online delivery on course design. EMD disseminated this information in print, in meetings with academic centres, and through an expanded department website. EMD Web Designers also collaborated with Public Affairs to formalize web page design and maintenance practices. For example, public information pages would use a template, all web pages would be validated, checked for broken links, and be redirected for at least 6 months before being deleted.

Online growth and innovation continued. By 2002, Athabasca University had accumulated several full or semi Learning Management Systems including e-Class (Lotus Notes), Bazaar, and WebCT. Demands on EMD for wide ranging online technology support skills were stretched despite additional staffing. Some staff could focus on one delivery system, but others were required to know how to produce and maintain courses on several delivery systems.

Copyright, FOIPP (Freedom of Information and Protection of Privacy), and accessibility were emerging as major issues in course design. Maintenance of existing online and print-based materials was overtaking production. Development of courses using LMSs was increasingly hindered by lack of automatic authentication of student accounts between the different University servers and databases. Student market demographics were changing – including their Web browser capabilities.

The Strategic University Plan (SUP) of 2002 made a significant break from the past. It projected online delivery to be core delivery and print-based to be optional for the University by 2006. This was a wake up call for the traditional print-based delivery adherents. Processes, designs, and production procedures would have to reorient to online production and delivery. The implications would be felt less in the academic centres that were already focussing on online delivery than on those academic centres focussed on print-based delivery, and on the EMD representatives who provided production support for them. According to the SUP, EMD had to address online production and delivery as core rather than as the exception and provide appropriate guidance for all the academic centres it supports.

This Strategic University Plan spurred the reassessment by EMD of all its practices related to course design production and delivery. Currently, there is a seven-phase course development process for undergraduate courses that has been used at Athabasca University for over 25 years (*Course Author's Guide*, 2003). This process ensures that program plans and individual courses proposals are openly reviewed, debated, and agreed upon by the university community, and that program and course development are consistent with University strategic and operational plans (Educational Media Development, 2003).

The introduction of the E-Learning Plan, which flows from the SUP (2002-2006), renewed the effort by EMD instructional Web designers to share and gain consensus on best practices from their experiences with online course projects in different academic centres. Authorization of more online delivery would mean greater volume of online production and support. It also had significant implications about which the editors and copyright officers were very much aware. Previously, if there were copyright, content, or budget issues which prohibited placing materials online, those materials could be delivered in print. From then on, new solutions needed to be found to deliver all materials online. Consequently, consolidating current process, practice and standards was seen as essential to adapt to the shift. To help determine current best practices for the new emphasis on online delivery, EMD selected several courses, assigned course project teams to them, and revisited the whole course production process. Full project teams had worked on courses before, but not necessarily focussing on online delivery as core, or not fully involving EMD, or not recent enough to be adequately informative.

Lessons Learned for Successful Management of E-Learning in the Context of DE

The course team projects and review had several outcomes. It was determined that there were several competing practices and that all practices were subject to rapid change. For print production and delivery, an Author's guide and Course Coordinator's guide had been printed and disseminated, but for the more rapidly changing nature of online design and delivery, it appeared to some that current practice and guidelines would be better disseminated and updated online. Even within EMD, arriving at consensus might not occur within a few meetings, nor would consensus remain static for very long. One attempt to resolve this has been to use a discussion board to discuss and document the evolving and changing consensus on e-learning practice.

Consensus was gained on some issues. It was determined that current wordings of various statements in online materials and student services (such as FOIPP, copyright, various disclaimers, and instructions for online activities) be made current and consistent not only within courses but among all departments dealing with students across campus. Within EMD, the production process itself needed reorientation to online design. Online course projects needed to be made part of the mainstream of production. All online course projects should be processed by the department's project coordinator, as is the practice for the more traditional print-based production. The same project coordinator would vet all course project proposals, prioritize them, and assign course teams to them according to workloads and necessary skill sets.

It was determined that some EMD production roles would need to change to take better advantage of core competencies. Lawler (1996) states: "To be effective, an organization needs to develop the appropriate performance capabilities and to use them to do the right things" (Lawler, 1996, p.61). Typesetters could transfer their mark-up skills to provide more online content mark-up and relieve Web Designers to focus more on finding better technologies for appropriate online activities, or to focus more on Instructional Design. Editors would not change their roles as much, but they would need closer assistance by Web Designers and Instructional Designers to choose materials and learning activities more appropriate for online delivery. The use of a core competency model would, thus, ensure the creation of an online course team who would thrive on a productive synergy that is essential to achieve great levels of effective project performance.

It was also determined that findings from course projects would need to be more routinely shared and more easily accessed. Previously, some course project documents were kept by academic centres and occasionally shared at presentations. It was suggested that a repository of course project documents be established for easier access by EMD staff. This way, members of one project team could look at another project for ideas. Team members would also be better able to analyse several projects and synthesize findings to share with the rest of EMD. The repository could also hold current online design and production forms as they evolved for use by EMD project teams.

Future Directions/Trends and Conclusion

Athabasca University's most recent Strategic University Plan represents a coming of age in e-learning for the University. The plan has had particular consequences for the department of Educational Media Development. It encouraged a reassessment and consolidation of practices and processes within the department. Rossett (2002) provides a list that encapsulates the benefits of implementing a successful e-learning model: "to deliver learning and information immediately; to deliver everywhere; to empower individuals; to coach; to collect and distribute best practices; to increase dialogue; to bust through the classroom walls; to increase community; and to know who is learning, referring to source materials, and contributing" (p.16). Oddly enough, some of the recommended changes in EMD are similar to what a student might experience in a successful e-learning model. This is because EMD staff are also learners in a knowledge society facing rapid change.

References

1. *Athabasca University Mandate (April 1999*) http://www.athabascau.ca
2. *Athabasca University Strategic University Plan 2002-2006.* http://www.athabascau.ca
3. *Athabasca University Institutional Studies,* Report of Athabasca University Historical Student and Registration Profile 1997-98 to 2001-02. http://www.athabascau.ca
4. BERGE, Z. L. (2001) *The Context of Distance Training: Predicting Change,* 3-12. Sustaining Distance Training: Integrating Learning Technologies into the Fabric of the Enterprise. San Francisco, CA: Jossey-Bass. *Course Author's Guide*. (2003). http://www.emd.athabascau.ca
5. DAFT, R. L. (2001) *Organization Theory Design,* (7th ed.), Cincinnati, Ohio: South-Western College Publishing. Educational Media Development. http://www.athabascau.ca/html/mandate.html
6. GRAVES, W. H. (2000) *The Dot.xxx Challenge to Higher Education*, Syllabus.6. http://www.syallbus.com

7. HAWKINS, B. L. (1999) *Distributed learning and instructional restructuring*, Educom Review*, 34*(4), 12-15. In Z. L. Berge (Ed.). Sustaining Distance Training: Integrating Learning in the Fabric of the Enterprise. San Francisco: Jossey-Bass.
8. LAWLER, E. E. (1996) *From the Ground Up: Six Principles for Building the NewCorporation,* San Francisco: Jossey-Bass
9. ROSSETT, A. (2002) *Waking in the Night and Thinking about E-Learning,* 3-18, The ASTD E-Learning Handbook. New York: McGraw-Hill

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'E-LEARNING' MEETS 'DIGITAL MEDIA': NEW STRATEGIC QUESTIONS FOR HIGHER EDUCATION

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Introduction

> "...teachers do not automatically deserve a future. We must earn it by the skill with which we disorient our students, energise them and inculcate in them a taste for the hard disciplines of seeing and thinking."
>
> James J. O'Donnell, Avatars of the Word, 1998, p.123

In 2004, many will argue that e-learning has by and large 'arrived'. The necessary technologies and infrastructure are becoming ubiquitous and reliable. Illustrative examples of good practice can be found in many domains of higher education. Approaches are more measured as higher education institutions include explicit reference to e-learning in their strategic plans. We know how to 'do e-learning' well: there are of course significant gaps and implementation is uneven across different countries and across the socio-economic spectrum. The digital divide has yet to be overcome. We might argue that the future is looking good and for enthusiasts who have experienced the evolution from CBT in the 1980's, through multimedia, open and distance learning and the e-education bubble of the late 1990's, expectation is high. The stakes too are high and the emergence of a new species: the digitally-enabled student, for whom the 'e' in e-learning is a redundant qualifier, poses entirely new pedagogical challenges. It was Neil Postman who posed the question: "...does television shape culture or merely reflect it?" and concluded that "... the question has largely disappeared as television has gradually *become* the culture" (Postman, 1985, p.79). We have now arguably arrived at analogous position in relation to *digital media* and an ability to frame e-learning in this context will be important for future strategic direction. It is argued that, while much remains to be done in terms of embedding the current generation of e-learning, the absence of a media-based analysis may prove to be its Achilles heel. This paper takes the implementation of current e-learning strategies as its starting point as asks what comes next?

In approaching this paper, I can trace a long lineage as an enthusiast, energised by a curiosity about individual learning and about how we formalise the environments in which we teach, assess and support our students. Having spent much of that time in the role of pilot project doer, agent provocateur, seeking with others to influence leaders in higher education in Ireland and in Europe[1], I find myself in the role of Director of IADT – a small specialist higher education institute within the polytechnic sector in Ireland, recently confirmed for the second year in succession as 'best digital media college'[2] and with a strategic cluster of disciplines that span creativity, technology and enterprise. The boot is now on the other foot and strategy is firmly in my sights – a strategy that commits IADT to "provide a distinctive student experience [and] academic leadership in the development of innovative curricula, modes of assessment and teaching and learning methodologies"[3]. E-learning and digital media on the face of it make strange bedfellows. Taken together, they offer a glimpse of a new set of strategic questions for higher education.

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1 See the publications of the European University Association [formerly CRE] in the field of ICT: CRE doc N°1: Restructuring the University – Universities and the Challenge of New Technologies (1996) and CRE doc N°5: Formative Evaluation of University Strategy for New Technologies in Teaching and Learning (2000). Geneva, CRE. [www.unige.ch/eua/] See also the study and report prepared by the Coimbra Group of Universities: [HECTIC Report] European Union Policies and Strategic Change for eLearning in Universities (2002) [www.flp.ed.ac.uk/hecticreport.pdf]

2 'Best Digital Media College': Higher Education award at the National Digital Media Awards, January 2003 and again January 2004. 'Grand Prix' 2003.

3 FutureProof – the IADT Strategic Plan [2003]

Foregrounding learning

Personal and institutional strategies need to be pedagogically grounded, since "...underlying the belief-systems in the efficacy of one teaching method over another is an implicit model of how teaching and learning are linked." [Dubin & Taveggia, 1968, p. 3]. Therefore, I must straight away place my cards on the table and my conviction that real learning is active and is driven by an intense curiosity and wish to *find* and *solve* problems. The process of learning must receive no less attention than the product, although the latter is more frequently assessed. For anyone concerned with individual learning, the work of Carol Dweck makes a compelling case for the value of "a life governed by an incremental theory [of intelligence] and learning goals" [Dweck, 2000, p.155]. Too often, she argues, individuals are fixated on entity theories [of intelligence] and on performance goals. The learner of course cannot be divorced from the learning situation and the approach to a social theory of learning articulated by Etienne Wenger provides a basis for integrating thinking in relation to practice, identity, social structure and situated experience. "Learning is first and foremost the ability to negotiate new meanings" [Wenger, 1998, p.226]. What we must keep in the foreground is a determination about students as learners and a constant questioning of how learning takes place, particularly when mediated by ever more sophisticated digital media.

All technologies were once new: arguments for a renewed focus on media

Not withstanding exemplary developments in e-learning, well-intentioned but haphazard undertakings remain all too common. High production values that combine quality instructional, interaction, and visual design are unfortunately neither well understood nor the rule. Richard Clark some ten years ago expressed the frustration that "we too often act as if we believe that each new delivery technology requires a new theory of learning and performance. Thus we 'reinvent the wheel' constantly but inadequately." [Clark, 1994, p 8]. We miss the essential point that when we are constructing e-learning environments, we are dealing with media. Carolyn Marvin [1988] reminds us that all technologies were once new and remarkable insights can be gained from reconsideration of the introduction of earlier technologies, e.g. the telegraph, with characteristics remarkably similar to the internet chat rooms of today. Marvin offers a prescient warning about technology for technology's sake and advises that we should avoid the pitfall of artifactual approaches that "service and encourage the appliance-buying demand of mass audiences". [Marvin, 1988, p.4]. At best we need to be mindful that "early uses of technological innovations are essentially conservative, because their capacity to create (...) disequilibrium is intuitively recognised amidst declarations of progress and enthusiasm for the new" [p.235]. This is precisely the break point where many pilot projects fail to make the mainstream and remain more powerfully imagined than implemented. The change demanded is often a bridge too far at faculty or institutional level. Diffusion of innovation can be slow and gaps can open between enthusiastic implementation at faculty level and the needs of institutional strategic planning: to the extent that this is anticipated, it can be addressed. Gitelman refers to the 'crisis' that occurs in the lag between potential and actuality when a new medium is introduced. This crisis "will be resolved when the perceptions of the medium, as well as its practical uses, are somehow adapted to existing categories of (…) understanding about what the medium does for whom and why." [Gitelman, 2003, p.xii] In short, a media analysis is particularly helpful in developing our understanding of the both the strategic and deployment issues.

Thinking differently about the 'e'

It is important to consider how today's technologies *extend* or *enhance* human capabilities. Where technology is concerned, we need to think about the "person plus" [Salomon et al., 1991 p.3] and have confidence that "...our technologically enhanced minds are barely, if at all, tethered to the ancestral realm" [Clark, 2003, p.197]. Let's not miss the opportunities! We need to be open to the reality that students are growing up 'digital' and enjoy an entirely different relationship with technology. According to Seely Brown [2002, p.61], "there's a new vernacular developing, one that most faculty are unaware of: a digital vernacular coming out of digital interactive media. It has to do with the extension of the language of film with the interactivity of multiple media and computer games".

Technology is the enabler par excellence of innovation in teaching and learning. By way of illustration, IADT is currently engaged in a project which introduces scripting and film-making to pupils in schools.[4] Together with their teachers, pupils are working with digital stills cameras, digital video cameras and editing software [iMovie]. The results are astonishing and the level of self-confidence and sophistication demonstrated by children of a young age, often coming from schools in areas of socio-economic disadvantage, is remarkable. Future strategy for e-learning should take the meaning of 'e' as '*extended*'. Students increasingly mediate their daily activities through an array of mobile wireless devices and are extensive producers and brokers of media, as they use digital cameras, creative software, upload and download images and music files and immerse themselves in multi-player online games. Within higher education we need to start looking beyond what our current e-learning systems are offering.

Current generation e-learning: the rise of the Learner Management System

Current e-learning practice has reached a good level of maturity. The study by Collis and van der Wende [2002] presents the findings of an extensive international survey of five European countries, the US and Australia. The study concluded that: "...change is slow and not radical, (...) [use of] ICT in teaching and learning is widespread but part of a blend [and] instructors are gradually doing more but with no reward" [pp.7-8]. They are also clear in their conclusion that "the strategic use of ICT for the diversity of higher education target groups will require explicit policies at both institutional and governmental levels" [p.70]. Bates [2001] suggests what the role of governments might be, particularly in relation to the stimulation of best practice and choice, enabler, funder and broker of partnerships and creator of utilities and technological networks.

Practice is dominated by a rush to web-based delivery, using custom-built or proprietary learning platforms or learning management systems [LMS] with the emphasis almost exclusively on content creation and content or knowledge management, supported by online interaction with the tutor and online group discussion. As long as we are concerned with the transmission of information, this approach is sufficient and for the many institutions who are at this point only commencing such initiatives, there are many good examples to draw upon for guidance. A pragmatic approach is necessary if we are to set meaningful goals and expectations. The recently published HECTIC report by the Coimbra Group of Universities [2002] offers strategic guidance.

Practitioners use LMS platforms precisely because they offer reliable web-based delivery. But we need to recognise both the utility and the limitations of an LMS, both from a pedagogical and a systems perspective. For example, Landow is concerned that we do not use such systems with sufficient imagination: "even our technologists (...) too frequently assume that we are still dealing with some sort of Essential Book". [Landow, 2003, p.44]. Furthermore, LMS are not value-neutral in the pedagogical approaches they support and compromise is inevitable. Commenting on the much vauted question of metadata and standards for such platforms, Lanestedt cautions that "interests and assumptions about how learning should be organised, about hierarchy and power in the learning situation, as well as institutional biases are built into the standards' syntax as premises and restraints on educational activities" [Lanestedt, 2003, pp.80-81]. Small wonder that higher education institutions, as part of their strategic thinking on e-learning, expend considerable efforts on LMS platform selection or design!

Again, reflection on old media can be instructive: what goes round comes round. 'A place for everything and everything in its place' was the the motto of Joseph Lancaster, creator of the monitorial system of education in the early 1800's with a vision of school as a 'manufactory'. [Crain, 2003, p.63]. As higher education curricula become overtly competence-based, there is a real risk of turning to today's e-learning platforms to provide the knowledge and skills transfer in a way that fosters surface rather than deep learning. We need to be alert to this risk and also to begin to look to an e-learning future, where students will substantially *create* rather than consume knowledge and that they

[4] The FIS project is jointly funded by the Department of Education and Science and Allied Irish Banks. IADT works with the Blackrock Education Centre, a teacher centre on our campus, and with teachers and pupils in 30 schools. 'FIS' is an Irish word. Translated, it means 'Vision'.

will do so using “the multiplicity of representational modes afforded by digital multimedia” [Bolter, 2003, p.29]. The extent to which this will vary from one academic discipline to another remains to be seen and will reflect the convergence of ICT as instrument *of* the discipline and instrument of *learning within* the discipline.

And what do students think?

What is the disposition of students: how comfortable and competent are they in their use of ICT? Is access to e-learning convenient and reliable? Is their perception positive in relation to learning in an e-learning environment? These questions are difficult to benchmark. A recent survey of some 12,700 students across seven universities in different European Countries [Haywood, 2003], concludes that “almost all students could handle word processors, web browsers, email and chat.” [p.2]. New students were less well versed in the use of presentation software and bibliographic databases; these skills are acquired during their courses. The key message is that students are now entering college with ICT competence and expect to operate in an ICT-mediated environment. There is however a potential weakness in that much of their basic ICT skills are self-acquired and their use of ICT applications may be less systematic for that reason. Another study, this time of 751 learners following distance learning programmes in Ireland and an on-campus programme in northern Ireland [MacKeogh, 2003], reports access levels to PCs in excess of 53% with internet access close to 40%. These are impressive statistics, but it is premature to generalise from them. More importantly, when asked about their experience with e-learning, “there was substantial support for using ICTs to enhance existing modes of learning (...) [but] there was considerable resistance to replacing existing modes [of learning] with technology” [p.7], confirming that from a student perspective ‘blended learning’ represents our current stage of development. But how soon before the digitally-enabled student becomes the stock and trade of universities and how prepared are we for the challenge of shaping their learning?

Forward thinking: new strategic questions for higher education

The key proposition of this paper is that an understanding of digital media and ubiquitous computing are essential to strategy formulation, particularly in relation to the next generation of learning environments. New questions and priorities are emerging in relation to infrastructure, content creation, aggregation and management and new modes of participation by students – questions that go significantly beyond current practice and for which current strategies provide no guidance.

1. In terms of infrastructure, universities must prepare for a shift from fixed to wireless networks allowing students to access courses and services via a range of mobile devices. Such a shift will significantly alter the economics of ICT provision.
2. The *strategic* balance needs to alter from course content generated by the individual academic – current strategies already give us ‘best practice’ models for this. Institutions, individually and collectively, nationally and trans-nationally must focus for the future on strategies for content aggregation and management and particularly on the acquisition for the common good of archival material which can be made available royalty-free for educational purposes. The development and support of relevant portals is central to the success of such strategies.
3. Media literacy, or ‘electracy’, the term coined by Gregory Ulmer, must extend beyond its current realm. It must be considered in the context of each and every academic discipline. It will refer to the language and communication of the discipline and in a fundamental way to the conduct of the discipline itself. Modes of presentation and assessment are open to radical innovation and change in a digital world.
4. Suitably designed gaming and simulation environments offer rich learning opportunities. However, the creative expertise e.g. in storyboarding, animation, virtual worlds and visual/aesthetic design required to create such learning environments is unlikely to emerge within higher education other than on a significant collaborative and probably international basis.

Addressing these questions will require a significant level of inter-institutional collaboration as the nature and development of academic disciplines themselves come under the pervasive influence of digital media and technologies.

Conclusion

It will take some time for current e-learning practice to become more widely established with uniformly high standards. In that same time window, a new generation of digitally-enabled students will populate our universities, bringing with them new ways of learning, working and communicating. Significant strategic development of e-learning has taken place in the last decade and we should now be positioning higher education for the next step change, the integration of thinking and practice of digital media and e-learning. Innovation is a constant process as O'Donnell reminds us when he recounts the fable of the farmer who had a favourite axe. He liked it so much that over time he had put two new heads and three new handles on "it" [O'Donnell, 1998, p.158] – an appropriate metaphor for twenty or more years of e-learning development!

References

1. BATES, A. (2001) *National strategies for e-learning in post-secondary education and training*. Paris, UNESCO/IIEP
2. BOLTER, JAY DAVID (2003) *Theory and Practice in New Media Studies*. In Liestøl G., Morrison A. and Rasmussen, T. [Eds.] Digital Media Revisited. MIT Press
3. CLARK, A. (2003) Natural Born Cyborgs: Minds, Technologies and the Future of Human Intelligence. Oxford University Press
4. CLARK, R. E. (1994) *Media and Method.* ETR&D 42 (30, 1994 pp. 7-10)
5. COIMBRA GROUP OF UNIVERSITIES (2002) *European Union Policies and Strategic Change for eLearning in Universities. Report of the HECTIC Project [Higher Education Consultation in Technologies of Information and Communication].* [www.flp.ed.ac.uk/hecticreport.pdf]
6. COLLIS, B. AND VAN DER WENDE, M. (Eds. 2002) *Models of Technology and Change in Higher Education: An international comparative survey on the current and future uses of ICT in Higher Education*. Centre for Higher Education Policy, Twente University, Netherlands http://www.utwente.nl/cheps/publications
7. CRAIN, P. (2003) *Children of Media, Children as Media*. In Gitelman, L. and Pingree G.B. [Eds.] New Media, 1740-1915. MIT Press
8. DUBIN, ROBERT & TAVEGGIA, THOMAS C. (1968) *The Teaching-Learning Paradox. Centre for the Advanced Study of Educational Administration*, University of Oregon, 1968
9. DWECK, CAROL S. (2000) Self-Theories: Their Role in Motivation, Personality and Development. Taylor & Francis
10. GITELMAN, L. AND PINGREE G. B. (Eds. 2003) New Media, 1740-1915. MIT Press
11. HAYWOOD, J. (2003) *Surveys of European Universities Skills in Information and Communication Technology for Staff and Students*. Final Report of the SEUSISS Project, EU MINERVA Programme. www.intermedia.uib.no/seuiss/seuissreport.pdf
12. LANDOW, GEORGE P. (2003) *The Paradigm is More Important than the Purchase*, In Liestøl G., Morrison A. and Rasmussen, T. [Eds.] Digital Media Revisited. MIT Press
13. LANESTEDT, J. (2003) *The Challenge of Digital Learning Environments in Higher Education*, In Liestøl G., Morrison A. and Rasmussen, T. [Eds.] Digital Media Revisited. MIT Press
14. MACKEOGH, K. (2003) *Student Perceptions of the Use of ICTs in European Education.* Research Report, OSCAIL, Dublin City University
15. MARVIN, C. (1988) When Old Technologies Were New. Oxford University Press

16. O'DONNELL, JAMES J. (1998) Avatars of the Word. Harvard University Press

17. POSTMAN, N. (1985) Amusing Ourselves to Death: Public Discourse in the Age of Show Business. Heinmann, London

18. SALOMON, G., PERKINS, D. AND GLOBERSON, T. (1991) *Partners in Cognition: Extending Human Intelligence with Intelligent Technologies*. Educational Researcher 20(3), pp. 2-9

19. SEELY BROWN, J. (2002) The Social Life of Learning: *How can Continuing Education be Reconfigured in the Future?* Continuing Higher Education Review, Vol. 66, pp. 50-69

20. WENGER, E. (1998) Communities of Practice: Learning, Meaning and Identity. Cambridge University Press

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OLD UNIVERSITIES IN NEW ENVIRONMENTS: NEW TECHNOLOGY AND INTERNATIONALISATION PROCESSES IN HIGHER EDUCATION

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Globalisation

The following text is based on a research project funded by the Swedish Agency for Distance Education (DISTUM). The result of the project will be published as a book in April 2004. The purpose of the project has been to study how new technology is implemented at old universities, especially in relation to internationalisation of higher education. In this connection we have studied four old universities as cases: University of Bologna, University of Cambridge, K. U. Leuven, and Lund University. In the report we focus both on a general discussion concerning new technology in an environment of globalisation and internationalisation, as well on the specific relationship between higher education, new technology and globalisation processes.

Since the concept "globalisation" is in focus in the report, we have to discuss some ways of using it, and how we can apply this discussion to possible consequences for higher education.

As one starting point we can use, according to Robin Cohen and Paul Kennedy (2000), six separate strands in the discussion and apply those to the situation in higher education today:

- Changing concepts of space and time
- An increasing number of cultural interactions
- The commonality of problems facing all the world's inhabitants
- Growing interconnections and interdependence
- A network of increasingly powerful transnational actors and organization
- The synchronization of all the dimension involved in globalisation

All these strands are ways to place higher education in a more general cultural context.

Another starting point is to use five major topical discourses, according to Therborn (2000), on globalisation and relate those topical discourses to the changes in higher education: competition economics, sociocritical, state (im)potence, cultural and planetary ecology. All theses discourses can include changes in higher education.

One important question related to the distinctions above is: Who, then, are the winners and loosers in the globalisation process? Therborn says:

> Globalisation can affect the social space of actors from two angles: by direct changing their given social location and by opening channels to the rest of the world. Generally speaking, we may say that (for the foreseeable term) the winners of globalisations are those for whom an opened world is either an opportunity of action or a connection to resourceful friends. The importance of globalisation to social actors, then varies with the size of the direct gains and losses or threats to the actors in their situation and with the effects of mobility and connections. Opportunity, in turn, may be either in terms of vertical ascendance, becoming rich or at least affluent or successful in some other way on the spot or, alternatively in terms of horizontal mobility, getting a better life somewhere else. It may also mean access to sources of information, of values and norms more congenial to those prevailing at home, and link-ups with friends in other part of the world. To the losers, globalization is a closure of opportunities, of employment, of chances for decent wages or profits, and/or a cultural invasion that occupies the high ground of cultural communication and subverts important values.

We can transform the more analytical framework above to consider organisations like universities. Who will be the winners and the losers? Of course, the real situation is more complicated than the distinction above. But if we are living in a new globalised society, there certainly will be new winners and losers also among the universities.

Technology and Society – a dialectical relation

One of the most widely discussed texts in the debate on globalisation is Manuel Castells' Opus Magnum (three volumes) on *The Information Age*.

Castells' (2000) starting point is that the relationship between technology and other fields in society is very complicated, as all dialectical relations are. According to Castells the present technological revolution is characterized, not in the centrality of knowledge and information (nothing is new in that) but by "the application of such knowledge and information to knowledge generation and information processing/communication devices, in a cumulative feedback loop between innovation and the uses of innovation" (Castells 2000:31). The uses of new telecommunication technologies in the past two decades have, according to Castells, passed three stages: a/ automation of tasks, b/ experimentation of uses and c/ reconfiguration of applications. These three stages are without doubt interesting to use when analysing how new technologies have had effects on higher education – how the process have gone from learning by using to learning by doing, both when it comes to the single student as to the university as an organisation.

Castells ends this discussion by saying "The feed-back loop between introducing new technology, using it, and developing it into new realms becomes much faster under the new technological paradigm" (Castells 2000:31). New information technology is not a simple tool to use, but processes to be developed. By this statement we think Castells have put his finger on one of the most important questions to deal with in analysing higher education and new technology. Let us go into more detail how Castells characterises the new technological paradigm, which is the material foundation of the new network society. The characteristics is formulated by five criteria (Castells 2000:70 ff):

- "The first characteristic of the new paradigm is that information is its raw material: *these are technologies to act on information*, not just information to act on technology, as was the case in previous technological revolutions."
- "The second feature refers to the *pervasiveness of effects of new technologies*. Because information is an integral part of all human activity, all processes of our individual and collective existence are directly shaped (though certainly not determined) by the new technological medium."
- "The third characteristic refers to the *networking logic* of any system or set of relationships using these new information technologies. The morphology of the network seems to be well adapted to increasing complexity of interaction and to unpredictable patterns of development arising from the creative power of such interaction. This topological configuration, the network, can now be materially implemented, in all kinds of processes and organizations, by newly available information technologies."
- "Fourthly, related to networking but a clearly distinct feature, the information technology paradigm is based on *flexibility*. Not only processes are reversible, but organizations and institutions can be modified, and even fundamentally altered, by rearranging their components."
- "Then, a fifth characteristic of this technological revolution is the growing *convergence of specific technologies into a highly integrated system*, within which old, separate technological trajectories become literally indistinguishable."

All the characteristics mentioned above are interesting as analytical tools regarding changes in today's higher education.

Organisational change in a globalising world

In our report we discuss organisational responses within higher education to changes in the surrounding environment – changes connected with globalisation and development of new technology as well as policies and governance both at national and international level. And we apply this discussion to our four case universities.

Our different case universities have chosen different strategies to cope with and handle changes in society and technology. In some cases they "buffer" their core activity like their campus degrees from demands for continuing education or distance education, and de-couple these new activities from the regular organisation and degree system. They may also form alliances and networks with other universities to promote co-operation to reduce uncertainty and competition (or to strengthen their commercial capacity) when facing the challenge of a globalised higher education market.

In a recently published anthology, *Higher Education in a Globalising World* (Enders and Fulton eds, 2002), the authors discuss international trends within higher education – how the societal and organisational environment for universities has changed during the last decades. Referring to Teichler (1999), the editors identify two types of internationalisation processes in higher education today, one initiated by the universities themselves, and the other related to national and supranational policies in response to globalisation. Activities initiated by the universities themselves include such activities as student and teacher exchange, courses in English, and joint research projects. The other type of change processes that occur in the environment may affect universities in various ways in different countries, and responses may range from a "buffering strategy" to avoid these changes to influence what is considered to be the core tasks of the university, to different strategies to absorb and incorporate new policies and structures into the university (for instance lifelong learning, e-learning, commercialisation of courses, convergence of degree systems and study programmes). Supranational examples of such changes in the environment are the development of a global market for higher education, where WTO (through the GATS agreement) plays an important role, and the so-called Bologna process to create a common European higher education area, with European governments as the main actors.

While WTO are proponents of commercialisation and competition, the Bologna agreement on the contrary tries to promote co-operation between higher education institutions. Thus, globalisation and internationalisation of higher education may take two different directions. One that promotes *competition* between universities or different systems of higher education. The opposite direction of globalisation policy and development is a one of international *co-operation*, in which case the character of higher education as a public good is stressed and international co-operation is seen as way to counteract the forces of globalisation that promote competition.

The environment that promoted higher education as a public good for an increasing number of students is now changing in two important aspects (Enders and Fulton, 2002):

- There has been a stagnation or decrease in funding by the nation states, which has increased the need for other sources of income
- New information and communication technology blurs the boundaries of time and space, increasing the possibilities to deliver higher education outside the local context and hereby compete with other universities on the international market for higher education.

What we have seen in all our case universities is the creation, and re-creation, of units to handle new tasks like distance education, lifelong learning and internationalisation. These adaptations have taken different forms in our four universities, but all of them have employed strategies and tactics to protect what they perceive as their core academic tasks.

In an interesting article on globalisation of higher education, Lynn Meek (2002) discusses how past models of co-ordination have been changed by current reform policies at an international level, where governance and co-ordination move from the nation state to international and supranational bodies. In his text Meek deals with three different types of international co-ordination of higher education:

- International higher education consortia

- Supranational co-ordination in Western Europe (The Bologna Agreement)
- Globalisation of higher education through the GATS (General Agreement on Trade in Services) agreement within WTO

In relation to the market competitive approach of the Anglo-Saxon countries, most of the other western European countries seem to follow a more co-operative policy, which is explained by the fact that in many of these countries free access to higher education is an important social and democratic value.

Resistance against market-oriented regulation of higher education in the form that GATS proposes has been widespread among university organisations, also in market-oriented countries like the United States. The critique is based on the argument that academic education should be considered as a "public good", which demands sufficient funding by the state, and where a market orientation may even further undermine government funding.

For the European universities, the environment is currently changing dramatically as a consequence of the so-called Bologna process. Also before the Bologna Agreement, supranational co-ordination within the European Union had been quite extensive. European Union programs like ERASMUS have had significant impact on universities in Europe, with its promotion of student and teacher exchange. Internally, universities have established international units and often developed courses in English to be able to receive foreign students.

Competition or co-operation

With the cases as background we are almost able to construct some ideal types in a Weberian sense. Cambridge, as the well-reputed university with its residence requirement for students, could be one; Lund with a dual policy of academic distance education and commercial ventures into a global market of higher education, another. Leuven and Bologna, where free access to higher education has pushed the universities to use ICT at campus, a third.

Are these ideal typical traits that we think we have found in respective universities also present in other universities in Europe? And how are universities in the Third world affected by different aspects of globalisation, and by globalised European universities?

Another aspect is how the differences in organisational structure and strategic choices will affect internationalisation and the use of new technology. Is commercialisation a feasible strategic alternative in a state-funded traditional academic institution? Or is it collaboration between universities á la the Bologna Agreement that will dominate internationalisation strategies among traditional universities? What role will lifelong learning play in a society that seems to change faster and faster? Will it be a regular part of the university? What preferences will the young generation have in the future, will they choose to be a "Wanderstudent" or to inculcate a specific university culture? If Castells' description, too, is a reality – will the universities in the future become nodes in a continuously changing network?

References

1. CASTELLS, MANUEL (2000) *Rise of the Network Society*. Oxford: Blackwell
2. COHEN, ROBIN & KENNEDY, PAUL M (2000) *Global Sociology*. New York:New York University Press
3. ENDERS, JÜRGEN AND FULTON, OLIVER (EDS) (2002) *Higher Education in a Globalising World*. Dordrecht: Kluwer Academic Publishers
4. ENDERS, JÜRGEN AND FULTON, OLIVER (2002) *"Blurring Boundaries and Blistering Institutions: An Introduction."* In Enders and Fulton (eds): *Higher Education in a Globalising World*. Dordrecht: Kluwer Academic Publishers
5. MEEK, LYNN V. (2002) *"Changing Patterns in Modes of Co-ordination of Higher Education"*
6. IN ENDERS, JÜRGEN AND FULTON, OLIVER (EDS) *Higher Education in a Globalising World*. Dordrecht: Kluwer Academic Publishers

7. TEICHLER, ULRICH (1999) “*Internationalisation as a Challenge for Higher Education in Europe”*. Tertiary Education and Management, 5 (1), 5-23

8. THERBORN, GÖRAN (2000) *“Introduction”*. International Sociology. June 2000

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SUSTAINABILITY OF E-LEARNING FOR UNIVERSITIES

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Introduction

A system approach to e-Learning for Universities should consider the whole life-cycle of "e-Learning products": in particular, to guarantee the satisfactory operation of the educational system based on e-Learning.

Special attention should be paid to the following aspects:

- e-Learning model
- Authoring
- Maintenance
- Quality Assurance
- Non-educational support to learners
- Economical balance

All of these factors, that are evidently of heterogeneous nature, contribute to guarantee the sustainability over time of an e-Learning educational system. In this paper we will discuss each of the previous points in some detail.

e-Learning model

For the sake of sustainability, our point is that this model should be flexible and inclusive, i.e. apt to allow the utilisation of most of the present and future available digital supports to teaching and learning.

Some key features to be guaranteed by an e-learning university program, whatever the model/s followed, should be: strict compliance with a constructivist approach to learning, clear definition of the competency planned to be attained with the program in each of the knowledge domains where such programs are offered, explicit definition of the modalities and criteria of learning appraisal, explicit definition and verifiability of the Quality Assurance process followed in the implementation and delivery of the program, substantial interaction of the learners with the available learning resources always guaranteed (Collis, van der Velde, 2002). In such a context the e-learning program could cover one course or fraction of it up to all the courses needed to attain degrees. It could be constituted by the simple availability on line of the metacognitive model of each course offered by the University and of the way of accessing its Learning facilities-libraries, laboratories, teachers, mentors, academic authorities, international liaisons for students exchange, cultural programs and activities, student organizations, job opportunities and so on, together with suitable virtual meeting places and free or moderated forums, up to whole degree programs apt to be attended in blended mode in a virtual environment. Of course all the intermediate modalities apt to allow the student participation to the university learning community can be taken into consideration.

The reference to the constructivist approach requires the adoption of pedagogic attitudes ranging from the systematic active student involvement to the availability and systematic use of e-portfolio constitution tools. A rich net-based knowledge Gymnasium has to be the environment where e-learning develops. Blogs could be a usual way of building on individual reflections.

All of this means a substantial reorganization of the teaching attitude of faculties, professors, instructors. Suitable training and education programs have to be defined and the e-learning modality would be desirable, to make the instructors aware in an experiential way of the learning by doing paradigm.

Authoring

While in the current practice authoring is frequently embedded into the adopted Learning Management System platform, the perception increases that motivation of University professors with respect to the creation of e-Learning content has to be improved. Our point in this respect is to improve Learning Content creation and management ease and speed in order to reduce author's time waste.

The primary way for obtaining this result appears to be, also in accordance with all the documented success cases in e-learning implementation, to establish a University structure specifically aimed to support professors in didactic and medial design of the Learning Objects (LOs) they wish to implement. Such a structure should be composed by high level professionals and/or experts in both the kinds of design, able to interact with the Domain Knowledge owner in order to integrate excellent content selection with the proper didactic approach and medium effective communication. LOs here are meant to be every kind of digital MultiMedia (MM) objects able to enter in the learning process of a learner.

In such a context technological tools apt to be directly used by the professor to edit in very quick way every material he/she engenders in the context of his teaching activity (from specific textual notes to the streaming of a lecture or the results of a highly focused internet research) in order to have a quick prototype of the learning object he/she has in mind, could be extremely useful. The same can be said for Content Management Systems (CMSs), meant as tools for organizing the active work of the students in a context a thematic supervised forums, or for rapidly and effectively edit the materials produced in a case study performed by many persons in a context of Cooperative work (Valenti, 2004). Moreover CMSs can be effectively adapted for totally or partially automatising the implementation of some of the W3C recommendations relative to the usability and accessibility of the materials by persons with reduced abilities.

A critical point in the Authoring activities is the timely production of the Metadata of the LO (IEEE, 2002). Timely, in our view, means simultaneous. This has to be or automatised or committed to the design-support structure, the components of which are fully aware of the importance of indexing while the authors perceive mainly the boring aspect of the Metadata production. In such a context the evolutive characters of Metadata have to be taken into account, together with some critical point, currently under discussion by the standardisation Bodies, relative to their not completely satisfactory composition for a real re-usability.

All the previous goals may be obtained by setting up a permanent structure able to support the professors in the design of the learning contents. Design has to be considered as a multi-faceted activity where choice of the topics has to be integrated with the didactic and multimedia design. While the first aspects is, by definition, mainly managed by the professor in charge of the course, he/she needs in general strong support by, and interaction with, high level professionals in pedagogy and MM publishing. These competencies are a strategic asset that every University planning to enter the e-learning market must own. Moreover such a structure should be able to participate to the current debate concerning indexing of the Learning Objects for the sake of their re-usability in different contexts. Similar results are reported by many universities adopting e-learning approaches (SREB, 2001; HU, 2003; KYVU, 2004).

At the same time a suitable technological infrastructure able to guarantee courses delivery, back office services, general administrative and librarian services, should be constituted. This technological infrastructure should be also apt to manage the knowledge pool of the university and to guarantee support and promotion of the birth and growth of "communities" among the students. This latter aspects seems to us particularly relevant to create and maintain over the net a cultural environment similar to the one the students attending a traditional University enjoy. This kind of infrastructure appears to be a strategic asset.

Quality Assurance

Quality in education should not be forced into one single definition, but rather a collection of smaller elements, processes, which contribute to educational quality in different dimensions. These elements, when chained together, constitute the overall quality in training and the improvement of quality is achieved through simultaneous action on all these levels. Furthermore, accreditation and quality assessment in education should not be considered as separate systems. They are an integral part of the continuous quality improvement context on the road of total quality. According to the Higher Engineering Education for Europe working group, quality in higher education can be obtained by fulfilling two issues: “specifying worthwhile learning goals” and “enabling the students to achieve them” (H3E, 1999). The former involves paying attention to academic standards, to the expectations of society, to students’ aspirations, to the demands of industry and other employers, to the requirements of professional institutions, to the fundamental principles of the subject, and so on. The latter issue involves making use of research into how students learn, adapting good course design procedures and building on successful teaching experience, all of which may require professional development for lecturers. Thus, quality assurance implies quality of contents, that means defining authoring procedures for content creation; teaching procedures to guarantee proper monitoring and support/assistance to the learning process; and didactic/administrative procedures. Every procedure is meant to be implemented by one or more actors, whose operation should be inserted in a proper organisation framework. The basic mechanism in assuring quality of the contents is independent peer review. We suggest that three experts are involved in the review of each course: two domain experts, variable from course to course, and one faculty expert, to be involved in all the courses review to guarantee the needed levels of homogeneity. The learning material has to be accredited by third parties active the educational field as, for instance, Academic Institutions who define the procedures for the accreditation. Finally, the quality of the software tools developed and of their documentation, along with the security of services and networks has to be ensured via proper procedures that refer to well known standards coming from the field of software engineering (ISO, 1998; IEEE, 1997; ISO-9000-3; ITSEC, 2001).

Non-educational support to learners

The University environment is a rich and multifaceted one, comprehending many aspects dealing with daily life, administration, social interlocutors. The constructivist paradigm should be implemented at large in a University e-learning system.

This means at the current status of the WEB applications that an University e-learning program should always comprehend a campus every day life facility, allowing the students to meet, to have social exchanges, to create net-communities as in the traditional campuses happens by means of every day social interactions. Sport activities, for instance, could be replaced by game activities or by the availability of flying or driving simulators.

We must admit that even if the need of this kind of facility seems to us a crucial point, we are not able to define a consistent set of significant examples of proper practices.

Economic balance

Universities are complex organisations permanently facing this issue. Up to now it appears that e-Learning initiatives not always are considered from the self-sustainability point of view: sound business plans being a mandatory criterion for launching e-Learning initiatives. The Intellectual Property Rights and Copyright issues must be integral part of such an issue.

Almost all the e-learning initiatives in operation, either compliant with the “inclusive” e-learning model or not, document high development costs and significant maintenance costs. It is frequent the case that the implementation of a “virtual campus” or of a degree course offered in a third generation e-learning modality has been done by, or has been planned with the intention of, using special funds, provided by local, national or international organisations (see for instance MIT initiative asking for a huge amount of venture capital three years ago in USA, or the Milan Polytechnic at distance degree in informatics launched some years ago). The self-sustaining examples are in reality covering only the actual costs of delivery and the Return of Investments if any, is very low. At the moment we are not aware of European initiatives that have already faced the need of substantially updating the e-learning courses.

We are acutely aware that in the present situation of funding public Universities in Italy this kind of approach is not viable, at least if the involved University intends to offer high quality third generation e-learning courses.

Our point is that a sound business plan has to be prepared. First of all a unique business motivation has to be precisely defined. The elements of costs to be considered are, in our vision, the following:

- Constitution of a permanent structure able to support the professors in the design of the learning contents.
- Constitution of a suitable technological infrastructure able to guarantee courses delivery, back office services, general administrative and librarian services.
- Implementation of the Learning Objects. It could be reasonable to outsource the implementation to a multimedia producer.
- Periodic significant updating of the Learning material with a period of two years.
- Tutoring. Expert tutors have to be taken into account, with a maximum number of 25 students/course assigned to each tutor.
- Mentoring.
- Specific training of the staff involved in the operation of the e-learning university system.
- Proper IPR payment and Copyrights have to be defined for the Authors of the learning objects and for the University, presumed to be the owner of the material. Authorship refers to all the aspects of the design. Proper contractual agreements have to be defined with the eventual MM producer.
- Agreements must be defined in relation to the exchange of Learning Contents among different universities and in relation to the mutual recognition of the credits gained by the student of one University through courses delivered by another one.

The revenues have to be provided by the tuition fees of the students exploiting the e-learning system. Definition of these fees is a delicate matter that should be based on a fair evaluation of the economic advantages that the students would have because of the e-learning modality and on the effective enhancement of quality of learning that can be obtained via this approach. A sound market analysis should help in understanding if the breakeven point could be attained in a period not longer than three years. In case of longer times it could be advisable that the involved University would not play the game. In fact, having in mind the present estimation of knowledge obsolescence in five years, the rebuilding of learning contents every five years in the average has to be planned (LEARNFRAME, 2000).

References

1. CEN/ISSS (2000) CEN/ISSS/WS-LT Project 1 Draft Report, March 22, 2000
2. COLLIS B., VAN DER WENDE M. (2002) *Models of Technology and Change In Higher Education: An international comparative survey on the current and future use of ICT in Higher Education,* CHEPS, Toegepaste Onderwijskunde, 89 p
3. ECTS (1998) European Credit Transfer System – Users' Guide http://europa.eu.int/comm/education/socrates/guide-en.doc
4. H3E (1999) H3E-wg2 *Position Paper on Quality and Quality Assurance – A proposal for a formalised procedure for achieving good quality teaching of engineering in European Universities.* http://www.hut.fi/Misc/H3E/wg2/wg2p1_F0.html
5. HU (2003) Distance and Distributed Learning Action Plan, University of Hawaii
6. IEEE (1997) IEEE Standards Collection: Software Engineering, 1997 Edition
7. IEEE (2002) Standard for Learning Object Metadata – 1484.12.1. IEEE Piscataway, NJ, USA

8. ISO (1994) Guidelines for the application of ISO-9001:1994 to the Development, Supply, Installation and Maintenance of Computer Software, section 4.5
9. ISO (1998) ISO/IEC 9126 IHS/Infodoc: World-wide Standards Service, Englewood, Colorado, USA
10. ITSEC (2001) Information Technology Security Evaluation Criteria. Assurance Levels. http://www.cesg.gov.uk/assurance/iacs/itsec/criteria/itsec-levels/index.htm
11. LEARNFRAME (2000) Facts, figure and forces behind e-Learning. LEANFRAME
12. KYVU (2004) Policies and Procedures Relating to Implementation of Distance Learning Instructional Support in Academic Affairs, Student Affairs, and Business Affairs, Kentucky Commonwealth Virtual University
13. SREB (2001) *Supporting Faculty in the Use of Technology: A Guide to Principles, Policies, and Implementation Strategies.* A Report and Recommendations in a Series on Distance Learning Policy Issues, Southern Regional Education Board (SREB)
14. VALENTI S., CUCCHIARELLI A., LEO T. (2004) LIMEFRAME: Learning content Management systEm in the FRAmework of MEtacognition, to appear in Proceedings of The Americas Conference on Information Systems, New York City, NY, August 5-8

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LIVIUS: THE EUROPEAN VIRTUAL UNIVERSITY FOR A NEW E-LEARNING MODEL

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Thanks to the LIVIUS Project – Learning in Virtual Integrated University System, funded by the European Commission in the framework of the Socrates Minerva Programme, a model for the European Virtual University was designed. This model starts from the idea that distance teaching should be founded on traditional universities that have to re-organise themselves to give adequate answers to the qualitative and quantitative educational needs of the cognitive society and to the demand for flexibility, diversification and internationalisation of the learning-teaching processes.

The question we faced in designing the LIVIUS Project European Virtual University model was that of creating a distance education structure that, in order to meet the educational needs of the cognitive society, could take into account the evolution and the development of the information technologies and the outcomes of research work done in the psycho-pedagogical field as well; this latter one represents the theoretical foundations of the distance teaching and learning process. The achieved outcomes allow to develop a university system that organises itself at local, national and international level integrating presence and distance. It is a model that can set off synergies among partners of different kinds to make them jointly develop innovation as it regards products, processes and systems assuring a fair balance between unity and diversity: the unity of values and traditions that memory gives us and the diversities existing among cultures and languages.

Organisational Model

The organisational model that was designed to realise the European Virtual University is based upon a Consortium among traditional European Universities, distance Universities and technology companies structured as a network. The proposed network model allows to transfer knowledge not only from an institution (a supplying university) to a group of students scattered in different geographical areas, but also from institutions apart from the academic ones, where Technological Poles can be established, that is to say in the students' homes and workplaces and in organisations and institutions outside traditional educational structures.

The advantages for learners are linked to the fact that they can have at their disposal a varied educational offer and enjoy it in very flexible way according to times and spaces that best suit them.

The advantages for the network partners are determined by the fact that a limited effort on the part of every one of them leads to a significant global offer and that scale economies, that this way are brought about, make the development and the use of learning materials sinergically profitable.

From the organisational viewpoint, inter-operability modes among the different envisaged structures, such as the European Centre, the different National Centres, the Supplying Universities, the Technological Poles and the Production Centres were conceived. These structures have to:

- Create a European open space for advanced-level (academic and professional) education having high quality standards and great skills to innovate contents, methods and processes;
- Stimulate the use of technologies currently available on the market, satellite television and Internet via satellite to set off face-to-face and distance teaching and learning processes;
- Promote the development of new distance products and of new models of communication and interaction among different cultures and individuals;
- Get a shared basic standard for e-Learning based upon the interoperability of technologies and on shared communication models.

Common Curriculum

One of the most significant results obtained thanks to the LIVIUS Project is that, after a lot of mediation activities among the engineering faculties of the many universities involved in the project, the first European-level common curriculum for Computer Science and Telecommunications Engineering was established, in compliance with the indications given in the Sorbonne and Bologna declarations. The identification of this curriculum inherently has extremely innovative features, not only because for the first time universities such as Cambridge University, the INSA – Institut National des Science Appliquée de Toulouse, the University of Barcelona, the Universidad Obierta de Cataluna, the National Technical University of Athens, the Politecnico di Torino, the Faculty of Engineering of the University of Rome “La Sapienza” shared a curriculum, but also because we could identify an educational path to produce the skills of an engineer whose competencies are required by the European labour market, but also by the international one.

This Curriculum was designed taking into account the experiences made by the above mentioned universities through the analysis of existing materials. The systematisation of the reviewed materials linked to different curricula turned out particularly difficult. There are a lot of differences among the curricula used in the different universities involved in the project. We have to think about these differences; they definitely do not facilitate the so-wished creation of a European common space for education, above all if we take into account that differences among curricula are significant also in a disciplinary field such as the one of Computer Science and Telecommunications Engineering. Surely, as regards the humanities sector, differences are more pronounced.

The established curriculum, in compliance with the Sorbonne and Bologna declarations, envisages three-year university degree courses, corresponding to the first three year of a five-year programme (3 years + 2 for specialising). It is characterised by a modular structure. In fact, it includes a common path of 5 semesters that in the last semester branches off into two alternative paths, one for Computer Science Engineering and the other one for Telecommunications Engineering. We established a total amount of 30 subjects that are common to the two paths and 4 specialisation subjects for each one of the two paths corresponding to 180 credits, divided into three years of course.

Within this Common Curriculum defined by a Scientific-Didactic Committee, we decided to produce two courses, as Pilot Modules to be used during the experimentation phase. In particular, we selected the course on “Programming Techniques” of the first year and “Signals Theory” of the second year. The contents related to these disciplines were designed by different teachers of the same subject belonging to the project partner universities. Each one produced courses in different languages (English, Italian, French and Spanish).

100 hours of video lessons were co-produced to be broadcast on television and on the Internet via satellite and related didactic materials that were posted into the LIVIUS learning environment on the Internet.

Didactic-psycho-pedagogical Model

The didactic-psycho-pedagogical model was designed to concretely achieve a teaching and learning process that takes into account theories that allow for:

- considering the student at the centre of the teaching process and the teacher as a thoughtful guide that leads and follows the cognitive growth;
- moving from a mere transfer of knowledge to the creation of knowledge;
- integrating theory with practice;
- developing an active and collaborative learning integrating different languages and technologies.

The envisaged psycho-pedagogical model meets the need for flexibility and allows to weaken the student’s feeling of isolation; it is a mixed one since it enhances the traditional system using a kind of teaching that is free from space-time limits, but which maintains a certain degree of direct interaction;

it is a model that synthetically blends elements of the traditional mode (direct interaction with teacher and tutor, practical activities and seminars, etc.) with those of the distance mode (lectures broadcast on television and Internet via satellite, Internet-based practice work, videoconferencing and distance tutoring by audio-, video-chat-rooms, forums) both in a synchronic and diachronic mode in order to develop different aspects of the learning process: symbolic-reconstructive, learning by doing, collaborative learning.

With this new psycho-pedagogical model professors were forced to find a new way of explaining, summarising and presenting their knowledge to a virtual student in order to trigger a critical and attentive learning process. The professors of the different partner universities, helped by experts in multimedia communication methodologies and languages and by experts in technology, became the producers of contents in a multicultural and multilingual version.

In the Internet-based learning environment each video teacher, actually, posts his own contents following to a definite psycho-pedagogical model.

The Internet-based Learning Environment

The environment (www.uninettuno.it/livius) allows to lead the student along the path that best suits him and to develop hypertextual, collaborative, customised learning processes.

The environments, whose contents are designed by teachers, are:

- The Videoteque, which contains the digitised courses. The innovative features of the videolessons are: the contents' modular structure which allows the student-user to access to a specific level of competence; the indexing by subjects which facilitates hyper-textual navigation; bookmarks that take the student-user to other learning environments in an hyper-textual way.
- The Virtual Library, which allows to query codified texts by means of common variables (authors, title, year of publication, etc.) and allows for an intelligent query of the system which interprets the user's requests supplying a bibliography that is targeted upon his own needs.
- A Virtual Laboratory, which gives the opportunity of developing practical competences and to be supported by a telematic Socratic tutoring system that is always available.
- A Didactic cyberspace (videoconferencing with a telematic teacher⇒tutor, video-chat-rooms, discussion forums). In this environment students can set up two-way communication processes and develop collaborative learning with students and teachers of different countries and of different cultural settings.

The results obtained with the LIVIUS Project allow to make available a pilot University degree course in Computer Science and Telecommunications Engineering at European level, but, above all, allow youths from different countries to:

- Share a common didactic path;
- Get their titles be acknowledged at European level, according to the ECTS system;
- Acquire skills and competences required by the New Economy and by the e-Learning global markets.

By the LIVIUS Project European Virtual University model and thanks to the satellite technologies it is possible to transfer directly from the different universities' sites to the student/user's desk academic video lessons in different languages, multimedia products, databases, auto-evaluations systems just by means of common PCs.

Thanks to interactive communication, virtual environments and physical distances can be easily cancelled and people and cultures can get closer to each other and create a European common space to spread and democratise knowledge.

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THE CHALLENGE OF A DISTANCE-LEARNING PROFESSIONAL DOCTORATE IN EDUCATION

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Introduction

The first Doctorate in Education (EdD) in the UK was presented at Bristol University in 1992, following US innovations eighty years earlier, when the EdD was seen as a pre-service award, and Australian developments from 1990 where the EdD is seen as an in-service, professional development award. Over the last ten years, a rapid expansion of professional doctorates in education has taken place, with 37 different universities in the UK now offering EdD programmes. This is undoubtedly a response to a growing market (both national and international), which might be a direct result of changing political agendas. These EdDs are all in their different ways a doctoral qualification with an explicitly professional orientation, generally presented as requiring part-time independent study supported by blocks of taught components (for example research methodology) delivered at weekend residential schools in the university. Recent policy initiatives in the UK have suggested a model of teacher professional development conceptualising teaching as a research-based, or evidence-based practice. However, there is a contrary policy direction running simultaneously in England and Wales, which is seeking to impose a more instrumental, Standards driven approach to professional development.

Significantly, the OU EdD is unique in being designed as an open and distance learning programme. This uniqueness is reflected in the part played by electronic conferencing in supervision and student support. Because of this, tutor/supervisors work with their individual students (at a distance) in a range of ways to meet a diversity of learner needs. The OU EdD aims to meet a demand for a particular type of professional development endorsed by the professions themselves, through the development of knowledge about education systems and structures, and through the development of policy and practice. The scale of the Open University (OU) programme is large (70-90 applications per year from the UK, Ireland and continental western Europe resulting in at least 30 students starting per year).

The OU programme commenced with its first cohort in 1997 and its first EdD graduates emerged in 2000. Since then, four cohorts have successfully graduated, 100 in total. The EdD requires applicants to have completed an MA in Education and/with a substantial research methods element, and to submit a structured initial proposal. Students, in negotiation with the programme director, fit their proposal into one of seven subject lines. These "lines" are not hermetically sealed, and students are encouraged to bend them to meet their needs. If accepted (at least half are unsuccessful), the student's first year is a self-contained "probationary" Part 1, requiring three formative progress reports (12,000 words in all) and a summative report of 10,000 words. If the work is assessed as demonstrating the potential to reach doctoral standard in the next two years, the student moves onto Part 2, a two year programme which requires the student to submit six progress reports (25,000 words in total), a draft dissertation and the final dissertation of 40-50,000 words. The EdD is assessed by an internal and external examiner through a viva, much like a standard PhD.

Registration data suggests the typical OU EdD graduate is more likely to be female, is likely to be in the age range 46-55 (plus some in the 41-45 age range) and is (unsurprisingly) likely to be working in education. They are slightly more likely to be in Higher education than to be working in a school (although secondary senior staff are represented). Most are therefore in the third quartile of their careers, with a number graduating at the same time their careers end (challenging a notion of an EdD being an award for a mid-career professional).

Such contextual data does connect with Maxwell and Shanahan's (1997) definition of EdD students as voluntary learners, senior in their fields, with considerable knowledge and drive (undertaking their EdD on top of a busy professional schedule). It also fits the Doncaster and Lester (2002) description of candidates who were experienced practitioners ranging in age from early thirties to nearing retirement and who had previous postgraduate or professional qualifications. For them, professional doctorates are appealing because they are relevant to, and integrated with, a candidate's work. This fits the model proposed by Becher et al (1994) that:

Most mature students enrol for doctoral studies for their own personal development and their work is project focused (p. 59).

Literature

A number of recent studies in the UK have considered the nature of professional doctorates in education, as part of a wider examination of the nature and purposes of doctoral education. Jarvis (2000) interprets the rise of the professional doctorate as part of a broad movement of some research from the university to the workplace, reflecting a need for workers in the knowledge society to continually develop themselves professionally (the professionalisation of the doctorate). Becher (1999) sees this as evidence of a drift towards obligatory Continuing Professional Development in many professions, including education, particularly for those in mid-career. This would suggest an explicit audience for the EdD: senior education professionals engaging in higher professional development.

Scott et al (in press) emphasise the "twilight zone" (p. 3) the professional doctorate occupies, between the university and the workplace, reflecting the dissonance between two cultures of learning. Maxwell and Shanahan (1997) question how to place "professional" at the centre of doctoral study? They answer this by emphasising the different intended population, the different orientation and the different process to achieve the award as compared to the PhD. Key is the nature of knowledge-in-context generated on an EdD: the outcome is procedural, developmental, applied, particular, specific. Part-time EdD candidates are considered "more in touch with professional practice" (p. 147). Doncaster and Lester (2002) remind us that the on-the job requirements of professional life now require more than enculturation into bodies of formal knowledge. Usher (2002, p. 145) claims the alternative routes to the PhD are signified by advanced learning that is highly contextualised and problem-oriented.

Bourner et al (2001) emphasise the important distinction between the narrow career focus of the PhD, generally a pre-service award aimed at those seeking to be "professional researchers", and the EdD, which addresses the in-service career needs of "researching professionals". For them, the key professional rationale is the idea of a practical aim to doctoral study, of improving professional practice, as well as generating new knowledge. They also consider the rationale that the professional doctorate contributes to professional knowledge and the improvement of professional practice. This is certainly true in a prescriptive sense of EdDs, in that research topics have to relate to a candidate's own field of professional practice. What none of these describe is the student experience on an EdD.

Thorne and Francis (2001) argue context is important if senior professionals are attracted with the intention of making a contribution to professional practice. For such candidates, the professional doctorate is not about acquiring new knowledge, rather to capitalise and focus on a current aspect of work in which they already possess significant professional knowledge.

Methodology

The methodological approach taken in this study was to develop an initial series of case studies exemplifying how professional needs were met on a distance-learning EdD. The principal methods of data collection were a postal survey to all OU EdD graduates (2000-2003), and follow-up semi-structured telephone interviews with a representative sample of OU EdD graduates. The interviews were recorded and transcribed. The questionnaire was designed to elicit information about the personal characteristics of the students and factors that motivated the student to register for the degree. Samples of doctoral theses were also analysed to capture the way students articulated the professional impact of their research.

An initial analysis of the professional backgrounds of OU EdD graduates was carried out using registration data. This was confirmed by responses to the opening questions to the postal survey. This provided a contextualisation of employment status, age, gender and previous qualifications. Data was gathered on student's original reasons for undertaking a professional doctorate, and compared to their responses once their doctorates had been completed and awarded. This linked to research questions asked of Open University MA in Education graduates in a previous survey (Bird et al, 2001). Using prompts generated from open questions asking students to articulate the professional orientation of their research, and the impact of the programme on their professional practice, the series of follow-up telephone interviews were held with a sample of EdD graduates, to reflect gender, age and professional status. These generated case studies to exemplify the student's perception of doctoral work in education and their motivation. The aim was to capture the motivations of EdD participants, and the impact of the EdD on their distinctive professional circumstances. 47 questionnaire responses were received and analysed, 10 theses were scrutinised and 6 telephone interviews were carried out.

Findings

The most highly rated factors which motivated students to register for the degree were the achievement of a doctoral degree, being able to link theory to practice, and being motivated by a desire to improve their own practice. Most students wanted to increase their professional standing and most were interested in being able to disseminate new ideas emerging from their research. The desire to develop a new career and obtain enhanced financial benefits as a result of holding a doctorate were not as significant factors as those mentioned above in motivating registration. Only a quarter said that their decision to register for the degree was influenced to some extent by possible financial benefit. The possibly of developing a new career was considered as influential for half the students.

My existing practice led to and informed my research, the research challenged and developed my teaching.

Inevitably the goal of achieving of a doctoral degree was rated equally highly on completion of the programme as it was prior to registration. On completion the vast majority had found their doctorate studies helpful in making links between theory and practice and claimed that undertaking the degree had resulted in improvements in their own professional practice. Most respondents had had some opportunities to disseminate new ideas. The development of a new career and obtaining enhanced financial benefits as a result of holding a doctorate were not significant outcomes for EdD graduates. On completion over half claimed that the qualification had assisted them in developing a new career. However, it may be too early to assess the impact on EdD on career opportunities. A strong correlation was found between initial factors motivating registration and the outcomes of the qualification on personal development and professional practice.

My research provided academic support for changes to teaching and learning and models of good practice.

This is important because it marks out a unique territory for the EdD in relation to the PhD, in which the student's advanced study for the EdD has a clear and explicit thread of professional impact.

Another impact has a particular resonance for those working in HE. For example:

The research skills I have developed have improved my supervision skills and critical reading skills (…) I feel more confident in supervising students.

I delighted in the research process itself and in methodology. If you are talking about new understandings and new skills certainly I feel fairly adept in that sort of enquiry now.

The final impact has perhaps not been as explicitly described in the literature, and is perhaps not fully understood. Undertaking advanced study for the EdD appears to enhance self-esteem and professional credibility. For example:

Gained greater credibility amongst peers (…) my advice is being sought.

Responses were very positive about the impact on professional colleagues. Only in one case did a teacher comment that their EdD had made little impact on the work of colleagues, because his new knowledge and skills were perceived as a threat by senior management in his school. More representatively, for teachers based in schools, the impact was:

Helping Newly Qualified Teachers (…) made findings available to school management, some recommendations implemented.

For staff working in HE, the impact was that:

Trainee teachers were asked to reflect more, and their attention is directed to supporting research literature.

Respondents were asked to comment on what a professionally oriented doctorate meant for them. For many, it represented an enjoyable, teacher focussed research opportunity.

It is a professional/applied qualification and not an indulgence (…) studying my own area of interest was an exhilarating experience.

I believe the voice of teachers expressed through research has greater credibility with the teaching profession than that of academic, university based research.

For a minority, a more negative view was voiced in relation to the award's status next to the PhD.

It has more impact on professional practice than a PhD yet status is still unclear (…) considered less than a PhD.

Exploring the particular nature of the EdD through a series of case studies, drew out student intentions in undertaking an EdD and how it evolved in practice. Case study 1 conceptualised the professional aspect of doctoral study by setting out clear objectives which were evaluated in terms of his own learning at the end. In relation to the first: *To develop my own learning in respect of the practice of teachers' Continuing Professional Development.* He asserted at the end:

I have indeed learned a great deal both professionally and personally (…) most (…) from the teachers concerned (…) I (…) learned about the processes of staff development in schools (…) and all this will be useful professionally both to myself and my institution (…) learned about myself as a learner (…) learned a great deal about researching (…) the sensitivities involved in conducting fieldwork within a professional workplace (…) the literature review is a valuable resource in itself.

Case study 2 drew on observation of the limited research on exclusions from special schools to make thirty implications for practice (effectively recommendations) for government policy, the local authority, the local education authority and schools.

Other case studies focussed on Initial Teacher Training. Case study 3 explored the implications of government policy, focussing on a tension between initiatives concerned with broadening access into teaching (flexibility) versus a commitment to raising standards of competence in written and spoken English on the other (prescription). His conclusions included:

…remove the ability to use spoken standard English at interview as it is impossible to implement with any consistency (…) move away from simplistic evaluations of student subject knowledge (…) the revised ITT curriculum should reflect a descriptive model of grammar.

He is also explicit in outlining dissemination strategies, via an institutional research seminar, a conference paper, assisting with students' research projects and through his own teaching.

Also researching in the area of ITT, Case study 4 suggests implications and recommendations for mentoring in secondary ITT, drawing on perceptions of effective training. This conceptualised high quality mentor support as being characterised by consistent and planned support, sufficient mentor time and trainees managing their mentor and prepared to listen constructively to their advice. Importantly, this EdD graduate also relates the research to his own professional development, which he sees as enhancing personal and professional skills, developing research writing skills and raising his personal profile and self-esteem. He sought to consider the implications of findings in relation to HE, to make a number of recommendations, which reinforce the responsibility of HE to the profession for its continuing development. He concludes that:

…high quality, focussed education and training can play a significant role both in improving the status of the teaching profession, and in helping bring about equality in the classroom (...). The EdD has given me a lot of professional confidence and assurance. It makes me feel more professional relevant particularly (…). It may be very psychological but it just seems to be that the thing has proved for me to be something which has said well OK I really can do this stuff honestly now and its official.

Conclusion

The EdD is attractive to those who view their own personal development and academic ambition as fully integrated with their professional development and have a commitment to furthering the cause of their profession. (Bourner et al, p. 81)

A four part model emerges of the professional orientation of EdD study at a distance, based on what students themselves say about impact. EdD graduates will achieve all or some of the impacts according to their particular circumstances, some of which will be achieved short term, while others will evolve over a much longer term.

1. Impact on the Professional self at the micro level, involving reflection on own professional practice leading to enhanced confidence in applying new knowledge and skills to that practice. A number of these are transferable skills.
2. Impact on professional colleagues at the departmental or institutional level, through revised teaching plans and policies.
3. Impact on the wider professional/academic community, through conference papers, professional and academic articles, book reviews, project proposals, supervision of research students.
4. (Informing all of these) is the intrinsic impact on professional self-esteem, enhancing the credibility of the education professional.

For HE staff in this survey, the EdD has had an explicit impact on their supervisory skills, their teaching, and their attendance at conferences and journal publications as part of the dissemination process. For school staff, the impact has been different. Some have used the EdD to shift careers into Initial Teacher Training. Others have gained a greater confidence in understanding their own teaching and the needs of learners. Others have enhanced their staff development roles, or contributed explicitly to school or departmental policy. For some the EdD has been viewed in their schools with suspicion. Advisors/Inspectors have seen an impact on their own professional skills, to be exercised with greater confidence and credibility.

References

1. BECHER, T, HENKEL, M & KOGAN, M (1994) Graduate Education in Britain, (London, Jessica Kingsley)
2. BECHER, T (1999) *Universities and Mid-Career Professionals: The Policy Potential*, Higher Education Quarterly, 53, (2)
3. BIRD, M, HANSON, A, LEONTOVISCH, A & MCCARTNEY, R (2001) The Aspirations and Achievements of MA Graduates in Education (1993-1998), Open University Occasional Paper
4. BOURNER, T, BOWDEN, R & LAING, S (2001) *Professional Doctorates in England,* Studies in Higher Education, 26, (1)

5. BOWDEN, R, BOURNER, T & LAING, S (2001) *Professional doctorates in England and Australia: not a world of difference*, Higher Education Review, 35, (1)
6. DONCASTER, K & LESTER, S (2002) *Capability and its Development: experiences form a work-based doctorate*, Studies in Higher Education, 27, (1)
7. JARVIS, P (2000) *The Changing University: Meeting a Need and Needing to Change*, Higher Education Quarterly, 54, (1)
8. MAXWELL, T & SHANAHAN, P (1997) *Towards a Reconceptualisation of the Doctorate: issues arising from comparative data relating to the EdD degree in Australia*, Studies in Higher Education, 22, (2)
9. SCOTT, D, BROWN, A, LUNT, I & THORNE, L (in press) Examining Professional Doctorates: Integrating Academic and Professional Knowledge, (SRHE & Open University Press).
10. THORNE, L & FRANCIS, J, (2001) *PhD and professional doctorate experience: the problematics of the National Qualifications framework*, Higher Education Review, 33, (3)
11. USHER, R, (2002) *A Diversity of Doctorates: fitness for the knowledge economy?,* Higher Education Research and Development, 21, (2)

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ONE SITE FITS ALL: CREATING FACULTY-TAILORED AND REUSABLE STUDY SKILLS WEBSITES FOR STUDENTS IN OPEN AND DISTANCE LEARNING A CASE STUDY FROM THE OPEN UNIVERSITY UK

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Introduction

This paper describes the pedagogy and methodology behind the building of a prototype study skills website, which can be both tailored for different faculties and disciplines, and easily transportable to different environments.

The UK Open University (OU UK)

The OU UK is a very large open entry distance institution offering its courses via supported open learning. It delivers both paper based courses and, increasingly, courses which either have an online component or are taught solely online. Since the original charter was awarded in 1967, it has moved from the initial undergraduate institution to one which now also embraces access, vocational and postgraduate courses (and therefore has some educational entrance restrictions on some courses). In 2002, the OU UK had over 300,000 students taking 224 different undergraduate and 185 post-graduate courses. Students come from a wide variety of backgrounds in terms of educational qualifications and life experiences. They can, on an undergraduate programme, choose their own entry point which means that some students inevitably find themselves on courses for which they do not have the prerequisite knowledge and skills.

The notion of learner support has always been fundamental to the OU UK. This support has been delivered in a variety of ways which have developed over the years: via written materials, web based resources, access to help and advice via telephone, letter and electronic communication, and some limited opportunity to attend face-to-face workshops and meetings. All students are allocated to a tutor (a part-time academic) who is their first and most important point of contact with the university. The tutor marks students' assignments, giving correspondence tuition as well as assessment; offers help and advice on both the academic content of the course and study related matters; and runs either face-to-face or electronic group tutorials. Behind the tutor there is a whole raft of staff both at the central campus in Milton Keynes or in one of the 13 regional centres scattered across the UK who offer academic and personal support backed up by strong administrative systems.

The Need for Study Skills Development

Open and distance learning students need to develop a whole range of study skills – both course specific and generic – in order to be effective learners. They will need to develop different skills at different times in their career; they will also wish to use different methods according to their particular need and learning style. For these reasons, student study skills support must be presented in a highly student centred way, using different media.

Many students who are attracted to enrol on a distance learning course will not be traditional young undergraduate or postgraduate students. They may be mature students or students who, because of geography, mobility or financial constraints, are unable to travel to or attend a campus university. Some of these are likely to have skills gaps. This may be because they are unused to study per se; or that they have little past educational experience; or because the mode of distance learning may be new to them. Whatever the reason, distance learning is less tutor-centred than the more traditional university system, relying on the student to be more proactive and take a greater responsibility for their own studies.

It is easy to demonstrate why competent study skills are essential for the student, but institutions too should have an interest in developing study skills, as clearly the success of their students is important to them. Many institutions are trying to draw in more untraditional students through their widening participation strategies. The OU UK Strategic Plan, *Plans for Change 2002-2012,* (2002, p. 12) includes the following objective:

> *To increase the successful participation of adults with low previous educational qualifications, those from lower socio-economic groups, and from Black and Asian communities, and those with disabilities.*

Once students are in, the institution has a duty to provide an inclusive learning environment which involves the development of the necessary study skills for success. The institution also needs to retain these students for economic and reputational reasons. Institutions (in the UK certainly) are funded according to numbers of successful students and the 'revolving door' helps neither the student nor the reputation of the institution.

Student Toolkit Project

In the case of the OU UK, there could not be the assumption that the tutor would be able to address all these student needs as they might not have the necessary skills base themselves, nor the time as they only work part time within the constraints of specific contracts. Therefore, a whole University approach was needed. The Student Toolkit Project was set up in response to the perceived need for generic study skills materials that would be available free of charge on request to the whole range of students. A suite of professionally produced printed materials with an agreed content was developed, overseen by a small steering group drawn from practitioners across the university who could provide a wide range of academic perspectives. Each Toolkit focuses on a particular study skills area and is designed to complement the work undertaken by regional learning support staff as well as the approaches being taken to study skills by faculty course teams. They are aimed at meeting the needs of students who have a particular gap in their study skills. The printed Toolkits to date are as follows: *Effective Use of English; Revision and Examinations; Working with Charts, Graphs and Tables; Reading and Note Taking; Essay and Report Writing Skills; More Charts, Graphs and Tables; Maths for Science and Technology; Learning How to Learn; Extending and Developing Your Thinking Skills; Using a Computer for Study.*

Web Developments

Additionally, all the Toolkits were put on the Learners' Guide, the main study skills site of the OU UK, in pdf form to be read or downloaded and printed. The advantages of placing the Toolkits on the web was that they could reach a large number of students and could be updated more easily and cheaply than paper versions. They were also there as a resource for tutors to which they could refer their students in the knowledge that they were self standing without the need for tutor mediation and also had the university's authority and assurance of quality. The first two, *Effective Use of English* (Johnson & Goodwin, 1999) and *Revision and Examinations (*Goodwin & Bishop, 1999) also developed as interactive websites with practice exercises. The original intention had been to develop all the Toolkits in this way, but time constraints prevented this.

A further development was made possible by the award of a UK National Teaching Fellowship to one of this paper's authors. This brought with it funding to undertake a major project: to test out the possibility of taking generic study skills sites and building them in such a way as to be both reusable and also able to be contextualised for different academic areas. Thus, the project was testing a concept, not simply creating a one-off learning skills website.

We also wanted to push the idea of interactivity even further, based on sound pedagogical research. This fitted in with OU UK policy, which aimed to create a suite of web based study skills support materials, and it built on the work already done with the existing interactive Student Toolkits.

We chose the *Effective use of English* (EuE) for the project: it was in the area of expertise of the fellowship holder, but it was also based on the acknowledged premise that language skills are best taught within the discourse of a particular subject area and so there would be real advantages to the student. The faculty chosen to test this model was the School of Health and Social Welfare where its level one course, *K100: Understanding health and social care,* attracted large numbers of students (59% in 2003) with low or low-ish educational qualifications (less than the minimum standard requirement for entry into Higher Education).

Research into Web-Based Learning

The first stage of the EuE(K100) project was research based. This research took the form of three different elements: the response of students to the existing EuE website, research into other interactive teaching sites and the pedagogy of online learning and interactivity.

In February 2002, towards the start of the project, we "usability tested" the original EuE website with four students, each of whom had studied K100 the previous year. The usability tests were conducted by one researcher taking the participant through the EuE website, as the computer screen was videoed and their voices recorded. Another researcher watched the recording on a screen in a separate room and took notes.

Several recommendations arose from this usability test. Firstly, with regards to contextualisation, all participants voiced that they would not have the time to do an exercise if they felt the exercise was irrelevant to what they were studying and would divert their attention. Participants frequently made the point that they would prefer examples of text relating to their course, '*otherwise it is out of context*' (Doye and Johnson, 2002). Secondly, with regards to the usability of the interactive exercises, participants struggled with most of the interactive exercises that they attempted on the EuE website. Participants stated that they wanted exercises that were easy to engage with, did not involve complicated instructions and provided immediate feedback to their answers. This correlates to Sweller's (1994) argument that 'inappropriate instructional designs can impose a heavy extraneous cognitive load that interferes with learning'; if a student is taken up with learning how to use the computer to do an exercise, they have less room for the learning process. Lastly, with regards to navigation, there was quite a range in the participants' understanding of the different titles and sub-titles. This meant that participants were often uncertain about what a section of the website would give them in terms of development. Therefore, it was clear that titles needed to be more meaningful and each section or exercise needed a short descriptive introduction. All these recommendations fed into the development of the new EuE(K100) site.

The second element of research that took place was an investigation into other sites that used interactive exercises and/or were concerned with the use of English in order to find good practice. Many of the sites found were built for the ESL (English as a Second Language) market. Their content was therefore not appropriate for a university level toolkit. Nonetheless, we picked up some good features from these sites, including the idea of supplying tips, as well as providing positive and immediate feedback.[1] We also found examples of good practice from British and American universities.[2]

Thirdly, getting the right pedagogical approach for the site was paramount. We wanted to develop learning skills in an active and reflective way, not simply put up examples: an example of e-learning not an e-library (Stefik & Cerf, 1997). Students needed to interact rather than just read: a constructivist

[1] See, for instance, www.paragraphpunch.com, www.englishgrammarconnection.com, www.readingcomprehensionconnection.com

[2] See, for instance, http://www.ucl.ac.uk/internet-grammar/home.htm, http://writing2.richmond.edu/writing/wweb.html, http://www.wisc-online.com/

rather than a merely instructivist model of learning. We aimed to help students develop the cognitive skills needed to write effectively, so we wanted them to engage fully in the process. They needed a chance to reflect and to do practice exercises to reinforce and test out their knowledge and skills with immediate feedback on whether they were right or wrong and the opportunity to try again if they had got it wrong. This process accords with Reeve's (1998) adaptation of the Carroll model of school learning to create a model of web based learning based on major input, process and outcome factors to develop knowledge, skills and higher order outcomes.

How, when and how often a student interacts with a computer is also a vital consideration in the learning process. Methods of interaction e.g. by mouse or by typing, according to Schar, Schluep, Schierz and Kruger (2000) provoke either explicit or implicit methods of learning, whereby an explicit learning mode is characterised by 'rational, selective and conscious attention' and implicit by an 'unconscious process that yields abstract knowledge'. Likewise, Haynes and Broadbent (1988) distinguish between selective and unselective learning. S-mode is similar to "explicit" learning, insofar as under a 'dynamic' learning situation, a type of learning is formed by problem solving. U-mode, on the other hand, learns by trial and error. These two types of learning are instigated respectively by different actions by the learner when interacting with a computer. Moreover, Smith (2001) found that alternating between interaction with the computer, and "consultation", gave the most positive learning results. Thus, having a break from interaction is as important as the interactive activity: the two elements work together.

Alexander and Boud (2001) stress the importance of designing opportunities for students to maximise their learning from experience, by including activities which allow them to build on what they already know and to make sense of new information by reflective interaction. This is important in the OU UK context as students are studying a wide range of different courses and at different levels and so the site must be flexible enough for students to take what they want from it and offer appropriate guidance and support.

Building the Site

The second stage of the project concentrated on the building of the EuE(K100) site. The premise behind the EuE(K100) model is that it can be "reused". The site is therefore made up of a series of Reusable Learning Objects (RLOs), or chunks. RLOs have several defining features. They are portable sections that can be "mixed and matched" with other lessons to give a bespoke learning experience. To allow portability and reusability, RLOs are self-contained, self-referential and non-sequential. They also have the ability to be adapted to different environments and audiences. Finally, RLOs can be captured and described by metatags. As Polsani (2003) describes, 'A [Reusable] Learning Object is an independent and self-standing unit of learning content that is predisposed to reuse in multiple instructional contexts'.

There were some models of Reusable Learning Objects already in existence, one notable example being Cisco's model (2000). However, when examined, this model seemed too restrictive, lending itself to an impersonal writing style which would not suit the aims and audience of the EuE(K100) site. The team therefore decided to disregard the constraints of the Cisco model, while retaining its positive features.

The team therefore needed to create their own methodology for ensuring that the EuE(K100) site was reusable. The first task in the construction of the site as a RLO was to break down the different parts of the EuE site into separate "chunks"; that is, to decide the parameters of each lesson that would have the facility to be transferable. Deciding the aim of each chunk was not only a useful process for identifying the different, autonomous, RLOs, but would also act as metadata. This is data that sits "behind" the module (i.e. it is invisible to the learner), which is stored in a database and provides information on that module. Metadata allows the nature and contents of each chunk to be easily identified. Therefore, a science lecturer who wishes to complement an online workshop on report writing in the lab with a section on paragraphs, may search the metadata from the EuE(K100) site for an appropriate module. The portable nature of the RLO then allows the module to be transferred easily into the new learning environment.

It was at this stage that any “joining” material was identified. Joining material is the additional material that sits “above” the chunks and makes a site specific and unique. In the case of the EuE(K100) site, this meant, for instance, the quiz that helps students decide what material they might find useful. This would obviously only be relevant for the EuE(K100) site, and could not be transferred as an independent module.

Other than the joining material, each chunk in the EuE(K100) site was stripped of references to other chunks. This was necessary to ensure portability. This also meant that the chunks were non-sequential (although different sections within a chunk may well follow an order).

The portability of the EuE(K100) site is complemented by its ability to be contextualised. This means that sections of subject specific text, examples or rules, can be “slotted” into parts of the site to make it more subject appropriate. To return to our science lecturer, she or he may well want to contextualise the EuE(K100) site, or any of the individual chunks, so that they refer to science-based examples, or rules or writing. Those areas of the site that can be contextualised are identified in the metadata.

Evaluating the EuE(K100) Site

The building of the EuE(K100) site has been closely related to the feedback we have received from students and tutors on both the original EuE site and on the developing new site. Once the new EuE(K100) site had been partially built, usability tests were again conducted on newly built elements of the website in order to assess the usability of specific sections. This second round of tests both confirmed the ease of use of the new interactive exercises, as well as helping to pin point areas that needed further development.

The completed EuE(K100) site is also to be usability tested by another batch of K100 students. As with the first usability test, these students will be asked questions concerned with the contextualisation of parts of the site to make it K100 specific, their learning experience, and the ease of use of the interactive exercises.

As well as usability testing the site with students, the researchers also sought the views of K100 tutors. Once the site was built, a group of tutors were sent a questionnaire that looked at contextualisation, interactive exercises, look and feel, and the site as a teaching tool. The response to the site was overwhelmingly positive, with all the responses commenting that it was useful having course specific text when helping students develop their writing skills. As one tutor explained, ‘because the topic is familiar they are not struggling or distracted by trying to understand the content. Instead they can concentrate on the study skills’.

Lastly, in order to demonstrate the site and show how it could be integrated into the teaching programme a number of staff development events for tutors were held in several of the OU UK regional centres. It was met with enthusiasm, one tutor commenting on their feedback form: ‘Having looked at the site I think it is just brilliant – a great resource for both tutors and students alike’.

Conclusion

This project has been successful in building a model with a number of innovative features. It is a model that can be used for large numbers of students, since it can be customised relatively cheaply and easily. This makes it invaluable for large institutions, and for institutions that cannot provide much face-to-face tuition. The ability for the model to be re-used a number of times make it extremely cost effective: once the template has been created, there is minimal expense and expertise in making it faculty specific. Moreover, substantial research into interactivity and online learning has ensured that the model is pedagogically sound. Since only one template needs to be built, this ensures standardisation and quality across the institution.

The overriding aim of this project has been to create a principle that the OU UK can use with other sites. The project has recognised that there is a need in large, distance learning institutions for web-based study skills development. Moreover, it has also recognised that to be cost effective, pedagogically sound and quality assured, these toolkits are best researched and built the once, and then tailored to be faculty specific. In this way, one basic site can be said to fit a variety of contexts and academic areas.

References

1. ALEXANDER A. & BOUD D. (2001) *Learners still learn from experience when online* in J. STEPHENSON (ed), Teaching and learning for New Technologies, (London: Kogan Page)
2. CISCO SYSTEM INC. (2000) Reusable Learning Object Strategy: Definition, Creation Process and guidelines for Building, Vol. 3.1 http://www.cisco.com/warp/public/10/wwtraining/elearning/implement/rlo_strategy_v3-1.pdf
3. DOYE Z. & JOHNSON M. (2002) The contextualisation of web based learning skills material: usability testing the effective use of English website (Open University Internal Report)
4. GOODWIN V. & BISHOP J. (1999) *Revision and Examinations*, (Milton Keynes: The Open University), http://www3.open.ac.uk/learners-guide/learning-skills/
5. HAYES N. & BROADBENT D. (1988) *Two modes of learning for interactive tasks*, Cognition, Vol. 28
6. JOHNSON M. & GOODWIN V. (1999) *Effective Use of English*, (Milton Keynes: The Open University), http://www3.open.ac.uk/learners-guide/learning-skills/
7. THE OPEN UNIVERSITY (1999) K100: Understanding health and social care (Milton Keynes: The Open University)
8. THE OPEN UNIVERSITY (2002) Plans for change: the university's strategic and development plans 2000-2012 (Milton Keynes: The Open University)
9. THE OPEN UNIVERSITY (2003) Learners' Guide, http://www3.open.ac.uk/learners-guide/learning-skills/index.htm
10. POLSANI P. R. (2003) *Use and Abuse of Reusable Learning Objects*, Journal of Digital Information, vol 3(4) http://jodi.ecs.soton.ac.uk/Articles/v03/i04/Polsani/
11. REEVES T. C. (1998) *A model of the Effective Dimensions of Interactive Learning on the World Wide Web*, http://it.coe.uga.edu/~treeves/WebPaper.pdf
12. SCHAR S. et al. (2000) *Interaction for Computer-Aided Learning*, Interactive Multimedia Electronic Journal of Computer-Enhanced Learning, Vol. 2(1)
13. SMITH G. (2001) *Interaction Evokes Reflection: Learning Efficiency in Spatial visualization*, Interactive Multimedia Electronic Journal of Computer-Enhanced Learning, Vol. 3(2)
14. STEFIK M. J. & CERF V. G. (1997) Internet Dreams: Archetypes, Myths, and Metaphors, (MIT Press)
15. SWELLER J. (1994) *Cognitive load theory*, Learning and Instruction: The journal of the European Association for Research on Learning and Instruction, Vol. 4(5)

SHARING TEACHING RESOURCES IN THE SPANISH GROUP 9 (G9) OF UNIVERSITIES: LEARNING FROM EXPERIENCE

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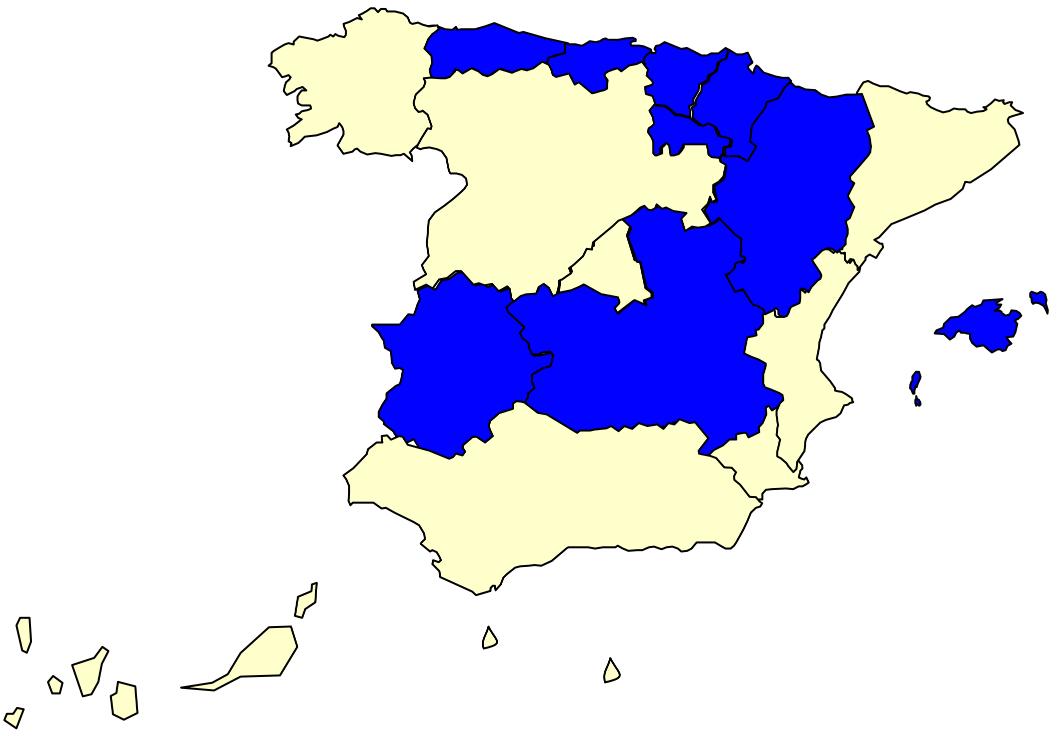
Introduction

This presentation resumes the experience of Shared Virtual Campus, carried out by 9 universities in Spain, the reflections about the above mentioned experience, develop in the group that leads this project and exposes the results and the lessons learned. The policy of carrying out collaboration between universities of the same state and putting in motion actions based on sharing training resources in virtual environments, it allows us to get an overall view of how the transnational collaboration between universities of different states will be, when qualifications are normally organised through a virtual way.

Description

The Group 7 of Universities was founded on the 16th of May 1997 and was finally transformed into the G9 with the incorporation of two new universities; the main goal of the group was to support joint actions to improve the contribution to cultural, technological, and scientific development of our society. The above mentioned group covers the zone that appears in the enclosed map of Spain and it has about 239,000 students enrolled, with a potential of approximately 18,000 professors.

Among the diverse actions developed by this group of universities constituted in the network, we emphasize a set of initiatives related to the use of the Computing and the Communication Technologies (ICT) for improving teaching. Since the foundation of the group, it was clear the convenience of exchanging and to sharing teaching through the systems of Virtual Campus of every university. The need of having more accessible and more flexible educational resources, the need of integrating the use of ICT in teaching and the need of fitting university teaching to the information society has led the university members of the G9 to build a Shared Virtual Campus with different projects in this environment among the ones we emphasize:



Shared subjects

The shared subjects are a set of subjects that are offered in virtual way to all the students of the G9; any student of any university of the G9 can be registered or enrolled in those subjects and study it through the Virtual Campus of each university. So, students and faculties make a super virtual community that allows them learn and teach even they do not belong the same university; we can say that this has proved as a very powerful way to build a mega virtual community able of breaking down the space barrier. We think this is a previous step and a positive experience in order to prepare other collaborative exchange with European universities in the draft of European Space of Higher Education (ESHE) such as is planned in the Bologna Declaration.

This exchange began in the year 1999-2000 with 4 shared subjects for all the universities. Currently the Shared Virtual Campus of the G9 of universities receives 42 subjects and manages more than 2235 students. Forecasts for the year 2004-2005 are: 54 shared subjects; this assumes the maturing of the experience acquired these last few years, but at the same time present some questions and worries about the project.

Faculties in network

It is a program with 14 projects of shared teaching between professors of different universities carried out through systems of videoconference and learning materials distributed through internet. The aim of this program is to test mechanisms of joint training actions in order to share and to exchange resources using the means of ICT. In this experience a group of faculties from different universities reach an agreement in order to teach a subject or a course mainly through videoconference; every faculty expound a part of the program and it is watched by all the students enrolled in the subject in the different universities. So, all the students enrolled in the same subject share differents faculties of different universities. Faculties could use repositories in the Virtual Campus for sharing learning resources, bibliography, etc. and students can reach them, if necessary through the Internet.

Faculty's shared training for the use of ICT for teaching in university

The role of the faculty is changing, focusing on the functions of the guide, counselor, advisor and facilitator to the students of resources and tools for learning. All of this implies better professional preparation, support services and professional help in order to allow faculties to develop themselves as professionals.

Along these lines the Universities of the Group 9 of Universities have begun to exchange and to share resources for training and to take measures of training in virtual format. Currently a course is being designed that will permit the faculty to enlarge its competences and skills in this issue. This course will be offered through internet as a distance course for all the faculty members of the G9 Group of universities. Topics allow faculties to deep in the concept of e-learning, the role of faculty in tne new scene, tips for doing better teaching in virtual environments, steps for planning teaching, assessment of virtual learning and main tools for use in virtual environments.

Postgraduate qualifications

The subjects offered permit the configuration of coherent training itineraries; students can choose a set of subjects that are not related between them or to choose subjects that permit to go deeply into a determined area in order to reach the academic recognition; currently university qualifications to specialise are being offered in:

- e-business
- ICT in the teaching
- Ecology and sustainable development

Each of this training itineraries should be done in a minimum of two years and requires at least 250 hours and the university degree is recognized and confered by all the universities of the group. We do not have definitive data because this is the first year of the experience, but the answer of students to the proposal has been good and currently 12% of the total amount of students enrolled in this kind of courses are taking these itineraries.

Reflecting on the experience

The exchange of teaching in the Group 9 of universities and in flexible training actions in transinstitutional projects, has suggested to us that the cooperation in the use of ICT in teaching is indispensable for the universities due to the changes in a changing world.

These experiences mainly developed in studies of degrees, are intensifying this year in the studies of postgrade and doctorate. This implies new didactic situations, new environments for the student, and this is the reason why we are contemplating a combination of autonomous work; attend activities (in the conventional classroom or through videoconference); collaborative and group work; practical tutorial classes; telematic tutor and/or with local support, etc; all this implies that we should prepare our students and our professors to carry out the task.

For this reason our universities require:

- Infrastructures and special resources, thought and designed for the coordinated management in the application and interchange for the professional use of the ICT. It is the need to establish services that coordinate and centralize the management and to design and to develop efficient ways of coordination for an agile management of the Shared Virtual Campus.
- ICT training in order to guarantee that faculty are able to apply this knowledge in the professional teaching.
- A network of services and structures coordinated with the adequate and sufficient infrastructure to deal with the processes of integration of the ICT in the teaching between our universities.

These processes require a permanent updating highlighted by three key elements:

- Change and innovation (permanent projects of improvement of the human capacity, use of information and communication technologies, reformation of the processes, etc.)
- Connectivity (updating what we refer to has to be understood from an interinstitutional perspective, with projects coordinated, shared teaching, institutional consortiums, etc.)
- The institutional flexibility (new structures and functions inside/outside the institutions, evaluation of the quality and teaching improvement, etc.)

Due to this reflection about this experience and the proposals of improvement should be permanent.

Conclusions

It is considered that the university should socially lead the innovation of the educational and research system, with the purpose of providing quality to the services demanded by society. Currently this assumes an approach to the future of the possibilities of e-learning and of an adequate utilization of the technologies of communication in teaching and at the same time requires the organization of networks and powerful consortiums able to share the necessary resources of learning. An answer to this challenge has been the experience of the Shared Virtual Campus of the G9 universities.

THE SWEDISH NET UNIVERSITY AGENCY – NATIONAL AND REGIONAL PROMOTION AND CO-OPERATION CONCERNING DISTANCE EDUCATION

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Abstract

The Swedish Net University Agency finances national and regional projects promoting higher level distance education. The projects can be divided into three different categories:

- Projects for improvement of skills, and the development of national networks for university teachers and staff, e.g. video workshops and a network for language teachers,
- National help services such as on-duty librarian and study-guidance counsellor,
- Co-operation within educational programs.

This paper presents some of the projects which could be of international interest.

Introduction

The Swedish Net University is a partnership which is based on courses and education already given by or under development within Swedish higher education. Participation is voluntary and today 34 universities and university colleges are active. During the first year of its existence, 2002-2003, there was a 40% increase from 29,000 to 41,000 students attending courses within the partnership. With approx. 50,000 students in roughly 3,000 courses and 40 educational programs the Swedish Net University comprises almost 15% of the students in higher education in Sweden today.

The Swedish Net University Agency was formed on March 1st, 2002 to promote higher level distance education by financing different activities such as stimulating improvement in skills and competence among university teachers and staff, and promoting the development of distance education in areas where there is a national demand (e.g. mathematics, engineering, health care and teaching). The agency also runs and develops a web site where the courses and programs that form the Swedish Net University are presented (www.netuniversity.se). The outcome of all projects is publicly accessible.

1. Projects for improvement of skills and development of national networks

Video in net-based courses

There is a need for competence in producing videos for distance education in Sweden. Several universities have the technical resources needed but not the competence to produce videos, even on a small scale. This project was started to enhance competence within this area at all universities involved in the Swedish Net University, and facilitate for the universities to have courses for their own staff. The essence of it is a combination of journalism, academic knowledge and a combination of theory and learning-by-doing.

During 2003 around 100 university teachers/staff members were educated and approximately 50 videos for educational purposes were produced.

The Network for Information Technology in Academic Language Learning (ITAS)

The Network is open to all who are interested, who wish to exchange experiences, and to try new methods using IT in academic language learning. Those interested can become members by mailing to itas@humlab.umu.se, and thereafter will be included on the network's mailing list. New technology itself is used by the network in its various activities, so that network members have the opportunity to test and experience various aspects of the use of IT. The projects vision is that within the framework of the network, helped by new techniques and inspired by new methodologies, ITAS members and other interested parties can communicate in virtual and actual meetings. In a practical sense this manifests as online conferences, both in the HUMlab world in ActiveWorlds and in the form of live web-streamed media where those involved have the possibility to engage in the proceedings with the help of a chat platform. Under the Activities section of the ITAS site there is more information about these. The network is also connected to a multilingual discussion forum, which can be found at http://forum.humlab.umu.se/.

LRC – Learning centre on campus

The overall aim of this project is to support the development of Learning Recourse Centres (LRC) in institutions of higher education in Sweden. The objective is to identify benefits and characteristics of an LRC and furthermore to promote and stimulate the progress of new, and improved existing LRC's.

To reach these objectives a network for exchanging experience, discussing mutual problems and generating ideas has been formed. The network consists of representatives from ten higher educational institutions that already gained experience from developing the LRC concept. Questions, for example concerning advantages of different functions in an LRC and how to motivate the existence of one in the institutional context, are raised discussed and documented within the network.

The results achieved will later be distributed among institutions not yet familiar to the LRC concept to further promote the establishment of new ones.

2. National help functions

Librarian on duty

To support flexibility for e-learning students, the Swedish Net University has launched a "Librarian on duty" (http://hj.se.cb.docutek.com/vrlplus/homepage/default.asp), which is a chat service for search help and information searching guidance. You can chat synchronously with a reference librarian Monday to Friday 6 pm-10 pm and Saturdays and Sundays between 1 pm and 5 pm. The system includes a function where the librarian can actually load your web pages onto his/her computer and help you by controlling the mouse function in your system. The service is maintained by 15 universities today. The long term aim is to provide a virtual library which is open 24 hours a day, seven days a week. The system has so far been successful, and has a good chance of becoming a national standard for the more than 1,300 Swedish libraries.

Study guidance counsellor on duty

A national study guidance counsellor on duty service was established for students on the net. Guidance is primarily carried out by e-mail correspondence and telephone, but web-cam and video-conferences are also used. Communication with so called Learning centres is especially well suited for the use of video conferences.

A network for educating study guidance counsellors in using web-cam's in their work with distance students is also supported by the agency.

Net-based examination

Is it possible to carry out examinations on the net, with retained quality and security?

The project will:

- Carry out a survey of how universities have solved legal issues concerning net based examination.
- Identify common problems.

- Present good examples in a common database.
- Facilitate co-operation between different universities concerning these questions.

3. Co-operation within educational programs

Although the universities that constitute the Swedish Net University are competing for students, there has been a growing awareness of the need for increased co-operation within courses and programs. Today around 100 of the 3,000 Net University courses are given by 3 or more co-operating universities, and joint educational programs in *e.g.* business economics, mathematics, teacher training and nursing are planned.

The agency is currently a financing partner in the development of 6 educational programs and finances 3 pre-development surveys, of which some are presented below.

Electric and computer engineering

A complete, three year electric and computer engineering program was launched in the autumn 2003 (www.ingonline.nu). The program is given jointly by 8 universities. During their first year, the students will have had courses at 5 different universities.

All courses have the same communication platform (LMS), but virtual labs and lectures are held in different LMS systems.

This is a pilot project in Sweden and many structural, economical and pedagogical problems have been exposed. It is hoped that other joint projects that are going to be launched can benefit from the experiences of this program.

Co-operation and networks for teacher training programs

The agency has launched a survey of all net based higher level education for teachers to identify in which areas (subjects) it would be nationally beneficial with increased co-operation. Some areas, where there has been an obvious deficiency in the supply of teachers have already been identified and a number of the projects dealing with these are presented below:

- A vocational teacher training program is planned involving co-operation between 5 universities.
- There is a shortage of languages teachers in first and second grade schools (except in English and perhaps in Spanish). A pilot project dealing with a teacher training program in Arabic has therefore been launched. Programs for German and French teacher training will probably also be financed if the evaluation of the Arabic program is positive.
- As net-based education has increased enormously in Sweden during the last few years, the urgent need for improvement of skills in ICT for teachers at all levels has been obvious. A masters educational program concentrating on ICT-supported distance education will be launched in the autumn 2004.

Net-based education in healthcare, medicine and nursing

As within the teacher training programs there is a project established which has begun compiling all net-based higher level education within the areas of healthcare, medicine and nursing. This project will be based on the needs of courses and resources in relation to the access. The result will be used as a foundation for further discussion concerning co-operation between universities, but there are a number of co-operation projects that have already started e.g.:

- coordination of specialist training for nurses,
- a national in-service training program for instructors of ophthalmology nurse specialisation,
- net-based education for school nurses,

- a project for planning a masters educational program for teamwork in home nursing (a co-operation between five universities).

Discussion and conclusions

One of the main problems that the increase in net-based learning and increased cooperation has put focus on is the money flow between the institutions of higher education. In Sweden higher education is free of charge and the universities get money from the government based on the number of students and the throughput. There is although a maximum funding level which many of the faculties, and also universities, have reached. The possibility to "sell" students to the universities which not has reached that level has been brought up and the increase of net-based education during the last two years has made it possible. The development of learning centres on campuses will also probably increase the incitement for cooperation between universities as other universities courses will be more easily accessible. Another important aspect that has been exposed is the possibility for students to be given credit for education when they change institute of higher education. As the educational programs differ between the universities and between different subjects it is not possible to reach a national consensus. Here the Agency as a neutral arena has played as important role to enhance cooperation. The financing of subject specific networks is also one of the main success strategies which have made it possible for several of the Swedish universities to cooperate within educational programs despite initial difficulties.

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OPEN UNIVERSITY IN FINLAND

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In Finland, the Open University system was founded to promote educational equality. There are 20 universities in Finland, 19 of which offer Open University education. The principles of Open University are accessibility and equivalence with basic university studies. Accessibility means that tuition is open to everyone, regardless of their educational background and educational targets. Equivalence means that the studies correspond to university studies on the basic level and can be accepted as credits toward a degree. However, one cannot pursue a degree in the Open University.

Students can enrol for individual courses or pursue a study unit in the Open University. Most of the course selection includes basic studies in different subjects, but there is more advanced tuition in many subjects. The course selection also includes general studies, language courses and courses supporting studying. The most popular Open University subjects have been education, social sciences and humanities, but in recent times the open university provision has expanded to include engineering, natural sciences, economic sciences and arts.

The lectures take place in the evening and on weekends, so that as many as possible might participate in the studies. Studying at the Open University is part-time and general in nature and, therefore, students are not entitled to financial aid or other social benefits for students.

There are 5.2 million inhabitants in Finland, 174,000 of which are enrolled in actual universities. Every year, some 85,000 students participate in courses offered by the Open University. The universities arrange almost two-thirds (63%) of the Open University teaching, and the rest is done in co-operation with other educational institutions (Figure 1). A special feature of the Finnish Open Universities is its extensive coverage outside university towns. Open University tuition is given in over 600 educational institutions outside university towns. The large size of the country and its sparse population have placed special demands on the educational arrangements. These have been a factor in reaching an internationally high level of distance and eLearning in Finland.

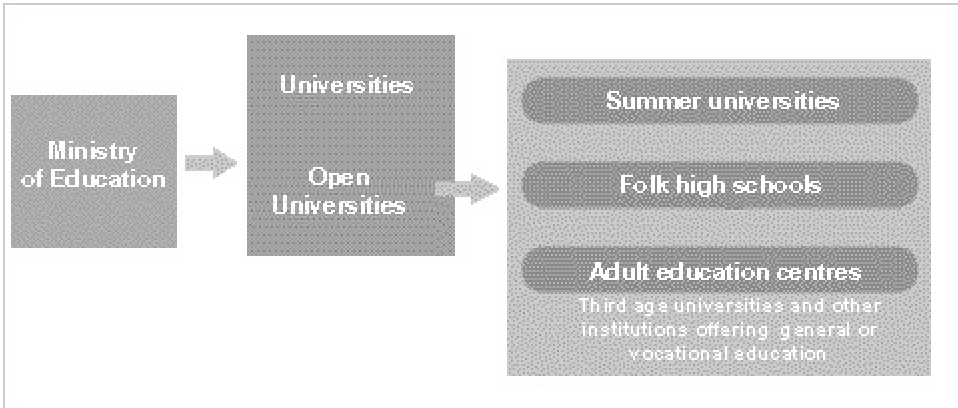

Figure 1. Co-operation network

As stated above, 19 universities in Finland offer Open University education either themselves or in co-operation with other educational institutions. The range of education is vast, approximately 13,000 courses. Most of the teaching takes place in the classroom, but 20% of it is open and distance learning and 7% is eLearning. The Internet is increasingly used to support studies; enrolment takes place over the Net, the Net contains study materials and forums for students etc. Open Universities also offer televised courses in co-operation with the Finnish Broadcast Company (YLE).

One of the special forms of Open University is University of the Third Age. Nine universities offer courses for this, and there are over 13,000 students annually. The Open Universities also offer Studia Generalia lectures, open and free to the public.

The Open University system is quite decentralised in Finland. It is important, however, to any prospective student of Open University that basic information on studies and the course selection can be found in one central place. For this purpose, the Network Service of Finnish Open Universities was set up six years ago.

The Network Service of Finnish Open Universities (www.avoinyliopisto.fi)

Our network service has been very popular from day one. The site has over 440,000 page requests a month. The busiest time is in August, when enrolment for Open University courses begins, with over 800,000 page requests.

The site is maintained and developed by a team of experts representing three universities. The University of Helsinki coordinates the project, which is funded by the Ministry of Education. For the past three years, the network service has been a part of the Finnish Virtual University.

The service is offered in both Finnish and Swedish, Swedish being the second official language in Finland, spoken by 6% of the population. A limited English version is also available.

The main sections of the network service are: Introduction to Open Universities, Courses, Guide to studies, Libraries and information search, Topical issues and Feedback.

The site introduces the main principles of Open University studies. All Finnish Universities, as well as Open Universities, have their own, informative sites. Their links appear on this site.

The pages featuring the Courses are the most important and most used part of the service. They contain all 13,000 Open University courses in Finland. The database contains information of the courses on the following issues:

- university, discipline, subject
- the instance implementing the course and location
- time and location of teaching
- price
- enrolment
- description of studies
- the methods of completing the courses
- examinations
- set books
- teacher
- guidance and advice services

You can retrieve information sorted by the university, the faculty or the place, and there is an advance search as well as word search. With the data from the database, the student can easily find and compare courses offered in different Open Universities. The courses are entered into the database from each university, and all Open Universities have people who update the database regularly. There are 350 people who do this, and another 100 people in the co-operating educational institutions. The updaters are trained and have a guide in the Internet. The Open Universities retrieve the course information from this national database, which lessens their workload. The information is entered into the database just once and is then available for all kinds of searches.

The Study Guide contains general information about studying and learning and plenty of practical advice on learning situations. This section serves students planning their studies, as well as enrolled students, and offers information about opportunities to continue studies. Study guidance and counselling are available in different forms: one can either look at the material on the web or request personal guidance either through the Net or by telephone. The students can also build their own portfolios in the Net, and have a guidance counsellor from the web services help them.

Frequently asked questions have been published on one page, and there is a glossary of Open University terms. The Topical issues section presents articles on the Open University activities and educational supply nation-wide. Both students and Open University staff can send their suggestions for news subjects using a virtual form.

The section about the Libraries and information search tells about methods and instruments of information search and management. The aim is to prepare the student to use library services, effectively and independently retrieve information and be able to judge the suitability of different information sources. Students can also take advantage of a glossary that contains the central terms and their definitions related to libraries and information search.

From the very beginning, research has been an integral part of developing the network services. A researcher has been working closely with the experts developing the service. Research objects have been set, and the results utilised in improving the service.

The network service users are active in giving feedback. They comment on the site both via the feedback form and by e-mailing the study counsellors. Very often they praise the clarity of the site. The visitors also like that all information on Open University studies can be found in one place.

Future of the Open University

Finally, a few words on the future of Open Universities in Finland. The law governing universities is being amended. This will have an effect on the way the open universities operate. The amended law suggests that the universities' tasks include teaching and research, as well as emphasis on the interaction between the universities and society. Accordingly, the universities should increasingly interact with the surrounding society and promote the dissemination of research results in society. Open Universities have always practised the principle of regional and educational equality. With the new Universities Act, this task of the Open University will be even more significant.

Switching to a two-tier structure in university basic degrees is considered important for the international comparability of degrees. It is hoped that the reform will shorten graduation time, which in Finland is rather long by international standards. This reform process will mean new tasks for the Open Universities.

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UNIVERSITIES OF APPLIED SCIENCES: A NEW FRONTIER FOR ELEARNING?

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Introduction

In this paper we present some preliminary results of a study on the adoption of eLearning[1] in the Universities of Applied Sciences (UAS) in four selected European countries (Germany, Finland, Netherlands and Switzerland). The adoption of eLearning within Universities has been widely studied in order to identify the trends and to design models and future strategies (Coimbra Group 2002, Collins & Van der Wende 2002, Phipps & Merisotis 2000). Unlike the university sector, the UAS sector has been almost neglected in the analysis of eLearning in higher education, probably because UAS are not present in all countries and account for a small share of university students. Yet, in countries like Germany or the Netherlands, UAS enrol from 1/4 to 2/3 of all higher education students; moreover, these schools differ significantly from universities in their mission, organization and curricula. Thus, the aim of this study is to inquire if there are models of adoption of eLearning specific to the UAS and how these are related to the mission and organization of these schools; moreover, we want to assess if (and how) national specificities in the organisation of the UAS sector impact on the use of eLearning. The paper is organised in four sections. In the first one, we shortly introduce to the role of UAS in higher education and we present the situation in the four selected countries. It follows the description of the design and methodology of our study and some preliminary results on the German and Swiss case. Finally, we draw some preliminary conclusions and a further hypothesis to be tested in the follow-up of the study.

Binary Higher Education Systems

We define Universities of Applied Science (UAS) as tertiary education organizations releasing university degrees (ISCED 5A[2]), but with a prevalent professional orientation[3]. In most cases, these degrees do not grant access to doctoral education, even if in some countries UAS graduates can switch to university programmes and achieve there a further degree. Even if schools corresponding to this definition exist in almost all countries, it is only in some of them that the UAS sector has become institutionalized as a "second" university sector with a distinctive identity and function in tertiary education and collecting a large share of higher education students; we speak in these cases of a "binary" higher education sector (Huisman & Kaiser 2001). The best known example are the German Fachhochschulen, other cases are the Hogescholen in the Netherlands, the Polytechnics in Finland and Fachhochschulen in Austria and Switzerland. Teichler (1988, 2001) identifies the major differences between UAS and Universities in the type of institutions, the type of programmes (e.g. academic vs. professional), the duration of programmes (years of study, credits, etc.) and the variations in reputation and prestige within formally equal institutions and programmes. The distinction is also associated in some countries to a restriction of the research function to the university side or to distinctive admission and selection procedures and different funding models. However, it is important to notice that there is a considerable degree of overlapping between the two sectors in their educational function and that

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[1] In this paper we will use the term *eLearning* as it is defined by the Commission of the European Communities: "the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration" (CEC 2001: 2; website: europa.eu.int/comm/education/elearning/index.html).

[2] International Standard Classification of Education (UNESCO 1997).

[3] Various efforts were made for naming this second sector of higher education emerging in Europe since the 1960s. Various terms were chosen: "Short-cycle" higher education, "Non-university" higher education, "The alternative sector" of higher education, "Vocational" higher education, "Professional" higher education, "New" higher education institutions or programmes, the "college sector", a list of names of national types, e.g. the "polytechnics", "Fachhochschule", etc. sector. (Teichler 2001).

UAS tend to try to get an university status ("academic drift"; Huisman & Kaiser 2001), a phenomenon which in the UK led to the merging of the UAS into the university sector. To the other hand, to upgrade professional tertiary education some countries have created in the last years a large UAS sector through reforms of existing professional schools (Finland: 1990; Switzerland: 1995).

Four case studies

Below we briefly outline the educational systems of the considered countries (Germany, Finland, Netherlands and Switzerland). Some data and information are given to appreciate differences between countries and between the university and the non-university sector. Table 1 summarizes some basic data for these countries.

Table 1: Data on national higher education systems

	UAS	Universities	n. of students in UAS (1000)	Share of UAS students[4]
Finland	29	20	59	29%
Germany	152	92	436	24%
Netherlands	50	14	290	65%
Switzerland	7	12	22	19%

Source: Huisman & Kaiser 2001; Eurydice; Ministries' websites.

- *Finland.* The Polytechnics (AMK-Ammattikorkeakoulu) were created gradually during the 1990s and nowadays form a professional higher education sector, which operates alongside the university sector (OECD 2003a). There are 29 UAS and 20 universities. The universities are run by the state, while UAS are either locally or privately run. In the latter case, local authorities have founded private companies to run an UAS. Because of the regional nature, most of the publicly owned polytechnics are run by municipal federations (Huisman & Kaiser 2001). Polytechnics usually offer education in a number of different fields and students complete higher education degrees with a professional emphasis: the starting points for the development of these degrees include the requirements and needs of working life and the degrees qualify for different expert functions in working life. The minimum and maximum duration of polytechnic degrees are mainly three and four years respectively. In addition to education leading to polytechnic degrees, polytechnics organise adult education. They can also carry out research and development work that serves polytechnic education and supports working life (Eurydice 2004).
- *The Netherlands*. The Netherlands has 50 Universities of Professional Education (UAS) and 14 universities, one of which is an open university offering distance education. There are some differences between the two sectors of the Dutch binary system. Three elements stand out: differences in entrance qualifications, the exclusive basic research function of the universities (including the right to award PhD degrees), and variations in the degrees awarded. In some respects there are also similarities: the length of programmes is, for instance, rather similar in both sectors (the standard is still four years). Furthermore, professionally-oriented programmes are offered both by universities and UAS. They are allowed to perform research activities, but the size of contract research activities is relatively small. The total government budget for the UAS in 2000 is 2,728 Mfl and for the universities 5,613 Mfl. UAS institutions can now also offer UAS master's degree courses that are recognised by law. All bachelor's and master's courses must be accredited by the Netherlands Accreditation Organisation (NAO). However, universities will usually require holders of such degrees to complete a bridging programme (Eurydice 2004).
- *Germany*. In 1998 in Germany 344 institutions of higher education existed. The non-university sector consists of Fachhochschulen and colleges of public administration (Verwaltungsfachhochschulen). Fachhochschulen offer highly practice-related training for

[4] Over regular students in universities and UAS.

occupations which require the application of scientific findings and methods of artistic ability. Above all, they offer courses in the fields of engineering, economics, social studies, agriculture and design. The study courses are shorter than in the university sector. In some Länder, Fachhochschule graduates have direct access to doctoral studies at universities. The colleges of public administration are a special type of Fachhochschule in which civil servants are trained for careers in the higher levels of the civil service (Huisman & Kaiser 2001).

- *Switzerland.* The seven Swiss universities of applied sciences have been created in 1995 through a new law decided by the Parliament (OECD 2003; Confédération Suisse 2002; Conseil federal 1994) by grouping existing tertiary professional schools in the domains of technology, economy and architecture. UAS are Cantonal schools (or based on agreements between Cantons where they cover different cantons), but the federal act on UAS defines the basic rules for the sectors and the Confederation is responsible for the accreditation of the curricula; financing is shared between the Cantons and the Confederation. The process of restructuring and accreditation of these schools is still in development, especially for some UAS covering large geographical regions and divided in many educational establishments (Commission fédérale des HES 2002). While some schools already developed a unitary strategy and organisation, others are still largely the grouping of almost independent establishments with little central power. UAS deliver a bachelor degree after three years of study; in many domains, curricula for students working part-time are also offered. Moreover, these schools are very active in vocational education. With the introduction of the Bologna model, UAS will also develop professional master studies recognised by the state. Students access to UAS through a professional secondary diploma, which doesn't give access to universities; in some domains, like informatics, UAS degrees can access to the corresponding university curricula, but acquired credits are recognized only partially. Since the reform, UAS have also received an official mandate for applied research and technology transfer and are thus seen as a major actor in regional development and cooperation with SMEs.

Outline of the research

This research is part of a wider research program developed at the New Media in Education Laboratory of the Università della Svizzera Italiana (www.newmine.org) on the adoption of eLearning in higher education in European countries. The major aim is to identify the distinctive patterns in these organizations and to link them both to the characteristics of each higher education system and to the specific features of each organization. This will reveal the main factors influencing the use of eLearning in higher education, will enable to identify the most promising opportunities and to design suitable support programs at the national level. In a first phase, we have studied the use of eLearning in Swiss and European universities. We firstly realized a benchmarking study on eLearning activities in the four motors of European regions (Baden-Württenberg; Catalunya; Lombardy; Rhône-Alpes), as well as in Switzerland (Cantoni, Lepori & Succi 2003); afterwards, we carried out 26 interviews to universities in these regions, including all Swiss universities. The results are presented in a report delivered to the Swiss Virtual Campus Program in autumn 2003 (Lepori, Cantoni & Succi 2003, Lepori & Succi 2003)[5]. The work presented here will extend these results to the UAS domain. The aims are to operate a first assessment of eLearning introduction in the UAS, to compare the situation between countries and to identify some best practices at the organisation's level. At the political level, the objective of the study is to identify the development potential of eLearning in UAS and to prepare recommendations for a support strategy of the Swiss government[6].

To this aim, we firstly selected four countries, where the UAS sector is clearly defined and distinguished from the university sector and accounts for a large share of university students (see Table 1). Through the analysis of official documents and research reports, we produced a short outline of each national higher education sector, as well as a more precise description of the UAS. In the next

[5] This activity was financed by the Swiss Virtual Campus Programme.

[6] The study is financed by the Swiss Federal Office of Professional Education and Technology (www.admin.ch/bbt), which is in charge of the coordination and development of the UAS sector and, in particular, coordinates the implementation of eLearning in the Swiss UAS as a part of the Swiss Virtual Campus programme.

phase, we select for each country some cases of UAS being particularly active in eLearning, through analysis of web sites and consultation of experts. Each UAS is then visited by the research team and an interview with the person in charge of eLearning (or leading a large eLearning project) is performed. The interview focuses on the following main subjects: eLearning adoption, objectives and strategies, organisation, funds and future scenarios. Further, a national report is prepared and sent back to our correspondents for further comments and integration. Finally, we will prepare a synthesis report comparing the four countries and summarizing the main findings. The report will also provide advice to the Swiss federal government on how to implement an eLearning strategy for the UAS sector.

Preliminary results

In this section, we present the preliminary results of our work concerning two of the four countries, i.e. Switzerland and Germany. The interviews in all the countries will be completed until June 2004, while the final report will be available in autumn 2004.

Switzerland

In Switzerland, the development of eLearning in the higher education sector has been promoted through the Swiss Virtual Campus Programme (www.virtualcampus.ch), which was launched in 1999 and was financed by the Confederation. In its first period (1999-2003), the programme has supported 50 large projects aiming to develop on-line courses in universities (Lepori & Rezzonico 2003). UAS coordinated 12 projects, participating as partner to other 11 projects; thus their participation to the SVC was well above their share in the number of higher education students.

At the same time, the Federal Office for Professional Education and Technology (OPET) launched a specific program for UAS, supporting small-scale developments targeted to improve the quality of UAS education (Creatools: www.creatools.ch). Thus, there is a relatively large number of eLearning activities and, due to the decentralised nature of these programs, all UAS have benefited from these experiences. Our first interviews show that these activities are quite dispersed and that there are very few centres achieving a critical mass to sustain the development of eLearning after the end of the support programs. Many projects are the creation of a single teacher interested in the domain and only in rare cases these are supported by a strategy at the level of the school. However, there are some positive exceptions like the Italian-speaking UAS of Ticino (www.supsi.ch) and the UAS in Basel (www.fhbb.ch), which developed a well-defined strategy to adopt eLearning for supporting existing curricula. A special case is the distance UAS in Brig (www.fernfachhochschule.ch), which was created in 1995 and recognised from the Confederation in 1998. This school has received accreditation from the Swiss government (and, thus, can deliver Swiss diplomas) and has been recently integrated in UAS of Ticino. The organization of the UAS sector in Switzerland is the main responsible for this situation. With a few exceptions, the merging process of the existing schools in the seven UAS is far from being concluded and the development of a unitary strategy is still at its beginning. Most schools are also restructuring radically their organization. At the same time, the individual schools are in many cases too small to have an eLearning centre. To correct these structural weaknesses, the OPET will finance in the years from 2004 to 2007 the creation of a support centre in each UAS. While in some cases a suitable solution has been already found (like in the UAS of Ticino which created a joint support centre with the university), the UAS dispersed across different cantons are facing difficult (political) decisions to locate this centre and to make all schools profit of it. However, the general opinion is that the Swiss context creates very interesting opportunities for the use eLearning in UAS, especially in three areas:

- firstly, to support regular students through on-line materials and tools; this is particularly important for part-time study, where students need flexibility in their organization of time; part-time study is widespread in some UAS domains like economics, arts or social work.
- secondly, to develop professional master studies through cooperation between different UAS. In the wake of the introduction of the Bologna model, Swiss UAS should introduce some master studies starting in 2007/8. However, in most domains, the small number of students will require cooperation between different schools (or with the universities). Blended learning courses, with a large distance part, could be a very suitable solution in this context.

- thirdly, to extend the offer of adult education courses. Adult education is a very important part of UAS activities, but the market is in many cases limited by geographical constraints. Some experiences in the Swiss Virtual Campus have demonstrated that blended courses (reducing strongly the number of face-to-face meetings) can attract new students at a cost comparable to presence courses (MACS project; http://virtualcampus.supsi.ch/macs/). Adult education is an interesting opportunity for UAS since it fully covers its costs, including general costs of the school.

Our (preliminary) conclusion is that thanks to the experiences in the last years competences have been developed and possible application domains have been identified; however, most schools have yet to find the way to consolidate these experiences and to integrate them in structures with a sufficient critical mass.

Germany

The Federal Ministry of Education and research (BMBF) has funded many projects on eLearning, following the EU policies and foreseeing its strategic role in the higher education sector development. The programme New Media in Education (http://www.medien-bildung.net) has been financed with 267 Mio € for the period 2000-2004 of which about 220 Mio € are dedicated specifically to higher education. Another 100 Mio € are estimated to be contributed by the German Bundesländer (states) to eLearning promotion activities. The German academic context has also fostered the diffusion of distance degrees, mainly in the East area; in the ’60 this movement led to the creation of the FernUniversität Hagen (Guri-Rosenblit 1999). Thus two different approaches to the introduction of new technology for education have developed. In the first case eLearning is introduced in presence universities in order to improve face-to-face lessons, testing new tools and multimedia supports. In the second case, distance institutions are converted to eLearning, digitalizing materials and adopting Internet to enhance communication between students and tutors.

In the UAS area there are three institutions delivering an online distance degree[7] the Virtuelle Fachhochschule (VFH; www.oncampus.de), the ZFH-Zentralstelle für Fernstudien an Fachhochschulen (www.zfh.de) and the FHOOW (Fachhochschule Oldenburg/Ostfriesland/Wilhelmshaven). The first two cases are particularly interesting, since they represent and attempt to develop distance degrees building on existing presence schools:

- the Virtual Fachhochschule (www.oncampus.de) was one of the largest projects financed by BMBF, receiving 22,5 M euros and involving at the beginning 10 UAS. The VFH is now a consortium of 7 UAS lead by the Fachhochschule Lübeck; they developed two full degree programs (Media & Computing and Business Engineering) that are entering in the 5h semester of life with almost 700 participants. While students are still enrolled in one of the partner UAS, the VFH is going towards the model of a “virtual” UAS, where each program is managed by its own faculty council (composed of representatives of the partner schools); a financial transfer mechanism has been also set up to account for the services provided by each partner.
- the Zentralstelle für Fernstudien an Fachhochschulen is a service organization of the Länder of Rheinland-Pfalz, Saarland and Hessen supporting the development of distance and online degrees in 13 UAS of the regions. They offer 11 distance professional degrees, among which a master in Business Administration and an online program in social work (www.basa-online.de). In this model, students enrolled in one of the UAS participating to the program, while presence activities and tutoring are organized independently by each school; however, course materials for self-study and exercises are shared through a platform managed by the ZFH, which is partly financed by the Land and partly by the UAS participating to the project.

Both cases are examples of how existing UAS can take advantage of eLearning to offer new degrees through cooperative arrangements, allowing for sharing of contents and of technological resources. They show that the ability to negotiate suitable institutional agreements, rather than content or technical issues, is a central issue for the development of eLearning in existing higher education institutions.

[7] Fernstudienangebote in der Bundesrepublik Deutschland (www.zfh.de/fernstudium/andereangebote/staatfh.pdf)

However, our interviews show that the institutional context of higher education in Germany is not particularly favorable to these developments. Firstly, German higher education is still largely based on the Humboldtian model, providing for a close connection between research and education and emphasizing the direct relationship between teacher and students. Secondly, higher education in Germany is considered almost as a public service and students' fees are very low: unlike in the Anglo-Saxon countries, the development of new programs is thus financially not interesting for German UAS. Finally, German UAS seem not very open to the adult education market, where opportunities for eLearning programs seem more interesting.

Conclusions

There are some interesting remarks emerging from the work done until now. Firstly, UAS are important actors in the development of eLearning in higher education and, actually, their role seems to be greater in the two examined countries than their share of higher education students. Secondly, UAS seem to have some advantages over universities in introducing eLearning: they offer mostly technical curricula, where the subject seems to be more adapted to distance education and to standardization of contents than in humanities and social sciences. These schools are younger and less stuck to an academic model than universities and thus more prone to experiment new forms of delivery. For the same reason, collaboration and joint offer of curricula seems less difficult than in universities, as the German case shows. Thirdly, there are clear signs that specific features of national systems strongly influence the adoption of eLearning: thus, eLearning seems to be more interesting for the Swiss UAS than for the German ones, thanks to their involvement in adult education and in part-time curricula; however, the decentralised structure of many Swiss UAS largely impairs the creation of centres having a critical mass to support long-term developments.

It will be the task of the rest of the study to complete and to enlarge these remarks, towards a systematic analysis of the relations between the characteristics of the national higher education systems and the models of adoption of eLearning.

References

1. CANTONI L., LEPORI B., SUCCI C. (2003) *European Universities managing quality in eLearning*, In A. Szücs, E. Wagner & C. Tsolakidis, Conference Proceedings, EDEN 2003 Annual Conference, Rhodes, Greece
2. CEC (2001) Communication from the Commission to the council and the European Parliament, The eLearning Action Plan: Designing tomorrow's education, COM(2001)172, Brussels, 28.3.2001
3. COIMBRA GROUP (2002) European Union Policies and Strategic Change for eLearning in Universities, Brussels
4. COLLINS B., VAN DER WENDE M. (2002) *Models of technology and Change in Higher Education,* CHEPS, Toegepaste Onderwijskunde, 2002 (website: http://www.utwente.nl/cheps)
5. COMMISSION FEDERALE DES HES (2002) Rapport sur la création des Hautes écoles spécialisées suisses, Berne (website: http://www.swiss-science.org/_peerreview/f/fh2_01.htm)
6. CONFEDERATION SUISSE (2002) La politique de l'éducation tertiaire suisse. Rapport national de la Suisse, Berne
7. CONSEIL FEDERAL (1994) Message relatif à la loi fédérale sur les Hautes Ecoles spécialisées du 30 mai 1994, Berne
8. EURYDICE (2004) The information Database on Education systems in Europe, (website www.eurydice.org)
9. GURI-ROSENBLIT S. (1999) Distance and Campus Universities: Tensions and Interactions, Pergamon, Paris

10. HUISMAN, J. AND KAISER, F., EDS. (2001) *Fixed and Fuzzy Boundaries in Higher Education; A comparative study of (Binary) structures in nine countries.* Den Haag, Adviesraad voor het Wetenschaps- en Technologiebeleid (website: http://www.awt.nl/nl/pdf/as19.pdf)
11. LEPORI B., SUCCI C. (2003) *eLearning in Higher Education. Prospects for Swiss Universities*, EDUM report, Lugano (website: www.edum.ch)
12. LEPORI B., CANTONI L., SUCCI C. (2003) *The introduction of eLearning in European universities: models and strategies*, Kerres M., Voss B. (Hrgs.), Digitaler Campus. Vom Medienprojekt zum Nachhaltigen Medieneinsatz in der Hochschule, Waxmann, Münster
13. LEPORI B., REZZONICO S. (2003) *Models of eLearning: the case of the Swiss Virtual Campus*, Jutz C., Flückiger F., Wäfler K., 5th International Conference on New Educational Environments, Lucerne, May 2003
14. PHIPPS R. & MERISOTIS J. (2000) *Quality On The Line. Benchmarks For Success In Internet-Based Distance Education*, prepared by The Institute For Higher Education Policy (available online on the IHEP website)
15. OECD (1997) Thematic Review of the first year of Tertiary Education. Country Note: Germany, Paris
16. OECD (2003) L'enseignement tertiaire en Suisse, Paris
17. OECD (2003a) Polytechnic Education in Finland, Paris
18. TEICHLER U. (1988) Changing Patterns of the Higher Education System, Kingsley, London
19. TEICHLER U. (2001) *Changing patterns of the Higher Education System and the perennial search of the second sector for stability and identity*, Millenium, Revista do Instituto Superior Politécnico de Viseu, n.º 21, Janeiro
20. UNESCO (1997) ISCED – International Standard Classification of Education (website: http://www.prie.cl/ingles/seccion/documento/annex_3.pdf)

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E-LEARNING IN PROCESS AND CHEMICAL ENGINEERING EDUCATION – WHAT'S THE LEARNING BEHIND THE E?

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1. Introduction

Three years ago, at the German e-learning fair *Learntec* 2001, we encountered sanguine slogans like "e-learning is a tidal wave, either you surf or you drown in". Since this time of premature enthusiasm, e-learning has grown up, and educational technologists are wondering what has become of their child prodigy – have "great expectations turned into myths?" (Felix, 2003). For example, unlike in the early days, experts now agree that e-learning – at least in the short run – will hardly contribute to save costs for campus universities (Bates, 2000, Felix, 2003). Instead of provoking revolutionary changes, the introduction of e-learning into academic organisations is rather characterised by "continuity and diversity" (Lepori et al., 2003). The technological tidal wave has ebbed away, some have surfed, none has drowned, and time is ripe for a realistic assessment of what e-learning is worthwhile using for and what not.

As in most fields of study, there is a great number and variety of e-learning activities in the domain of process and chemical engineering (PaCE) education in Europe. Efforts range from single personal initiatives ("lone rangers", see Bates, 2000) to cooperative projects on local, national or international level. The lack of coordination between the various projects is an outstanding problem, leading to isolated applications and insufficient transfer of know-how. Therefore, harmonisation, shared standards, and a dialogue about best practices and promising approaches is needed at the European level.

The aim of this paper is to initiate a discussion about trends and challenges for e-learning in PaCE education in Europe. The paper is organised as follows: In the next section, we introduce the European Network for e-Learning in Process and Chemical Engineering (EuPaCE.net), as an attempt to exploit synergies in this domain through international dialogue and cooperation. Subsequently, we present the methodology and preliminary results of a survey, which has been conducted with the EuPaCE.net members. Finally, we will not provide answers in this paper but rather identify open questions and topics as a frame for further discussion and research about e-learning in PaCE.

2. European Network for e-Learning in Process and Chemical Engineering (EuPaCE.net)

EuPaCE.net is a consortium of seven European universities: Technische Universitaet Berlin (Germany, coordinators), University of Barcelona (Spain), Lappeenranta University of Technology (Finland), UMIST Manchester (UK), University of Oxford (UK), Ecole des Mines de Saint-Etienne (France), University Politehnica of Bucharest (Romania). The main objective of this consortium is to establish a community to:

- Provide a platform for dialogue and exchange of experiences and ideas,
- Lay the foundations and identify topics for future cooperation and joint efforts to promote e-learning in PaCE on the academic level as well as in schools, vocational training and in the industry,
- Specify e-learning requirements of national and European stakeholders in PaCE (universities, enterprises, professional organisations, schools),
- Develop systematic methodologies to design and evaluate course curricula and study programmes adaptable to e-learning environments,
- Set up a network for sharing resources,
- Promote the internationalisation of e-learning materials for PaCE.

The EuPaCE.net community is built up with an action-research approach: The coordinating activities to establish the network (e.g. workshops, focus groups) go together with scientific research and evaluation. Based on the results of a survey (see next section) and peer reviews, EuPaCE.net aims to develop guidelines with recommendations for the use of information and communication technologies (ICTs) in PaCE education. The peer reviews focus on didactical issues (e.g., students' teamwork, cooperative learning scenarios), organisational development (e.g. introducing and coordinating e-learning at the faculty) as well as technological standards and methods for course building and maintenance.

To support cooperation and communication of e-learning experts in PaCE, the internet portal www.eupace.net has been launched in January 2004. In the future, the technology of the platform will be migrated to advanced socialware, based on the approach of useworld.net (Leuchter et al., 2003), to further enhance user-centred community building.

3. Survey on e-learning in PaCE

3.1 Objectives

The central issue of the survey consisted in the identification of trends, challenges, and open questions about e-learning in PaCE, which should be clarified in further research and discussions. In particular, the following topics were addressed:

- Which role do ICTs currently play in the academic curriculum of PaCE?
- What are experiences, ideas and expectancies concerning e-learning in this domain?
- What kinds of e-learning materials and environments are used?
- What is the pedagogical benefit of ICTs in PaCE education?

3.2 Methods

The survey was carried out with faculty members and students. Faculty members were surveyed in two rounds. The first round consisted of a questionnaire with open questions (e.g. "What are the major challenges for e-learning in PaCE?", "Which is your most successful e-learning application?", "What are the [possible] disadvantages of e-learning?") and rating questions (e.g. "Learning with computers should play a bigger role for the students", "The quality of computer-based learning materials at our faculty should be improved"). After the analysis of the first round, a second round with structured interviews via Voice-over-IP was conducted. Interview guidelines were individually adapted according to the answers of the participant in the first round. The interviews were recorded and transcribed using the *Transcriber* software (Barras et al., 1998). Protocols are analysed with qualitative content analysis (Mayring, 2002).

The student survey was realised with a questionnaire, which comprised 54 items, divided into four sections: (1) personal data, (2) computer experience, (3) attitudes towards computer based learning, and (4) motivation for studying. Some items for the student questionnaire were selected from the following existing questionnaires and scales: 16th Social Survey of German Students' Social Welfare Organisation (Middendorf, 2002), Questionnaire on Motivational Orientation for Studying (Schiefele et al., 1993), Academic Self Concept Scale from OECD PISA Study (Kunter et al., 2002). Criteria for item selection was appropriateness for answering the following questions:

- What is the current state of hardware equipment and computer experience of PaCE students?
- How do these students judge the use of computers at their faculty?
- To what extent are the students knowing and using computer-based applications for learning which are offered by their faculty?
- How can their motivation for studying be described?

After the detailed analyses of the faculty members interviews and the students questionnaire, the results of the two target groups can be compared to identify consistencies and contradictions between staff and students at the faculties.

3.3 Results

In this paper, we concentrate on the results of the first round of the faculty members survey, since the other parts of the survey are still being conducted and analysed. Therefore, the present results have rather the character of qualitative observations than of "hard facts". Fourteen PaCE faculty members of six universities in five European countries participated in the first round of the survey. In average, participants were 41 years old, had a teaching experience of 13 years, and were heavy computer-users (average computer usage time: 40 hours per week).

First of all, the general observation of continuity and diversity for the introduction of e-learning into academic organisations (Lepori et al., 2003, see above) is confirmed in our sample of PaCE faculties. The EuPaCE.net partners share a realistic and pragmatic view on the possibilities of e-learning. New ICTs are not seen as panacea for PaCE education, but as potentially useful tools, for which successful scenarios of usage are constantly being developed and enhanced. The partners see no need to force the introduction of e-learning into their faculties. Instead, they use ICTs for specific purposes if they expect a clear benefit of technology use.

While two of the faculties already offer virtual courses and could be characterised as "dual-mode universities" (Lepori et al., 2003), the majority of academic PaCE education still takes place at traditional campus universities, and new ICTs are used to enrich learning scenarios. Even within a faculty, there can be a considerable diversity between different staff members concerning their use and attitudes towards e-learning. At least at campus universities that do not have a concerted strategy to go "dual-mode", individual preferences seem to play a bigger role than organisational (not to mention national) culture for a faculty member's engagement in e-learning activities. While there is some support available from university-wide centres, the actual use of e-learning depends highly on the individual professor, assistant or tutor. We can still meet a lot of "lone rangers" (Bates, 2000) in the academic PaCE education wilderness.

The most common e-learning application offered by the surveyed faculty members is the download of course materials like lecture notes, slides or tasks and solutions for homework. Also, the use of e-mail and – less frequently – internet forums for communication is widespread. Concerning forums, it is seen as a challenge to achieve the right balance of usage. On the one hand, without a "critical mass" of students, the forum will die out (this seems to be the most frequent case when forums are introduced, but not properly integrated into the courses). On the other hand, in the rare case of a "chain reaction", i.e. the forum is used too extensively, tutors can get overloaded by students' requests. Compared to downloads or communication, web-based learning modules and virtual courses are less prevalent in today's PaCE education, but considerable efforts are being made at the moment to develop and establish these kinds of e-learning applications.

Regarding attitudes towards e-learning, most faculty members agree that computers should play a bigger role in PaCE education (M=2.4)[1], that there should be a wider choice of computer-based learning materials (M=2.3), and that the quality of e-learning materials for their subject matter should be improved (M=2.2). However, e-learning is mostly not seen as substitute but as complement to "traditional" face-to-face courses like lectures ("Computer-based learning is superior to lectures": M=1.4).

4. Discussion

So far, the readers might think that the results of our study are not very surprising, just reflecting the current situation of e-learning at European universities in general. What is special about Process and Chemical Engineering, why do we need another international network for this field of study? First of all, the particularity of PaCE consists in the learning contents. Thus, a central issue of a cooperative network concerned with a special field of study is to clarify how to employ ICTs for the specific learning contents of the subject matter. Another particularity of PaCE education, which is directly linked to the learning content, is the use of professional industrial software for modelling and

[1] All mentioned values refer to a 4-point rating scale from 0=strongly disagree to 3=strongly agree (1.5=neutral point of the scale)

simulation (flowsheeting), as well as for process control. This means that the "nature" of this field of study already implies a more or less extensive use of computers, and any discussion on e-learning for PaCE should always consider the distinction between the use of computers as media for learning, cooperation or communication, and the use of computers as engineering tools. Therefore, to shape further discussion and research, we propose to distinguish between general e-learning topics and PaCE specific e-learning topics (see Table 1 for some examples, derived from the open questions of the first round of the survey).

Table 1: Examples for general and PaCE specific e-learning topics

General e-learning topics	PaCE specific e-learning topics
• E-learning quality • Learner interest and motivation • Learning styles • Self-directed learning • Standardisation • Intellectual property rights	• Modelling and simulation of chemical processes • Online experiments with real chemical plants • Visualisation of chemical processes, physical phenomena, and mathematical functions • Sustainable development in PaCE • Product and plant design • Interdisciplinary engineering in PaCE

In the faculty members' answers to the open questions of the first survey round, general e-learning topics were predominant compared to PaCE specific topics, which were therefore focused in the second round interviews. Nevertheless, the predominance of general topics shows that there is still a need to clarify these issues, which are important across subject matter boarders. In the following, we go into some selected issues (general and PaCE specific), which were the most emphasised topics in the first survey round, to exemplify e-learning requirements of PaCE education.

4.1 E-learning quality

The importance of e-learning quality is eminent, e.g. the main focus of the EDEN 2003 Annual Conference was on quality issues, and there are four major European consortia concerned with e-learning quality funded by the European Commission (SEEQUEL, EQO, SEEL, QUAL E-LEARNING), providing numerous methodologies and procedures to evaluate and assure quality. As for educational research in general, there seems to be a considerable gap between scientific research on e-learning quality and the PaCE education practice at the universities. While most of the surveyed faculty members agree that the quality of e-learning materials at their faculty should be improved (see above), they rarely apply systematic methodologies to assess and assure quality. Instead, the prevalent e-learning quality approach can be characterised as "pragmatic and passive":

- Pragmatic, because (in accordance to general engineering approaches) most faculty members aspire a "reasonably good", and not an "optimal" quality for their e-learning materials. As engineers, they seek the most advantageous trade-off between quality and costs.
- Passive, because faculty members make few active efforts to monitor quality. As long as there is no obvious evidence that quality is too low, they seem to assume that quality is satisfactory. As a consequence, the fact that students in general do not complain about bad quality of learning materials is considered as evidence that quality is fine (or, at least, sufferable).

In the future, PaCE faculties should be supported to establish pragmatic (cost-effective) and more active quality approaches. Research should specify e-learning quality requirements of PaCE, and results from general research should be transferred to the practice of learning and instruction.

4.2 Learner interest and motivation

Maintaining learner motivation in self-directed e-learning scenarios was identified as a challenge in the first round of the faculty members survey. Also, previous research findings suggest that interest and motivation are crucial factors influencing learning processes. For different e-learning scenarios in the domain of PaCE (web-based learning module for steady-state modelling: see Gauss & Urbas, 2004, 2003; troubleshooting of on-line distillation column: see Gauss et al., in press), learning outcome was significantly affected by learners' interest in the topic. The development and dissemination of pedagogical approaches for PaCE education to enhance learner motivation are of major interest to the EuPaCE.net community.

4.3 Standardisation

While standardisation is generally regarded as an important issue for the sustainability of e-learning systems, there is no shared standard amongst the EuPaCE.net community at the moment. Diversity is predominant, ranging from no concern with standards (a very common case) to faculty or university wide standards (with standards differing between faculties and between universities). The debate about learning objects and SCORM seems to touch today's academic PaCE education only marginally. However, it is worthwhile mentioning an observation from the survey. Exchange of e-learning materials between colleagues, faculties or even universities is still rare. Therefore, the need for standardisation of e-learning materials is for most faculty members rather a theoretical issue than a practical concern. If faculty members are queried about the possibility to exchange materials with colleagues, they tend to think in categories of whole courses or learning units, instead of smaller objects or assets. This suggests that learning objects should not be too fine-granular. The rationale for the size of a learning object should rather be a "meaningful stand-alone lesson" than a "single learning objective".

4.4 Experiments in PaCE education – hands-on, on-line, or virtual?

An example for a PaCE specific e-learning issue that should be clarified are the benefits and shortcomings of different "modes" of experiments for learning. There is some agreement among the surveyed faculty members that engineering graduates should have some hands-on experience with real plants, to know what they are actually dealing with when they are designing a plant on the computer in their air-conditioned offices. However, the optimum extent of hands-on experience during the study course is not clear. A lot of learning objectives can also be achieved with virtual experiments, based on simulations, which are much cheaper and also more comfortable for the students. But simulations only provide an idealised approximation to reality. In the last years, great efforts were made to enable remote access to real plants for on-line experiments. Still, suitable pedagogical scenarios for such on-line experiments have to be developed and evaluated (Gauss et al., in press).

5. Conclusion

The present paper provides no consolidated findings or solutions, but highlights on some exemplary issues of e-learning in PaCE education as food for thought and input for further discussion and research. All interested parties are invited to participate in this discussion, to visit the www.eupace.net website, and to join the EuPaCE.net community.

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References

1. BARRAS, C., GEOFFROIS, E., WU Z. & LIBERMAN M. (1998) *Transcriber: A Free Tool for Segmenting, Labeling and Transcribing Speech.* Proceedings of First International Conference on Language Resources and Evaluation (LREC), 1373-1376

2. BATES, A. W. (2000) Managing technological change. San Francisco: Jossey-Bass

3. FELIX, U. (2003) *Online Education: Great Expectations turned into myths*? Keynote speech at the ED-MEDIA 2003 – World Conference on Educational Multimedia, Hypermedia and Telecommunications, June 23-28, 2003 in Honolulu, USA. Retrieved January 5, 2004, from: http://www.aace.org/conf/edmedia/speakers/uschitalk.doc

4. GAUSS, B., KLEIN, A., URBAS, L. & WOZNY, G. (in press) *Learning by troubleshooting – a suitable didactical scenario for online-experiments?* Proceedings of INCOM 2004 – 11th IFAC Symposium on Information Control Problems in Manufacturing. April 5-7, 2004, Salvador, Brasil

5. GAUSS, B. & URBAS, L. (2004) *Adaptable navigation for a SCORM compliant learning module.* Unpublished manuscript. Submitted for publication in S. Y. Chen & G. D. Magoulas (Eds.) Adaptable and Adaptive Hypermedia Systems (draft available from the authors)

6. GAUSS, B. & URBAS, L. (2003) *Individual differences in navigation between Sharable Content Objects – an evaluation study of a learning module prototype.* British Journal of Education Technology, 34 (4), 499-509

7. KUNTER, M., SCHÜMER, G., ARTELT, C., BAUMERT, J., KLIEME, E., NEUBRAND, M., PRENZEL, M., SCHIEFELE, U., SCHNEIDER, W., STANAT, P., TILLMANN K.-J. & WEIß, M. (2003) Pisa 2000 - Dokumentation der Erhebungsinstrumente. Berlin: MPI for Human Development

8. LEPORI, B., CANTONI, L. & SUCCI, C. (2003) *The introduction of eLearning in European universities: models and strategies.* Paper presented at the GMW 2003. Retrieved January 5, 2004, from: http://www.newmine.com.unisi.ch/newmine_edum_lepori_alii_article_gmw03.pdf

9. LEUCHTER, S., URBAS, L. & RÖSE, K. (2003) *Engineering and Evaluation of Community support in useworld.net.* In: C. Stephanidis & J. Jacko (Eds.), Human-Computer Interaction. Theory and Practice. Proceedings of the 10th International Conference on Human-Computer Interaction in Crete, Greece, 22-27 June 2003, Vol.2 (pp. 959-963). Mahwah: Erlbaum

10. MAYRING, P. (2002) *Qualitative approaches in research on learning and instruction.* In B. Ralle & I. Eilks (Eds.), Research in chemical education – What does it mean? (111 – 118). Aachen: Shaker

11. MIDDENDORFF, E. (2002) Computernutzung und neue Medien im Studium. Bonn: Federal Ministry of Education and Research

12. SCHIEFELE, U., KRAPP, A., WILD, K.-P. & WINTELER, A. (1993) *Der "Fragebogen zum Studieninteresse" (FSI*). Diagnostica, 39, 335-351

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NEW STUDENT AND TEACHER ROLES – QUALITY REFORMS NETBASED LEARNING ON CAMPUS

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Introduction

Within higher education in Europe, there are processes going on, as a result of the Bologna Process, when the Bologna Declaration was signed on 19 June 1999 by the Ministers of Education of 29 European countries. The processes comprise: Recognition of qualifications, adoption of a system of easily readable and comparable degrees, reform of higher education systems (where specific reference is made to the adoption of «a system essentially based on two main cycles» – prior to doctoral studies) and clear emphasis on the role of higher education in preparing students for the labour market. One important issue is that the degree awarded after the first cycle shall also be relevant to the European labour market as an appropriate level of qualification.

As a result of the Bologna Declaration, a quality reform process is under way within higher education in Norway. There are two main reasons for the current reform:

- to achieve improved quality in higher education and research
- the Bologna Process and Norway's obligations in that respect

This paper deals with the Norwegian Quality Reform and how the author's institution, Gjøvik University College, has started up these processes. There are a number of interesting experiences and results so far.

The author believes these processes are going on all over Europe, and it may be of interest to discuss challenges and experiences with the audience. In addition, the author invites participating institutions for cross-national cooperation, sharing one's experiences and implementing internationalisation financed through EU-programmes, such as the ERASMUS and Leonardo Programmes.

Gjøvik University College

Gjøvik University College (GUC) [2] is one out of 26 regional university colleges in Norway. GUC runs three-year bachelor programmes within Civil-, Electrical-, Mechanical-, Media Technique- and Computer Engineering – further three-year programmes within Nursing. In addition GUC runs two Master Programmes in the form of a two-year extension on top of the Bachelor Programmes within Media Technique and Information Security. The number of students and employees are 1600 and 200 respectively. GUC is also running decentralised Undergraduate Programmes within Nursing and Radiology, the latter in cooperation with Bergen University College. Further GUC is implementing continuing education, mostly net-based, in cooperation with national and international institutions and enterprises.

The author [3] has played a central role in these developments through the years. Today, he is project coordinator for a three-year Leonardo Pilot Project within Geographical Information Science (GIS) (2002-2005), E-GIS, comprising 10 partners from 6 European countries. The objectives of the project are to develop a one-year, netbased course within GIS with 8 different course modules [4]. He is now mainly working online from his 'home office', 150 km from his institution, using Information and Communication Technology (ICT) in the form of Internet and videoconferencing for contact with students and colleagues.

The Heterogeneous Student

Students today comprise a heterogeneous group of young people. No longer do we find that all students dedicate all their time to their studies. Many of them take on paid jobs in order to make ‘ends meet’. Also a number of students spend a lot of time participating in high level sports needing special agreements with the institution for implementation of the studies. Others are active in student organisations and so on. We see that the demand for flexible pedagogic methods is increasing in order to satisfy the ‘modern student’.

During autumn semester 2003, ideas of The Quality Reform and The Bologna Process, were implemented at Gjøvik University College on courses in civil engineering.

In February this year, a full day seminar was arranged, when teachers and students met for discussions on quality and form of implementation and evaluation of results. During presentations in plenum and group discussions, interesting results turned up. We will come back to these later in this paper.

The Quality reform

The objective of the Quality reform [1] is to improve the quality of higher education in Norway, a reform process going on at universities and university colleges in the country. The reform covers both public (state) and private institutions of higher education.

Basic elements are: new degree structure, Increased institutional autonomy, new funding formula for the institutions, new forms of student guidance, evaluation and assessment, internationalisation.

The Basic Elements

New Degree Structure

The model for the new degree structure, adopted from the Bologna Process, will be Bachelor’s Degree (3 years) + Master’s degree (2 years) + Ph.D. (3 years). In a few subject areas, students will enrol for a five-year integrated Master’s Degree Course.

Increased institutional autonomy

The higher education institutions will be given significantly greater autonomy in managing and organising their activities than previous times. Universities and university colleges have increased autonomy in terms of introduction and repeal of courses and study programmes. In our case, as a university college, we can decide which disciplines, subjects and combinations we wish to offer, and that will form the basis for lower degrees.

New funding formula for the institutions

The new funding formula is more result-oriented than previous ones and consists of a basic component of 60 %, further an education component (approx. 25 %) based on number of completed student credits, the number of graduates + the number of international exchange students (in + out) – and finally, a research component (approx. 15 %) which consists of a result-based allocation.

New forms of student guidance, evaluation and assessment

The students’ academic performance will be assessed both through final examinations as well as through various term assignments. A new, standardised grading system is introduced, with descending scale from A to E for passes and F for fail. A full academic year is equivalent to 60 course credits being equivalent to the European Credit Transfer System (ECTS). The students will be subjected to more regular guidance. An Individual Study Plan will be signed by both parties securing that the students receive adequate guidance, as well as provide the institution with an overview to ensure proper use of resources.

Internationalisation

The overall aim regarding internationalisation is to ensure a qualitative competitive higher education sector through increased cross-boarder institutional cooperation as well as student and teacher mobility. Consequently, the institutions are strongly encouraged to participate in European and other international education and research programmes.

In this paper, the author, mainly, will deal with New forms of student guidance, evaluation and assessment.

What we did

During autumn semester 2003, a team of teachers of the civil engineering programme, decided to move into 'new thinking' around pedagogy, looking into The Quality Reform. We admit it was a process of 'trial and error'. However, we believe many issues here are new to others, also within Europe, and will experience the same as we did.

Team Work

First of all, teams of professionals were established around three specific subjects within the programme. The teams planned the content and implementation of the subjects also sharing responsibility for teaching and tutoring of each specific topic within the subject. The planning process started early winter 2003. The idea was to qualify the pedagogic process in all it's aspects, believing that a team do a better job than one person alone. Traditionally, one person has been responsible, alone, for all topics within a complete subject. Here are the subjects:

- Building Technology I, for 1st year students, comprising: Technical Drawing, Computer-aided Design (CAD), Introductory Construction Theory
- Building Technology II, for 2nd year students, comprising: Building Physics, Advanced Construction Theory, CAD, Administrative Law within Civil Engineering
- Project Administration (PA) for 3rd class students, comprising: General PA Theory, The Core Processes in PA, The Phases of a Construction Process, The Law Standards of Civil Engineering Construction Processes, Construction Plans and Invitation to Tenders, Construction Budgets and Contracts, Health, Environment and Safety on Construction Site

There were three different teams for these subjects. However, several of us were involved on specific topics within all of these.

In the following, description of implementation and experiences from all three subjects will be treated in general, since the principles are the same all over.

E-Learning Platform

For the whole institution an e-learning platform, ClassFronter (CF) has been adopted for the whole campus. CF is a Norwegian product being developed in close cooperation with education institutions in the country.

On CF, we may load all types of course material, establish Forums for asynchronous discussions, chat forums for synchronous discussions, folders for assignments – with possibilities for commenting the students work for possible later improvements, running theoretical examinations such as Multiple Choice or full writing and/or combinations.

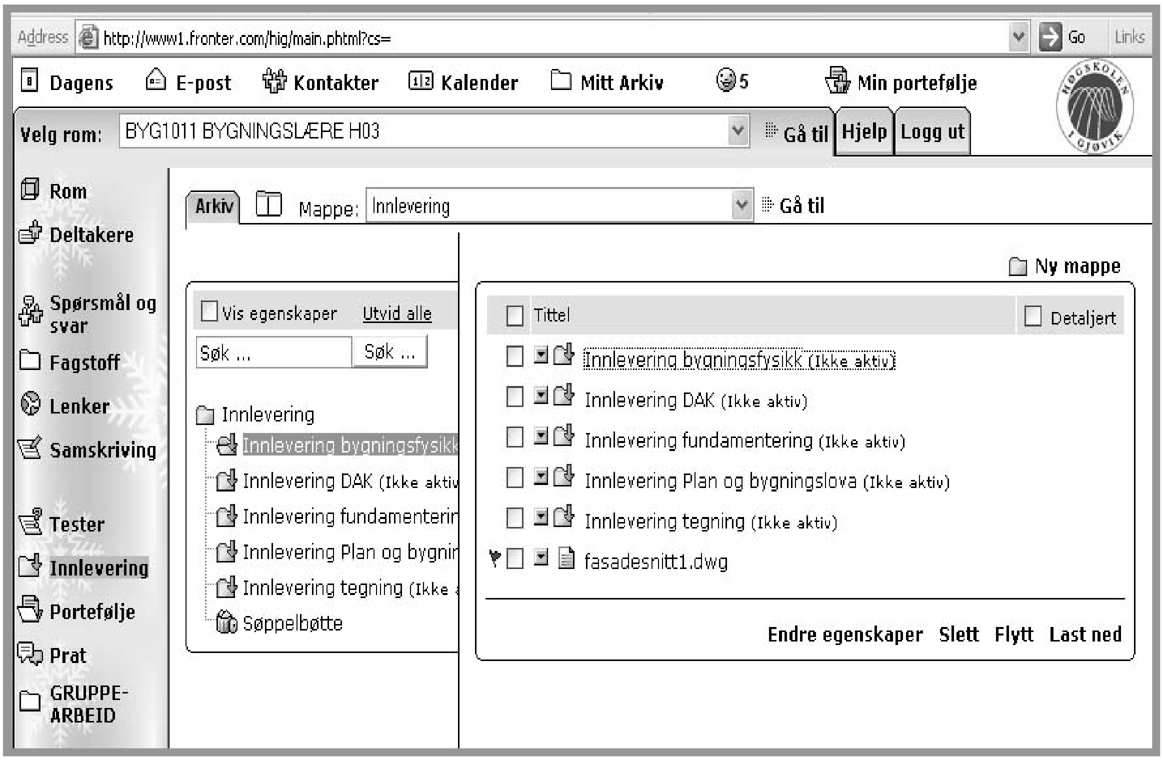

Figure 1. ClassFronter. The user interface for Building Theory. You see folders for loading assignments

The Study Process

Evaluation tradition

Traditionally, there has been lectures through the whole semester, ending up with a theoretical exam at the end. Assignments during the semester may have been compulsory, but with no effect on the resulting credits. The Competence Reform suggest evenly distributed work through the semester, work that influence on the students' credits. So, these thoughts were adapted to our courses.

Assignments

The learning process was driven as introductory theoretical lectures over a short period of time being followed up by group work at certain intervals during the semester. The projects were implemented after each of the topics as described above. For each main topic, the groups had the possibility to choose between 4-5 titles. The requirements for the students were to make investigations into the subject matter by reading literature, search for information on Internet, discuss with teachers, professional outside the institution and so on, under tutoring from the teacher team. This means that we expected the students to go far deeper into the subject than we did in our lectures.

After delivering the project reports, the responsible teacher looked through the reports, commenting the work in order to give the group a chance to improve the result before a final delivery date on CF.

For each subject, 4-5 group works were implemented.

Theoretical Examination

At the end of the semester, a theoretical net-based examination was implemented through the e-learning platform ClassFronter. The examination took place in a computer laboratory during two hours. The questions could be of the type 'multiple choice' or questions with answers in plain writing. There was also a possibility for introducing pictures, sketches, drawings or other graphics as part of the question.

11. Tegningen under viser en konstruksjonsløsning for lydisolasjon i etasjeskiller. Hva er spesielt med denne konstruksjonen? Skriv i tekstfeltet nedenfor!

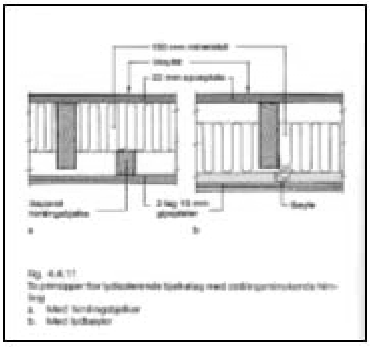

Figure 2. Example on theoretical question with text answer. You see that a picture is the basis for the question.

For multiple choice questions, we may choose between types where only one answer is correct and/or a type where two or more suggestions may be correct.

The Evaluation Process

The group work counted 67 % and the net-based exam 33 % for the final credit. For one class, it had been decided in the course plan to extract only on of the projects for evaluation, the result of this project contributing to the credits, 'for goods and for bads', by it's 67 %. The idea behind this process is to ensure that the students put equal amount of work into each project. This will be comparable to an oral exam. If the students shall obtain credits for this combined exam, all the projects have to be approved and the net-based exam must be passed.

Results

Credits

Except for a few student groups, all the group projects were accepted. The results demonstrated surprisingly high level. The students put a lot of energy into their work resulting in good reports. The students demonstrated ability for being able to attain new knowledge on quite complicated topics. As an example we may mention that, after introduction at 'low level' on the principles on Reinforced Concrete Design, one student group in it's 1st year, was able to give a good overview of the most important deeper principles on this topic. The subject Reinforced Concrete is not going to be given before 3rd year. The idea of introducing subjects at this early stage, is to give the student a real feeling of being engineering students. Traditionally, only mathematics, physics and other basic subject are being taught during 1st year and the students obtain no feeling of their future profession. The result of the net-based theory examination varied a great deal. We could observe, in many cases, a lack of theoretical understanding. Thus, there was a discrepancy between the demonstrated knowledge through project work and the necessary underlying theoretical knowledge demonstrated through the examination. However, most students also passed this part. The relatively heavy weight on the projects, with good results, led to the fact that the varying credits from the theory examination more or less was 'drowned' in the credits from the projects, resulting in almost equal total credits for all students in the classes. (We have discussed the possibility of reducing the weight on project work).

Students' opinion

The students appreciate the even workload given through the semester. They feel that the projects extend and develop their competence and understanding in a broad sense around their future profession. Also, they find it interesting to find out, for themselves, new and other information and knowledge 'on top of' the introductions given by the teachers. Some students still said they 'did not learn anything' during the lecture hours. However, the results from the projects demonstrated the opposite. The case is: they had learnt it by themselves through group cooperation, literature studies and search on Internet, guided by the tutors. Here, we may observe a 'matter of definition' when and where they learn. Anyway, for us, the results were most satisfactory. Based on the fact that students perform other activities in addition to full-time studies, there is a wish to be offered more net-based solutions in the learning process. Also, the students want more contact with the professional society outside the institution, such as guest lectures from the civil engineering branch and visits to civil engineering workplaces.

Conclusion

Even if we perform, to a certain extent, 'trial and error' kinds of pedagogy, we feel we are on the right way, closing up with the wishes of The Competence Reform. Through discussions with our students during the above mentioned joint seminar on quality in education, we will involve more professionals from the 'outside'. Also, we will develop net-based offers for students who cannot stay in the institution all the time. Finally, according to agreements between the students and the teacher team, the student groups will present their project for each other in the future. Since the projects will be different, depending on choice of project titles, the students will learn from each other and thus become part of the 'teaching team'. The students will, sort of, partly develop their own course material. In addition they will obtain training in presenting professional material. By this process, the students also will obtain a better understanding of the subjects in their study programmes. We also se that the increased use of net-based pedagogic solutions for all students, turn the students into a kind of distance education students – and we understand that it will become more and more difficult to distinguish between campus students and distance education students. Before we end this paper, there is to say that internationalisation in the form of trans-national student and teacher exchange, now, is being documented in all study plans of our institution.

Gjøvik University College is interested in sharing experiences with other European institutions and invite for cooperation on joint student and teacher exchange and cooperation on courses.

Our lives have become far more interesting during these new learning processes, being in closer contact with the students than before. Sometimes we feel more as colleagues than as teachers and students – fascinating.

References

1. THE COMPETENCE REFORM. INFORMATION IN ENGLISH *http://odin.dep.no/archive/ufdvedlegg/01/01/Folde028.pdf*, February 2003
2. GJØVIK UNIVERSITY COLLEGE *http://www.hig.no*
3. HILDING SPONBERG *http://www.hig.no/~hildings*
4. THE LEONARDO PILOT PROJECT, E-GIS *http://www.e-gis.org*

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UNIVERSITY OF PADOVA: "E-LEARNING PROJECT" FOR STRATEGIC CHANGE

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1. Scenario

The impact of ICT on university, on teaching by university teachers and on learning experiences by different kinds of students implies a complexity, going over the scientific knowledge and the good practices up to here consolidated during the distance education also Web-based Instruction. The declaration by the Italian Government dated 17/04/03 on "Criteria and procedures to accredit the distance courses by public and not public universities and by university institutions qualified to issue academic titles" (Telematic Universities) imposes pedagogical and technological quality indicators whose certification will be hard, considering the experiences conducted at universities up to here.

To introduce e-Learning into Universities and Faculties as a orderly training method on-site/on-line, requires a strategical change not only of the traditional teaching model face to face, but also of the more advanced one at a distance for the not attending ones, providing the latter with alternative/original training methods. The advantage of the Distance Education, pedagogically refined by the historical evolution of the communicative mediation, is given by the constitution of a convenient alternative, having at least the same efficacy for those who cannot or will not attend university laboratories or classrooms in predeterminated times and places.

The pedagogical-didactical question put by e-Learning – meant as systemic integration of the nets (Intranet and Internet) during the university teaching-learning processes – is radical: there is a benefit but how to determine and evaluate it in relation to the aims of university instruction? In fact we cannot discuss this problem only from a managerial and economic point of view through an analysis related only to cost and benefits coming out from a hard investment in technologies and specialized human resources, but also from a pedagogical point of view through an evaluation of a real improvement of knowledges, of skills and competences by students, who use web-based tools and methodologies.

The added value of an integrated training environment cannot superficially come out from the sum of the benefits of the on-site teaching (lesson and communicative relation face to face, working in a group in a classroom, in a laboratory or in field; individual study of books and other papers, individual works) and of the on-line teaching (modular organization of curricular units of the ordered knowledge, individual asynchronous use and choice of the learning tools, cooperative asynchronous learning through e-mail or forum or synchronous activities through chat and audio-video conferences). In fact it is necessary to think again altogether to the methodologies through which to design, distribute and evaluate courses at "traditional" Universities.

2. The project

At the University of Padua during these last years some important experiences in distance learning have been conducted, as it results from the inquiry carried out by the "Commission for Distance Education". In particular we have implemented both teleditactical models with virtual classes and distance training models guided by tutors and teachers through learning tools and remote resources, and collaborative learning models based on networks. We have to add that only in some cases (distance degree in Engineering Informatic, special distance courses in Educational Sciences, Campus One Project, Medical Training) we have joined the educational activity to the scientific research aiming to evaluate the advantages of the new modalities in organizing teaching and learning processes. The teachers who use during their face to face courses the ICT with off-line multimedial tools to present them or through the direct exploration of Internet sites, are still a minority at the University especially if we consider learning tools/courses/environment suitably producted. *The e-Learning Project intends at first to create a net of good practices through a University Task Force composed by teachers and experts from the 13 Faculties and from the most important University Centres (computation, linguistical, librarian). The aim is the sharing of methodologies and technologies of on-line teaching integration with face to face teaching, both during the first training and specialistics training for the young people and during life long training.* We can better explain the general aims:

- to develop inside a community of teachers and experts, crossing through the different scientific-disciplinary areas, the needed competences to adopted strategies of e-Learning in university instruction;
- to awaken Faculties, through this community of experts, to advantages of the integrated training between face to face teaching and distance teaching expecially for the opening, the flexibility and the personalization of the learning processes;
- to spread the good practices of blended learning involving all the Faculties through specific projects of intervention-research, to monitor and to evaluate;
- to produce a set of indicators and survey instruments for quality evaluation to use *in an integrated system of blended learning.*

The stages for the realization of the e-Learning Project are closely connected and related to the attainment of the aims mentioned above but also to the cultural and political agreement that a change of habits consolidated over the centuries will be requested from the University. We know from the experiences gathered during the last thirty years that ICT can develop and spread out all their potential only if they find a favourable environment. And the environment must be created first of all clearing our mind of the beliefs that technologies can take the place of teachers, virtual classes will replace the real ones, virtual communities will substitute the real ones that learn in classrooms, in laboratories and on field. The interpersonal relation, assured by teachers, will be the pedagogical base for every kind of educational and training activity than the human and social context of the interaction student-teacher and student-student represents the best condition to learn.

2.1 The phases

The stages of the e-Learning Project at University – that just want to integrate *real environments* with *virtual environments* of learning-studying-research, redefining through experimentation and sharing of good practices, the classes of *space* and the *time* in relation to the educational communication – are articulated into:

Phase one: Setting

During this stage the basis to realize the Project by the “Commission for Distance Education” of the University and a hard engagement by the University Senate is required.

Phase two: Training

During this stage the Academy Task Force is trained to develop commun methodological and technological interventions, through a three months training action turned to 70/80 teachers and experts coming from/choosed inside the 13 Faculties and Interdepartmental Centres.

Phase three: Experimentation

During this stage – that could go on for one or two academic years – must be put in action in each Faculty, interventions of blended learning, with projects regarding triennial and specialistic degree courses, masters and vocational training. This stage has to be supported by the University through specific finances, above all if it is followed with scientific research and acquisition of equipments.

Phase four: Evaluation and Spreading

At the end of experimentation stage, supported by monitoring and evaluation of results, not only a spreading of good practices must follow but also the starting of a total reorganization of university instruction, through a reconsidering of the teachers’ tasks and the incentive system related to them.

Stage 1 had a positive result and the assent of the Project by the University Senate the 1st July 2003 and a finance of the activities of the stage 2 by the Financial Council the 22nd July 2003; the stage 2, started the 6th January 2004 is going on and will end in May 2004. Stage 3 is expected at the starting of the courses of the Academic Year 2004-2005.

3. Training path

The effective realization of a training course on methodologies and technologies that qualify e-Learning as a systemic integration of on-line teaching and face to face teaching, depends on a clear definition of the aims, the receivers, the competences to build, the contents, the instruments, the studying modalities and the evaluation.

3.1 Aims

- Comprehension of the potential and of the advantages of e-Learning and of the added value that it can furnish to the face-to-face learning.
- To implement an efficacy analisys of the training needs.
- To plan integrated educational paths, suited to satisfy the analised training needs.
- To coordinate the production of educational tools and to manage the training intervention.
- To organize a suited activity in monitoring and evaluation.

3.2 Target

The aim in choosing the target is to reach an impact in the academic system, so that the presence of groups belonging to each Faculty could favour as result a spreading of the methodological and technological strategies acquired and shared during the training course.

The target of the training activity has been *individualised by the Deans of the Faculties among the teaching staff (professors, assistants and researchers) assuring in any way the presence of almost one expert with web master competences.*

To work in a professional community called up to study in-depth, share and develop e-Learning knowledges and competences, the receivers were chosen in relation to these criteria:

1. *familiarity with ICT* (use of computers and the Internet);
2. *previous professional experience* (of production-integration of audiovisual and multimedial tools in classroom and-or for Internet use, for asynchrounouse and synchrounouse communicative activities teacher-student and student-student);
3. *motivation* to develop the proposed competences and to became promoter and spreader of good practices among the collegues in the Faculties.

3.3 Skills

The teacher who wants to innovate the traditional didactic using ICT and therefore integrating multimedial tools and online communicative activities with the face to face ones, has not only to acquire specific methodological and technological competences but has also to prepare oneself to a change of state. In fact he has to think of himself no more as an absolute protagonist of training as when he sits at the desk, but rather as the director of a training process who, with scientific contents, also chooses the communicative trend with which working and learning individually or in a group is made possible.

The integrated teaching both face-to-face and at a distance asks the teacher for a new centrality in the training process that is no more to transmit knowledges but he must have the maieutic and critical centrality of a mentor who has to contextualize and personalize the specific training contents and the needs of each student.

Following again the aims just indicated, the training path at first makes out competences in *analysing training needs.* An opening and flexible distance learning can answer to the specific kind of users of university instruction, included those excluded, outcasted or neglected till now because of the closing and the strictness of the curricula founded exclusively on face-to-face education in a classroom.

The planning of the training paths and of multimedial supports is the other area that needs specific competences. The teacher has to coordinate the methodological planning and has to collaborate at the defining of aims, contents, learning tools and evaluation modalties. Inside the area of those competences that are closer bounded to realisation of multimedial and interactive objects, the teacher is responsible for the coherence of language and contents and for the technological-communicative compatibily of the educational tools. The production of the learning objects (hypertextual, audiovisual, multimedial) must be inscribed within constructivistic-social learning strategies, and the teacher can be the guarantor for them if he has got suitable instruments for a dialogue with those figures that intervent within the e-Learning processes.

The participants of the course, teachers and experts, have not to lack of competences inside the area of the *promotion*. In fact they must be able to achieve consent on the new paths of integrated university instruction influencing the collegues of the other Faculties and experts-to-be in transferring and spreading the good practices.

The experimentation of the integrated courses face-to-face and at the distance develops besides *pedagogical-didactical competences* to make learning for the single person or for a group easier by stimulating-supporting the comparision between the proposed contents and their personal and social contextualization.

Being able to organize the activities to *monitor* and to *evaluate* learning process and training services belongs to the area of the competences that are releated to the evaluation. Not only the teacher alone but also the researching group can afford the new evaluating modalities about the quality of the integrated educational system.

3.4 Contents and working modalities

In relation to the training aims to pursue, the proposed subjects during the course mean to develop specific competence, as described at the previous stage. The *six* listed *subjects* present a range of arguments that will be afforded inside *a series of classroom meetings*, with inside and outside experts, followed by *individual on-line activities and in a group and by a group project-work*. After a meeting for the orientation, the welcome, and the presentation of the course, the participants, the LMS platform and the discussion about aims, contents-working methods, the arguments to be dealt with are the following:

1. *design of integrated courses between face to face activities and activities at a distance* (analysis of the target, design of a path, methods and instruments of teaching-learning);
2. *learning objects and researching of informations on the net* (semantic-web, cognitive maps, categorial and reticular research on the Internet);
3. *models of cooperative learning* (learning and practising communities, sharing and allocation of work, motivation to learn, role of the tutor);
4. *planning of multimedial and interactive tools* (from storyboard to realisation of presentation, hypertexts, web pages, multimedia, video streaming);
5. *monitoring and evaluating of the online training process and of the integrated educational system* (self assessment, test for single person and for groups face to face and on net, satisfaction by user, instruments to evaluate the system);
6. *the education quality of the technological-communicative platforms* (comparison among different environments both proprietary and open source).

Teaching in a classroom tends, because of its nature, to favour only some styles of learning, so that the *contents of each of the six meetings*, besides the presentation of the experts subsequent collective discussion inside small groups, develops on line through *downloading documents*, exchange *multimedial and interactive educational units, forum and chat, links* for an approach from different sights of view of the treated arguments. The four “online study groups” are coordinated by tutors transversally composed by teachers and experts coming from more Faculties.

The *project work* activity is defined in detail starting from the interests expressed by the participants after having afforded the six subjects. The subgroups (3-4 persons) are formed by the teachers coming from the same Faculties and the *project works will regard training interventions to experiment and evaluate during the academic year 2004/2005.*

The educational activity in the classroom, but above all on-line, is supported by tutors, while the development of project works is aided by expert counsellors.

The training path performed during three months went on for about 100 hours, integrating *moments in classroom* (7 meetings for 4 hours), and *online activities* (6 meetings for 5 hours).

The *project work* needs 32 hours of laboratorial work in small groups (8 meetings for 4 hours).

A whole day (8 hours) is dedicated to the presentation of the projects and the conclusive evaluation of the activities.

4. Conclusion

A University of the future – considering from one side, the European tradition of quality in higher training and, from the other side, the innovation belonging to the ICT – will not give up the learning modalities that assure a regular and usual lecture of a scientific literature and the face-to-face interpersonal relation of single persons and of a group, but at the same time it has to open itself to virtual spaces/enviroments of interaction and learning among teachers, tutors and students.

The Telematic University, qualified to allocate only courses totally online, will be an exception in the higher training survey, also if *blended learning* and *complex learning* have in any way to be in the majority. In this scenario, the integration of the *three modalties* (individual learning, autonomous and guided at a distance, of texts and materials; face-to-face lessons, laboratory and field experiences; collaborative learning inside virtual communities through the net) can constitute not only the way of a new university teaching, but also a more flexible, open and motivated model to acquire knowledge, skills and competences to transfer to the working context.

References

1. GALLIANI LUCIANO (2003) *Educazione versus Formazione,* Edizioni Scientifiche Italiane, Roma
2. GALLIANI LUCIANO (2002) *L’Università aperta e virtuale,* Pensa Multimedia, Lecce
3. Conference Proceeding of the EADTU Paris Millennium Conference “Wiring the Ivory Tower”, September 28-30, 2000
4. COIMBRA GROUP OF UNIVERSITIES (2002) *European Union Policies and Strategic Change for e-learning in Universities,* Report of the project HECTIC, Bruxelles, 2002
5. COLLINS B., GOMMER H. (2000) *Stretching the Mold, or a new Economy? Scenarios for the University in 2005,* Educational Technology, 41
6. DE BOER W. (2001) *Decision support for e-learning flexibility and enrichment,* Internal Report – Faculty of Educational Science and Technology, University of Twente, Enschede, The Netherlands
7. SETT (2002) *Educational Technologies: Key elements for the integration of ICT in Higher Education,* Project supported by European Commission, Socrates Programmes, ODL Action, Minerva
8. KATZ R. N. (1999) *Dancing With the Devil: InformationTechnology and the New Competition in Higher Education,* Higher and Adult Education Series, Jossey-Bass, San Francisco, CA, 1999

9. ARDIZZONE P., RIVOLTELLA P. C. (2003) *Didattiche per l'e-learning. Metodi e strumenti per l'innovazione dell'insegnamento universitario;* Carocci

10. GALLIANI L., COSTA R. (2003) *Valutare l'e-learning,* Pensa Multimedia, Lecce

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ORGANISATIONAL CAPACITY DEVELOPMENT – THE FRAGMENTED AND THE SYSTEMIC PERSPECTIVE FROM ANOTHER POINT OF VIEW

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Introduction

This paper speaks to the conference theme of institutional and organisational capacity development. More specifically, it addresses the maturity of focus that is required for fragmented attitudes to be left behind and a systemic perspective to be adopted if progress toward a desired end point is to be successful. It draws on the authors' experiences within post-secondary institutions in Canada – one of which is a well-established dual mode university; the other, an institute of technology that resisted becoming such. The discussion takes place within an e-learning context and depicts how, in one instance, there is an institutional push to become a leader in the field; and how, in the other, attempts to lead the institution in that direction have not been as immediately successful as hoped. Although the experiences are Canadian, we anticipate that the underlying principles and attitudes encountered may not be country or institutionally specific.

The Institute of Technology – A Case for Bridging the Gap between Technology Usages on Campus and Using Technology to Build a Campus at a Distance

Three years ago, as a new administrator on campus, one of the authors was given a unique opportunity to initiate structural and cultural changes to the way the Institute was organized to use learning technologies to service students on and off campus. With this mandate, a process known as Virtual Space Planning (VSP) was developed by the Steering Committee and approved by Senior Management. The main goal of the six-month process was to allow for participatory consultation by all stakeholders.

The following themes were identified: People, Content, and Technology. Internal and external experts were selected to address each theme at a scheduled Forum, workshops were organized and led by peers, and facilitators were hired to keep the process as neutral as possible. The end product was a written institutional policy with key recommendations for bridging the gap between technology usages on campus and using technology for building a campus at a distance.

In the past, similar organizational changes in the Institute had been imposed by management and had been unsuccessful. Being aware of this reality, members of the Steering Committee wanted to send a clear message that this time the Institute was serious about the promise of a new beginning. "Most strategies for reform focus on structures, formal requirements, and event-based activities involving, for example professional development. They do not struggle directly with existing cultures and which new values and practices may be required – restructuring occurs time and time again, whereas reculturing is what is needed. (Fullan p.34)."

In his research on educational change, Fullan draws two basic conclusions: "change will always fail until we find some way of developing infrastructure and processes that engage (educators) in developing new understandings; second, it turns out that we are talking not about surface meaning, but rather deep meaning about new approaches to teaching and learning" (Fullan p.37).

It turns out that we were successful in the area of restructuring (developing infrastructure and engaging processes) but missed out completely on reculturing (deep meaning and new approaches). The Management Council quickly adopted the policy. However, three years have passed and key recommendations are still being implemented or discussed.

Lessons Learned

- Planning educational changes is a slow process and implementing changes is even slower.
- Senior management support for the process does not equate senior management support for implementation.
- Good processes do not always lead to good political decisions.
- It is difficult to plan for and anticipate required time and resources for reculturing – restructuring is easier to plan for.

Fullan notes that it is "…not a matter of establishing a bunch of policies and requirements. We are talking about reculturing the teaching profession – the process of creating and fostering purposeful learning communities. (Fullan pp. 135-136)"

The Dual Mode University – A Restructuring Initiative in Progress

The lessons learned are interesting to consider in the context of the restructuring initiative in progress at the dual mode university. Issues of deep and surface meaning and restructuring and reculturing are pertinent in this context as well. One of the questions that should arise – but has not so far – is "how does an organization 'reculture' such that deeply valued components of the existing culture can be honoured?" This assumes, of course, that the proponents of the change continue to hold those values dear. We shall return to the lessons learned after providing a context for that discussion.

The dual-mode university referenced here wishes to establish itself as a leader in the use of educational technologies. As will become evident through the description of resources described below, this is a realistic goal for the institution. And, as is the case with many Canadian universities with a similar agenda, this one is looking to organizational restructuring as a way to realize that potential. At one time there was only one unit on campus that worked with faculty intensively to develop distance/online courses. Now there are three units engaged in similar but, in some important ways, distinct work.

The Centre for Online and Distance Education (CODE)

CODE (formerly known as the Centre for Distance Education) was established in 1975. This took place in the relatively early days of the institution, which itself was established in 1965. From the outset, the university was known for being innovative. Faculty, staff, and students took pride in the fact that they were part of a university that did things differently. Members of the university community also took collective pride in the institution's commitment to non-traditional students – one measure being the large number of "mature students" who were on campus at the time. (Mature students are defined as people 23 years or older who have attempted less than one year of post-secondary course work and who do not meet regular admission requirements.)

There was, therefore, a hospitable environment in which to start something new. Working in full partnership with the academic units with which it continues to collaborate, the Centre offered just five courses in 1975. Today, it offers between 80 and 90 courses during each of the three semesters comprising the academic year. Approximately 14,000 course registrants are serviced during this same time frame. Because of its long history of offering courses at a distance, well-established systems have been established to ensure the production and delivery of quality courses and service to faculty, staff, and the academic units with which we partner.

The Centre works closely with faculty members to develop and deliver courses that typically require no on-campus attendance. Because this work is considered above load, faculty receive a stipend to develop the online/distance counterpart of the courses they teach on campus.

Until recently, distance courses reflected the technology of their early beginnings (i.e. print, audio- and video-cassettes, broadcast television, and two-way audio-conferences). Now, however, virtually all new courses and those under revision are in some appropriate way enhanced through the use of technology.

While committed to promoting the use of technology, allowances are made for faculty who, though interested in the outreach aspect of the Centre's work, are not yet convinced of the value of teaching with technology. When a decision must be made *between* making an entire program available to the off campus student *and* promoting the use of technology, the tension is resolved in favour of the former. We view the faculty member's decision regarding delivery mode as an aspect of academic freedom, which is at all times honoured.

The more usual pattern of events, however, is for faculty to agree to explore the possibilities and from there to become more committed users of technology – not unusually incorporating technology into their on campus teaching as well. While the end result is most often positive, there is no question that if the Centre were to insist that the faculty member use technology, course and program development would be jeopardized – and an opportunity would be lost to slowly and respectfully exercise influence with regard to the adoption of new technology-related teaching practices.

CODE is financially supported through central administration. In return, it commits to servicing a given number of FTEs (full time equivalent students) and often in targeted fields of study. This is a good investment on the part of the university, as the cost of servicing an FTE through CODE is considerably less than the per-FTE grant the university receives from the provincial government. (Education in Canada falls within the jurisdiction of the provincial rather than federal government.) In addition, the Centre generates over five million dollars in undergraduate tuition fee revenue. During times of financial shortfalls, such as now, the financial benefits to the university are not insignificant.

CODE is one of several units within the office of Continuing Studies. It is not unusual to be asked why *this* association rather than other seemingly natural linkages. Association with a continuing education unit, however, is a very much in keeping with the Centre's commitment to outreach and to providing educational opportunities to the non-traditional student. These values are not shared evenly across most university campuses. The synergy created through clustering like-minded professionals, therefore, serves our clients and learners well in that the office of Continuing Studies stays focused on and champions the University's stated commitment to access to educational opportunity and lifelong learning.

The Director of the Centre reports to the Dean of Continuing Studies, who, in turn, reports to the Vice-President, Academic.

The Learning and Instructional Development Centre (LIDC)

The Learning and Instructional Development Centre (LIDC), is the university's faculty development unit. The former director of the Centre was careful to create a roster of professional development activities that demonstrated as much commitment to face-to-face teaching as it did to teaching with technology. To over-emphasize the latter, he reasoned, could have a detrimental affect on the unit's mandate to improve teaching overall in that it may alienate those who had yet – and who may never – choose to take their teaching online.

The new director, hired approximately three years ago, adopted a different approach. With a much larger budget than his predecessor enjoyed, he has placed greater emphasis on promoting teaching with technology through workshops and one-on-one consultations. Faculty who visit the LIDC for IT support are typically looking for ways to enhance the courses they teach on campus. While valuable support is provided to faculty members, there is not the same degree of intensive involvement in the course production process from inception through completion as there is with a CODE project.

The LIDC is funded, in part, through central administration and, in part, through revenues generated through programs and conferences. The Centre is an entity unto itself, with a director who reports to the Associate Vice-President responsible for, amongst other things, learning technologies. He, in turn, reports to the Vice-President, Academic.

eLINC (e-Learning Innovation Centre)

eLINC was the online course development unit at what was, until a few years ago, the Technical University of British Columbia. TechBC ceased to exist as an independent entity in 2002 and merged with SFU. The Technical University, as its name suggests, relied heavily on online methodologies to deliver courses. Because of the ubiquitous use of technology, it was commonly, though mistakenly, believed that courses were delivered entirely online. Some were. Many others, however, required students to attend classes. A mixed mode or hybrid approach to teaching with technology more accurately describes the mode of delivery.

Upon hire, former TechBC faculty agreed to teach online, to participate in a particular approach to course development, and to use the online platform developed in-house. Given its recent beginnings and the conditions of hiring, it is to be expected that all courses developed through eLINC would reflect recent instructional design and delivery preferences.

One important difference between the two units delivering courses to off campus students is the number of FTEs served. The provincial government has recently announced projected enrolment figures for the new campus. Currently, however, eLINC has not had the development and delivery challenges as CODE with regard to number of students serviced. They have, therefore, had greater opportunity (though not as much as would be desirable) to engage in research and development activities in support of course components. Another key difference between eLINC and CODE is that eLINC works only with faculty who are willing to teach online.

The director of this Centre also reports to the Associate Vice-President responsible for learning technologies.

The Consultative Process

In October 2003 the Learning Technologies Coordinating Committee focused its attention on how to maximize the potential of the university to realize its goal of becoming a leader in teaching and learning with technology. The committee was comprised of the directors of the LIDC, eLINC, and CODE, the University Librarian, the Chief Information Officer, and the Director of the new university campus (where eLINC is based). The Associate Vice President responsible for Technology chaired the committee.

The question to be answered was: how can the University best structure itself to meet the goal of becoming a leader in the field of teaching and learning with technology? While a consultative process was assured, it was clear from the outset that at least three people at the table, including the Chair and the two individuals who report through to him, had a clear preference for a particular model. Early in the process, the Chair openly acknowledged that a very convincing argument would need to be advanced for him to waiver from his original position. It was also evident that some members of the committee had consulted amongst themselves prior to the commencement of the consultation. Those conversations had led to a decision that eLINC and LIDC would merge. Given that the directors of these two units were in a reporting relationship to the Chair and given that all three agreed to the amalgamation, there were no jurisdictional issues.

It is evident that the pre-consultation conversations also focused on the Centre for Online and Distance Education. This became clear when the Director of CODE was advised, prior to the commencement of the consultation, that it, too, should form part of a newly amalgamated unit. That director, however, reports through to the Dean of Continuing Studies. The Dean had been advised that discussions were about to take place that would explore *collaboration* amongst the three units. He had not been directly informed that consideration was being given to removing the Centre for Online and Distance Education from Continuing Studies, thereby reducing the Dean’s staff complement by approximately one third. Such action would jeopardize a number of initiatives predicated on the joint and complementary strengths of the full Continuing Studies unit.

And thus the consultation began. Space does not permit a detailed summary of what transpired during the following five months. While some members of the committee believe the commitment to a consultative process has been honoured, I believe all, if questioned, would have to agree that it did not follow the Virtual Space Planning process undertaken at the Institute of Technology.

Where Are We Now?

At time of writing, a report is being prepared that outlines two restructuring scenarios. Scenario one has the Centre for Online and Distance Education staying within Continuing Studies and working collaboratively with a newly merged unit consisting of what are now known as LIDC and eLINC. Scenario two sees the three units merging, reporting through to an as yet to be determined position. Although discussions did not achieve unanimity, it is anticipated that the report will recommend that the university pursue scenario two. Again, it is anticipated, given what was and was not discussed during the consultation process, that the report will focus on structure – not implementation. As the Institute of Technology case addressed, implementation is a key component of success – or lack thereof. Given that an organizational structure can play itself out in any one of a number of ways, depending on the how and the who of implementation, failure to speak to these issues leaves much left unsaid about the structural plan itself.

The consultation process will continue by discussing the report with the Deans and Vice Presidents and certain Senate committees and employee groups. The extent to which Chairs and Directors of academic units and individual faculty members will have direct access to the report has yet to be addressed. Who will present the report to these various groups and be present for the discussion? This has yet to be addressed. Who has final decision-making authority on what changes, if any, are to be made? That question has not been discussed with the LTCC committee.

As pointed out during the consultations, in theory and all things being equal, either plan has the potential to take the university forward. There is nothing inherent in either plan that speaks to its potential for success or failure. However, it is not the case that all things are equal. One option has the capacity to impact severely on a continuing studies unit that champions the university's commitment to lifelong learning and which, over the years, has become known as one of the strongest units in Canada.

Conclusion

This paper began with a reference to the conference theme of institutional and organisational capacity development and, more specifically, the maturity of focus that is required for fragmented attitudes to be left behind and a systemic perspective to be adopted if progress toward a desired end point is to be successful. In the case of the Institute of Technology, fragmentation manifested itself not through the dissociation of discrete bits, as we often think of it, but rather through the disconnect between surface and deep meaning – between restructuring and "reculturing". If these two components of change are not viewed systemically, we see that transition from one state to another is negatively affected. In this instance, although some change has taken place and some continues to occur, the consequence of fragmentation is a slower and less complete shift to a scenario that was considered desirable.

With regard to the dual-mode university, it is interesting to contemplate that a surface analysis gives rise to a misapprehension. What on the surface appears to be fragmented – i.e. three units all doing the same thing – reflects, when examined more deeply, a distinctiveness of purpose assigned to each unit, each of which has a different target audience and, as a consequence, different course development needs if quality learning experiences are, in fact, what's driving the call for change. Furthermore, recommended changes that purport to be systemic fail to take into account how such changes, depending on how they are implemented, could have a negative affect on other areas critical to the university's proclaimed values and goals – not mention its financial well being. Had the university considered the lessons learned through the Institute of Technology's experience, deeper levels of understanding would have been our reward. Would this have resulted in a different recommendation coming forward? That is an empirical question to which, at this time, this is no answer.

What is fragmented to some is not to others – and with good reason. What appears to be a systemic analysis at one level appears fragmented at another. What, then, constitutes maturity of focus? Appreciating Fullan's distinction between deep and surface analysis and then allowing it to guide our inquiry may provide an answer.

References

FULLAN, MICHAEL (2001) The New Meaning of Educational Change. Teachers College Press. New York

TRANSFORMING A CAMPUS BASED COURSE TO A NET BASED – PRACTICAL EXPERIENCES IN CONTINUING ENGINEERING EDUCATION

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Introduction

Allergies and other hypersensitivities are common symptoms and difficulties that can be linked to the indoor environment. The causes can be poor ventilation, emissions from materials, damp, mould etc. Despite the fact that these problems are well known, we have not succeeded in eliminating them from new buildings, or preventing their return in buildings where measures have already been taken. The need for continuation education in this field among companies and organisations within the building and the real-estate sector is obvious!

A course in indoor environment has been offered for the past few years by Mid Sweden University. The course was developed in co-operation with Professor Jan Sundell at the Technical University of Denmark (DTU). The course is an attempt to establish a comprehensive view of the indoor environment and its importance for allergies, infections of the respiratory passages and other symptoms that can be linked to the indoor environment. Choice of building materials, building technology, installation technology and construction methods are discussed, as are energy consumption, cleaning and other aspects of the buildings' management and maintenance and the influence they have on the indoor environment and the working environment.

In 2002 Mid Sweden University was offered the opportunity of participating in the national project LLL (Life Long Learning) founded by the Swedish Knowledge Foundation (KK-Stiftelsen). Mid Sweden University was granted funds to develop a course for continuing engineering education in a flexible distance form, in co-operation with three other universities. A survey was carried out among companies within the building and the real-estate sector. This survey showed that there was a great amount of interest in distance courses in indoor environment. The above-mentioned course was therefore judged to be a suitable course to transform for online delivery.

Course development

Partners and strategy for development

Development of the course was carried out in co-operation with the Department of Ergonomics and Aerosol Technology, Lund Institute of Technology (LTH), the Department of Social Sciences, Karlstad University and the Center for Indoor Environment and Energy, the Technical University of Denmark. Mid Sweden University has been responsible for the technical and pedagogical structure of the course and the other institutions have contributed with course material and also participated as a reference group and quality assurance assessors for the course. Personnel participating from Mid Sweden University were: Lars-Åke Mikaelsson, Herje Westman and Erland Eriksson from the Department of Engineering, Physics and Mathematics and Bengt Nykvist and Jörgen Pålsson from the "Forum for flexible learning". The three first-mentioned have provided the subject content and the two last-named are responsible for the technical/pedagogical structure. In addition, Mats Boghard and Lars-Göran Swensson (LTH), Carl-Gustaf Bornehag (KU), Jan Sundell and Love Lagercrantz (DTU) have participated as mentors and provided a sounding board with regard to the structure and realization of the course. Jan Sundell and Love Lagercrantz have also been responsible for the final formulation of the curriculum and course content.

A basic structure of the content, pedagogy and presentation of the course was first created. Material from the previously established campus-based course was then added and adapted for distance delivery. Further material was than added with the support of the partners in Lund, Karlstad and Denmark. To adapt traditional classroom courses for delivery as flexible distance courses involves a range of different adjustments and actions:

- In traditional education the focus often lies upon giving good presentations and lectures. In flexible distance education the focus is shifted towards creating high-quality learning activities for the students. Expressed simply; the focus shifts from teaching to learning.
- A good lecture is often based on a large degree of improvisation, founded on the interplay between the lecturer and the spectators/students. In flexible distance education such improvisation is not possible to the same extent. Instead, the material must be presented in such a way that the students are able to choose how they "take in" the information. This requires careful planning and a very clear course structure.
- Traditional education often consists of solitary work for the teacher, whereas flexible distance education usually requires teamwork. The group can consist of subject-specialists and media-specialists that prepare the course materials, editors who compile and present the material and tutors to assist the students with their studies.
- Traditional education is usually "one size fits all". If flexible distance education, especially for working students, is to be successful it must be suited to the needs of the individual. In particular, the students must be able to work with assignments relevant to their profession.
- Working students frequently have professional experience that can contribute to the course. In group work this experience is of great advantage to other students. Furthermore, the discussion and analysis of course material in groups has evident pedagogical effects, with students being able to help and support each other in their studies.
- In order to create a "driving force" in flexible distance education, continual assessment is necessary. Working students have many competing activities and due to the flexible form of the education, intermediate goals in the form of assessments, individual or group reports etc are required in order to maintain a continual focus on the course by the student
- One risk with distance education is that instead having a group of e.g. 30 students and a tutor, you have 30 groups. This is a problem both for the students (isolation, lack of stimulation) and the tutor (high workload with time consuming handling of student assignments, supplying feedback etc). This can be avoided if high quality collaborative learning activities are utilised, encouraging students to work in groups.

Course content and structure of content

The course aims to provide a broad outline of the field "indoor environment" and is directed towards professional engineers, architects, teachers and others who need to broaden their knowledge, either within their profession or for personal development. This mixed target group influenced the selection of material for the course. Material both at an introductory level and articles from scientific journals, presenting the latest research results were selected.

The course was divided into five modules that deal with different aspects of the indoor environment. Each module consists in its turn of three sections: one section which assigns study material, one section containing exercises and one section containing assignments which must be submitted. The material also consists of a study-guide with practical information about the course. The majority of the material to be studied consists of books and articles, which the students buy or borrow from the library. Mid Sweden University's library has provided a "course specific" web page containing literature lists and relevant web links. The National Institute of Public Health has placed several films at the students' disposal, which the project has digitised made available as streaming video over the Internet.

Furthermore the course is constructed in modules in order to make it possible for modules to be re-used in combination with other material in other associated courses. The course web pages are constructed using a simple but attractive layout. The course modules are loaded into a learning management system (LMS). We have used WebCT, which is the LMS used by Mid Sweden University, but the modules can be loaded into any LMS.

Learning activities, interaction and assessment

Two face-to-face course meetings are included in the course. At the first meeting the course and the course materials are presented and instruction in how to use WebCT is provided. On this occasion the students are divided into groups for study and for the presentation of projects and assignments. At a meeting at the end of the course the students present their project work (see below) Between meetings, contact with the students is maintained via WebCT. Students are expected to connect to the course web site 1-2 times per week in order to keep informed about what is happening and to participate in activities on the web.

The exercises and assignments contain problems that stimulate the students to learn at all cognitive levels, in accordance with Bloom's Taxonomy (Bloom, 1956). The students are stimulated to read and reflect on the course materials by solving a number of exercises. The material is first considered individually and thereafter as a group, providing the opportunity to discuss and learn from each other. By discussing the material in groups, learning is deepened and it is possible to see new points of view and correct any misunderstandings that may have arisen. As a third step remaining questions are dealt with together with all groups and the teacher/tutor gives feedback to the groups and the individual students. (Dahlén, 1997).

Assignments submitted are assessed as "pass" or "requiring supplementary material". Both group assignments and individual assignments are assessed and feedback is given individually to each student. Since solutions are worked on as a group, most faults and misunderstandings have hopefully been cleared up before the tutor provides feedback. Students can normally expect feedback 1-2 weeks after submitting group assignments.

Parallel to submitting assignments the student also carries out a project, individually or as part of a small group. If possible, the project is chosen so that it has some link to the students' workplace. Project work should be equivalent to approx. one week of study and is presented as a written report and as presentational material in the form of e.g. overheads, power point presentations or web pages. The scope of the report can of course vary depending upon its aim and direction, but it should comprise of at least five pages (2,000 words). It was originally planned that the project should run in parallel with other activities in the course but unfortunately this did not work (see below).

The pilot course

The course is now available as a prototype and was delivered in the autumn of 2003 in a participant collaborative form. The course began September 1st 2003 with fifteen students, approximately half of who were professionally active and half were full-time students. The course was continuously evaluated. In these evaluations students expressed their satisfaction both with the course content and the way of learning. In the final evaluation of 10 students 5 agreed and 5 fully agreed with the statement "I will recommend this course to colleagues/other students". There were some negative comments about the project work. Our original idea was that the students should carry out their project work parallel to the modules, adding new aspects while they were learning, but it was too difficult to find subjects that were suitable for this method of working.

The teachers' and tutors' experiences of working with the course were also positive. Using the three step method described above, the traditional workload problem in this type of courses; reading and commenting many similar papers, was diminished considerably. A problem that is as yet unsolved is how to handle contributions from students that for one reason or another send in their contributions after the group work has started. The students are expected to first consider the material individually and *thereafter* as a group!

Conclusions and experiences

So far, the results of the project demonstrate that transforming a campus-based course to an onlinecourse, using the strategies mentioned above, can be a successful way to meet the demand for continuing education.

We also believe that we have confirmed the theory that good learning activities are a key to success. The *amount* of course material published on the web (film clips, animations, interactive multimedia exercises) is not the crucial point. The course contains only a few components of this type, but very few negative comments about lack of media from the students were noted. Studies carried out by Open University, UK (Thorpe, 2001) point out that too much material might have a negative effect on learning. Another of our experiences is that learning activities (relevant questions, exercises etc.) should be connected to digitised films made available as streaming video, otherwise most of the students will pay little attention to this material.

In the evaluation, the students confirmed that interaction between students contributes to the learning process. In the pilot course most of the group work took place during face-to-face meetings since the group members worked or lived close to each other. Face-to-face meetings were preferred when compared to discussions on the net.

In autumn 2004 the course will run as a regular course. The course is advertised nationally through the Swedish Net University.

References

1. BLOOM, B. S. (1956) *Taxonomy of Educational Objectives: The Classification of Educational Goals*, Handbook 1: Cognitive Domain, New York: David Mc Kay Company
2. DAHLÉN, S. (1997) *Att skriva studiehandledning – manual för författare i distansundervisning,* Uppsala: Kunskapsföretaget (In Swedish)
3. KK-STIFTELSEN, THE KNOWLEDGE FOUNDATION. Retrieved from the WWW in March 2004: <http://www.kks.se/>
4. LIFE LONG LEARNING. Retrieved from the WWW in March 2004: <http://www.lll.nu>. (In Swedish)
5. MYRINGER, B.& WIGFORSS E. (2002) *Guide för nätbaserad distansutbildning vid högskola och universitet,* Lund: Univ, FoV rapport nr 3. (In Swedish)
6. THE SWEDISH NET UNIVERSITY. Retrieved from the WWW in March 2004: <http://www.netuniversity.se >
7. THORPE, M. (2001) *Evaluating the Use of Learning Technologies,* Using learning technologies: International perspective on practice. Ed. Burge, E. J & Haughy, M. London: Routledge/Falmer

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THE MANAGERS' HANDBOOK. ON-LINE E-BOOK FOR UNIVERSITY CONTINUING EDUCATION IN EUROPE

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Introduction

For the last decade terms like Lifelong Learning and Continuing Education have been in the forefront in the discussion not only about educational policy, but also in other areas such as social policy and economic development. Though not altogether a new concept, increased momentum was added through the European Year of Lifelong Learning that was launched in 1996.

There are many factors behind this development. Some of the important ones are:

- *The Knowledge Society.* The rate of change in the economy is so rapid, especially due to the development on Information and Communication Technology (ICT), that skills and knowledge become obsolete and there is a need for continuous renewal of knowledge.
- *Social inclusion.* Continuing Education is seen a means of giving those who are falling behind a new chance. The new technology also opens new frontiers for those with various forms of disabilities.
- *Competitiveness.* Europe aims for competitive advantage in comparison with USA, Japan etc., and the level of education is regarded as a decisive factor to achieve this.

However, Europe consists of countries with large differences in language, social structures, and also in the structure and quality of the educational systems. This situation also hinders the mobility of the labour force. Therefore, there is a need to "standardise" in a way the educational systems. Some of the initiatives in this respect are ECTS (European Credit Transfer System) and the Tuning project. The Bologna and Brügge processes are also very important parts of the current activity. Among the more recent developments is the increased recognition of skills and knowledge achieved through other means than the formal educational system, ie. APEL (Accreditation of Prior Experiental Learning).

It was proposed to develop a SOCRATES ERASMUS European Thematic Network in response to the Commission's Communication: "Making a European Area of Lifelong Learning a Reality", to identify coherent strategies and practical measures with a view to fostering university lifelong learning. The traditional systems must be transformed to become more open and flexible and allow the learners to have individual learning pathways, suitable to their needs and interests, and thus genuinely take advantage of equal opportunities throughout their lives.

University Continuing Education – challenges and management

European University Continuing Education (UCE) will have an important role in the learning European society. In the future, multiple factors will affect UCE. These include globalisation, the world and European economies, international politics and security, and continuing development in ICT. Thus, for the management of university continuing education there is a greater need than ever to acquire both European wide experiences and to develop joint good practice not only in UCE, but also in Lifelong Learning. Many universities are developing or expanding their continuing education to provide the diverse programmes needed by individuals, business and society. Good management is essential for successful university continuing education.

Through the ERASMUS Thematic Networks as defined by the European Union university co-operation has been developed in subjects of mutual interest and comparative understanding. One of these Thematic Networks has been THENUCE – The European Socrates Thematic Network in University Continuing Education (1996-2003). It has been organised within the Institutional Contract of the University of Liege (Belgium) and with 140 partner universities from 28 countries, including National UCE networks and European University Networks. THENUCE project co-ordinator has been prof. Victor de Kosinsky, University of Liege.

THENUCE has succeeded in attracting a great number of academic and educational experts from across Europe to a wide range of activities connected with Lifelong Learning. The project (actually 3 consecutive projects) has thus been a long term process that has had a fairly strong focus on concrete results and the most successful areas of work have been ones that have resulted in tangible products. The longevity of the project has made possible continual development and improvement in some areas, such as the Managers' Handbook which was first published as a working document, and then as a printed book (2000) and finally as an on-line version (2003).

EULLearN (http://www.eullearn.net), the European thematic network of University Life Long Learning can be seen as a direct continuation of THENUCE, running from 2003 to the end of 2006. EULLearN runs within the Socrates Institutional Contract of some 87 partner institutions in 31 countries, co-ordinated by the International School of Management (ISM) in Lithuania. The project co-ordinator is prof. Petras Barsauskas, ISM.

The purpose of this paper is to describe one concrete result of THENUCE and EULLearN Thematic Networks – the on-line book: The Managers' Handbook, edited by Mick Brennan, Valerie Mitchell, Frank Moe and Helka Urponen and with many other contributors. Web production has been carried out in The Kaunas University of Technology, by Dr Danguole Rutkauskiene.

The electronic Managers' Handbook

The Electronic Managers' Handbook has been developed as part of THENUCE activities, as was The European UCE survey "Lifelong learning in a changing continent" (eds. Osborne and Thomas 2003), The European Observatory as a reference point of European UCE activities to monitor and predict the evolution of UCE, "Relay Centres" extending and disseminating UCE in Central European and Baltic states and regions and promoting and creating National Networks in the field of UCE. Although there will be major changes in the focus from the preceding THENUCE project, the previous outputs like The Managers' Handbook will be used in EULLearN as a basis for future development.

The Handbook work has been one of several contributions from THENUCE towards the construction of a "European Space for Higher Education". It will also assist UCE to serve the people of Europe more effectively. We hope to stimulate many comments from all stakeholders in lifelong learning.

The Managers' Handbook is a practical guide for managers in continuing education in European universities. It draws on the knowledge and experiences of the authors and contributors as senior managers of university continuing education and as researchers. It also reflects their experience from participation in multi-national European projects and in European networks.

The Handbook addresses key aspects of the management of university continuing education and is the result of extensive collaboration and contribution from a large number of experts in many universities. in addition to the main text, checklists and references, the Handbook contains 63 case studies from 23 European countries. It has provided opportunities for many European universities to contribute to the development of the Managers' Handbook and to work together and share experience. The Handbook thus reflects the rapid changes in European Universities in general and in UCE in particular.

The Managers' Handbook has been published online and as a CD ROM, and also in pdf format on the web to facilitate users who want to print a copy. It is thus made accessible to people in all parts of Europe (or the world for that matter) and it provides flexibility in its use. The wide range of material should be of interest to both managers and policy makers concerned with university continuing education.

The Handbook consists of 10 main chapters with 63 case studies, checklists, links and references.

1. The Management of University Continuing Education: An Overview
2. A Policy for University Continuing Education
3. Regional Development and University Continuing Education
4. Organisational Structures
5. The Management of Distance Education
6. Marketing
7. Staff and Staff Development
8. Financial Management
9. Quality Assurance
10. Looking to the future

The on-line address for The Managers' Handbook is http://distance.ktu.lt/thenuce/ebook.

Electronic Managers' Handbook on the Internet and CD

While preparing the Managers' Handbook on the Internet and CD, an original design and user-friendly navigation was developed for each chapter. Information about authors is presented, as well as the contents of the book and the list of case studies.

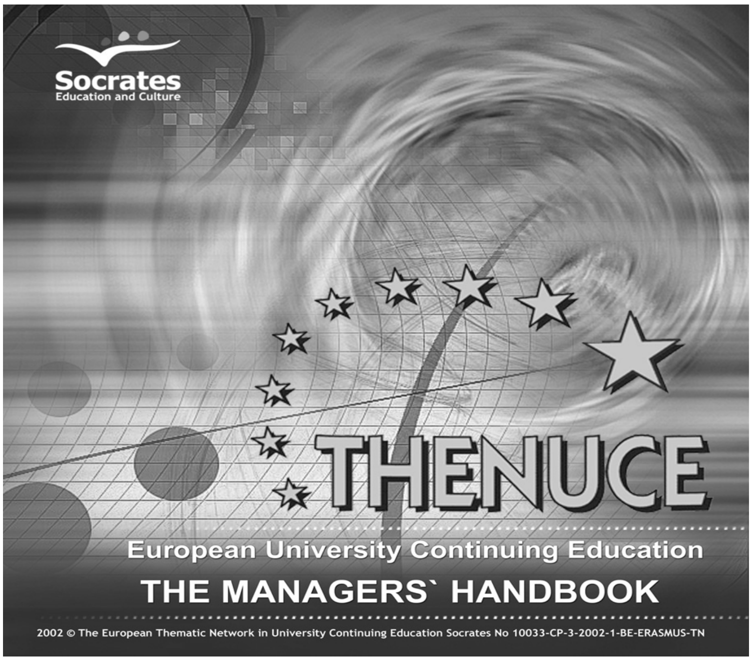

Figure 1. CD-ROM cover

Special attention is paid to the presentation of Case studies in the material of the 10 chapters of the book. This material can be found in several ways: by the number of the Case study, by chapter or by the map. By navigation in the map you may choose a study from an area of your interest.

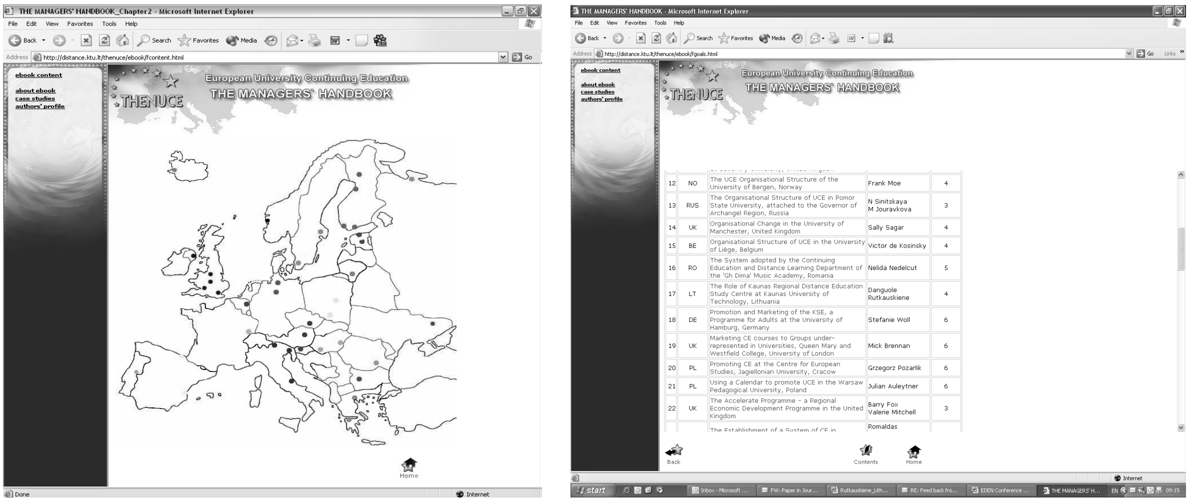

Figure 2.-3. Case studies distribution by countries or by chapters

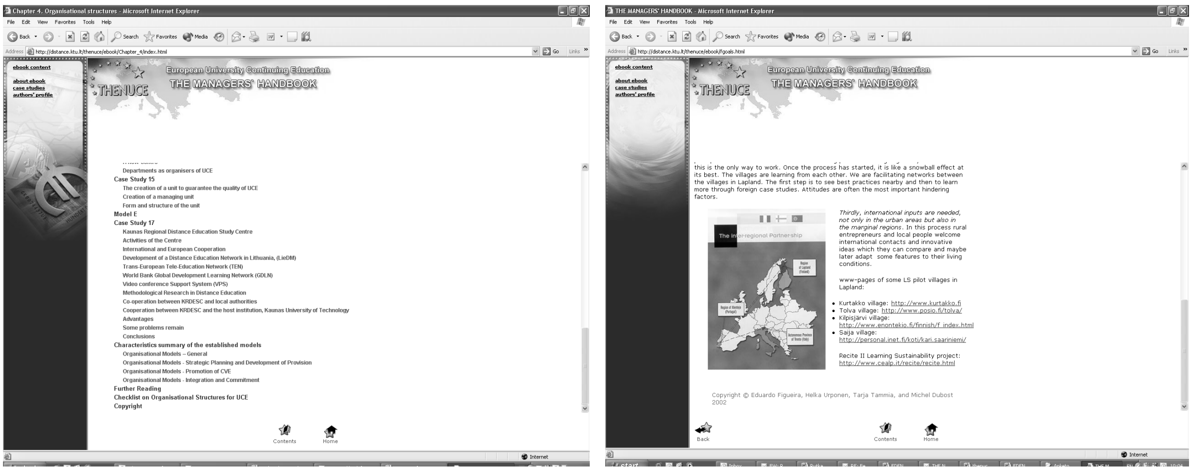

Figure 4.-5. The electronic material of electronic Managers' Handbook

The electronic material for the Manager's Handbook has been developed using Course Development Kit which is built on state of the art data markup and presentation language. E-books and e-courses developed with this tool have the material managed into structured pieces of information. Different presentation styles and medias of the electronic publishing material can be achieved through material transformation. Basic interactivity is achieved with automatically added navigation facilities.

The material of the Managers' Handbook is freely accessible on the internet, and it is more and more of interest not only among specialists of continuing education, but among many teachers from various universities, as additional resources supplied for their students. However, we should note that this material is especially urgent for the specialists of continuing education who implement Lifelong Learning paradigm in adult education. In the future, we plan to add the material with interactive self-tests, and this should improve this electronic managers handbook and make it more useful for the users.

Need for improvements in the functionality of the e-book

The aim of the Handbook has been very much a "how to do it", aimed at managers with little or no prior experience in the practical running of continuing education courses. The chapters cover what is regarded as the basic areas of necessary knowledge. A very important feature is the collection of case studies describing in various levels of detail, practical experiences from many countries. In paper based format space is a limiting factor, while with an electronic handbook there are practically no limits to the volume of contents that can be included. Due to the limited funding for its development, the Handbook, even when converted to electronic format, is in the main still a book, that is to say that there is little opportunity for cross navigation etc. We think that the concept of the electronic handbook is a very interesting one, and one that could form the basis for similar products in other areas, or maybe even a larger resource bank for University Lifelong Learning. Improving the Handbook's functionality and scope and developing its contents might bring benefits for all users.

What are the options for improvement of the Handbook? We would like to do some of the following:

1. Increasing the scope of the book, adding other subject areas, e.g. APEL.
2. Increasing the options for cross navigation within the book. Case studies are now linked to just one chapter, although they may be relevant to more than one chapter. Cross referencing and linking would make the book more dynamic.
3. Adding more interactivity and dynamic elements, e.g. linking the book directly to outside sources (home pages of universities, EU institutions etc.).
4. Extending and improving texts, both the general chapters and the case studies. Increasing the number of examples.
5. Adding more theoretical weight to the contents, without losing the "hands on" notion. This can be done through changing the basic texts or, more likely, through adding extra texts, referencing, linking, etc.
6. Developing the contents in the direction of using it as learning material for courses. This may be done through enhancing the theoretical level of the contents itself, but especially through preparing study guides, etc.
7. Initiating the translation of parts of the book, either sections of chapters, parts of or whole case studies or abstracts of texts.

References

1. V. MITCHELL (ED.) (2000) European University Continuing Education. The Managers' Handbook. ISBN 2-930260-07-6. Liege, Belgium
2. M. OSBORNE AND E. THOMAS. NIACE (ED.) (2003) *Lifelong Learning in a changing continent.* Continuing education in the universities of Europe. p.540
3. ROSENBERG MARC J. (2001) *E-learning, Strategies for delivering Knowledge in the Digital age*, p.344, ISBN 0-07-136268-1, McGrawHill
4. LIFELONG LEARNING MEMORANDUM (2000)
5. http://distance.ktu.lt/thenuce/ebook
6. http://www.eullearn.net

THE ROLE OF ICT – ELEARNING IN THE CONVERGENCE PHENOMENA IN THE DEVELOPMENT OF DIFFERENT LIFELONG LEARNING SYSTEMS

Péter Soltész, Hungary

Lifelong learning (LLL) is in the mainstream of education strategies of the developed countries for about two decades. Nevertheless a coherent vision of LLL emerged only in the 90s when international organisations like the OECD and the European Union came up with LLL as an overarching priority of the education systems they federated.

More exactly it was in 1996 when both mentioned organisations declared the year as the year of LLL. But even if they tried to give basic characteristics and attempted definitions from that time, it was too late to initiate homogeneous developments in the different countries. LLL-type developments started much earlier in the countries and, of course, on the basis of their extremely divers national traditions.

These traditions are divers, so much that even the EU handles education as a decentralised sector, without defining concrete "acquis communautaires" in this field. Of course, common denominators could be found and the analysis of them started in different international forums. In order to get closer to the objectives of this presentation it is worthwhile to enumerate some basic characteristics of LLL:

- LLL implies above all a systemic view on the whole education and training system. It builds strong linkages between learning at different stages of life and in a wide range of settings and partnership rather than just looking at various forms of education and training provision in isolation from each other. This implies in particular that education governments are supposed to manage the traditionally isolated education sectors simultaneously, with special interest in their interrelations.
- An other systemic feature is that all learning should be recognised, not just formal courses. The validation of informal learning and work experience can lead to exemptions and individual learning pathways, major motivational forces for adult learners.
- LLL requires good foundation skills among both the young and adults: particularly those with poor initial education. Motivation must be in the centre. This requires fundamental changes in curriculum and pedagogy, emphasising willingness to learn as much as content mastery.
- Equitable access to learning requires a lifelong perspective. Isolated education sectors are not able to ensure equity; in a systemic approach imbalanced equity issues in one sector can be handled in the future, leaving – of course – a large stake for adult education.
- In a LLL context countries can evaluate resources according to lifecycle needs and deploy them effectively. Many examples show that with lifecycle planning and incentives more private resources can be attracted.
- Policy coordination cannot be restricted to the ministries of education. Interministerial approach is imposing.

Is support for lifelong learning only at the level of political rhetoric or are countries doing something practical about it? I think that many countries are trying to conceptualise LLL in terms of a broad "cradle to grave" view. But in the same time countries have not articulated explicit targets for the LLL system as a whole. Instead, where targets have been identified they relate to specific sectors of the education system.

Many countries are introducing reforms at the sector level that are framed in the context of LLL requirements. Countries differ in the emphasis they place on different sectors or type of provision of LLL. For example, some countries cite LLL as a reason to strengthen teaching and learning at the school level while others put the main emphasis on improving post-secondary and adult training opportunities.

Though all countries recognise both the economic and social objectives of LLL, some emphasise employability and competitiveness while others pay special attention to personal development and citizenship.

The role of the state is different in the different models. Traditional education structures define partially the state's attitude but also general policy has important influence on it. *A major difference – in my view – is in how the state wants to motivate the individuals for learning during their lifecycle. The liberal approach is, for example, personal financial motivation, like the Individual Learning Accounts or freely diversified training provisions while the conservative one uses well controlled, indirect financial motivation and more structured but also rich provision system.*

But one point is certainly common: the use of ICT, the promotion of its' penetration into all education and training sectors, regardless of traditions and motivation strategy.

Let me present two examples, one on both sides:

The English Individual Learning Account Programme

Individual Learning Accounts (ILA) made available public money for individuals to gain the skills they needed for employment. The overall aim was to widen participation in learning and to help overcome financial barriers to learning faced by individuals.

The original delivery model, piloted in a variety of forms through Training and Enterprise Councils and the Further Education Funding Council, envisaged the concept of a real account where individuals could bank, and save their own money in addition to any other contributions from, for example, government, employers and trade unions. The finance sector was not enthusiastic to handle this high volume of low value transactions so the delivery mechanism was changed several times in order to be acceptable for the financing sector and empowering, giving control and freedom of choice for the individuals.

ILAs were intended as a mechanism to encourage the development of wider choice and innovation in the delivery of training and to attract new providers. Consequently the programme was designed to be simple and flexible for the learner and provider with the minimum of bureaucracy. A fundamental principle of the design was that individuals had to pay a contribution for their learning. ILAs were not, however, intended to be a guarantee of quality of learning or learning providers as such Government endorsement might give an unfair market advantage to registered ILA providers.

At the beginning the ILA programme was a real success and even final evaluations show that many objectives of the programme have been achieved. However, more and more evidence of widespread serious fraud came to light and after having 2,6 million account holders (!) the Government was obliged to suspend the scheme.

It was clear that the light-touch, non-bureaucratic nature of the programme designed to reach non-traditional learners was successful but regrettably, this also enabled a minority of unscrupulous learning providers to act against the ethos of the programme.

Attempts are being made to establish better schemes in the same line and it is clear that ILAs cannot be declared dead.

Evaluations show that ILAs were used in large volume for ICT trainings and also for further trainings using ICT facilities. The partial failure of this "liberal" scheme to promote LLL does not suggest that the approach can not appropriate in the long run.

A German example for non-formal learning as a structural element of LLL: the example of further ICT training

A core element of the German LLL system is a networked complex of educational offerings that afford individuals opportunities to select and combine various options to suit their personal needs. Of particular interest in this context are approaches that seek to interlink these educational offerings along the line of the individual's occupational biography – initial training with further training, or further training with continuing education. The example to be presented here was developed by the social partners of the ICT sector.

As early as the mid-1990s, the social partners of the ICT sector together with the Federal Government realised an important shortage of ICT specialists creating slowly a backlash in this field compared to other developed countries. As a result a large scale campaign and new regulations were initiated with the involvement of experts from both the employers and employees sides.

The outcome of these endeavours is a new continuing education and training system in the ICT sector that is innovative in many respects: its profiles, levels, flexibility, and learning concepts clearly differ from previous further training provision.

The new system is based on the four ICT training occupations – defined by the above mentioned regulations –, namely ICT system electronics technician, information technology specialist, ICT system support specialist and information technology officer, but it also expressly includes the possibility of lateral entry and re-entry.

At the first level, the "specialist" level, further ICT training is offered for 29 specialisation in six functional groups. Training at the next level, the "operative professionals" level, leads to the following qualifications considered equivalent to a bachelor's degree: ICT engineer, ICT manager, ICT consultant and ICT commercial manager. The qualifications earned at the top level, the "strategic professionals" level, are equivalent to a master's degree: ICT system engineer and ICT business engineer.

The various further training profiles at the three levels have been interlinked in a way that enables employees who wish to enhance their qualifications to choose among different pathways without having to start from scratch. This facilitates both horizontal skill development and upward career development, including diagonal routes.

The central learning approach throughout this system is competence development in the process of work, a didactic principle that combines productive activity with personnel development. Learning is based on a process-oriented curriculum. The structure of the content of learning is therefore not meant to meet the requirements of a specific subject but instead follows the logic of the work process – which can be understood on the basis of the work experience acquired.

Owing to this practical work-oriented learning concept, it is possible to open further ICT training to lateral entrants and re-entrants. It is expressly stated that entry into the system is also possible on the basis of relevant work experience acquired either within the ICT sector or externally on the labour market, from where bridging measures financed by the employment offices may lead to further ICT training.

This well thought, rich provision structure with the implicit financial support behind proved to be efficient enough to make ICT trainings penetrate the whole labour market. This clearly shows that Germany's LLL policy encompasses investment in the development of skills, education networks and support structures rather than provision of financial resources to individuals alone.

The two examples may suggest that different LLL political strategies superposed on very different educational traditions might lead to very different systems. In our view this will not be the case. The penetration of ICT – in a way or in an other – will homogenise the international panorama. ICT based leaning is the first education sector where general benchmarks can be defined and have been defined by the European Union (see: eLearning Action Plans). Due to the enhanced comparability of schemes, structures and curricula of e- and b-Learning systems LLL national strategies will get closer, a convergence can be forecasted. The lecture will give further proofs of this idea.

What is going on the top: the US development

The education and training market, Technology Based Learning (TBL) included, raised in the US in a very dynamic way up to the famous 11.09.2001. The market achieved a level as high as 900 billion USD in 2001. After the terrorist attack a large part of the training programmes was cancelled or delayed, 2 million people lost their job. The eLearning euphoria faded away, and some major failures forced the decision makers to draw up more realistic strategies. Nevertheless, a steady development – although slower then foreseen earlier – can be witnessed.

56,8 billion USD out of the above mentioned large market was budget of the online learning. The cancelled training volume at the end of 2001 lead to a special situation: people looking for training opportunities – coming from a decreased working population – began to prefer more secure online solutions to the traditional trainings needing less secure travel and city traffic. This gave a renewal to the eLearning market and the budget for 2002 went to 54,2 billion (with much less working force).

Forecasts show that market based learning will grow by 8% a year compared to the 27% yearly increase of the eLearning market!

Business communities and army seem to be offering the easiest field for eLearning providers. SMEs are still more reluctant to introduce these approaches since tailoring the curricula for their employees is still expensive. This sector will need to-the-point curricula with efficient pedagogical approach, and can become the most important user community.

US strategy makers realised – much ahead of the European counterparts – that to reach this fragmented market an integrated approach of the three major protagonists of the field is needed:

- Content developers
- Infrastructure and software providers
- Service providers (portals, content integrators, online communities, external trainings with their administration, examinations, qualifications and student guidance)

This harmonisation is the key of the success. In a previous stage the infrastructure providers were the protagonists of the field outnumbering and overweighting the two others. It turned out that infrastructure people were not able to produce appropriate contents and so they could not comply with the demands. But in the meantime eLearning and its reputation suffered a lot.

Actually the US market arrived to a higher maturity level. Profitable models have emerged, well introduced companies will have relatively easy access to new sources if they need it. The introduction of the first wave of the risk capital is over, many new players are not waited in the field. The already well established companies have time to stabilise themselves. The majority will be taken by the strengthening of their US positions. *In a certain sense it is good luck for Europe: It has some time to make up a coherent strategy without being flooded by US made eEducation rooted in American culture.*

But gradually some large and integrated companies will go abroad. Associations like Smartforce – Cisco – Microsoft – Docent, or Docent – KPGM, or Saba – NETg, or IBM – Cisco have been created. Partners in these associations have access to the technologies of the others, while the roles of content development, infrastructure provision and service offering are distributed, decreasing in this way the development costs.

Very soon these associations will integrate – if not swallow – higher education institutions and other traditional training providers, and with them or without, will penetrate the market. *This will be a new, accelerated phase of the convergence phenomena of the different LLL systems due to – again – the penetration of the ICT facilities.*

As it has already been mentioned, Europe in general and Central and Eastern Europe in particular have a certain "last" chance with their different national cultures, different languages, different education and curriculum systems, different development levels and different market sizes. This fragmentation is not attractive – for the time being – for the large international, American players. But harmonisation of the systems is going on one side, and technology is developing to overcome the fragmentation problems on the other. *The convergence phenomena strengthened after this stage will not be without any danger.*

eGlobalisation

A number of studies and projects – like for instance the very interesting "Filter" project – are asking the following questions:

- Does an American hegemony already exist and can it be foreseen on the World Wide Web?
- To what extent are small nations, regions and even Europe vulnerable to US dominance?
- Will the increased globalisation lead to a homogenisation of available knowledge?
- Will the "Bildung" ideal be replaced by the ideal of an efficient preparation for jobs?
- Will the democratic values of school change for corporate values along with a general academic de-skilling procedure?

As the previous section suggests, we think that these dangers are real, and even a sort of smooth e-colonisation can be envisaged. It is not necessary to use guns and tanks to subdue resistance consumerism, the free market and global competitiveness. It is easier and more acceptable to control structures and shape minds. Web based education can be a soft technology to secure US strategic interests and to position American culture and values as a norm.

To show the US position it is worthwile to cite vice-president Gore from 1994: "delivering education on the Internet will mean students will have access to the best teachers regardless of distance or other disadvantages. This will result in 30% more learning in 40% less time at 30% of the cost."

Analysts point out that these clearly corporate US aspirations and "Californian ideology" can secure global dominance for US values and norms because of the missing opponents! This is not the US to be blamed because of defending its interests.

Homogenisation and pre-selection of knowledge can be envisaged leading to academic de-skilling even in universities. These forecasts alarmed European leaders, at least those who wish to safeguard cultural and academic traditions. Guy Verhofstadt stated in 2001:

"the challenge that we are facing today is not how to thwart globalisation but instead how to give it an ethical dimension."

What Europe can do?

We should recognise that the current trend towards globalisation is not an evil. Efforts on local, regional and European level are to be made to develop appropriate eLearning curricula with interactivity and links going to sources rooted in European culture and calling for student creativity. Real teachers can teach students to think, even by eLearning techniques. But for that they must be trained to acquire methods of the new knowledge transmission procedures. But this cannot be carried out without governmental initiatives and incentives. *Where governments are extreme free marketers even in education, ODL and eLearning will be empowered predominantly by the educational industry and teaching may end up as the poor end product of power-pointed knowledge.*

Europe and particularly *Central Europe have a unique chance with timing*. As we pointed out Europe and especially Central Europe is so fragmented from cultural and linguistic point of view, that to invest in tailor made curricula in this multilingual region – with the actual technological level – is still not commercially interesting for the large multinational eLearning providers. This good luck gives Europe and the European countries an extension of time to strengthen their eLearning systems and competences in order to be – later on – competitive with, or at least a partner of US and supranational providers.

This lecture showed – in this respect – some excellent examples for national and European initiatives. *The most serious error of a government can be passivity – deliberate or not – helping in the long run e-globalisation to turn into e-colonisation.*

Literature

1. J. MLINARICS, P. SOLTÉSZ The present and the future of the simultaneous development of Lifelong Learning and the Information and Communication Technologies, 2003, MATISZ, Hungary, in Hungary
2. SYLVIA VAN DE BUNT-KOKHUIS E-Learning and the Quality of Knowledge in a Globalised World, Conference Proceedings, Rhodos, EDEN, 2003
3. R. BOSHIER, M. WILSON AND A. QAYYUM *Lifelong Education and the World Wide Web: American Hegemony or Diverse Utopia?,* International Journal of Lifelong Education, Vol. 18, No. 4, 1999
4. G. VERHOFSTADT The paradox of anti-globalisation, Business World, Manila, 2001

NEW PERSPECTIVES IN OPEN AND DISTANCE LEARNING FOSTERED BY THE INSTITUTIONAL INITIATION OF ADULT EDUCATION

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Introduction

The goal of this paper is to present the experience obtained by the Budapest University of Technology and Economics in answering the challenge of the changing social, economic and financial environment of the present time. The realignment that took place last year was fostered mainly by the changing emphasis on adult education. It is one of the most pressing matters of this country accentuated by both the government and the European Union. If – according to the Lisboa Memorandum – the Union is to become the world leading, most dynamic knowledge-based economy by 2010 and to reach this goal the member countries have to create a national strategy of lifelong learning by 2005, then the biggest polytechnic in the country has to be a part of that apparently. Not mainly in creating the strategy but to become a role model in showing how to use a huge teaching potential and experience in adult education to reach our common goal.

But the picture would not be complete without mentioning the also present strong financial necessity which drives the university into entering the market of adult education. Given that in Hungary most of the higher educational institutions are financed by the state – although not exclusively – they are always subjected to the cyclical increasing and decreasing of the country's economy. As a result of the government restriction, higher education is always liable to withdrawal of the funds. The university had to find a way to compensate for these cuts and also to finance its developments. The financing is basically normative but it is subjected to the yearly decision on the central budget, so it is constantly changing. Besides normative financing, the universities have always been forced upon making an income. Presently the proportion between normative funding and income is 60-40 percent, respectively. However, it is also true that the parallel presence of deficit and waste is one of the main characteristics of the higher educational finances. It was one of the reasons behind the integration of institutions that took place at the end of 90s. That way the government wanted to cut down on administration and parallel courses expenses. Unfortunately, it did not have the wanted result.

About the University

In order to evaluate the situation and the sustainability, the university has chosen, it is needed to highlight its history and present stance. The establishment of this University is dated back to the late 18th century. This university is the first in the world to offer education in engineering on a university level. By the beginning of the 20th century according to the number of enrolled students the University had been the third biggest technical university in Europe, with only Berlin and Munich preceding it. In 1939 the Institute for Continuing Education opens its gates being the very first in Europe of its kind and is still successfully operating today. Given the growing emphasis on economy studies lately the university broadened its profile from being only a polytechnic to meet the national and international demands and in 2000 it became the Budapest University of Technology and Economics. In the present time more than 110 departments and institutes operate within the structure of eight faculties and it issues about 70% of Hungary's engineering diplomas. The number of its students is growing rapidly and at present more than 15 000 students are enrolled. The University gave three Nobel-Prize winners to the world and numerous famous scientists, inventors and architects.

Obviously, this is a fabulous past and present, a tradition to envy but what if the situation is such that a university with such assets has to enter a market dominated by costumer oriented business firms and enterprises with much less experience in education but much more experience in marketing their services and being much more sensitive to the needs of their customers. The university has different aspects of the operation. Serving the customers is not a general expectation towards the Hungarian higher institutions. The demand for higher education is rather induced by higher educational institutions, than by the need of the customers. This has resulted in having both absent and excessive occupations, for example skilled workers are a rarity whilst young university graduates may face employment problems. This inflexibility is partially maintained through the state financing as well, but mostly it is a problem of uncertainty in the labor market.

The University's approach towards adult education

For all the above reasons, on the one hand, it would be necessary to have a resilient, market-oriented institution, but on the other hand, the university is the trustee of tradition and therefore are much less able to change than the smaller firms or schools. Given the size of this institution and its strong believe in tradition, introducing new ideas requires a lot of time and energy. The main problems that have to be dealt with are:

- there is a certain aristocratic approach towards education given that the professional prominence is the result of strict demands based on tradition. Unfortunately this has caused a lack of openness as well. For the same reason participating in adult education is considered not appealing to professors although a lot of them are teaching such courses outside the university;
- entering the market requires some changes in administration. For example they have to be ready to the needs of working people paying training fees and given that it warrants them tax refunds, the university has to issue proper certificate to them;
- there was no reliable overview, financial or statistical of the trainings that took place in the university, the reports didn't have any relation or connection to each other;
- and finally, it is ambiguous how higher education should relate to adult education. In other words whose concern is adult education and why should it be that of the university.

On the other hand, the university does have a tradition in adult education given that since 1939 the Institute for Continuing Education is present in further education and training for engineers. There is also a couple of courses that different departments created and manage and there are trainings that are necessarily take place at the university such as training engineers for the work in Paks, the nuclear reactor of Hungary given that here is the only educational nuclear reactor in the country. But there was never a need to create centralized strategy which would join all these activities. Neither was there a need to be able to compare them on the basis of mutual operational principles. Only that this unity is inevitable in order to be successful in the market together with lifting the negative assumptions listed above.

Legal regulations

Although the university made some changes during the 90s concerning open and distance learning, the main facilitator of change concerning adult education was the Adult Education Act issued in 2001. These regulations connected adult education to general education because they were issued by the Ministry of Education. The regulations brought quality assurance principles into adult education, implying comparability and central actions.

The legal requirements involved:

- state registry of both the institution and the programs;
- complete training programs by given parameters;
- an institutional training plan.

But other than requiring a certain level of quality assurance, unfortunately, it repeated the ambiguity of how to treat adult education, and it has been modified over and over again since it was issued. It is undecided even which Ministry is competent to deal with this field. It has changed from the Ministry of Education to the Ministry of Employment and Labour given the government change in 2002. This results in a series of overruling orders and double meanings. The constant changing of the legal background leaves it a difficult task on how to regulate the university processes related to adult education. So what should have been an ally in changing the stance of the university in favor of adult education became one of the main obstacles of a successful university regulation for its main goal of fitting the legal regulations cannot be met.

Chance of renewal

In the meantime, the University government has started its own course of actions. Given its size, there had to be an institutional change made in order to have the proper resources for this task. This resulted in creating the Distance and Adult Education Centre in 2003.

The predecessor of this center was the Distance Education Centre established in 1997. The University Senate has decided that given the Center's success in introducing open and distance learning it has a chance of the same success in taking up the challenging task of creating a proper strategy and operation for adult education as well. The Centre differs from the rest of the university because

- it is a sort of internal business enterprise in a way it is self-financed therefore the customer-based approach and business resilience is present;
- it is free from the negative aspects of strong traditions like inflexibility;
- it already has a co-operational model with the professors, due to previous teaching in our trainings, which is the one that can be used in terms of adult education as well;
- it has the proper experience in open and distance education which can be of mutual profit for adult education.

Since 1997, the Centre among others has facilitated and promoted the introduction of new technology in the education of the University and other traditional universities in the country, to deliver high quality jobmarket-oriented courses, training of employees, continuing education in order to meet the needs of the economy. In terms of a co-operational agreement with the National Institute for Adult Education, the Centre provides professional support for the development of country-wide implementation of adult learning. The Professional Advisory Board for Adult Education of the University was formed in 2003 consisting university professors linked to adult education and leading figures from business enterprises as representatives of the corporate target group to foster links and cooperation between the university, the market and experts in the field of adult and distance education. Following a detailed survey and consultation procedure with the departments, an exhaustive online institutional database of trainings and services – falling under the power of the Adult Education Act – has also been established.

The Centre works on realizing the following goals:

- modular trainings,
- a more customer-focused environment,
- to profit from the benefit of being a higher educational institution and a training "firm" as well,
- to get the teachers who are presently working for educational enterprises on a part-time basis work within the University,
- to define and build a quality assurance model for adult education within the University's quality assurance system,
- nevertheless to give distance learning a fresh start by adult education.

The adult educational programs consist mainly of graduate programs and their modules. If one created a positive approach towards adult education and made it work with profit and prestige, there could be a chance to introduce distance learning to the graduate courses. The institution has a great teaching potential: the question is if there is a chance to use it for everybody's benefit. Given that the university government puts a strong emphasis on raising the income, pressure by them on the departments to cooperate with the Centre in adult education is expected. The Centre hopes that it could be connected with distance education and its financial and market benefits as well. The Centre positioned itself in the university in such a way that it is possible to reach this goal. The Centre has already proved to be effective in raising funds for adult education, centralizing the information flow and defining the basic quality assurance processes. Moreover, the Centre is introducing a different methodological approach of adult and distance education viewed to be a benefit of the same value as the financial.

Conclusion

The Budapest University of Technology and Economics is a traditional institution, representing the highest quality education concerning polytechnics, natural sciences and economics. Due to the necessity of modernisation, politics and finances, it has taken up a new task of entering the market of education, more precisely the market of adult education and training. However, there are negative assumptions concerning this field of education and also a lack of overview of these activities at the University.

The University Council has created the Distance and Adult Education Centre and appoints it for this task. Since then the Centre has been working on raising awareness of the benefits of involvement in adult education. It has also created an operating system for management and advisory and is also working on a quality assurance plan.

The Centre sees the new task of adult education as a chance to give open and distance education a new chance of gaining more attention. As a result, it could expand to graduate programs and that would mean a quality and quantity increase in supplying education and training benefiting all the involved.

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THE EXTENSION OF ICT IN THE "NEW ENLARGED EUROPE" AND THE ROLE OF CEDEFOP

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The context

Accession is now a reality that will bring about many changes. Changes that will affect everyone involved, Member States and the candidate countries that are joining the European Union on May 1, 2004.

Information and communication technology has changed dramatically over the last decade and the Internet has put very powerful tools within the reach of citizens all over the world, as well as governments and businesses. This has resulted in internal changes in organisations, businesses, trading partners, and governments. The result of these technological changes is that citizens are now more encouraged to use the new advancement, such as the Internet, in their everyday lives. This gives people more opportunities for employment and the ability to more actively take part in economy and policies and to contribute to society in general.

The European Commission, that is, the Heads of Government and State of the EU-15, set specific goals for Europe. Europe is to become "*the most competitive and dynamic knowledge-based economy in the world*". The Commission realised the need to set goals to give its citizens the opportunity to become as fluent and efficient as could be in the information and communication technologies, that is why the "eEurope Action Plan" was set up.

The programmes

The Central and Eastern European Countries recognised the goals set up by EU-15 with the eEurope Action Plan and decided to launch an "eEurope-like Action Plan" *by and for* Candidate Countries. The eEurope+ 2003 is a programme designed to deal with specific changes necessary in the Candidate Countries.

The eEurope+ Action Plan *aims to accelerate reform and modernisation of the economies in the candidate countries,* encourage capacity and institution building, improve overall competitiveness through the use of Information Society technologies and tools, and provide actions which address the specific situation of the Candidate Countries. It is mirrored in the eEurope 2002 Action Plan of the EU-15 but changes and additional points, objectives, actions and timetables to reflect the economic and social situation in the Candidate Countries.

Candidate countries will be working with EU Member States to make sure Europe becomes "*the most competitive and dynamic knowledge-based economy in the world*"*.* For this reason EU Member States and candidate countries must co-operate, exchange know-how and experiences to help integrate Europe.

By investing in people and skills European youths will enter the digital age, working a knowledge-based economy and also participating in it. In order to stimulate the use of the Internet, candidate countries and Member States are required to accelerate e-commerce, provide government online services, intelligent transport systems, health online and a European digital content for areas of the economy that should be further developed. This would have to be done in detail to help promote new systems and enhance ICT communication through the Internet. The eEurope 2003 Action Plan provides the incentive for development in the economic, social and industrial environments.

The objectives of the eEurope+ 2003 Action Plan

The objectives of the eEurope+ 2003 Action Plan with regard Candidate Countries are:

- to accelerate the putting into place of the basic building blocks of the Information Society
- to develop a cheaper, faster, secure Internet
- to invest in people and skills
- to stimulate the use of the Internet
- to implement regulations for the achievement of universal service in telecommunications services and secure the availability of affordable basic telephone service in order to permit access to the Internet

More specific objectives of the eEuropa+Action Plan concerning "Faster Internet for researchers and students" are:

Candidate countries must join their efforts with the EU-15 Member States to increase priority in research networking in order to make Europe a globally connected leader in ICT communications, thus, enabling Europe to become a leader in a knowledge-based society.

Candidate countries must work towards upgrading national research networks to make sure researchers and students can benefit from powerful networks, enabling them to work more progressively.

High speed Internet access and intranets must be accessible to students and researchers in universities and organisations to enable students to have quick access to the Internet. Research must be made available through the Internet to be used by schools, museums and libraries by the candidate countries.

In order to invest in people and skills and in European youth into the digital age more specifically, candidate countries must make every effort to connect all schools to the Internet. This will allow students and teachers quick access to the Information Society. It will enable candidate countries to exploit the strengths and tradition of the European education system and to overcome barriers which hold back the uptake of digital technologies.

The objective of installing the Internet and elearning in schools and universities must be achieved as fast as possible. Access will depend on the current level of Internet connections for each of the candidate countries separately. The private and public sectors must make combined efforts to brought together to meet the challenge of the digital age and ICT.

In further detail, the following points must be achieved in candidate countries as far as elearning and the digital age are concerned:

- Provision for all schools with convenient access for teachers and students to the Internet and multimedia sources.
- Ensure availability of support services and educational resources on the Internet, along with elearning platforms, for teachers, pupils and parents.
- Provide training to all teachers, and adapt teacher curricula and offer incentives to teachers to use and apply new technologies for developing innovative, practical teaching methods.
- Adapt schools curricula by integrating new learning methods based on information and communication technologies.
- Ensure that pupils have the possibility to be digitally literate by the time they leave school.

Special institutions involved in the process of elearning and related ICT developments are:

- Cedefop
- ETF (European Training Foundation)
- The Committee of Regions
- Conseil de l'Union Europeenne
- The Education and Culture Directorate General (European Commission)
- Employment and Social Affairs Directorate General (European Commission)
- Enterprise Directorate (European Commission)
- European Agency for Development in Special Needs Education
- European Foundation for the Improvement of Living and Working Conditions (Eurofound) and the
- European Investment Fund

Funding of eEurope Action Plan

Funding the eEurope Action Plan comes from national budgets, private sector investments, relevant programmes and funds that are made available by the European Union through its existing programmes. International financial institutions such as EIB, EBRD, and The world Bank are instruments that facilitate this process. PHARE will make significant resources available to support the action plan through its support for economic and social cohesion. PHARE is a programme intended to provide assistance to the Central and Eastern European countries after accession.

The following are European Commission projects undertaken by European actors in all elearning areas:

- ATHENA
- EUCEET II
- HEROdotNET
- ISEKI-Food
- 2EQBS
- 3DE
- 3DcL
- 4DcL and
- 5D
- Leonardo da Vinci

Time frame of the eEurope Action Plan

The eEurope and eEurope+ Action Plans have been set on a specific time frame, thus enabling candidate countries the use of statistical information to access their progress. Special indicators will be used to report and monitor progress of the acceleration and putting in place of the basic building blocks of the *Information Society.*

Cedefop's role in the enlargement process of candidate countries

The Commission, Cedefop and ETF are involved in the elearning and enlargement process of the candidate countries. After the accession process is finalised, each candidate country will become a member of Cedefop. Cedefop's main task is to provide information on the development of vocational education and training at European level. Cedefop compares knowledge and understands trends in the educational system providing information to member states on education and training policies. It carries out scientific analyses and overviews of research results, innovation and other developments.

Cedefop's involvement in elearning concerning the candidate countries is:

- implementation of projects, such as the one aiming to enhance social dialogue practices in vocational education and training;
- Cedefop experts' involvement in events and projects organised by ETF such as PHARE, TACIS, MEDA;
- Cedefop's use of the various candidate country reports produced by ETF for the implementation of the work programmes of the agency;

Candidate countries are required to participate in activities of the EU Agencies. This means involvement in special meetings, participation in seminars, joint working parties, and secondment of national experts.

The situation as it is today

- All candidate countries have undertaken to facilitate implementation of ICT for their citizens
- Progress is being made as far as public access to communication systems is concerned
- Costs of the Internet vary in candidate countries. Since costs are considered high, fewer people use the Internet
- Low penetration of computers in schools. There is a great difference in primary, secondary and tertiary level for all countries
- Public access points to the Internet are very important since lack of access in many countries is high
- Progress is being made of public on-line services (through eGovernment)
- There are great differences as to ICT development among candidate countries

By the end of 2005, Member States, supported by the elearning and eTEN programmes, should make sure that all universities offer on-line access for students and researchers to maximise quality and efficiency of learning processes and activities.

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A FIRST LOOK AT THE STATE OF E-LEARNING IN CEE COUNTRIES

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Introduction

The non-profit organization Oktopusz Foundation, dedicated to heightening the awareness of e-learning, carried out a survey amongst e-learning professionals and practitioners in the CEE region during summer and winter of 2003. The aim of the survey was to explore and gather first hand information about the level and nature of employment of e-learning in these countries.

Our preliminary research confirmed our assumption that there was little relevant and valid data available about the state of e-learning in Central Europe. But since the same could be told about the European e-learning market (or in fact, any kind of market), we decided for another approach: focusing on the practitioners' direct experiences and knowledge about e-learning deployment. The results, while they may not be 100% statistically accurate, definitely present a revealing overview of the state of e-learning in CEE countries. We believe that by putting these countries' experiences into a wider context, this overview serves as a beneficial starting point to a better understanding of e-learning deployment as well as gaining new perspectives about the possibilities of enhancement in the CEE region. Since the results will be published and distributed amongst the participants of the survey and the foundation's partners, it may contribute to the open flow of information and the common understanding of the e-learning state of affairs. In addition, we hope that the quality information sourced from this survey helps to stimulate the efforts of cooperation between CEE countries and also catching up with the EU standards in the field of e-learning.

The survey was based on a multiple choice questionnaire containing 85 elements grouped into five areas: Personal view, Usage, E-learning solutions, E-learning market, E-learning initiatives. The questions touched upon every aspect of e-learning from user attitude and detailed user profiling to the range and division of the market. In addition, the recipients of the questionnaire were asked to share their outlook on e-learning identifying the areas where they thought progress was needed and outlining their expectations for the future of e-learning in their countries. The 231 recipients were selected from the foundation's list of contacts as well as from other related professional lists (such as the Who's who? pages of the European Forum for Vocational Education and Training) and internet sources. We received a total of 148 responses that were useable to us. The countries that were represented in these responses and thus in our survey were Belorussia (2), Bulgaria (31), Czech Republic (17), Croatia (11), Poland (33), Romania (26), Serbia (3), Slovakia (12), Slovenia (10) and Ukraine (3). The private sector was represented by 35% of the respondents, while 65% of them works in the academic/non-profit sector. The professional positions of the recipients included company CEO, HR director, lecturer, researcher, trainer and university professor, while their fields of activities related to e-learning included tutoring, course developing, course administration, curriculum designing, developing e-learning strategies and supervising e-learning education. Many of the recipients work for NGOs or governmental bodies of education or take part in EU-funded projects, such as MISSION and PHARE. The questionnaires were sent out by e-mail which enabled direct feedback from both parties and clarifications on data from our part where needed.

General Findings

If we define e-learning in the broadest sense, which is learning via electronic means, it can be said to have been employed for narrowly a decade in CEE countries. If we identify e-learning as online learning, its past goes back to the last couple of years only. As it turned out from the survey, e-learning is most commonly referred to as learning content on a CD-ROM and web-based learning materials. The most established mode of e-learning delivery is the Internet, followed closely by CD-ROM and the intranet. Apparently, the use of educational softwares and coursewares is about 40% less prevalent then CD-ROMs and the Internet.

The age group of the most typical e-learning users falls between 18-35 years, which correlates with the finding that e-learning is used predominantly by university students and young employees – universities are key actors in both developing and buying e-learning, usually in the form of PPP or funding from EU/World Bank or other outside sources, while larger companies in the IT (and other technical), financial and business sectors are the ones that can afford to deploy e-learning in their training. Still, if we look at the rate of e-learning deployment by sectors we find that the corporate sector is almost half as big (25%) as the educational sector (45%). Significantly, one fifth of the total e-learning deployment comes from individuals in the form of self learning adult learning. (The rate of users accessing e-learning from their workplace and from their home is almost even.) Apart from educational institutions and the corporate and business world, e-learning is present in a wide array of sectors from HR to healthcare – the obvious difference of the CEE countries from Western European countries is the significant level of deployment in tourism, and the rather disappointingly low level of deployment in governmental sectors. As for the e-learning subject areas, the most widely available and used is language learning, which is another unique characteristic for the CEE countries, followed by IT, academic/school subjects and subjects of general interest (although this latter category is less widely used than available).

"Content in e-learning is king" – as all the American and European e-learning experts would say, and it is definitely true for even the CEE countries. This is by far the largest and most profitable segment of the e-learning market (where content development is the leading segment, and even at the level of services the majority is linked to content) – almost two times bigger than the e-learning platform market. The most established way to obtain e-learning content is by in-house development, although custom and off-the-shelf content are closely behind. The source of content is most of the times domestic, localization is not favoured in the CEE region (only one third of all content comes from localization). This can be explained on the one hand by the weaknesses of the CEE economies and the small size of the market that makes localization costly for foreign e-learning providers – especially online training vendors – for whom the CEE region is not yet a target. The only area where localization is a favourable option is IT training – this is mainly because the IT material only needs to be translated and not adapted to the cultural context amongst other factors. Because of insignificant market opportunities, global providers are scarcely present or have e-learning activities (such as the multinational IT companies) in CEE countries – BrainBench, ExecuTrain, Global Learning Alliance and ProsoftTraining are the main players who ventured into the CEE territory. The total number of e-learning providers operating in these countries is around 10 on average, and they supply training for a couple of hundred thousand people.

The survey shows that within the platform segment, learning management systems and learning content management systems are deployed on an almost equal scale. It was surprising to learn that a wide variety of tools and applications are available, e.g. virtual classroom, video/web conferencing, digital library, digital portfolio, exercise/test pools, whiteboard. However, only virtual classroom applications are actually used to the extent of having worth a mention.

The data we could gather from the survey is insufficient to make even conservative estimations about the size of the CEE e-learning market; however, we can assert that it is a miniscule one and homogeneous in its nature since all countries have almost identical characteristics.

The most spectacular feature of the divide between the public and private sectors in these countries is the fact that e-learning users at universities have faint ideas on corporate e-learning, and vice versa. There is practically no information shared or communication to or from these two areas. In the Czech Republic, for instance, a practitioner managing a pure e-learning company provided us with the highly unlikely estimate that 80% of the e-learning activity in the country takes place in the private sector. Other numbers he listed were: the total number/percentage of the organizations that provide e-learning (15); the total number of pure e-learning companies (approx. 15); the total number of e-learning content vendors (approx. 20); the total number of e-learning platform vendors (approx. 8).

However, most of the market players are unable to make estimates – even inaccurate ones – about either the size and value of the market in their country, or the size or number of e-learning companies and vendors, whereas they tend to agree on the groups targeted by these firms and organizations: the two most prominent contexts in which e-learning has actually started spreading are university education and adult learning. This insight coincides with another strong and concordant opinion: that the public and the private sectors are by far the most extensive areas in which e-learning flourishes, and the difference between the actual size of these two has to be, though undefinable, irrelevantly small. E-learning, even if to a smaller extent, also deployed for vocational training and self training, ranking third and forth, as to their dominancy. Any other aims of e-learning use is rarer by the order of magnitude.

Government initiatives aimed at the heightening of e-learning are rare in the region. Most of the few examples are concerned with the increasing of the quantity of computers and the quality of infrastructure and primarily directed towards educational institutions or public community telecottages, just as “Sulinet” program in Hungary and the very similar initiative in Poland. The operation of the field is strongly influenced by the lack of standards and government policy-making and any professional bodies competent in assessment, formation of methodologies and other general issues.

The importance of these shortcomings also dominate the last, and supposedly the most showing passage of the questionnaire. In this the respondants were invited to identify the areas where they thought progress was needed in the field of e-learning in their countries. Here the most characteristic views touched upon the international cooperation in field of content, standardization of programmes, research of the needs, cost cutting of development of e-learning programs, measuring quality, coherent national strategy, assessment criteria of e-learning systems, content development, courses certification, pedagogical principles, support for implementation and development of an e-learning system, and transcultural communication issues.

Summary

The general attributes of this region include a belated start and thus short history of e-learning, which fact explains some of the shortcomings of tools and services produced. The other distinctive feature of e-learning in CEE is that of size. The nature and dynamics of markets are entirely different in these countries than on a global scale as demand is on a much smaller scale. E-learning in higher education does not lag that much behind corporate e-learning regarding the number of programs as it globally does. Government support defined and formed the first solutions available at the universites – which were predominantly technical institutions. E-learning is used mostly for the same purposes as anywhere else in the world, but it is done so with the marked lack of data, statistics or any transparency.

WHAT MOTIVATES FACULTY TO TEACH ONLINE? A TWO-COUNTRY COMPARISON

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Introduction

Online instruction increases both the educational choices available to students and the way faculty may deliver course material. A simple definition of distance education is where the students and the instructor are geographically in separate locations. Another, more contemporary definition is by Moore and Kearsley (1996), stating that "distance education is planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements".

This paper compares what motivated faculties in two institutions, in two countries, to get involved in online education. The two institutions are St. John's University (SJU) in New York and Szolnok College in Hungary. St. John's University is one of the largest catholic universities in the USA with a student body of 16,000 and Szolnok College, is the assigned college in the North Plains region of Hungary, to be the center of distance learning. Szolnok College, offers majors in the hospitality, tourism and commerce industries, and has about 5,000 students. Both institutions are in urban areas and got involved in online teaching at about the same time, at the end of the 1990s.

The software backbone of online teaching at SJU is WebCT, a package that the university leases, and the university IT center provides support and training for faculty interested in using the software. SJU designed its program, with its mission in mind, which is to provide "access to those lacking economic, physical, or social advantages"[1], a distance-learning program with relatively small classes by capping enrollment at 25 students in each class. Faculty participates in distance education on a voluntary basis, and the university provides all the necessary support to both students and faculty.

In Hungary, distance education was viewed as one of the tools to increase access to higher education opportunities for high school graduates. This goal is formulated in the College's mission statement, which is, "the goal to train (…) young professionals (…) for the Hungarian and European Union labour market"[2]. Preparing faculty for distance education began in 1992 in Hungary with the so-called Pannonia Project. This was an EU funded higher education project with a goal of promoting the development of a regional network of distance education in Hungary. The project helped finance the infrastructural needs of distance education and trained distance learning managers and distance learning specialists. Some Szolnok College faculty participated in this training project.

A Comparison of the Two Systems

The different missions of the colleges explain why the basic expectation for faculty participation in distance education is dissimilar in the two countries. At SJU, each faculty member has the option of teaching online or not, of writing their own material or using ready-made materials supplied by publishers (e-packs). At Szolnok, faculty must teach online and students may attend one or two consulting sessions each semester with the faculty. The Hungarian goal of funding education content development, and then sharing it amongst institutions, is in its infancy, and the faculty at Szolnok creates most of their own teaching materials. At SJU, it is up to the individual faculty member to decide to meet with the students or not.

[1] http://new.stjohns.edu/about/mission.sju
[2] www.szolf.hu

Despite the differences in expectation about participation, there are some similarities between the two faculties teaching online. At both schools, faculty is relatively older as shown by Table 1. Faculty teaching online at SJU is somewhat older than the Szolnok faculty. This can be explained by the fact, that SJU faculty teaching online tend to be tenured, as younger faculty is more involved in activities such as research and publications, that are more demanded of them by the university. Tenure is not an issue in Hungarian institutions, and Szolnok College is a much younger institution. (In various guises the College has only existed since 1976.)

Table 1. Age distribution of faculty teaching online

Age	Szolnok	SJU
Under 30 yrs	4%	4.3%
30-44 yrs	40%	23.9%
45-60 yrs	52%	54.3%
60+ yrs	4%	17.4%

Both the gender ratios of faculties in higher education in Hungary and the USA, and the gender ratio of faculty teaching online at Szolnok and SJU are similar as shown by Table 2. Faculties teaching online at both institutions are nearly evenly distributed between males and females. However, if we compare SJU and the Szolnok faculties teaching online to their respective nation's gender breakdown for college faculties, then, at both schools there are more women teaching online than the national average.

Table 2. Gender distribution of faculty

	Szolnok teaching online	Hungary* all faculty	SJU teaching online	USA** all faculty
Male	55.8 %	67.9 %	53.1 %	63 %
Female	44.2 %	32.1 %	46.9 %	37 %

*state financed institutions (http://www.om.hu/letolt/felsoo/stat_felsoo_2002_2003.pdf)

**NCES statistics for Fall 1999 (http://nces.ed.gov/programs/digest/d02/list_tables3.asp#c3a_3)

There was absolute consensus between the two faculties on two issues, namely that teaching online requires more work and that the student dropout rate is much higher than in traditional face-to-face education. Although no statistics were collected at SJU for the dropout rate, the anecdotal evidence (and American distance educational literature, e.g. Parker, 2003) places this to be around 25%, and the same is true for Szolnok. (Calculations based on data published by the Hungarian Ministry of Education.)[3]

If teaching online is more work, then why do faculties get involved?

To find out what motivated faculties to get involved in online teaching, a 29-question survey was emailed to 120 faculty members with WebCT accounts at SJU, and the same questionnaire was emailed to 65 faculty members in Szolnok. (With permission from the author of the survey (Betts, personal communication, 2003), (Betts, 1998) at SJU 44 surveys were returned, a 37% rate, and at Szolnok 25 were completed, a 38% participation rate.)

Lonsdale (1993) outlined several general principles from motivational theory that apply to academic staff. He stated that in an academic environment, intrinsic satisfactions are more effective than extrinsic factors in influencing motivation and performance of faculty. American literature on distance

[3] www.om.hu (Oktatási Évkönyv 2001/2002, 2002/2003 [Educational Annual Reports 2001/2002, 2002/2003])

education, where motivational studies were completed, found this to be the case in all but one college (Betts, 1998, Schifter, 1998, Clay, 2000, Parker, 2000, Sims, 2002, Herbert, 2003). In our survey, of the 29 motivating factors, 14 can be classified as intrinsic motivating factors and 15 as extrinsic factors, using the definitions of Ryan and Deci (2000).

Results of the Survey

The results of the survey were as expected for SJU but not for Szolnok. Ranking of SJU faculty answers are summarized in Table 3, and the answers from the Hungarian faculty are in Table 4. While the ranking of motivating factors for the SJU neatly divides into intrinsic and extrinsic motivators, the rankings of motivating factors for the Szolnok faculty cannot be divided into such distinctive order.

The differences between tables 3 and 4 can partly be explained by the disparity in expectations about participation in online education. At SJU, mostly tenured faculty teach online, for whom external rewards are not important, in fact, very few such rewards were offered by the university. Faculty members look at distance education as a personal challenge and an opportunity for personal growth. Currently less than 10% of all SJU faculty have online accounts. This ratio represents faculty who teach online, or use the capabilities of WebCT to enhance their work in the classroom. About half of the faculty members with online accounts have developed online courses, and they can be characterized as “innovators”, for whom the lack of financial rewards is not an inhibiting factor. At Szolnok, while tenure is not an issue, since none is offered, the majority of the college’s faculty must take part in online education, and this lack of choice, makes extrinsic factors the vital component of this educational outreach. As tables 3 and 4 show, for the SJU the top 8 factors are intrinsic motivators, and these are on the bottom half of the rankings for the Hungarian faculty.

As faculty at SJU can decide how and how much technology to use, and outside support does exist from textbook publishers, the SJU faculty list intellectual challenge and improvement of teaching as the two most important factors for getting online. The Hungarian faculty, however, feel their hands are tied and these factors are rated low (26th and 18th respectively). This difference in options available to faculty, is also supported by the ranking of personal motivation to use technology, which was ranked 4th at SJU, and 20th in Szolnok. Faculty at Szolnok do not have much say in whether they teach online or not, and their pay is relatively low, however, faculty get a small stipend for teaching online. This explains why the first two factors for teaching online were either directly (additional pay) or indirectly financially motivated (visibility for jobs at other institutions).

SJU faculty see the internet as providing them with flexible working conditions as relative compensation for the increased workload, and rank this as number 15, or the 2nd highest on the list of extrinsic factors. The Hungarian faculty see themselves as having fewer choices, and they have to be present for consulting sessions, thus rank this factor as number 21. The highest ranked intrinsic motivator for the Hungarian faculty was the opportunity to use own research in teaching (3rd), and this was one of the lowest ranked for SJU faculty (14th). The available choices to faculty members to participate or not, can be also be seen by the ranking of extrinsic factors. At SJU, the highest ranked extrinsic factors were the perceived expectations by the administration that faculty participate and their support and encouragement for this participation (13 and 16), at Szolnok these factors ranked 5th and 7th. Support and encouragement from colleagues, consequently, was also ranked higher at Szolnok (8th) than at SJU (17th). The fact that the Hungarian faculty is relatively younger is reflected by their ranking of graduate training received is higher than SJU faculty’s (10 vs. 26).

Some of the differences in ranking the motivational factors for faculty can be explained by the differences in student motivation to take online classes. The majority of the students enrolled in online classes at SJU are regular day students who opt to take a few classes online, either because they are working and classes are not offered at a convenient time, or because they would like to try something different. However, the online students at Szolnok are traditional students who are enrolled in a degree granting online program which they either self selected or accepted as a second best alternative as they were not accepted into a regular day program. SJU faculty ranks the importance of greater flexibility for students #3, but in Szolnok, it is ranked as #19. A Hungarian faculty member commented, that “the students in the online classes are less prepared than the day students. They need more support than the day students”.

Some similarities in the rankings

Both faculties love their profession; their satisfaction with their chosen career is ranked 7th by SJU faculty and 6th at Szolnok. Both faculties are relatively secure in their jobs, thus job security was ranked low, 22nd at SJU and 16th at Szolnok. Both faculties view online teaching as an innovative way to reach to new audiences, but is viewed as of medium importance, which is shown by both faculties ranking it #9. Neither institution provided or expect to provide release time or reduced workload to faculty, thus both faculties ranked these factors very low (28th and 27th at SJU and 28th and 29th at Szolnok). The importance of distance education training by the respective institutions is ranked low by both faculties (18th at SJU and 27th at Szolnok). For SJU, this is because the most technically savvy faculty is the first to embrace this mode of teaching. For the Szolnok faculty, this is because of the difficulty of opting out of this mode of teaching. These two statements are further supported by the ranking of technical support provided by the college, which was ranked lower for the "adventurous" SJU faculty than for the Hungarians. Both faculties are eager to encourage the development of an online teaching and learning community at their college, at SJU several faculty members try to involve their face-to-face class into the ongoing discussions while at Szolnok there is a chat room for all distance-learning students.

Conclusion

Within a context of rapid technological changes and shifting market conditions, all education systems are challenged with providing increased educational opportunities without greatly increasing their educational budgets. Many higher educational institutions answered this challenge by developing distance education programs, or online teaching. However, in Hungary where there is lower computer penetration, reduced internet access and bandwidth limitations, make this undertaking for the Hungarian faculty more difficult than it is for their SJU counterparts. But both institutions, SJU and Szolnok, try to fulfill their missions by promoting equity and access to lifelong learning by opening their virtual doors to provide opportunities to an increasing number of students.

Table 3. Ranking of motivating factors to teach online from the point of view of the St. John's University faculty (I = intrinsic motivator; E = extrinsic motivator)

What motivated you to get involved with online teaching? Please rate the listed factors from 5 to 1, with 5 being highest.

Question #	**Rank at SJU**	**Motivating factor**	**Mean at SJU**		**Rank at Szolnok**
9	1	Intellectual challenge	4.55	**I**	26
16	2	Opportunity to improve my teaching	4.39	**I**	18
8	3	Greater flexibility for students	4.39	**I**	19
19	4	Personal motivation to use technology	4.36	**I**	20
14	5	Opportunity to develop new ideas	4.21	**I**	23
15	6	Opportunity to diversify program offerings	4.11	**I**	24
18	7	Overall job satisfaction	4.00	**I**	6
2	8	Career exploration	3.79	**I**	15
1	9	Ability to reach new audiences	3.79	**I**	9
13	10	Opportunity for scholarly pursuit	3.71	**I**	22
20	11	Professional prestige and status	3.57	**I**	25
27	12	Technical support provided by school	3.46	**I**	4
25	13	Support and encouragement from school administrators	3.34	**E**	7
17	14	Opportunity to use personal research as a teaching tool	3.25	**I**	3
29	15	Working conditions (e.g., hours, locations)	3.19	**E**	21
5	16	Expectations by school that faculty participate	3.07	**E**	5
26	17	Support and encouragement from department colleagues	2.96	**E**	8
4	18	Distance education training provided by school	2.89	**E**	27
24	19	Support and encouragement from dean or chair	2.89	**E**	14
3	20	Credit toward promotion and tenure	2.82	**E**	13

11	21	Merit pay	2.75	**E**	1
12	22	Monetary support for participation	2.68	**E**	11
10	23	Job security	2.46	**E**	16
28	24	Visibility for jobs at other institutions	2.46	**E**	2
7	25	Grants for materials/expenses	2.43	**E**	12
6	26	Graduate training received	2.18	**I**	10
21	27	Reduced teaching load	2.11	**E**	28
22	28	Release time	2.04	**E**	29
23	29	Requirements by department	1.96	**E**	17

Table 4. Ranking of motivating factors to teach online from the point of view of the Szolnok College faculty (I = intrinsic motivator; E = extrinsic motivator)

What motivated you to get involved with online teaching? Please rate the listed factors from 5 to 1, with 5 being the highest.

Question #	**Rank at Szolnok College**	**Motivating factor**	**Mean at Szolnok**		**Rank at SJU**
11	**1**	Merit pay	4.25	**E**	21
28	**2**	Visibility for jobs at other institutions	4.08	**E**	23
17	**3**	Opportunity to use personal research as a teaching tool	4.04	**I**	14
27	**4**	Technical support provided by school	4.00	**I**	12
5	**5**	Expectations by school that faculty participate	4.00	**E**	16
18	**6**	Overall job satisfaction	3.92	**I**	7
25	**7**	Support and encouragement from school administrators	3.92	**E**	13
26	**8**	Support and encouragement from department colleagues	3.71	**E**	17
1	**9**	Ability to reach new audiences	3.68	**I**	9
6	**10**	Graduate training received	3.68	**I**	26
12	**11**	Monetary support for participation	3.32	**E**	25
7	**12**	Grants for materials/expenses	3.25	**E**	24
3	**13**	Credit toward promotion and tenure	3.24	**E**	20
24	**14**	Support and encouragement from dean or chair	3.21	**E**	19
2	**15**	Career exploration	3.2	**I**	8
10	**16**	Job security	3.2	**E**	22
23	**17**	Requirements by department	3.08	**E**	29
16	**18**	Opportunity to improve my teaching	3.00	**I**	2
8	**19**	Greater flexibility for students	2.92	**I**	3
19	**20**	Personal motivation to use technology	2.88	**I**	4
29	**21**	Working conditions (e.g., hours, locations)	2.72	**E**	15
13	**22**	Opportunity for scholarly pursuit	2.64	**I**	10
14	**23**	Opportunity to develop new ideas	2.64	**I**	5
15	**24**	Opportunity to diversify program offerings	2.56	**I**	6
20	**25**	Professional prestige and status	2.46	**I**	11
9	**26**	Intellectual challenge	2.38	**I**	1
4	**27**	Distance education training provided by school	2.36	**E**	18
21	**28**	Reduced teaching load	2.16	**E**	27
22	**29**	Release time	2.08	**E**	28

References

1. KRISTEN S. BETTS (1998) *Factors Influencing Faculty Participation in Distance Education in Postsecondary Education in the United States:* An Institutional Study. Dissertation Abstracts International: UMI No. 9900013

2. DR. KRISTEN S. BETTS (1998) *An Institutional Overview: Factors Influencing Faculty Participation in Distance Education in Postsecondary Education in the United States: An Institutional Study*, OJDLA Fall, Vol. I. no. 3. http://www.westga.edu/~distance/betts13.html

3. DR. MELANIE CLAY (2000) *Faculty Attitudes Toward Distance Education at the State University of West Georgia*, http://www.westga.edu/~distance/attitudes.html
4. JANET GWEN HERBERT (2003) *Perceived Barriers to Faculty Participation in Distance Education at a 4-Year University,* U. of North Texas, (p.88), http://www.coe.unt.edu/allen/Dissertation-Example/JannHebert.pdf
5. LONSDALE, A. (1993) *Changes in Incentives, Rewards and Sanctions*. Higher Education Management, 5, 223-35
6. MICHAEL MOORE AND GREG KEARSLEY (1996) *Distance Education: A Systems View,* California: Wadsworth Publishing Company, (p. 2), http://www.uwex.edu/disted/definition.html
7. DR. ANGIE PARKER (2003) *Motivation and Incentives for Distance Faculty*, OJDLA, Fall, Vol. VI. No.3, http://www.westga.edu/~distance/ojdla/fall63/parker63.htm
8. DR. ANGIE PARKER (2003) *Identifying Predictors of Academic Persistence in Distance Education*, USDLA, Jan., Vol. 17. No. 1. http://www.usdla.org/html/journal/JAN03_Issue/article06.html
9. RICHARD M. RYAN AND EDWARD L. DECI (2000) *Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions.* http://www.psych.rochester.edu/SDT/publications/manuscripts/2000RyanDeciIntExtDefs.pdf
10. DR. CATHERINE C. SCHIFTER, (2000) *Factors Influencing Faculty Participation in Distance Education: A Factor Analysis*, USDLA, Jan., Vol. 13, no. 1. http://www.usdla.org/html/journal/JAN00_Issue/Factors.htm
11. JANE SIMS (2002) *Factors Impacting Faculty Participation in Distance Education*, http://www.crk.umn.edu/cal/papers/

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EXPERIENCE AND PERSPECTIVES OF THE BERTELSMANN FOUNDATION IN THE DEVELOPMENT AND TRANSFER OF E-LEARNING PROJECTS TO EASTERN EUROPE

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Introduction

True to the tradition of its founder Reinhard Mohn, the Bertelsmann Foundation is committed to public welfare. Its aims are to identify at an early stage social challenges as well as develop and realise exemplary solution models. This pursues the goal of confronting effective central social problems, effecting change and achieving reforms. The Foundation sees itself as an "engine" initiating necessary reforms and driving them forward. As a knowledge-based organisation, it strives to trigger a lively dialogue regarding the political reform issues of our times and advise political decision-makers.

Within the framework of its project work, the Bertelsmann Foundation reflects the convictions of its founder Reinhard Mohn, that the principles of corporate action can contribute towards developing a future-enabled society. Against the backdrop of this reform-oriented approach, transformation has been and remains a central issue of the Foundation's work as well as a basis for commitment during the transformation process in numerous projects in Eastern European countries formerly subject to central administration.

The various instruments applied by the Foundation in its reform work at home and abroad include e-learning. This method, however, is not seen as an end in itself but rather as a particularly effective medium for communicating content to large numbers of participants.

Two e-learning-based reform projects of the Bertelsmann Foundation are presented as examples below and transferred by the Foundation from Poland to the Russian Federation in its role as change agent. The issue involves online training for librarians (project: "bibweb – Internet training for libraries") which was tried and tested in Germany and is now fully implemented in Poland, too (www.bibweb.pl). Another project involves Internet-aided (blended learning) economics training for teachers in modular design (the "Economics Education online" project) which was also tested in Germany and is now being transferred in the form of pilot projects to the Russian Federation. In each case, the basic concepts of the projects are presented, how they worked in Germany is illustrated and finally experience gleaned from the transfer is described. The projects are concluded by a series of issues as regards the necessary conditions and success factors in the transfer of e-learning projects.

The bibweb Project – Internet training for libraries in Poland

Initial situation

The Internet is an increasingly important component of everyday media activity. More and more information is offered exclusively in electronic form. Enquiries by library users as regards Internet services are also increasing in number, e.g. as regards introductory courses, research support or recommendations of selected Web sites.

Inexpensive access to the Internet is currently only available to a minority of citizens in Poland. The number of households with Internet access is currently estimated to be approx. 5-10 per cent. Furthermore, there is often a lack of skills for actually dealing with the new medium.

Libraries in Poland can considerably strengthen their role as an element of the information and knowledge society by expanding their offers regarding Internet access. Moreover, integration of the

Internet in work processes at libraries promotes interlinking and transfer of experience which in turn lead to improved quality of what is on offer.

Up to now, relatively few libraries have availed of Internet access – in medium-sized cities approx. 50 per cent, in rural regions a mere 10 per cent. Library employees are therefore faced with the challenge of acquiring skills for coping with a new medium within a comparatively short period of time.

The situation in Germany in 1999 was comparable to the current situation in Poland as far as Internet facilities and qualification requirements of library employees were concerned. As a reaction to this, the Bertelsmann Foundation and its project partner ekz.bibliotheksservice GmbH initiated an online course offer comprising three modules: "bibweb – Internet training for libraries" (online at www.bibweb.de), which met with great acceptance by the respective target group with more than 3,000 library employees registering for this qualification measure. For this reason, it made sense to translate the existing successful course product and adapt it to the special requirements of libraries in Poland within the framework of a contribution towards promoting Polish libraries.

The Bertelsmann Foundation and its two project partners, the Warsaw University Library and the "Elektroniczna Biblioteka" (EBIB) library information service have jointly developed such a Polish-language online course offer and will be offering it on the Internet to the specialist target group over a period of at least three years.

Developing the project

Encompassing a total of three learning modules, the training programme aimed at enabling participants to acquire extensive skills in dealing with the Internet and then apply these skills practically in professional environments.

The project involves a general section with tasks on the issue of the "Internet" as well as a section on specific library knowledge. Issues in this specific section include media development relevant for libraries and strategies for the systematic introduction of electronic media in the library. Considering the technical challenges involved, participants should also be communicated key skills as regards employee motivation and securing communal sponsorship.

The target group for the offer involves employees of Polish libraries. The course is, however, also open to related professional groups as well as ongoing librarians and the unemployed. Registration is via the Warsaw University Library after which the participant is obliged to transfer a registration fee of approx. 100 Zloty (discount of approx. € 25.00 for students and the unemployed) to the Warsaw University Library. The participant is then supplied with a PIN providing access to the corresponding learning module.

After completing a learning module and achieving the corresponding goals, the participant receives a certificate from the Bertelsmann Foundation and project partners. Completion of all three learning modules entitles the participant to an overall certificate underlining his special qualifications in the "Internet" sector.

A total of three years are planned for implementing the project. Following translation and adaptation of the course offer to Polish requirements, the project was made available to the Polish trade public in May 2003 on the following site: www.bibweb.pl.

The project is a co-operation between the Bertelsmann Foundation, the Warsaw University Library and the EBIB library information service. More than 300 library employees have since registered for the course.

Project: Economic Education online

Initial situation

The establishment of economic training in schooling is not only very topical in Germany – this issue is also of particular relevance in the former socialist states of Eastern Europe. Understanding and acceptance of a new social and economic system is largely dependent on how successfully children and young people are communicated basic economic principles. As a result, Poland introduced "Entrepreneurialship" as a school subject last year and introduction of economics as a standard school subject is under consideration in the Russian Federation, to name just two examples. In the form of the "Economic training online" project, the Bertelsmann Foundation avails of a sophisticated and tried-and-tested blended learning concept which is eminently suitable for the transfer owing to its design as a "train-the-trainer" model.

The aim of this project in Germany is to develop and set up an Internet-aided training, qualification and further education programme to cover the demand for economics teachers as well as the need for supplementary qualifications at secondary schools (secondary levels I and II). This project idea is based on the results of many years of experience in the development of economic curricula for secondary schools in general.

A public-private partnership with the following institutions was formed to realise the project: the Bertelsmann Foundation, the Heinz Nixdorf Foundation, the Ludwig-Erhard Foundation, the Stiftung der Deutschen Wirtschaft, the Ministry of Science and Culture in Lower Saxony, the Ministry of Culture, Youth and Sport in Baden-Württemberg and EWE Aktiengesellschaft Oldenburg. Operative implementation is the task of the Bertelsmann Foundation while the Institut für Ökonomische Bildung Oldenburg (IÖB) is responsible for scientific management.

The content of the qualification programme is formed by 74 modules specially developed by more than 50 professors in Germany, Austria and Switzerland for application in training teachers. A "blended learning" approach was also developed by the IÖB to accompany tutorials: apart from online learning, regular presence phases also take place focussing on specific national issues as well as specialist educational and methodical content.

The project was initially planned as a model with the states of Baden-Württemberg and Lower Saxony. Interest displayed by other German states has however significantly exceeded expectations: ten states are now involved and a total of 180 teachers are being trained with anticipated annual participant numbers to hit 500 in future.

Elements of the transfer concept

Experience with the ÖBO in Germany has shown how successful implementation of economic training in the secondary school system in general requires four approaches to be pursued in parallel: securing the political education and institutional framework conditions, developing teacher qualification, generating materials for teaching practice as well as setting up a sponsor community.

Framework conditions

The implementation of economic training in schooling is essentially dependent on the political and institutional framework conditions applicable in the respective state. These framework conditions can either be given or influenced within the framework of project work. At the political level, this means the incorporation of economic training in teaching must be fundamentally possible in terms of education policy, e.g. on the basis of existing teaching loads or the current curriculum situation. Institutional framework conditions are understood to be the required regional networks and co-operation possibilities for project implementation, for example, which may of course need to be created and influenced.

Teacher qualification

A central task involves specialist didactic and scientific Internet-aided teacher qualification using modules. To this aim, the modules need to be adapted to the requirements in the countries involved and translated by the ÖBO. Poor compatibility may also necessitate the development of further, country-specific modules for appropriate target group qualification.

The online and presence phases of qualification measures are accompanied by specially trained tutors who must be capable after completing training of providing their later course participants with didactic, specialist, social and technical support. The quality of tutor training is therefore a decisive success factor in the project. Tutors are also trained within the framework of presence and online phases. As a general rule, tutor training should by implemented by meta-tutors at the IÖB, whereby the presence phases can be implemented in either Germany or the partner country.

Teaching practice

To enable teachers to teach successfully at their original schools, teaching materials for pupils and teaching aids for teachers also need to be developed apart from actual teacher qualification. This includes schoolbooks, worksheets, solution sheets, processing information etc. Apart from printed material, an extensive data base has also been developed for this purpose which can serve as a pool for teachers following the appropriate technical adaptation as well as translation and adaptation of materials. Within the framework of these activities, an electronic newsletter could also be published, for example.

Financing/Sponsorship

Financing and sponsorship should be distributed among several institutions such as foundations, companies, ministries at home and abroad, cross-border institutions as well as the respective regional training and further education institutes poised to undertake a central role as regards project implementation. The IÖB itself avails of more than ten years of extensive experience in co-operation with Russian universities, having successfully co-ordinated several European projects for restructuring Russian third-level institutions and working on the development of a network of Russian universities for economic education on behalf of the DAAD.

The "Intekor" project

The Ministry of Science in Lower Saxony has commissioned the IÖB within the framework of a pilot project to prepare the export of "Economic training online" to Russia under the Russian project name "Intekor". Within the framework of this pilot, 23 modules were initially translated to be then adapted by Russian scientists to the conditions prevailing in Russia. In October 2003, an initial group of 20 ongoing tutors from various regions of the Russian Federation (Barnaul, Novosibirsk, Kasan, Perm, Moscow and St. Petersberg) were successfully trained. Further tutor training was conducted online, with a conclusive presence phase taking place in Moscow in early March 2004. In summer 2004, these tutors will implement the first teacher qualification measures in their regions. The future institutional and financial make-up of the project in the Russian Federation remains open, however.

The measures are prepared in co-ordination with the Ministry of Education of the Russian Federation and implemented on the basis of the national education standard governing economic training which envisages economic content being introduced across the board in schools of the Russian Federation. The teacher qualifications required remain, however, to be resolved in financial and institutional terms. Against this backdrop, particular interest is displayed as regards distributing "Intekor". ÖBO could be distributed by using the network of Russian universities initiated by the IÖB for the DAAD as well as the Russian network of the International Academy of Sciences for third-level education. Furthermore, the IÖB also has a branch in Moscow, via which the project activities could be steered.

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THE BUDAPEST DISTANCE STUDY CENTRE AND THE GERMAN-HUNGARIAN COOPERATION IN DISTANCE HIGHER EDUCATION

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1. Introduction

The Budapest Distance Study Centre was opened in October 1991 *with a view to contributing to the development of a modern distance higher education system in Hungary.* With grants from the European TEMPUS-PHARE Programme (1990-1993), the Budapest Distance Study Centre was established and commissioned.

A review of the past thirteen years of its existence shows remarkable results. This is particularly true referring to the *two most important fields of activity* of the Budapest Distance Study Centre: *making German-language distance higher education usable in Hungary* on the one hand, and *giving an impetus to the Hungarian development of distance higher education* on the other. Based on these activities the Budapest Distance Study Centre has become a platform for networking between FernUniversität in Hagen and Hungarian universities.

2. German-language distance higher education in Hungary – Development of student numbers, target groups and the operation of the Centre

Since winter semester 1991/92, the complete range of study programmes of the FernUniversität in Hagen has been available via the Budapest Distance Study Centre. With the support of the Centre, Hungarians have a chance of enrolling for German-language programmes of study with a view to obtaining German university degrees, such as Diplom, Magister-Artium, Bachelor, and Master degrees or certificates for academic further education programmes. Study opportunities are offered in: cultural and social sciences, economics, law, computer science, electrical and information engineering and mathematics (For details: www.fernuni-hagen.de).

In the last winter semester 2003/2004 the Budapest Distance Education Centre supported about *400 students of the FernUniversität.*

A special target group are *Hungarian teachers of German* who will earn additional qualifications by studying for a Magister degree at the FernUniversität. Presently, there are around 120 teachers involved. About 30 have already got their Magister degree. The background to this scheme is the Hungarian legislation by which only those secondary-school teachers will be able to keep their positions in the long run who can give evidence of a university degree.

Some of the Hungarian distance students *are registered simultaneously for a degree programme at a traditional Hungarian university.* Hungarian graduates having to provide proof of the command of two foreign languages, the German-language distance studies are regarded by the students as an additional chance of acquiring a subject-specific education in a foreign language. Existing contacts between professors of the FernUniversität and the Budapest universities as well as the exchange on teaching contents, and issues of mutual recognition of study and examination achievements in particular, have contributed to this opportunity.

Since summer semester 2002 a new target group has been added: Economics students of the *University of Pécs.* The Faculty of Economics of the FernUniversität in Hagen and the Faculty of Economics of the University of Pécs came to an agreement on *cooperation* in October 2001. Under this scheme

German speaking students with an intermediate examination of the University of Pécs are enabled to enrol for a four-semester-programme at the FernUniversität while they continue their studies with their first (local) university. Successful students will be awarded a Diplom degree from the University of Pécs as well as a Diplom degree from the FernUniversität in Hagen. At the moment 75 students are enrolled in this double-degree-programme, two students have already completed successfully within only three semesters.

Based on the great success of this double-degree-programme the FernUniversität in Hagen and the Budapest Distance Study Centre started the same kind of cooperation with the *Széchenyi István University Győr* in 2003.

Another double-degree-programme was started by the FernUniversität in Hagen and the *Budapest Business School* in the field of Economics (BBS) and Computer Science (FernUniversität in Hagen).

Subject-related support of the Hungarian students is mainly provided by academic staff of the Budapest universities who act as mentors. Compulsory face-to-face seminars for Hungarian students are performed by academic staff of the FernUniversität in Hagen at the Budapest Centre.

In spring 2003 an experiment was started with *"virtual tutors"* in the field of subject related support for the whole region of Central and Eastern Europe. In this experiment communication and cooperation between mentors and students are organised virtually by using the different internet-services like e-mail, news-group, chat, BSCW-server.

Since 1999 *oral examinations have been performed by video conferencing* between Hagen and Budapest.

Apart from *general counselling and support* the Budapest Distance Study Centre has *additional responsibilities,* as being a study centre in a non-German-speaking country. Special student support is offered during registration periods, for example by checking university entrance qualifications, translating certificates, etc. The staff issue Hungarian student identity cards, organise supervised written tests (Klausuren) in cooperation with FernUniversität's faculties and the Budapest Goethe Institute.

Meanwhile many Hungarian students have completed their studies with the FernUniversität. Every year about 15 to 20 students receive their German university degree. In this context it should be mentioned that in 1998 the *DAAD-Prize* for outstanding achievements by foreign students was awarded to a Hungarian graduate. In 2001 the prize was again awarded to a Hungarian graduate in recognition of her outstanding achievements.

Currently, there are three *Hungarian graduates* studying for *their doctorates* under the supervision of professors of the FernUniversität in Hagen.

3. Cooperations and contacts

The Budapest Distance Study Centre has developed into a *Competence and Service Centre* with special regards to FernUniversität's distance study system. The centre is providing contacts and cooperation opportunities with interested Hungarian universities and other higher education institutions.

In April 1999 an *agreement on cooperation* in the fields of distance higher education, professional academic further education and the use of new media was signed between the *Hungarian Ministry of Education* and the FernUniversität in Hagen; this agreement also includes the Budapest Distance Study Centre as well as the Hungarian National Council for Distance Education.

Good links have been established between the FernUniversität in Hagen and the Budapest Distance Study Centre with the *Embassy of the Republic of Germany in Hungary* as well as the *Budapest Goethe*

Institute. This year cooperation was started with the *German-Hungarian Chamber of Industry and Commerce at Budapest* in the field of professional academic further education in Hungary.

Furthermore, the Budapest Distance Study Centre is the only licensed test centre in Hungary offering *"TestDaF"* (Test of German as a foreign language); currently, TestDaF is runnig by almost 300 test centres in more than 75 countries worldwide.

4. Summary and perspectives

The Budapest Distance Study Centre has adopted the function of an *important cultural bridge between Hungary and Germany,* through being an integral part of the German-Hungarian cultural consultations. With costs kept to a minimum, it has promoted German study programmes for thirteen years, thus simultaneously disseminating the German language in Hungary. As a competence and service centre specialised in distance higher education it has also contributed to *the development of the Hungarian distance higher education system.*

The experiences and results from the Budapest Distance Study Centre project were very useful and stimulating for the FernUniversität's activities in other Central and Eastern European countries. The Budapest Distance Study Centre served as a *model* for the establishment of *Study Centres in Central and Eastern Europe* in collaboration between FernUniversität in Hagen and local universities.

The Budapest Distance Study Centre has become an important player in the cooperation between the FernUniversität in Hagen, Hungarian universities and other higher education institutions in Hungary. It is the nucleus of a growing *German-Hungarian network* in the field of (distance) higher education.

Already since its foundation by financial support of the European Union at the early nineties the Budapest Distance Study Centre has contributed to the realisation of the objectives formulated – at a later stage – in the Bologna Process and to the development of the *European Higher Education Area.*

Both, the FernUniversität in Hagen and the Budapest Distance Study Centre, look forward to an efficient and fruitful collaboration for their mutual benefit, and for the benefit of the German-Hungarian collaboration in the fields of (distance) higher education and new media in a European environment.

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BRITISH COUNCIL AND THE BROKERING OF DISTANCE EDUCATION RELATIONSHIPS

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Introduction

A challenge for any country trying to modernise and develop an effective workforce is a lack of capacity in delivering education to its people [1]. Distance learning can address this capacity shortfall in two important ways. Firstly, a shortfall in educational opportunities in a given country may be made up by foreign education providers delivering their courses by distance learning to the country. Secondly, a country may build its own capacity to deliver education by developing systems and institutions which deliver education via distance learning. In many cases this capacity building takes place through co-operation or collaboration with other countries.

This paper examines how one particular agency, the British Council helps countries to achieve these aims by brokering relationships with the UK.

The role of British Council

British Council is the main UK organisation for educational opportunities and cultural relations. British Council is represented in 109 countries with over 7,000 employees. British Council strategic objectives focus on creativity (both artistic and scientific innovation), the UK's democratic value and processes, and education (increasing recognition of UK learning opportunities, promoting learning of English, strengthening educational-co-operation between UK and other countries).

The role of British Council in distance education can best be understood as a broker of relationships. For the purpose of this paper, the term 'broker' and 'brokering' is taken to mean the role of the 'honest broker'. British Council is in a position whereby its interests are founded in the sharing and collaboration of ideas and best practice to be found in UK delivery of education rather than the withholding of information to gain competitive advantage (as is usually understood by the term commercial brokering). There are two main categories of relationships (see Figure 1):

- relationships through UK awards delivered via distance learning
- relationships through the exchange of distance education expertise and best practice

UK awards delivered
via distance learning

UK ⟷ International

Expertise in
distance education

Figure 1. Categories of relationship brokered by British Council

Analysing brokering

To begin analysing the brokering process it is necessary to identify the stakeholders involved in relationships. Stakeholders can be organisations (governments, educational institutions (both public and private)) or individuals (professionals (policy makers, practitioners, and consultants) or students). Relationships within distance education are rarely simple linear relationships i.e. government to government, institution-to-institution, professional to professional, and student to student. Instead they reflect a more sophisticated composition and exist both across and within e.g. institutions.

This gives rise to various relationships organised into 2 categories (see Figure 2).

UK awards	Expertise in distance learning
UK institution → Student	UK professional ↔ Local professional
UK institution ↔ Local institution	UK institution ↔ Local professional
	UK professional ↔ Local government/institution
	UK institution ↔ Local institution

Figure 2. Examples of relationships

Brokering UK awards relationships

In the UK awards category, the relationships develop around the programmes that lead to UK awards. The particular areas of provision of the UK award will depend on the particular sector (e.g. Higher Education, Vocational) or subject discipline where there is a course shortfall.

The first type of relationship is between a UK institution and the student. It concerns a student studying for a UK award delivered outside of the UK. This is typically via distance, on-line or blended learning.

British Council will typically broker such a relationship through the provision of information and counselling for prospective students. This can be seen as the first of 3 stages (pre-enrolment) in learner support [2]. The relationship is deepened and maintained through two further stages of learner support: post-enrolment (e.g. student clubs or library/information services); and post-course (e.g. alumni services).

British Council also provides institution-facing services such as market intelligence to UK institutions considering entering a new market. In countries such as China and India, British Council offers services for brokering relationships between UK and overseas institutions. These relationships usually take the form of a franchised or other contractual agreement. They represent the second form of connection – UK institution to local institution for the purposes of delivery of programmes leading to UK awards.

The range and form of services will vary considerably depending on the resources available in country and the state of the educational market. For example, the Serbian education market can be characterised as having low level interest from the UK sector and few state or private institutions to partner with. British Council activity involves provision of learner support services to students including a "light-touch" brokering between students and local institutions willing to provide tutors.

Brokering expertise relationships

The particular subject areas for exchange of expertise will depend on the section of the education sector that the country is reforming or developing. These typically include [3]:

- organisational structuring
- distance learning methodologies
- quality mechanisms (self-regulation of institutions; national regulatory frameworks; national frameworks for regulating overseas courses)

- technology and learning platforms
- staff development

Brokering can take place through the informal exchange of expertise, typically at the individual level. Individuals may be policy makers (e.g. Ministry planners or education institution leaders) or practitioners (e.g. Ministry staff, quality body staff or academics). This may involve individuals coming to the UK on study tours or visits. Another way in which British council achieves this is to mount seminars on specific topics. This allows a group of experts from the UK to meet at the same time with counterparts from other countries. For example, in 2004/2005 British Council will present 3 seminars directly relevant to distance learning: quality in HE, life-long learning, and establishing a virtual university.

More formal visits are also requested to specific UK institutions (e.g. Quality Assurance Agency, Open University, and Learndirect – who are engaged in life-long learning). These visits are limited by the capacity of the UK institutions to host visits. British Council will work with institutions (e.g. QAA) to manage the number of visits or to arrange windows for organised study tours.

Exchanges also take place in the reverse direction. British Council helps in identifying (and in some cases funding) professionals from the UK to serve as guest speakers at conferences or seminars overseas. In some cases, British Council itself will arrange seminars or events in a country.

In other cases it is not so much an exchange of expertise but a country is in need of expertise. In such cases British Council can identify consultants from the UK sector. For example, requests from a Ministry for UK staff to act as independent quality assessors or from an institution to undertake training of their staff.

Motivations underlying institution-institution relationships

Brokering an institution-institution relationship for expertise may on the surface resemble the process followed for brokering an institution-institution relationship for UK awards (see Figure 2). However, there are significant differences in the motivations underlying the two relationships [4, 5].

The institution-institution relationship in the UK awards category can be seen as primarily following a UK export agenda. The relationships being formed may be for the marketing of a UK programme or a franchise agreement governing aspects of its delivery. In some cases the relationship is being formed with a local institution from the private sector.

In contrast, the institution-institution relationships in the expertise category can be seen as being part of a more collaborative nature. The objectives may be joint curriculum development or to develop staff capacity, for example.

The reality is that the two categories of relationship involve both elements of a trade agenda and a mutuality/collaborative agenda. This is often driven by governments (e.g. China) who may insist on an element of capacity building in any institution-institution relationship.

In pursuing institution to institution partnerships on a large scale between UK and overseas, and if capacity building is a chosen objective for governments, then systemic and framework development is often considered desirable. As relationships develop at institution level, this often generates a further need to provide frameworks that will encourage further programme development. Hence, it is difficult to view the brokered institution to institution relationships as being independent from the systemic levels of collaboration. This level of brokerage (involving both government to government and institution to institution) is infrequent, however, there are a limited number of examples.

Funding for brokering

British Council is not a donor in the international distance education field [4]. There are 3 major ways in which it carries out its brokering activity:

- Self-funded activity
- Management of UK or international programmes
- Management of donor-funded development projects

Approximately one-third of British Council's income comes as a grant from the UK government. This grant may be used to support the full range of relationships described previously. For example, the British Council seminars are a grant-supported activity.

Another third of British Council income is derived from management of contracts and donor-funded development projects. Management of UK programmes also allow British Council to achieve its brokering aims. For example, the Higher Education Links programme has supported the exchange of staff between UK and institutions world-wide. This has been, funded by the Department for International Development (DfID). The Global Gateway programme is an initiative funded by the Department for Education and Skills (DfES) which will eventually link higher education institutions in the UK and internationally. The EU-funded CEDEFOP programme provides organised study visits in the vocational sector, one area of interest being e-learning.

British Council's work in management of donor-funded projects allows technical assistance work in areas of education reform. Such projects typically involve capacity building and training elements to be delivered by distance learning. Exchanges involve consultancy.

Figure 3 summarises some of the difference between the three funding approaches. In general, the self-funded activity can be inconsistent and short-term but has the advantage of being very flexible and responsive to needs in country. The managed programmes and projects tend to allow a more consistent and well-funded approach at the cost of being less flexible.

	Self-funded activity	**Management of programmes**	**Management of donor-funded projects**
Reach	Variable	UK-several countries, sometimes bi-lateral	Bi-lateral
Time scale	May be short-term or indefinite	Fixed-period	Fixed-period
Resourcing	Lower funding	Higher funding	Higher funding
Consistency	Can be inconsistent	Consistency across programme	Consistent within project
Flexibility	Very flexible	Defined by programme	Defined by donor

Figure 3. Comparison of funding mechanisms for brokering

The context of European Union enlargement

The accession countries from East and Central Europe may not initially provide an obvious area for UK education providers. The legal frameworks for offering distance learning will vary from country to country. Public acceptance of various forms of distance learning also varies (e.g. in Poland e-learning is most accepted in the corporate sector). Income levels will also affect whether UK institutions can afford to offer awards in that area. Delivery may remain restricted to individuals who can afford to pay. Bi-lateral agreements may provide the framework for niche sector areas where workforce development is needed.

The accession countries will move into the mainstream of EU-funded programmes that British Council may manage as opportunities for donor-funded projects decrease. It is likely that activity will focus on EU programmes or programmes arising from bi-lateral agreements at the government or institution level.

The attention for much donor-funded activity will shift to the borderlands or next wave of accession countries. British Council offices in South East Europe are moving towards a more regional approach. Many of the offices are equipped with videoconferencing facilities which makes global dialogues and events possible. British Council also has a strategic framework agreement with the World Bank. Amongst other things this includes co-operation between British Council country offices with the Global Development Learning Network (GDLN). The South East Europe network British council's strategic relationship with currently developing a network of centres in South East Europe.

Conclusions

The paper outlines one aspect of British Council's work – its brokering role in distance education.

The brokering role is a powerful mode for creating opportunities for collaboration and sharing of experience in the field of distance education. Through brokering, British Council is able to convey multiple messages and provide a platform for mutuality between education experts and institutions.

The mixture of funding underlying the brokering provides a rich means of meeting the challenges and need of an expanded European Union.

References

1. PERRATON, H. (2003) *Open and Distance Education in the Developing World*, Routledge, p. 228
2. PERRATON, H. *Policy and Planning in the Developing World*, in Planning & Management in Distance Education, S. Panda (Ed.), Kogan Page, pp. 31-51
3. MITCHELL, W. AND KNOWLES, S. (2004) *Multiple Missions in International Learner Support: A Case Study of the British Council*, Proceedings of the 3rd EDEN Research Workshop, Oldenburg, Germany, pp. 163-169
4. RUMBLE, G. AND LATCHEM, C. (2004) *Organisational Models for Open and Distance Learning*, In Policy for Open and Distance Learning, H. Perraton and H. Lentell (Eds.), RoutledgeFarmer, pp. 117-140
5. BERNATH, U. AND HÜLSMANN, T. (2004) *Low Cost/High Outcomes Approaches in Open, distance and E-learning*, Proceedings of the 3rd EDEN Research Workshop, Oldenburg, Germany, pp. 485-491

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THE POTENTIAL FOR ENGAGEMENT BETWEEN THE UNIVERSITY OF LONDON EXTERNAL PROGRAMME AND EASTERN EUROPEAN NATIONS JOINING THE EUROPEAN UNION IN 2004

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Introduction

The University of London has a well developed and longstanding commitment to distance learning, expressed through its External Programme with a role in international education which can be dated back at least to 1857. It has also, since 1915, included the School of Slavonic and Eastern European Studies (SSEES), a renowned centre of excellence in its field, as one of the its constituent elements (SSEES is now part of University College London, one of the founding Colleges of the University). However, these two streams of competence, in Eastern European studies and distance learning expertise, have never been conjoined, and the External Programme's role and influence in the region has thus far been fairly minimal. The advent of ten new member states entering the European Union, eight of which are of Slavonic or East European provenance, marks an appropriate point at which to consider the ways in which the University might approach this area in the future.

Background

As Szücs and Jenkins [1] explain, distance learning did not have a strong reputation in Eastern Europe prior to the late 1980s, but became rapidly established amongst leading regional educationalists as a medium for addressing some of the capacity issues of higher education provision in the region. Since 1991, European Union support for this sector, as provided via the PHARE and TEMPUS programmes, has concentrated on encouraging existing Eastern European universities to develop their own high quality distance learning courses, rather than by developing regional equivalents of open universities. The models and approaches used are very different to those employed by previous regimes to deliver somewhat discredited correspondence courses. More recent reviews – such as those detailed by Kárpáti [2] for Hungary, and Kangro and Kangro [3] for Latvia – indicate that the use of information technology in education has grown rapidly in Eastern Europe, though issues related to finance and sometimes to language and ICT competence can still be problematic. Political barriers to change have all but disappeared in the twenty-first century.

The University of London underwent a period of its own internal change with regard to distance learning in the late 1980s, on a timescale, as it happens, not dissimilar to that of the political changes which were then being wrought in Eastern Europe. It had for many years operated a system of setting syllabi, conducting examinations, and awarding degrees, in a way which allowed students from potentially any country to obtain a degree from the University without coming to London [4]. Under this mechanism, no teaching or student support was provided by the University; students either purchased tuition from a local provider, or simply organised their own study programmes, in order to cover the syllabi laid down by the University. The numbers of students registered on an External basis fell from over 25,000 in 1960 to less than 17,000 in 1985, when plans were made to discontinue this mode of study altogether.

However, the External Programme survived, and has since 1987 been remodelled with a stronger focus on student support. The concept of students purchasing tuition from local suppliers has been retained, especially at undergraduate level, though the materials which are provided directly to students by the University have been improved considerably in quality and scope. At postgraduate level, a model of full student support has been adopted, with students being provided with all necessary learning materials, and increasing use being made of the University's evolving Virtual

Learning Environment. There are now in excess of 30,000 students registered with the University on an External basis.

Present Situation

Relatively few of these University of London students are based in the Eastern European countries acceding to the European Union in 2004. Whilst the University has already developed linkages with the island nations of Malta and Cyprus, such relationships have not been fostered with the other eight new member states. In 2003, there were 120 postgraduate and 392 undergraduate students from countries categorised as "Eastern European", registered with the University of London – less than 2% of the total student numbers.

This lack of past engagement between the University of London and this particular region has been, in some ways, a positive scenario. As Szücs and Jenkins (op. cit.) note, any influx of western distance learning opportunities might have lead to stronger or wealthier students being attracted away from indigenous institutions, and competition from EU based open universities could have acted to challenge, rather than to strengthen, Eastern European developments in distance learning. As the record stands, the University of London External Programme cannot now be criticised on this count.

However, the position in Eastern Europe has now changed considerably, after more than a decade of development, particularly following the establishment of a network of distance education centres under the PHARE programme, and other multilateral and bilateral initiatives. A few examples can be given to indicate the levels of diversity and sophistication of open and distance education programmes now operating in Eastern Europe. The German Federal Ministry for Education and Research has helped to fund a distance learning centre at Riga Technical University [4]. PHARE support has led to the establishment of the Iasi Distance Education Study Centre at Alexandru Ioan Cuza University, in Romania [5]. The Slovak University of Technology, in Bratislava, has a well-established Local Centre of Distance Education, which is itself part of the wider Slovak Network of Distance Education [6]. Finally, Warsaw University, in collaboration with the University of Bonn, now offers the first ever internet course in Mayan Epigraphy [7]. It is clearly no longer the case that the distance learning programmes of Western European universities can simply be regarded as a source of damaging competition to ongoing academic developments further to the East.

Evolving a Regional Role for the University of London

The question that is now being posed is whether the University of London, which has a long history of involvement in distance learning and an extensive network of support services, can play an active part in the further development of distance education in Eastern Europe. There would appear to be a number of possible options that might be worthy of consideration.

Institutional Collaboration

From the External Programme's point of view, the simplest and most obvious form of enhancing the current levels of engagement would be through developing linkages with institutions. Most of the students currently registered on an External basis with the University of London are studying at undergraduate level, and the majority of these will structure their studies around the purchase of teaching support from local providers. Currently, around 75% of undergraduate students – about 19,000 in total – choose to attend supportive courses run by 118 institutions, in 31 different countries, though very few of these are currently located in Eastern Europe.

This is a low technology approach to study. The University provides the syllabus, and a series of study guides, and handles the examination arrangements. Students will usually need to purchase additional textbooks and, if they wish, to buy tuition from local agencies. The teaching arrangements are not organised or necessarily approved by the University, though the University will provide information to students about organisations with which it has concluded agreements.

The great advantage of this approach is its low cost. Students who follow this route are able to obtain University of London degrees without paying the fee levels incurred by online courses, which are typically eight to ten times more expensive. The additional tuition costs are paid for in local currency and at local rates. Additionally, there are benefits to students in that their studies are not dependent on internet connectivity, which itself involves a series of further and sometimes hidden expenses. This is a model which has proved particularly popular with young undergraduate students in Asia, and it would be interesting to assess whether this approach, which is relatively cheap and includes elements of face to face teaching and student to student contact, would be applicable in an Eastern European context. The system of involving local institutions is already well developed in Malta, one of the other 2004 accession countries.

Another possible collaboration option, which has already been discussed with a number of Russian Universities, is to organise joint qualifications. This allows students to register and study with an indigenous university, and then to add on selected compulsory or elective courses in order to obtain a diploma or degree from the University of London. This kind of mechanism has been used in the past, though under somewhat different circumstances, to foster the development of universities in Africa, the West Indies, and even in the United Kingdom. The Universities of Hull, Southampton, Exeter and Leicester were engaged in providing teaching for University of London degrees before becoming chartered as independent Universities. However, it is more than half a century since this particular model has been used, and there would obviously need to be significant modifications made in order to reflect the modern context in Eastern Europe. What can be said is that the University of London retains its requirement that students must pass a significant proportion of their assessment (usually at least 70%) through unseen written examinations. This stipulation is seen by the University, and by Ministries of Education in many countries, as providing a guarantor of academic quality which other assessment regimes may not be able to offer.

Short/Continuing Professional Development Courses

Historically, the University of London saw its role as one of providing access to full qualifications, at undergraduate, postgraduate, and doctoral levels. Recent developments within the External Programme have focused more closely on the provision of shorter learning programmes, which will usually be contained within or linked to a full qualification but which will not necessarily require students to complete the entire degree.

For several years after the External Programme's reformation in the mid-1980s, students were allowed to take "Occasional" courses, which were simply individual courses or modules extracted from the degrees offered by the University on a distance learning basis. There was a relatively small market for courses of this kind, but nevertheless they served a useful function for some students, in allowing them to test the study experience to see its services and demands were suitable for their own particular circumstances, before making any commitment to completing a full qualification. It was also possible for students to register to take individual courses for reasons of (Continuing Professional Development) or of particular personal interest, though the great majority of courses were not designed and constructed with these objectives in mind.

More recently, an explicit move has been made towards the production of short courses and modules which are specifically tailored to the CPD market. Veterinary courses, for example, are now available in 50 and 35 hour formats, and can be studied flexibly either as modules in their own right or as components of full courses which in turn lead on to complete qualifications. It is also now proposed to produce a course on European Union Law, written as part of a new Master's in Law degree but which will be available in modular and sub-modular formats. There are several advantages for students who choose to take the short course/CPD route, in terms of the flexibility of study and the portability of the qualification. It should be increasingly easy, under the terms of the Bologna process, for sub-module study of this kind to be imported into programmes offered by other European universities. Another important consideration is cost. Assuming that current planning proceeds on track, it should be possible for students to complete individual sub-modules of the European Union Law course, in a fully supported environment, for around 515 Euros, which is considerably less than the price of an entire qualification. Whether offered in partnership with local institutions, or directly to individual students, there seem to be grounds for believing that the function of short courses could well be relevant to the Eastern European region during this transitional period.

Direct Competition

As mentioned above, there is little reason now to suppose that the distance learning operations of Western European Universities should be seen as posing any particular threat to developments in the Eastern part of the enlarged Union. Distance learning is now well established in Eastern Europe, both as an educational concept and as an increasingly broad and sophisticated reality. The converse view might be expressed that the expansion of the single market brings with it the corollary of open competition, and that there is no reason why the University of London should not seek to promote its own programme alongside those of other Universities operating in the European Union.

The competitive advantages which London would seek to exploit would include its academic reputation, its regional network of examination centres, and the credibility of its examination-based qualifications. Amongst the disadvantages which any marketing operation would face would be the requirement for applications to produce evidence of English language proficiency, the relative paucity of local teaching institutions in Eastern Europe, the cost levels for full qualifications at postgraduate level, and, perhaps most importantly, the absence of any significant historical interaction with the region. It is possible that, with the advent of EU membership, certain key Eastern European cities may at least partially follow the pattern set by Brussels, which has a fairly sizeable number London students who are not Belgian nationals. Centres of power and authority within the EU tend to attract expatriate professionals who are frequently natural candidates for distance learning, and it may be the case that these types of niche markets will emerge in Eastern European capital cities. If this trend does materialise, then the University will need to consider how best to reach and target these particular individuals.

Potential Institutional Problems

There will be moves within the University of London External Programme to research and review the avenues mentioned above for interacting with the accession states within the altered European Union. The need to develop a policy and strategy to cater for the new Europe is evident: the alternative is disengagement from a potentially important market and a significant source of distance learning thought and creativity. However, if it proves to be the case that the University of London finds it difficult to build activities linked to the new EU member states, then potentially questions should be asked as to why this should be so.

Traditionally, the External Programme has not focused on Europe as a major market for students, and has not sought to develop regional alliances with other Universities in pursuing distance learning objectives. Both of these restrictions on policy are barriers to the promotion of the University's role within the European Union. Given that members of accession states will now pay EU level fees in order to study as full time students at British universities, there may well be increased interest in the option of studying in Britain, as opposed to pursuing qualifications at home via a distance learning format. Policy responses to this altered situation might include, as suggested above, collaboration with regional universities and other institutions, the use of shorter and more flexible learning programmes, and a more vigorous entrance to a competitive market.

The fact that no co-ordinated strategy, containing any or all of these elements, has yet emerged suggests several possible undercurrents of thought. It may be the case that, with Europe simply not seen as a core market, the activity of the current University of London operation remains geared towards Asia, so the expansion of the European Union is seen as a largely irrelevant issue. There may also be elements of a characteristically British reluctance to commit wholeheartedly to the essential project of European integration: equally, there may be an unwillingness to alter well-established models of course delivery to fit in with the needs of a changing EU. If all or any of these potential perspectives have real foundations, then alterations in the University's institutional approach would seem to be necessary prior to any effective engagement with the accession nations.

Conclusion

This paper is no more than a summary attempt to sketch out the ways in which the University of London might enter into constructive relationships with the new member states of the European Union, and to highlight some of the barriers that may be encountered during this process. More research will need to be conducted with regard to matching the University's current operations and the needs of the Eastern European region. If this equation is found to be uneven, then consideration will also need to be given as to whether and in what ways, the University of London will need to modify its approach to take the changes in European social and economic structures into account. There does however seem to be every reason to promote co-operation between a well-established provider of high quality External education, and a region with great potential for growth and development and a strong interest in modern models of distance learning.

References

1. SZÜCS, A. & JENKINS, J. (1999) *Distance Education in Central and Eastern Europe* in HARRY, K. (ed.) Higher Education through Open and Distance Learning, pp 227-243, Commonwealth of Learning Series, London: Routledge
2. KÁRPÁTI, A. (2004) *ICT in Hungarian Education – A Brief Overview*, Educational Media International, Vol 41, no. 1, pp 19-26
3. KANGRO, A. & KANGRO, I. (2004) *Integration of ICT in Teacher Education and Different School Subjects in Latvia*, Educational Media International, Vol. 41 No. 1, pp 31-38
4. UNIVERSITY OF HAGEN (2004) International Projects: German Study Centre for the Baltic States, http://www.fernuni-hagen.de/, 23.2.2004
5. STANKU, A. (2002) Iasi Distance Education Centre (IDESC), http://stoner.phys.uaic.ro/IDESC/idesc.php, 17.2.2004
6. SLOVAK UNIVERSITY OF TECHNOLOGY, BRATISLAVA (1996) Local Centre of Distance Education, http://www.kar.elf.stuba.sk/lsdv/index1_e.html 7.2.2004
7. WARSAW UNIVERSITY (2004) Centre for Open and Multimedia Education, http://www.come.uw.edu.pl/en/index.html, 3.2.2004

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TOHOST-CA: IDEAS ADAPTED TO NEW CHANGES IN EDUCATION FOR CENTRAL ASIA

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"Only with full consideration of the human factors involved in pedagogy will e-learning get to its full potential – the blend of traditional wisdom and new technologies will help us to make real progress"

Dr. Richard Straub, IBM

Introduction

In the wake of the transformation of e-learning to a mainstream activity in higher education, ToHoSt-CA, a multiplier project in the field of Tourism and Hospitality Studies in Central Asia (CA), sets as one of its goals to contribute to the promotion and use of Information and Communication Technology (ICT) for learning and teaching purposes by elaborating and delivering common, online courses in five Higher Education Institutions (HEI) from three CA countries. Through a homogenized and common structure of readable and comparable degrees and other related features, ToHoSt-Ca is not only extending the Bologna Process into Central Asia but can also be regarded as a tool for sustaining continuous curriculum development, in which the introduction of ICT skills should play a role. Although this sort of initiative is very appropriate for institutional development and lifelong learning and for supporting policies on employability, there are a number of challenges that CA partner countries may face.

Goal: Getting teachers and students in CA actively engaged with ICT resources

For more than one decade, the governments of CA have presented (or attempted to present) state reforms as reactions to rising levels of unemployment, illiteracy and other types of marginalisation and poverty. Rather than being seen as temporary measures to deal with economical scarcity, the need for more structural, fundamental and long-term state reforms have come to the fore. Within this context, both e-learning and e-communicating competencies would be expected to be linked to education and working. The need for improving skills (including ICT) has to find an answer through enhanced teaching materials and methods, and more effective synergy between education, technology and industry. According to the Summit of the 21st Century Literacies (Berlin, 2002)[1], new approaches in education should stress the ability to use information and knowledge extending beyond the traditional base of reading and writing. Keeping this in mind, ToHostCA should not solely bring competitive advantages for young students by providing ICT skills in CA, but should also incorporate the following components to enhance the knowledge and critical thinking skills of teachers, students and end-users (managers, administrators, etc.):

- technology literacy (the ability to use new media in an effective way);
- information literacy (the ability to gather, organise and evaluate information, and to form valid opinions based on the results);
- media creativity (the ability to produce and distribute content to audiences of all sizes);
- global literacy (understand the interdependence among people and nations and having the ability to interact and collaborate successfully across cultures); and
- literacy with responsibility (the competence to consider the social consequences of media from the standpoint of safety, privacy and other issues).

[1] 21st Century Literacy Summit. White Paper. 7-8 March 2002, Berlin, Germany.

Helping people adapt to the changes brought about by new technologies and helping them to see the value and benefits of new technologies does not come without a cost. The evolution of professional profiles in non-academic sectors is faster than the adaptation of Higher Education programmes to them, especially in CA where curricula are still strongly influenced by traditional pre-independence educational models. Besides, design and delivery models are formative and changing rapidly as we learn about developing quality learning programs that take best advantage of the available technology. Contents and course elements are not always relevant to the changing needs of the labour market, whilst ICTs have so far been introduced in HEIs principally as accompanying tools. One important aspect to consider when deciding which approach to use in developing a convergent curriculum for Central Asia is the varying interpretations on what should be included. Related to ICT, it is evident that for the time being the project is largely limited to improving basic, and often specific, technical proficiencies expected in everyday business life. These include the use of e-mail, the Internet, Microsoft environment and certain software applications. It can also be observed how teachers and instructors are increasingly obliged to implement such general technical skills in their home institutions. So far it has been natural for CA partners to design courses in an articulated traditional way with lectures and classroom instruction at specific times. Meanwhile, in Europe, teaching and learning behaviour have undergone a radical change. According to the Task Force of the International Council of Distance Education (Hall, 1996) there have been more than 20 changes to teaching and learning behaviour which have caused educational paradigm shifts. All these changes have brought about new reformed curricula for which CA institutions are not yet adapted.

Regardless of the effort involved, the development of online learning materials has become an imperative for most education and training institutions in western countries. The ToHostCa approach seeks to collaborate in the development of common resources for CA partner institutions. In this way knowledge is transferred and organisational resources are shared. While this sounds eminently sensible and obvious, it is difficult for teachers and lecturers within a department or faculty to agree on what approaches and resources to make use of, let alone involving five different HEIs. From an institutional point of view, immersed in what McLuhan (1967) described as “the global village”, the common framework for convergent (online) courses in the subject area will contribute to labour market transparency and to a greater recognition of educational programmes and professional qualifications. Figure 1 below shows a number of courses within ToHost-Ca that would potentially use ICT for teaching purposes. Moreover, the project outcomes should improve the content of curricula, the CA cooperation between industry and education, the recognition and implementation of skills and competences appropriate to the knowledge economy. The results will also strengthen the existing cooperation between the involved partners and support further common activities.

Expected competencies in CA partner institutions

Management of learning technology selection. This process involves: Supervising the selection of learning technologies and assuring that those selections meet organizational needs as well as determining when, how, and where learning technologies should be used and monitoring the progress of all the other roles in the delivery process. Skills and knowledge in this area should include:

- needs assessment skills
- knowledge of instructional design
- knowledge of programming and authoring tools
- resource identification skills
- technology evaluation skills
- ability to balance electronic and non-electronic instructional methodologies
- knowledge of future learners’ needs
- knowledge of adapted organizational needs
- knowledge of adapted instructors’ needs.

Management of learning technology design and development. This process involves: Supervising and ensuring the integration of performance objectives, course materials, and learning technologies in a design document that fulfils the organization's goals. Skills and knowledge in this area should include:

- knowledge of graphic design
- knowledge of HTML design skills
- knowledge of programming and authoring tools
- resource identification skills
- knowledge of storyboarding.

Management of learning technology implementation, support, and evaluation. Supervising the installation and maintenance of learning technologies and assuring that all systems continuously meet company specifications. Skills and knowledge in this area should include:

- knowledge of future learners' needs
- knowledge of adapted organizational needs
- knowledge of adapted instructors' needs
- ROI analysis skills.

Course Title	Course Description
Introduction to Computer Reservation Systems	Access and interpret product information
Create a Promotional Display / Stand	
Computer Operations & Word Processing	
Financial Management	Manage finances within a budget, prepare & monitor budgets
Business Planning & Management	Develop and implement operational plans, plan & manage meetings, manage physical assets, establish & maintain a safe & secure workplace
Tour Planning & Packaging	Source and package tourism products and services, coordinate the production of brochures and marketing materials
Tourism Sales & Marketing	Make presentations, establish & conduct business relations, plan & implement sales activities, coordinate marketing activities
Computer Reservations Systems	Amadeus, Fidelio
Tourism Marketing	Including market research and strategic planning, competitor analysis
Communication and Psychology	Including negotiation skills, cross-cultural communication, electronic communication, website building
Languages	English, Russian

Figure 1. Examples of courses using ICT for online delivery

The challenges of introducing e-learning and new technologies in CA

As a result of the globalisation process, CA countries are confronted with in-depth change processes. The recent New Independent States (NIS) have experienced some difficulties performing the necessary strategies and policies that link education to changing needs in the labour market in a sustainable manner. Furthermore, most results of former projects (Tempus or other) are 'frozen' because of the lack of initiative from the driving forces, that is, the institutional authorities. HEIs are aware that they have to align their programmes to the society's demands. Information gathered from websites and occasionally through contacts with Western European institutions lead them to search for standardisation criteria and instruments for quality control. Their desire to collaborate on a bilateral basis with western universities and industry – mainly as far as student and teaching staff exchanges are concerned is thwarted by problematic and insufficient competency from their side. Language skills, inadequate cultural awareness and ignorance of new educational methods are the primary obstacles. Most of the partner countries are changing their educational system to adapt to new realities. They have started to include more practical training, lifelong learning, ICT and research oriented education in the curriculum. In this sense, the updating of the current teaching/learning methods and strategies should soon be achieved.

CA HEIs are starting to enjoy the benefits of ICTs and Internet, which has cought up many in Western Europe now takes for granted. Through vast foreign investment, mostly from the USA, Europe and Japan, ICT has been introduced as a supporting tool in CA, embedding HEIs in the globalization process. From an educational perspective, CA authorities are realising that the teaching/learning process is no longer what it used to be, especially since the advent of the Internet revolution. CA countries lack the possibilities bestowed on Europe by Community programmes such as Leonardo da Vinci or Socrates, enabling regional network contacts, knowledge transfer and common research – more specifically ICT oriented.

The use of ICT for teaching/learning purposes poses a number of challenges for CA institutions and individuals alike. Teacher and trainers must themselves be trained in how to use them. Most SMEs in the region lack skills and experience as regards the management, policy making and the marketing of Tourism and Hospitality, either in the public or the private sector. Likewise, professionals must adapt their products and introduce new technologies in order to better manage the new tourism activities and developments. The industry has to network and to improve its management tools, based on a more rapid receipt and processing of essential market and support information. For example, some tour operating companies already started improving the use of web-based information and students from different disciplines had to analyse the results (cf. Glavtour and MuzaTour in Kyrgystan). The teaching value of the tools available must also be guaranteed. The introduction of online teaching and related student support places different demands on tutors and creates the potential for different teaching roles and styles. It is argued 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 (Stephenson, 2001). Attention should be drawn to the Internet's potential role in encouraging discussion and influencing strategies relating to active classrooms and participation as a mean to being part of wider forums. Still, the way ICT will be interpreted and accepted by students and professors must also be considered.

Concern over information overload is increasing for many students. Just as e-mail has brought a large volume of unstructured, and often undesired, junk mail to their box, mass electronic information will add chaos rather than learning support, without reducing the time spent on the class assignments they already have to deal with. The typical chat forum or line chatter in an e-learning environment is equally problematic. On the one hand, it supports the informal nature of the network; but on the other, it increases the acceptation of a new environment.

Teachers and teaching staff in CA are concerned about the changes new technologies will bring to the teaching/learning process. When teaching material is put in an e-environment, the output of each individual is available to scrutiny and evaluation by any other member of their institution. Traditional teaching environments allow for reviews to be scheduled or planned. New media threatens the privacy of instructors since they fear their work being monitored and the current evaluation processes being altered. Reluctance to use computers is not endemic to teachers or professors. People at all levels, teaching and clerical staff, may have resisted the PC in the past. PCs may be seen as clerical tools by some teachers. For others, the excuse is that they do not trust machines or that they can do without computers in order to carry out their work. Western experience has taught us that because the technological revolution requires a critical mass, teachers who resist using computers will have to use them anyway. Technologies work only if all members of a group use them. If communication is *made* available only through the computer, only through the computer will it *be* accessible. Additionally, the cultural factor is a difficult component to measure and to discuss because it is embedded in shared ways of meanings and perceptions of the world which are taken for granted by members of the same group. The solution might be, as Hoecklin (1995) stresses, to provide an integrative approach to ICTs which views cultural differences not as irreconcilable handicap but rather as a different starting point that can be exploited to develop uniquely competitive solutions.

Nevertheless, rather than resilience the major problems faced in CA Higher Education Institutions are the lack of skilled ICT teachers and sufficient computers and the poor infrastructure and slow Internet connections. Initiatives such as TEMPUS may aid with financial resouces to modernize HEIs in developing countries. Besides, they enable concrete actions to stimulate progress and facilitate modern ICT infrastructures. However, long-term sustainability should be provided by governments and public authorities in co-operation with private and foreign organisations. Public authorities should first make available the basic resources, companies must then help to co-finance learning actions in exchange for internships or practical training. HEIs should answer the changing needs of industry and industry should offer their expertise to HEIs by providing practical training for students and guest lectures, for example. Educational institutions should be encouraged to reconcile learning with work activities and work organization. These efforts should not be seen as costs but as an investment, bringing rewards in the future. Herein, it is important to motivate not only the decision-making bodies, but also each of the members involved on an individual basis.

Knowledge and innovation have become essential resources for economic development since new ICTs are playing a growing role. But Technology demands a sense of possibilities, a willingness to adapt skills to an evocative new medium, quite different from local oral traditions predominant in CA. For partner institutions, the challenges are even greater when trying to reform their national systems while dealing with the potential disruptions of emerging Web-based education and e-learning environments. For instance, in the HEIs from NIS centered on economics, political sciences, law and humanities in general, the courses are undergoing an even more fundamental overhaul, as the basic methods and entire philosophy have been overturned, opening up to new influences and interpretations on which democratic knowledge-based societies and global-oriented market economies are based. For ICT is indeed the center of gravity of knowledge-based activities; it brings flexibility and dynamism into the wider life of new educational practices.

From a Western perspective, new technologies are important in the way education is being developed, furnishing more flexible schemes of teaching and learning. No one – whether HEIs, students or teachers – should be denied the possibility to harvest the fruit of this technological momentum. Ideally, all HEIs should provide the necessary means but as we know resources are inequally distributed around the globe. Most universities struggle to find necessary funds, not only in CA but all over the world. Lack of financial resources hinders the supply of minimum requirements for a modern education with well equipped laboratories and libraries, computer rooms for everybody and a decent learning environment for students. Learning technology can help address these challenges only if technology can be made accessible to all.

Conclusive remarks

Rather than being a single and isolated project, ToHost-Ca is an attempt to guide educational institutions on the path towards co-operation in developing, *inter alia*, ICT skills so that graduates attain the correct competencies and knowledge. Digitised practices and online education will enable CA countries to react to and cope with the major educational changes outlined above. Employability, one of the cornerstones in the Bologna Declaration, is well present in the philosophy of ToHostCA. The project's outcomes and their dissemination aim to bridge the gap between labour market and education – at local level. Given that education in CA is influenced by globally-oriented trends, the importance of regional collaboration and identification of common strategies to adapt Tourism and Hospitality studies for the region has to be accentuated. As Peters (2002) asserts, digitised distance education will now assume the highest degree of importance as it can contribute substantially through its approaches, techniques, strategies and achievements to the development of the University of the Future.

It is clear that a European model can be used as frame of reference to support Mongolian and NIS efforts to reform their systems. Such a framework could identify common policy issues and define the links between education, training and employment strategy. It could encourage debate on ways of making (lifelong) learning a reality and help build consensus on the objectives of ODL and the measures for achieving them. It would also establish an effective system for the exchange of information and experience at CA level, providing a forum for discussion and analysis, whilst at the same time helping to reform education at government level. If HEIs in CA wish to prepare themselves for the tasks facing education in the future, fundamental new concepts have to be embraced. Hence, e-learning, web-based learning or self-learning, has a role to play by allowing new methods of education, higher flexibility for autonomous learning and self-study, in so far as they represent educational innovation in teaching/learning processes and are not confined to simple training or information supply.

New technologies offer CA partner countries a possibility for standardisation of the curriculum. The use of ICT for course design, textbook writings and testing by teachers and teacher trainers (both for academics and non-academics) still needs to be developed through existing platforms (e.g. @rest, Blackboard or open sources). Since ToHostCA is a subject-based international consortium, the delivery of common core courses which can be delivered online in all CA partner institutions is a pilot experience for the region. Unacquainted with e-learning or any methodology of teaching/learning through new technologies, CA partners do not expect benefits to be automatic. As with any technology, if it is used incorrectly, the introduction of e-learning can cause more problems than it solves. Harvesting e-learning benefits requires special sensitivy to changes in education. These changes offer both technical and people-related challenges

References

1. HALL, J. W. (ED.) (1996) *Report of the Task Force of the International Council on Distance Education.* The ICDE Paradigm Shift Report. Standing Committee of Presidents. Lillehammer, Norway
2. HOECKLIN, L. (1995) Managing Cultural Differences. Strategies for Competitive Advantage Wokingham, England: Addison-Wesley Publishing
3. MCLUHAN, M. & FIORE, Q. (1967) The Medium is the Massage. New York: Bantam
4. PETERS, O. (2002) *Distance Education in Transition. New Trends and Challenges*. Carl von Ossietsky, Universität Oldenburg, Center for Distance Education. Vol. 5
5. STEPHENSON J. (2001) *Teaching and learning online: pedagogies for new technologies*, London: Kogan

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ECONOMIC EDUCATION ONLINE – TANSFORMING AND SCALING QUALIFYING PROGRAMMES TO RUSSIA

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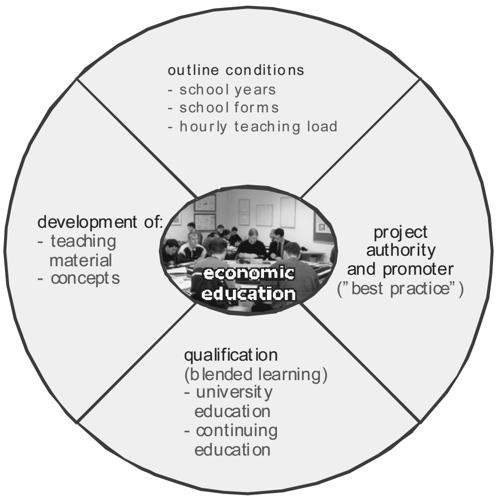
1. Introduction

The Oldenburg Institute for Economic Education is one of the largest academic establishments in Germany to focus on the role of economic education in the general education system. The institute conducts basic and applied research into teaching methods of economic education and promotes economic education in all types and levels of school within the general German school system as well as certain non-school areas. Our guiding principle is that economic education is an important part of general education. This principle is clear. However, implementing this into the general education system presents a challenge, since the following points all need to be taken into consideration:

1. Political and other framework conditions are required (e.g. set hours for economic education in general education schools).
2. Individuals are needed to run and promote projects to actively support the establishment of economic education with Public Private Partnership Models using best practice.
3. Teachers need to be trained in the subject.
4. Teaching materials, media and concepts need to be developed and made available.

It is clear that a whole range of measures are necessary to successfully promote economic education. One or two years of qualification are not sufficient for Teachers of Economics if they want to teach their subject in relation to the newest scientific cognitions an in relation to the socio-economic realtiy. The "Oldenburg Model" describes a strategic approach towards an innovative role in the general education system.



The Oldenburg Model of Economic Education

It is part of the strategy that Institute activities are always linked to local, regional, national and international perspectives. Our international perspectives are primarily directed towards Central and Eastern Europe.

2. "Economic Education Online" in Russia – a history of building a German/Russian network

The Institute for Economic Education began offering support to Russia regarding economic knowledge transfer back in the 1990s. The first co-operation partner was the renowned State University of Novosibirsk, where a process was started in 1994 to restructure the content and organisation of teaching in the economics department as part of a joint European project. The results of these projects were then expanded in a European Commission ratified compact project from 1998-2001 and used in other universities in the Russian Federation. This process was also supported by the DAAD through a tie-in with the Alexander Herzen programme, leading to the establishment of a network of Russian colleges. From 2002, the partnership took on a new dimension. With financial support from the Lower Saxony Ministry for Science and Culture, an internet based qualification process for economics teachers in Russian schools was set up as part of the INTEKOR project.

Whilst the joint European project and the compact project focussed primarily on the restructuring of economics education in general, the SINTEZ I + II projects concentrated on training the next generation of experts for economic education in schools. This is an exceptionally important field of activity, and one in which the Russian colleges are particularly keen to receive support, since there is no historical basis for this in the education system. Soviet colleges did not train economics teachers, since the subject simply did not exist in schools.

The SINTEZ I + II projects built on and expanded the co-operation resulting from the European projects. A network of Russian colleges was created, which stretches from St. Petersburg via Moscow and the Urals to Western Siberia and Altai.

The Institute for Economic Education (IÖB) is responsible for the scientific management of the project "Economic Education Online". The primary objective of this project is to develop and implement a complete ICT-based study course, ICT-based differentiated further teacher trainings and the preparation of a distribution of these educational services to Russia. An important intention is the sustainability of the services in future. That means, the services shall be self-supporting after expiration of financial subsidize (7/2001-12/2004).

This resulted in enthusiastic involvement by students and academics, who not only took part in conferences, but also worked jointly on creating concepts, teaching schedules, and teaching and learning materials.

In 1997 the specialist journal "Ekonomika" was established for the area of economic education, which was jointly published in Russian by the Institute for Economic Education and the State University of Novosibirsk. The journal is published quarterly in Novosibirsk and is an important support tool for economics teachers in their day-to-day teaching.

The Institute for Economic Education not only continues to co-operate within this network, but also maintains a number of bilateral partnerships, such as with the Moscow State University, the Teaching University of St. Petersburg and the State Academy for Business and Management in Novosibirsk.

3. Institutionalisation of international cooperation: Department of the IEE at the State University of the Moscow Region

A new level of co-operation was reached with the establishment of a branch of the Institute within the State University of the Moscow Region. The branch is a confirmation of the commitment to the partnership, enabling an even closer working relationship. It is especially significant that this secures the links to the relevant educational authorities in the Russian Federation and the Moscow region, meaning that not only can the Institute keep abreast of the latest developments in the area of economic education, but also actively contribute to them.

As an example, the Institute for Economic Education was asked by the Russian Ministry of Education to advise on the creation of a draft for new education standards for economics teaching within the general Russian school system.

The main focus of the branch is to set up and further develop study courses and training programmes for the State University of the Moscow Region, to develop concepts for the teaching and learning materials used in economic education, as well as to research specialist questions about economic education. The branch has a particularly important role, serving as a base for the establishment of the internet-based qualification programme within the INTEKOR project. This is where on-site sections of the tutor training for all participating colleges take place, as well as the printing and distribution of the modules. Initial training courses for economics teachers in other regions is also being developed as a pilot project through the branch office.

4. The role of economic education in Russia

We have two fundamental beliefs regarding education:

1. Education is not just a sensible economic investment – human capital is a valuable part of economic growth – but it is also an important element in any democratic society.
2. Economic education is a necessary spiritual precondition for understanding, establishing and developing a market economy.

A democracy requires that the citizens are aware of central principles and processes of an ordered society, in which they live, work, act as consumers, voters etc. This is particularly relevant in Russia and other transforming nations, where understanding of the market economy and the way it functions is obviously lower than in countries where the population has lived and worked in a market economy for generations. The importance of economic education in transforming nations should not be underestimated.

During changes in the economy and society, people feel they are in conflict with their previous way of thinking, their feelings, their knowledge, and the requirements of a new society at home and at work. A new society based on a market economy is critically dependent on the acceptance of this by the population, since the complexity of this model creates many roles for the citizen in business processes, that often have conflicting interests (e.g. entrepreneurs, consumers employees, investors, savers, voters, federation representatives, managers, politicians). Russia is currently undergoing fundamental changes to the economy, society and politics. Basic economic knowledge is necessary in order to make sense of the economic and social basis of the individual in such a transformation process. This does not mean specialist knowledge, but rather a general basic understanding of political, economic and social processes when transforming from a socialist planned economy to a capitalist market economy.

5. INTEKOR – qualifying teachers in Russia

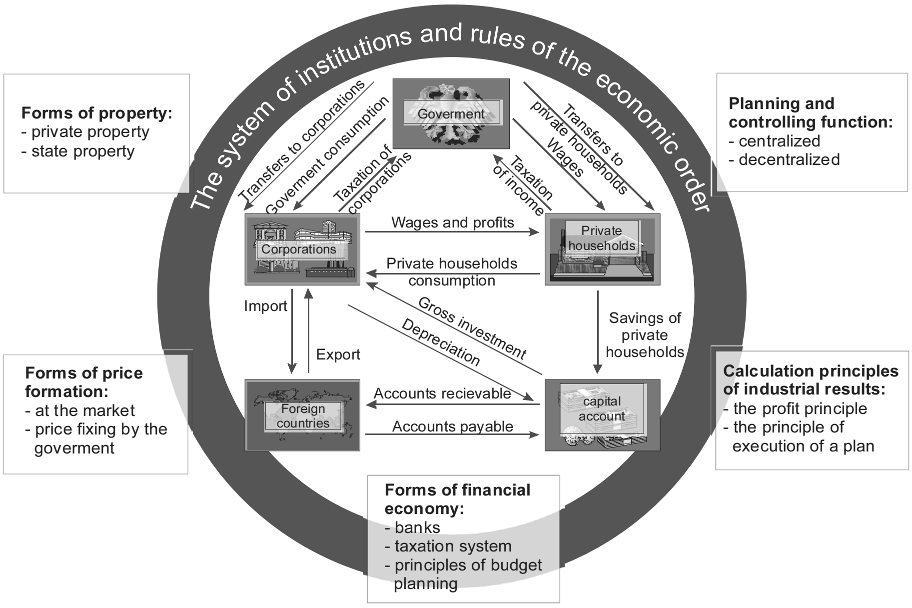
INTEKOR is a web-based qualification tool, based on the “Economic Education Online” project, which was carried out in 10 German states by the Institute. INTEKOR is backed by the Lower Saxony Ministry of Science and Culture. Initial plans are to translate and adapt 23 modules into Russian, and to train 20 tutors. The adaptation of the modules will be carried out by academic staff at the network universities. The qualification process is aimed at economics teachers in Russian schools, the majority of whom do not have formal training in the subject. The regions involved with INTEKOR will organise and implement the training courses themselves.

The switch from a planned economy to a market economy means that the importance of economics expertise in Russia has increased dramatically. New frameworks for the economy and for society require new expertise, especially concerning the functioning of the new economic framework. However, there is a lack of qualified teachers to pass on such knowledge, particularly in the school system. The demand for qualified teaching staff is so great that it cannot be met by using traditional on-site teacher training methods. This is why internet-based training measures are becoming so important. In addition, this enables cost savings. Reforms to the system foresee the introduction of specialist schools, including specialist economics schools. This requires specialist teacher training. A further advantage of internet-based training that is particularly relevant for Russia is that it cancels the problem of the enormous distances involved.

In line with the education theory behind economics education in the general Russian school system, it is also important to identify a reference system for developing target and content structure.

What contents, what structure

Our target and content concept for general schools is not to develop a watered down business studies course, but to find an approach which enables students to think in terms of related economic structures. Above all, this corresponds to modern views on learning theory. The development of the target and content concept is based on viewing the economic system as a series of related problems and not just as a miniature version of business studies.



Reference system for developing target and content structure

What does this mean? The transformation of the system in Central and Eastern Europe is a chance to apply and develop general considerations concerning aspects of an economic system. Important elements are, for example, property ownership, price systems, planning and steering instruments, accounting etc.

The 23 modules of the INTEKOR project are composed of 7 basis modules, designed to provide a basic knowledge of the economic systems and the key players in it, including private households, companies, the state, foreign trade, economic policy and economic theory. The basis modules are complemented by in-depth modules, that take themes from the basis modules and examine the topic in greater detail. A further set of modules is based on teaching modules, in which the basics of economics teaching are shown and the methods and ways of working are explained.

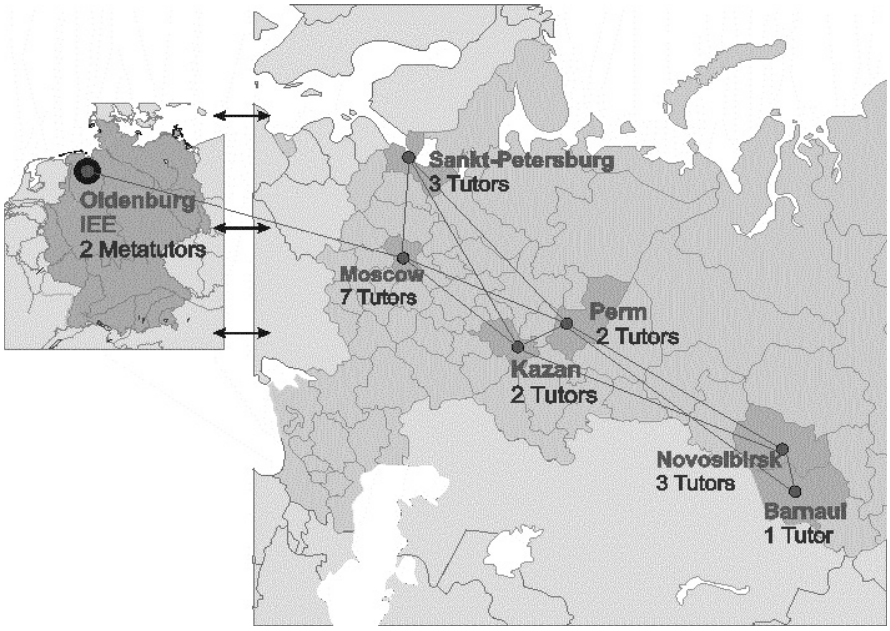
The training and development measures are a mixture of online and on-site elements, known as "Blended Learning".

University and college teachers act as tutors, playing a vital support role, which contributes significantly to overall success. They are primarily responsible for the following:

- Didactic elements
- Social elements
- Organisational and technical support

Communication with the tutors is normally asynchronous.

Internet-supported training means that the online phases offer greater flexibility concerning time and location than traditional training. A significant proportion of the training is carried out without direct contact with fellow learners or tutors. Online learning presents certain challenges with regards to self-motivation, organisation and self-discipline. Regular on-site events lasting several days offer a framework for personal contact and subject/teaching communication within a learning group.



Tutors Network in 5 time-zones, supervised by metatutors in Germany

6 regions in Russia are taking part in the project. Russia has 11 time zones, thus the regions taking part are in several different time zones. The time difference to Germany ranges from 2 hours in Moscow and St. Petersburg to 5 hours in Novosibirsk and Barnaul. In this instance, non-spontaneous communication is an advantage. For tutor training, Moscow time is used as standard. To give you an idea of the size, the regions involved have a combined population of approximately 25 million.

A “Blended Learning” concept means the mixture of online and on-site elements, both for tutor training and for training and development measures in the regions. An introductory on-site phase serves the following primary purposes:

- Learning the concept and organisation behind economic education
- Introduction to the concept and organisation from academic, teaching and technical perspectives
- Getting to know each other

On-site events are important for the social aspect. Getting to know each other promotes a friendly atmosphere for later online stages. This is confirmed by our experience in training the Russian tutors. They got to know each other at the initial on-site event, which led to an enjoyable working environment, which carried over into the online phase. The tutors enjoyed “hooking up” with each other online.

All further on-site events serve the following purposes

- Going over work from online stages
- Presenting work
- Practising active teaching and learning methods for economic education
- Discussing teaching possibilities
- Maintaining and deepening social relationships

The online stages focus on actual learning and using course materials, primarily the modular contents. Participants read the modules, interact with the excerpts, discuss the contents in online forums.

Teacher training commenced in October 2003. Tutors are university lecturers from the network of universities. An important part of the selection criteria for the tutors was basic training in economics and good computer skills. After the initial introduction week in Moscow, there were 9 online weeks. In these weeks, the basics of online tutoring were learned, and specialist articles on the subject were discussed. A further task of interest was a case-study about organisational skills, which was carried out in 3 groups. The groups were made up of tutors from different regions. At a fixed time, the groups then presented their results in a joint forum. Additionally, the tutors-to-be had to practice using the technology, to get used to the learning environment. For this, each tutor was given access to their own learning environment, so that they could practice using the learning environment, where the regional training will later take place.

The current focus is on the preparation and planning of internet-based training measures for the individual regions.

In March 2004, the State University of the Moscow Region starts a pilot project for the first training course for economics teachers in the Moscow region. Within 2 years, 30 participants will use 23 modules to better prepare themselves for their ongoing career as economics teachers. Participants will be supervised by tutors who themselves are a product of the INTEKOR project. These tutors will, in turn, be supervised by meta-tutors from Oldenburg, who have also done the course. The course is being financed by the Moscow regional education authority. Certification of successful students will be carried out jointly between the Moscow State University and the Institute for Economic Education.

You will find further Information about the network, the project an the participating institutions at:

http://www.ssu-ekonomika.net/ or at: www.ioeb.de

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KNOWLEDGE TRANSFER PARTNERSHIPS – INTEGRATING THE LIBRARY IN LEARNING SUPPORT

Lone Jensen, The Library of the Aarhus School of Business, Denmark

The Library of the Aarhus School of Business in Denmark (LASB) has since spring 2003 cooperated in a TEMPUS project which generally aims to contribute to social and economic development in Ukraine and specifically aims to develop an international bachelor science program with the title B.Sc. in Economics and Management at Ternopil Academy of National Economics (TANE) in Western Ukraine.

TANE is the leading economic university in Ukraine situated in the city Ternopil in Ternopil oblast (region). The university was in its present form established in 1994. Historically the institution has developed from the status of an affiliation of Finance and Economy Faculty of Kyiv Institute of National Economy established in 1966 to the independent university we see today. The taught subjects generally match the disciplines of the Aarhus School of Business (ASB) and the following programmes will be developed in the present project:

- Accounting
- Organisation and management
- Marketing
- Financial accounting
- Micro economics
- Macro economics
- Business computing
- Business law
- Business statistics
- Mathematics
- Bookkeeping

At present more than 14,000 students are studying at TANE including 5,000 adult part time students.

The bachelor science programme at TANE will level and be compatible to EU standards and teaching methods will be developed to become more problem- and case-based. By integrating central aspects of interactivity, tutorials and group work students will be challenged to take responsibility of their own learning situation. It is expected that students will develop competencies which will prove to be of primary importance in the transition process which the Ukranian society is facing these years.

TEMPUS – partnerships, dialogue and equal opportunities

TEMPUS is one of a number of European Community programmes designed to help the process of social and economic reform and/or development in the Western Balkans and partner countries in Eastern Europe and Central Asia.

The TEMPUS programme focuses on the development of the higher education systems in these countries through co-operation with institutions from the Member States of the European Community. TEMPUS programme is designed to help in the transition and reform processes through a range of mechanisms addressed to the higher education sector.

E.g. TEMPUS can help processes of establishing new courses or reforming already existing courses. Headlines in the TEMPUS programme are partnerships, dialogue and equal opportunities.

All these keywords match the present project and the role of the Aarhus School of Business perfectly.

The part of the TEMPUS programme which the Aarhus School of Business is involved in is a 'Joint European project'. In this type of project TEMPUS grants on a co-financing to groups of universities co-operating together on e.g. curriculum development. The 'Joint European projects' represent the primary activities of the TEMPUS programme.

The Faculty of Business Administration at the Aarhus School of Business is cooperating with Ternopil Academy of National Economics, Leeds Business School and Inholland University in the present project which primarily focuses on curriculum development and retraining of teachers at TANE. Modernising and development of learning support facilities is also a defined outcome of the project. The library facilities is considered in this context as the new teaching methods to a large extent challenge students to select knowledge to achieve the goals of the problem based learning concept.

A partial aim in the project is thus described under the headline: 'Modernising library and learning support facilities'.

The Library of the Aarhus School of Business (LASB) was invited to join this part of the project and has now cooperated with Ukranian-Dutch Faculty of Economics and Management and TANE Scientific Library for a year.

Dean Lyudmyla Havrylyuk-Yensen and Library Director Kazymyr Voznyy from Ternopil have visited Aarhus School of Business. Library Director Tove Bang, Research Librarian Lars Lund-Thomsen and Project Consultant Lone Jensen have visited TANE last autumn.

Cooperation with TANE Scientific Library

The library at TANE is mainly handling printed books and journals in Ukrainian or Russian.

The collection only consists of 5% foreign literature which of course is a problem when introducing and developing curricula to become more internationally focused. The library registers their collections in printed catalogues but a library database is under development. This database is in certain ways advanced and prepared for a future development of electronic information resources.

In the project LASB has established a portal 'TANE library portal' www.hba.dk/tanelib. The portal is a gateway to a selection of resources from our most used information providers. TANE library portal is central for our cooperation and functions as a platform for supporting TANE in their library development. The subject areas of the portal, which are economy and management, are covered broadly. All teachers and students involved in the programme will be able to benefit from this great pool of quality based information. Negotiations with providers as e.g. EBSCO, GALE, Ebrary, Bureau van Dijk and Encyclopedia Britannica have been part of the process. All providers have been willing to cooperate with LASB in playing the role as suppliers of netbased information at TANE.

Concerning pricing, publishers have been willing to provide their products at favourable prices. They have seen the project as a possibility to introduce their products at TANE and as an opportunity to make a first entrance at a market which has the same size of population as Great Britain.

Subsequently we have become aware of the eIFL.net www.eIFL.net Electronic Information for Libraries. eIFL network is an independent foundation that strives to lead, negotiate, support and advocate for the wide availability of electronic resources by library users in transition and developing countries. Its main focus is on negotiating affordable subscriptions on a multi-country consortia basis, while supporting the enhancement of emerging national library consortia in member countries. Ukraine is listed as part of the eIFL network. The network will be considered when renegotiating contracts and conditions with publishers during summer in cooperation with TANE Scientific Library.

TANE Library Portal will play a central role in the library's modernisation process. The portal and its exploitation in educational contexts will inspire the library to develop the present facilities in an international direction with more learning materials in English language. In this project it is emphasised that our cooperation is an experiment where TANE Scientific Library takes a very big step into the future which can give inspiration to make small steps but in the right direction and hopefully the library will learn from the cooperation to push development.

Library management at TANE is visionary and aware that organisational changes go hand in hand with the modernisation of library facilities to succeed in integrating them in the teaching programme. The transfer to the hybrid library challenges the reorganization and an understanding of moving resources from internal procedures to more extrovert and field based functions. Focus is at the process of developing the traditional library into an electronic library. A strategy for further development of the competencies of the library employees is now under consideration. This is a crucial step when developing the library function to match the modernised learning environment.

Knowledge transfer

In October 2003 LASB visited TANE and especially TANE Scientific Library. During this visit LASB had the chance to present the TANE Library Portal to staff at the library, teachers, students and project management at TANE. Visiting TANE was a perfect opportunity to present the portal and visions and goals for the cooperation. LASB is not supposed to provide TANE with library facilities, but it is to a larger extent a question of transferring knowledge and experiences about the modern hybrid library to our Ukrainian colleagues.

The vision is that the hybrid library can support the changing process which TANE will go through during the project. The library can be part of this process utilizing the opportunities of the electronic library by building a bridge between on one side the well known physical library and on the other side information technology facilities.

A primary goal for the actual project is retraining of teachers and mobility of students. During the project period The Aarhus School of Business welcomes teachers and students from TANE who participate in retraining and mobility programmes. Both groups are carefully selected to ensure professional qualifications, a certain level of English and high motivation.

The selection is carried out in cooperation between representatives from the academic environments at the partner institutions. For the selected teachers and students it is like going through the eye of a needle and a crucial point in their carriers.

Visiting teachers are typically at ASB for six weeks where they cooperate with Danish teachers in developing their teaching programmes and get overall inspiration from being part of the academic environment at the Aarhus School of Business. During this very intensive period detached from their everyday life in Ukraine, the teachers have the opportunity to devote themselves to their learning process by being at a Western higher education institution.

During our visitors' stay at ASB an effort is made to give them a profound introduction to LASB and TANE Library Portal. This introduction is placed in the beginning of their visit to make sure that teachers and students will benefit from LASB facilities during their visit. Visiting teachers get the possibility of integrating international electronic resources in their work which is important for achieving the goals of the project. Also they are made responsible for transferring their knowledge of TANE Library Portal to colleagues and fellow students when they return to TANE. Teachers as well as exchange students are therefore an important and essential part of the knowledge transfer process.

Communication with teachers and students has improved substantially after the library's visit at TANE. Project partners have achieved a far better understanding for cultural differences and the big change which TANE is facing.

‘Life after TEMPUS’

According to the time schedule the project is now half way through and it is important to be aware of sustainability of the achieved solutions. Project management at TANE is very aware of this crucial aspect and project manager Lyudmyla Havrylyuk-Yensen expressed it: *“We are aware that there is a life after TEMPUS”*. Project management and the library director are now considering organizational and economic strategies, which can further the development which the project has initiated.

The plan for the library part of the project focuses on two major activities in 2004 that is evaluation and renegotiations with information providers. Evaluation of the usage of TANE Library Portal and the impact on teachers’ programmes and student’s outputs will be essential to select information providers for the next project period, readjusting user interface of the portal and optimizing technical facilities. This evaluation will be based on quantitative and qualitative studies and will primarily be carried out by project management at TANE. The quantitative part of the evaluation will be based on measures of TANE’s actual use of the resources based on statistical information from vendors.

Another important issue is renegotiation with information providers in cooperation with TANE to make sure that agreements will last longer that the actual project. In this process foundations as eIFL.net, which is mentioned earlier, will be considered.

An overall aim is to continue the fruitful cooperation by communicating and exchanging of ideas with colleagues in Ternopil. The project group has now met twice and visited each others’ ‘houses’. This has given a profound insight and a perfect basis for an intensive cooperation despite the differences in cultural backgrounds. This will hopefully support TANE Scientific Library in the new initiatives which can place the library as a central and active partner in the modernised teaching and learning environment at TANE.

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CAPACITY BUILDING BY DISTANCE LEARNING IN THE FIELD OF ENVIRONMENTAL PROTECTION FOR A NEW EU-MEMBER COUNTRY EXPERIENCE OF A GERMAN-LATVIAN COOPERATION PROJECT

Dorothe Lütkemöller, Institute for Environmental and Sustainability Communication, University of Lüneburg, Germany

Introduction

The Baltic states – like all countries in the region of East-Central-Europe – face a period of transformation processes for more than 15 years now, involving all political sectors and groups of society. Especially for those countries, that become new full EU Members at the 1st of May 2004, the challenge to deal with is a double one: the economic transformation from post-communist centralised to open market economies on the one hand and the obligation to adopt the EU aquis communitaire on the other hand. The economic transformation and the obligation to comply with the EU standards during a limited period of time constitute a "double transformation" process (Lütteken, 2002), that is a strong driving force for change processes in all fields of politics, especially the environmental area, because environmental protection and discussions on sustainable development are a new field of politics with only a limited tradition in these countries (Turnock, 2002).

The paper presented here intends to report about a new distance education project and its role in the modernisation process taking place in the environmental administration of Latvia. In the context of EU-enlargement it provides an example of East-West cooperation and the experiences the project partners made during development and implementation of a capacity-building project, based on a distance education programme designed for officials in the environmental administration at the local and regional level of Latvia.

Background and Aims of the Project

The lack of well trained personnel in transition countries on the regional and local level of administrations, especially in the field of environmental protection, is a problem that has been referred to several times (Commission of the European Communities, 2002). Regional development, that focuses on the sutainable use of natural resources and the minimization of negative effects on the environment during economic transition, does need local actors in the public and private sector, that are able and willing to implement concepts that avoid negative effects of human activities on the quality of the environment. Thus the need for capacity building is obvious and was the starting point for a cooperation project at the Institute for Environmental and Sustainability Communication (University of Lüneburg, Germany) with the Institute for Environmental Science and Management, (University of Latvia, Riga) and the Union of Local and Regional Governments of Latvia (Riga). The project is subsidised by the German Federal Environment Foundation as well as by the Latvian Environmental Protection Fund. It is based on an existing further education distance-programme, developed and conducted at the University of Lüneburg.

The aims of the project are to be seen on two levels: first and foremost the main target was to develop a capacity-building instrument in an EU-accession country, that supports sustainable development and especially environmental protection on the local and regional level. Further on the hypothesis had to be examined, whether or not a quick know-how transfer concerning methods of further- and distance education was possible from a German university to a latvian institution without experiences in this field. Furthermore a know-how transfer from Germany to Latvia in practical oriented fields of environmental protection, like waste- and wastewater management, regional environmental planning etc. was intended. A second target on the operational project-level is to provide access to further education for employees not only in the national centre (the capital of Riga), but in rural regions of Latvia as well.

Development and Implementation of the Study Programme "Environmental Protection and Sustainable Regional Development in Latvia"

The study programme was designed as a distance education programme, based on written study materials provided to the participants as correspondence lessons, thus choosing a more "traditional" method of distance learning. This decision based on the facts, that the development of an e-learning programme would have been much more time- and cost intensive and – more importantly – that free and easy access to the internet was not guaranteed for all potential participants.

The project was conducted according to the following milestones:

- Development of a first three-month distance course as a pilot offer, with intensive evaluation and review of acceptance;
- Parallel detailed study on the medium-term demand for further education in environmental matters in Latvia;
- Extension of the pilot course and development of a one-year distance study programme, including regular study visits of participants to Germany.

Development, Testing and Evaluation of the Pilot Course

An opening event with Latvian experts was organised in order to adapt the development of the curriculum and the main contents of the course towards current environmental issues in Latvia and their practical solution. This circle of experts included representatives from the Technical University of Riga, as well as the Director of the Institute for Environmental Science and Management of the University of Latvia, members of the administrative management of the Union of Self-Governments of Latvia (USGL), a representative from the Baltic Environmental Forum (BEF) and a representative from the Latvian Ministry for the Environment.

In the course of this first hearing of experts, the German concept of study was presented and made the subject of detailed discussion regarding its possibilities for an adaptation according to the situation in Latvia. All the participants stressed that a further education course based on Latvian requirements should at all costs pick up on the current discussion and developments in the field of regional planning.

As a result of this discussion, it was agreed that the following study modules, each containing two correspondence lessons and providing a student work load of about 20 hours, were to be developed within the running-time of the pilot-project, based on the already existing German study materials:

- Environmental politics and management on the local level
- Environmental and regional planning (territorial planning)
- Sustainable Development and Agenda 21
- Project management

The Institute for Environmental and Sustainability Communication provided the Latvian project partners with the study materials of the German three-semester further education course "Municipal Environmental Protection", thus giving a starting-point for the adaptation of their contents, according to the framework and needs of the Latvian target-group. The next step was the partial translation of the German correspondence lessons into Latvian and, after being worked over, their integration into the process of the development of new correspondence lessons. During this phase of the project intensive discussions with the Latvian project partners and advice on didactical aspects of the study materials was very important.

Over the running period of the first three-month pilot course an accompanying evaluation revealed a high degree of acceptance and satisfaction by participants and gave hints for optimisations as well. Details of this evaluation have been published earlier (Lütkemöller, 2002).

Based on the experiences of the pilot course and a detailed study on the future needs on further education in the field of municipal environmental protection, that was based on expert – interviews in Latvia, the second stage of the project started. The aim of this ongoing project phase is to expand the content of the curriculum and to implement a full one-year distance study programme. Another important modification derived from the experiences of the pilot course, was the decision to implement regular study-journeys of programme-participants to Germany.

Practical oriented elements of further education are of particular importance, especially when the programme is directed at practitioners in small and medium sized local administrations. Therefore the theoretical part or the course in Riga is completed by two-week study-journeys to Germany, that are integrated elements of the study programme. It's a main purpose of the study-visits to bring Latvian participants into contact and exchange of experiences and ideas with German experts, institutions and enterprises, working in the field of environmental protection. Last but not least it is the intention of this part of the further education programme to support personal exchange between individuals of a "new" and an "old" EU-member state.

Results

The Curriculum

The design of the expanded curriculum intends to represent the practical needs of practitioners, the scientific demands on a further education programme, that is aimed at the principles of a modern environmental administration, and the ideas of sustainable development as well. In order to realize these aims the curriculum was extended to 12 modules, covering the following topics:

1. Municipal project application
2. Environmental and municipal development planning
3. Municipal environmental management
4. Sustainable development at municipalities
5. Management of rural development
6. Environmental resource management
7. Energy management, air and climate protection
8. Waste management
9. Water management
10. Nature protection and ecotourism
11. Ecoaudit and environmental management systems at municipalities
12. Local Agenda 21 management

Each module provides two study brochures, representing a student work load of approximately 20 hours. During the one-year course four face-to-face seminars are offered, conducted by the Institute for Environmental Science and Management at the University of Latvia in Riga.

The programme is open to participants with and without a university degree. A minimum of three years of professional experience in a relevant field of administration is necessary for application. The participants have to work with eight obligatory modules and are asked to make their personal choice for two more compulsory modules. Each correspondence lesson is accompanied by an examined homework. During the last period of the study-year the participants have to develop a written project-homework on a self-identified issue in the field of environmental protection they are working or especially interested in.

Since February 2002 four regular study groups started their further education activities at the University of Latvia and two groups joined study journeys to Germany. During excursions and seminars in Germany the following subjects were discussed:

- European environmental law and local environmental administration
- Municipal waste- and wastewater-management
- Agenda 21 and sustainable regional development
- Tourism and regional development
- Nature protection and tourism
- Tourism and visitors information, environmental education
- Ecological agriculture

The Participants

To make sure, that employees and decision-makers of local and regional administrations all over Latvia are informed about the study programme and are able to apply for the courses, the publishing of information on the study programme is conducted by the Union of Self-Governments of Latvia (USGL). This organisation has close and easy contact to the target group on the local and regional level and was therefor invited to join the project as a cooperation partner.

Looking at the participants and their regional origin, it can be stated, that they come from towns and regions all over Latvia. Thus the cooperation with the Union of Self-Governments of Latvia (USGL) and their information distribution system turned out to be successful and prevented the phenomenon that the majority of participants come from the countries capital, what could be observed with other further education programmes. Table 1 gives an overview on the vocational activities and functions of programme-participants.

Table 1: Vocational Activities and Functions of Programme-Participants (n=96)

Function/Vocational Activity	**Amount (%)**
Mayor	19,8
Dept. of Territorial Planning	18,8
Dept. of Development Planning	16,6
Municipal Enterprise	10,4
Dept. of Nature Protection	8,3
Management of (Single) Environmental Projects	6,3
Dept. of Municipal Finance Administration	4,1
Others	13,5
Sum (rounded down)	97,8

Up to now two study-groups with 25-30 students passed the one-year programme with a rate of successful students getting the final certificate of about 50%. First results of the accompanying evaluation programme show, that the overall satisfaction of participants with the programme is very high, but that there is also a potential for improvements concerning the learners support system by tutors and authors of correspondence lessons.

The accompanying evaluation of the study visit's programme made clear, that the participants appraised their stay in Germany as a success, because when asked in a questionaire, whether they were able to reach their personal targets during their stay, the majority of the participants answered with a clear yes. Table 2 gives an overview on three other aspects of the study visits and their assessment by the participants.

Table 2: Results of participants' assessment of the study visits to Germany (questionaire, n = 34; numbers = % of answers)

Assessment of the Study Visit	Absolutely correct	Mostly correct	Not fully correct	Not correct
1.1) The study visit was a personal benefit for me	79	21		
1.2) The study visit was a useful complement to my studies in Riga	62	29	9	
1.3) I was able to establish useful contacts for my professional work (n=33)	30	45	24	

Conclusions and Lessons Learned

The project results and the very positive reactions of participants clearly indicate, that the newly developed distance education programme is a very useful instrument of capacity building for the local and regional environmental administration in Latvia and for the support of sustainable development. It turned out, that the mixture of "traditional" distance education, based on correspondence lessons, plus practical oriented study-journeys to Germany, constitute a very effective setting of learning conditions. First evaluation results reveal, that the offer for direct personal exchange of experiences between German and Latvian specialists and administration professionals is highly appreciated by the Latvian participants.

The approach of developing a further education programme on local and regional environmental protection and sustainable development as a bilateral project, involving a German university and a university from an EU candidate country, proved to be useful and successful. During this cooperation it became very clear, that – with reference to the project objective of promoting the ideas of sustainable development – the special working-situation of the Latvian participants has to be taken into account. This means that a further education programme for practitioners on the local and regional administrative level has to offer first and foremost application-oriented ideas and examples, before participants will be willing and able to open their minds for more general ideas, like the topics around the sustainable development theme. This seems to have special importance in a situation, where difficult economic transition processes rule daily life and thinking.

A lesson learned and useful to be taken into consideration for further similar projects – according to the author's experiences – is the observation, that the relation between learners and teachers in Latvia differs substantially from that in a comparable German further education setting. The more traditional roles teachers and participants took during the courses referred to here, do have the effect, that evaluation activities during and around the further education programme were not looked at as a point of high priority by the Latvian teachers and authors involved. Suggestions from the German side, concerning learner-oriented evaluation steps and quality assessment activities, were taken up in a hesitant way and had to be discussed very intensively, though these activities were supported by an extra budget. This interesting observation may serve as a good starting point for further professional discussions concerning the framework, conditions and targets of further education in different EU-countries and their educational cultures.

References

1. COMMISSION OF THE EUROPEAN COMMUNITIES (2002) Regular Report on Latvia's Progress Towards Accession (COM (2002) 700 final) p. 107. (http://europa.eu.int/comm/enlargement/report2002/)

2. LÜTTEKEN, A. (2002) *Agrar-Umweltpolitik im Transformationsprozess. Das Beispiel Polen.* Institutional Change in Agriculture and Natural Resources Vol. 14. Shaker Verlag, Aachen (5-42)

3. LÜTKEMÖLLER, D. (2002) *Municipal Environmental Protection by Means of Further Education: Experiences of a German - Latvian Cooperation Project*. In: Sauer, P., Leal Filho, W. (Ed.) (2002): Environmental Cooperation 2002. German – Czech Environmental Information Programme. Prague, Hamburg. (ISBN 80-902168-9-7)

4. TURNOCK, D. (2002) *The Soviet Union and the successor states*. In: Carter, F. W.; Turnock, D. (Ed.) (2002): Environmental Problems of East Central Europe, Routledge, London and New York, (92-116)

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LITHUANIAN VIDEOCONFERENCING NETWORK: THE CORE FACTORS FOR ITS EFFECTIVE OPERATION

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Relevance of the Analyzed Problem

Today, during the creation of a dynamic knowledge society in Lithuania, it is necessary to ensure lifelong learning possibilities for *all inhabitants* in all regions of the country by developing a *distance learning system* and by decreasing the divide between towns and villages, involving citizens from all social groups to participate in this development. Innovative learning methods and forms should be developed to achieve this aim, their application should be expanded, and information technology skills should be formed among different social groups to use these methods successfully.

Lithuania has set the major goals to be achieved to perform the reformation of Lithuanian system of education. According to the European Commission, Lithuania has to implement the following tasks to be properly prepared to enter the European Union:

- to coordinate amended regulations with the requirements of European Union and to foresee decentralization of all links of education;
- to prepare long term programmes for teacher training and improvement of their qualification;
- to prepare inclusive programme for improving managers' qualification to ensure implementation of planned reforms;
- to review Lithuanian teaching content, standards and education levels, in order to coordinate them with European education content and systems of standards;
- to implement the transfer into the continuing education system involving industrial and business enterprises;
- to expand correspondent and distance education, to provide all Lithuanian citizens with better possibilities to get education and training;
- and to consider needs of international communities.

It is important to notice that the establishment of open and distance learning (ODL) system is one of the priorities of the system of education development in any country at the moment.

The Case of Lithuania: Development of Distance Studies

A major part of the research related to ODL analyses, Internet based courses and e-learning methods, though much less attention is paid to possibilities of applying videoconferencing facilities in the study process. In 1995, Lithuania joined PHARE programme of multi-country cooperation in distance education. During the implementation of the programme, Lithuanian Distance Education Centre was established, two distance education centres at Kaunas University of Technology and Vilnius University, and study support centres at Vilnius Gediminas Technical University, Vilnius Electronics College and Kaunas College of Technology. The main purpose of these centres is to develop distance education studies in Lithuania.

Lithuanian investment programme "Development of Distance Education Network in Lithuania" (LieDM) was started in 1998. In 2001, it was included as a sub-programme of the programme "Information Technologies for Science and Higher Education 2001-2006" (ITMiS) approved by the Ministry of Education and Science in Lithuania. Lithuanian distance education network LieDM was established according to these programmes. Studies in this network are based on modern IT, while blending internet based learning on videoconferencing, expanding the network of distance learning classes and centres, as well as establishing multimedia laboratories and videoconferencing studios. LieDM network (3 videoconferencing studios, 5 mini studios, and 16 remote learning classes) delivered 7 study programmes, various courses (more than 16 000 participants), and organised more than 30 seminars and conferences in 2003.

Figure 1: The Infrastructure of LieDM Network

LieDM network provides possibilities for Lithuanian citizens to maintain and raise their qualification and skills. It improves conditions for life long learning, expands the variety of education services, provides equal learning possibilities for citizens despite their place of living, gender, nationality, social status, and physical abilities. On the basis of national distance education network facilities, it also creates possibilities to access other international distance education networks. LieDM network is devoted not only for the academic society of universities, colleges and vocational schools, but also for state officers and specialists to raise their qualification, for the unemployed and for potential unemployed people to improve or change their qualifications, for training business people, the disabled and other social groups.

The project PHARE 2000, dedicated for the establishment of vocational training infrastructure on the basis of distance education studies, was started in 2002. In the framework of this project, distance learning classes in four Lithuanian counties (Marijampole, Klaipeda, Taurage, and Utena) were established, distance learning courses were developed, personnel was trained and pilot course delivery was undertaken.

While participating in international PHARE, Socrates, Leonardo da Vinci, FRAMEWORK, UNESCO and other projects, distance learning courses were developed and delivered. With the help of different financial funds, currently, there are more than 300 courses developed in WWW environment.

While implementing EUREKA project – "Tele-Education Software for Interactive Video-Lecturing" – the software for broadcasting lectures on the internet (ViPS – http://distance.ktu.lt/vips) was developed, which enabled a teacher to communicate with his/her remote students. A teacher can follow participation pattern and students' activeness in remote classes during a lecture, s/he can answer to students' questions during or after a lecture, send presentation slides to students, undertake instantaneous questioning and knowledge checking, observe the results, etc. ViPS provides students with possibilities to ask questions, to follow the slides on computer screen, and to exchange text messages with other participants. During the same project, the software MWLive for organisation of seminars and group work on the internet was also developed.

WebCT software was obtained and implemented in Vilnius and Kaunas for asynchronous teaching via internet, which already serves more than 340 different courses. However, the facilities which are available do not ensure the complete organization of the learning process.

During the implementation of European Union TEN (Trans European Tele-Education Network) project, LieDM network was integrated into distance education network operating through satellite connection. TEN network provides technical possibilities to receive distance education courses from other countries.

Activities Implemented in Lithuanian Distance Education Network

The network is the basic infrastructure of Distance Education in the country, which is open for everybody, thus all the institutions: universities, colleges, vocational schools, and other education organisations, are able to join the delivery of distance learning services. The costs of education services can be reduced a lot, as all these institutions are able to provide different kind of education for students all over Lithuania, they may supply all of them with learning resources, organise exams and plan engagement of new technologies.

ISDN lines enable any target point in the world to get connected to the LieDM classes. On the basis of the network, higher education schools in Lithuania exchange learning courses and share their experience. Moreover, the network is used to broadcast different events for the society: seminars, conferences, and meetings.

LieDM network costs from different kind of units:

- a centre with a video studio,
- a centre with a mini video studio,
- a centre of the regional network,
- a videoconferencing class,
- an Internet class.

These institutions undertake different kind of activities. The implemented functions influence not only technological supply, but also support from centralized financing mechanism. Relatively all education institutions of the network are classified into Centres and Classes.

The functions of *Centres* of distance education network:

- Be responsible for the organisation of studies in distance education network;
- Coordinate activities in the Classes;
- Organize distance education programmes and courses;
- Analyse the demand for distance education studies in the country, plan adequate supply to meet the demand;
- Advertise distance education in the country, provide information about distance education programmes and courses;
- Prepare methodological material for distance studies, undertake its publication (multiplication) and dissemination;

- Organize training courses about the methodology in distance education, issue qualification certificates;
- Provide consultations for the developers of distance education courses;
- Train and consult personnel of distance education classes;
- Administrate distance learning courses, register course participants, undertake their accounting, ensure student support, issue course certificates;
- Coordinate videoconferencing network activities, prepare schedules of lectures in coordination with other distance study centre and classes, with the focus on optimal usage of time suitable for learning;
- Provide information about activities and results for LieDM portal;
- Participate in LieDM scientific research in the area of distance education needs and methodology;
- Prepare and present proposals concerning the development of distance education network;
- Organize distance education studies in LieDM network in cooperation with the classes.

The functions of *Classes* of distance education network:

- Cooperate with distance education centres, assist them in organization of distance learning studies in the region;
- Organize distance education process in the Class;
- Invite local residents for distance education studies, assist them in choosing distance learning programmes and courses, consult them, organize self-depended work and assessments of the students;
- Disseminate regularly information about distance education courses and learning possibilities in LieDM network;
- Consult course participants about use of IT in distance learning process;
- Publish and disseminate methodological material for the learning purposes;
- Analyse the demand for distance education studies in the country, plan adequate supply to meet the demand;
- Provide information about activities and results for LieDM portal;
- Participate in LieDM scientific research in the area of distance education needs and methodology.

Coordination of LieDM Network Activities

Programme "Information Technologies for Science and Higher Education 2001-2006" (ITMiS) is implemented by ITMiS Board established by the Ministry of Education and Science in Lithuania. Its functions comprise coordination of strategic aspects of the development and financing of distance education network LieDM.

LieDM network activities are coordinated by LieDM Board established by the order of the director of Department of Science and Higher Education of the Ministry of Education and Science in Lithuania. The Board functions consist of:

- organization and coordination of studies,
- evaluation of the effectiveness of network operations,
- preparation of proposals for ITMiS Board.

LieDM Board comprises representatives from the centres, remote classes, ITMiS Board and Department of Science and Higher Education. Special work groups are formed for the analysis of specific questions.

Model for Allocation of Financial Support to LieDM Centres and Classes

The purpose of a method to allocate LieDM financial support is to indicate the rules on how to distribute LieDM sub-program financial resources to promote distance education network activities in the centres and classes. ITMiS Board is in charge of this method, related calculations and figures.

Financial funds to support distance education network activities in the centres and classes are intended for:

- *Sustaining activities* despite of activity indicators. This part is calculated by evaluating basic financing grant and status coefficient of a class/centre.
- *Increasing the activeness.* This part is calculated by allocated funds for the classes and centres on the basis of their accumulated activity indexes.

Status coefficient varies from 1 to 5, depending on the status of related institution in the network. Basic financial grant and funds for increasing the activeness are approved along with the ITMiS programme annual budget.

Financial support for classes and centres is calculated by LieDM network Coordination Centre and approved by the ITMiS Board. It should be noticed that only those activity indicators of classes and centres are evaluated which are registered in LieDM network Coordination Centre. The purpose of this registration is to increase motivation for dissemination of information about the project and developed products, i.e. increase motivation of the institutions to be more active in the network activities. Activity parameters of LieDM network Coordination Centre are not included into the calculations.

The following activity parameters are being evaluated:

- Number of provided study programmes;
- Number of students registered for study programmes;
- Number of delivered distance education courses;
- Number of students in delivered distance education courses multiplied by a number of course credits;
- Number of distance education course participants;
- Dissemination of information about LieDM (in the mass media, radio or television, presentations in conferences, participation in exhibitions, seminars);
- Advertisement of study programmes and courses (in the mass media, radio or television);
- Events organized in the LieDM network (seminars, conferences);
- Number of participants in the LieDM events;
- Number of employees participating in LieDM network trainings;
- Number of LieDM network employees participating in international courses.

Model for Allocation of Funds Received from Courses and Events Commonly Organized within Lithuanian Distance Education Network

Purpose of the method for allocating funds received from *commonly* organized courses and events is to indicate rules how to distribute these funds among members of the network who participated in the organization of those courses and events. The model is not applied for the distance education courses and events that are delivered by the institution independently.

The rates are assigned for exploitation of the studio, exploitation of the class, broadcast of videoconference using ViPS, and storage of video records.

Received funds from the mentioned LieDM activities are distributed as follows:

- 10% – to LieDM Coordination Centre for administration purposes (advertisement of courses, following of payments, administration and distribution of financial resources, dissemination of information about courses, registration of distance education certificates, invoicing, market research).
- 5% – to the centre administrating a course and course participants (registration of course participants, formation of course groups, provision of login names and passwords, student support, provision of learning material, placement of information into the virtual learning environment, provision of information for the LieDM website).
- 10% – to the centre broadcasting videoconferences if they are planned in the course run (broadcasting videoconference to the internet and LieDM network classes, consultation and training of distance education developers and providers).
- 5% – to a class supplying a learning space for the course participant if s/he uses class resources (provision of the work place, consultation of the course participant concerning technical issues).
- The rest (70%-85%) is allocated for the course provider (preparation of distance education course material according to the requirements of virtual learning environment, consultation of course participants and assessment of their knowledge).

Payments for distance education courses are transferred to the account of LieDM network Coordination Centre and then distributed according to the described model to the sub-accounts of classes and centres. Based on the requests of classes and centres, every quarter accumulated funds are transferred to the institutions or paid to their employees.

Development and adaptation of the economic model that is effective, stimulates self-sustainability and reflects needs of education providers and learners is a very important aspect stimulating smooth development of LieDM network. This increases effectiveness and efficiency of the network in promoting professional competence of all Lithuanian citizens seeking to use distance education advantages for deepening their professional knowledge on continuing basis. The future plans foresee to extend the circle of different potential and actual users of this network: institutions – education service providers (state and private), separate course authors and their collectives who require a distance education network as a tool for course development and dissemination of information. The network will enable these network users to compete in the growing global e-learning market.

Conclusions

- The role of distance education while using information technologies in the implementation of lifelong learning conception is expanding a lot, and it becomes more and more urgent for the representatives of different social groups worldwide.
- LieDM network improves life long learning conditions, expands the variety of education services, and provides equal learning possibilities for all citizens despite of their place of living, gender, nationality, social status, and physical abilities. On the basis of national distance education network facilities, it also creates possibilities to access other international distance education networks.
- According to the experience of LieDM network, it could be stated that current LieDM infrastructure and available system for development and delivery of distance education services requires:
  - To spread a delivery of distance education services in the whole network while covering all Lithuanian regions and meeting needs of different social groups;
  - To train social groups on how to benefit from distance education services;
  - To raise qualification of LieDM participants (administrators, course developers, tutors, technical personnel);

- To establish a system to present life long learning possibilities and ensure proper dissemination of structured information about developed distance education products (programmes, courses) to all interested social groups;
- To develop preconditions for the integration of Lithuanian distance education system into European and world networks of e-learning services.

• Current LieDM economic model has to be modified with the focus on increasing number of network participants: education service providers and users.

References

1. RUTKAUSKIENE, D., POCIUTE, E. (2003, 8-9 May) *Key aspects of the Development of Distance education*, International conference "TELDA'03 – Technology Enhanced Learning in a Digital Age", Kaunas
2. RUTKAUSKIENE, D., POCIUTE, E., RUTKAUSKAS, V. (2003, 28-29 January) *Role of Information Communication Technologies in the Modern Education Proces,* Conference "Information Technologies 2003", Kaunas, IV-5, ISBN 9955-09-336-6
3. ROSENBERG MARC J. (2001) *E-learning, strategies for delivering Knowledge in the Digital age,* ISBN 0-07-136268-1, McgrawHill, p. 344
4. RUTKAUSKIENE, D., CIBULSKIS, G. (2002) Open and Distance Learning Network in Lithuania, European Manual of Continuing Education, Europahandbuch Weiterbildung, Sonderdruck, Neuwied.Germany
5. MURASZKIEWICZ M. (ED.) (2003) Technology for mobile society, MOST Press Warsaw, p. 604, Poland
6. ZALYS, A., TARGAMADZE, A., RUTKAUSKIENE, D. (2002, October) *National Policies and Initiatives for ICT supported education and learning,* International Conference TELEBALT, Vilnius
7. Lifelong Learning Memorandum (2000)
8. http://distance.ktu.lt
9. http://www.liedm.lt
10. http://www.ndma.lt
11. http://www.smm.lt/svietimas/

APPLYING MODERN EDUCATIONAL TECHNOLOGIES IN ROMANIA: THE IMPACT OF E-LEARNING PLATFORMS

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Abstract

The activity of continuous education for adults by ODL is more and more conditioned on the using of educational electronic platforms. Most of the Romanian universities, both state and private, are represented by their own websites, which aknowledge the public of their managerial policy and their programs adressed to the students. However only a few use e-Learning platforms for the promotion of ODL. This situation relies on two reasons: one is internal, regarding the managerial policy, and one is external to the academic environment, related to the difficulties the students have in using and understanding the modern educational technologies.

Introduction

The Romanian education system, and most of all the higher education, knew two important different stages, separated historically and conceptually by the events of December 1989. The years that followed this historical event were characterised by the development of the higher education, applying first punctually and then generally, educational models that had been tested in Western European and in North American countries. A hundred years after the creation of the first department of teaching by correspondence at the Chicago University and over fifty years after the creation of the CNED in France, in 1992-1994, the Romanian higher education institutions and then the Romanian Education Ministry started to discuss the replacing of the old educational forms (partially or entirely off-campus courses, the student having to come to the campus only for the exams), with the modern form of Distance Learning. This new educational form for adults was represented for the first time in Romania by the creation in 1994 of the Distance Learning Centre CODECS (http://www.codecs.ro), as a branch of the Open University (UK) in the field of management.

After this moment, the Romanian Distance Education system began to bring its own contributions, theoretically, first through the papers written by prof. Adascalitei (http://www.ee.tuiasi.ro/~adascalitei) and then practically, coordinated by prof. Aurel Vlaicu (http://193.226.17.1).

Supporting Elements for the Development of Distance Education in Romania

The early discussions with the view to implementig a Distance Education system in Romania have taken place in the Education Ministry since 1995, but the lack of financing has stopped them to the stage of proposals and of modernizing the traditional educational system. The real basis of a national level Distance Education infrastructure was set in 1997-1999, when Romania benefited from a PHARE program. The support for the Distance Learning system initiated in 1997 went on with other programs financed by the World Bank and then by the European Community countries (Tempus, Leonardo, Socrates mainly by its subprogram Erasmus, and recently Minerva).

Since 1999, The "Denis Gabor" Foundation in Cluj has become The "Denis Gabor" Distance Education University, affiliated to the institution in Budapest with the same name. This university offers, both in Cluj and by its colleges/branches in Harghita and Covasna, instructional IT programs, mainly within the Hungarian community.

The year 2000 was stressed by the joining of the “Dunarea de Jos” University in Galati to the ARIADNE Consortium (http://www.ariadne-eu.org). This university, together with the “Spiru Haret” private university, use their own television channels to deliver Distance Education courses.

The Department for Distance Learning of the University of Bucharest has developed from the Center of Resources, References, Information and Services for Distance Education (CREDIS), institution that has been gradually created since 1994 on the basis of several international projects.

Between 1994 and 1999, the University of Bucharest was part of the PHARE Multi-country Programme for Distance Education. Attending this program helped with the creation of the first Centre of Distance Learning Studies at the University of Bucharest, which was related to the European ODL network and was recognized by the European Training Foundation (Torino).

In Romania there are 6 more centres similar to the above mentioned all of which were established by the great state universities (Iasi, Cluj, Timisoara, Brasov, Sibiu) and by an non-governmental organisation in Bucharest (CODECS). These centres and their managers, as well as the affiliation at the European Training Foundation (ETF) in Torino were recognized at national level by the Decision nr.3289/1998 of the National Education Ministry (prof.dr. Aurel Vlaicu was appointed manager for the CNODESC, prof.dr. Alexandru Stancu was appointed manager for the IDESC, prof.dr. Mihai Romanca was appointed manager for the BV-DESC and prof.dr. Bogdan Logofatu was appointed manager for the centre of the University of Bucharest).

From 1997 to 1999 the EDUCO (Continuous Education) Centre was created within a project that was financed by the World Bank. This centre deals with professional reconversion for postgraduates.

From 1999 to 2001 the REDEC (Regional Distance Education Centre) was established within a Tempus project in partnership with Barcelona University (Spain), Surrey University (UK) and EADTU (European Association of Distance Teaching Universities).

In May 1999, by the decision of the University of Bucharest Senate, the three centres for Distance Education research and implementation were put together in one institution called the CREDIS Centre.

Since autumn 1999, this centre has become the Department for Distance Learning, developing some basic traning programs through colleges (Technologies Assisted by Computer – TACO and The University College of Instructors) and faculties (Geography and Foreign Languages).

The Basis of Distance Education and the Establishing of the Standards System

The real basis for a Romanian Distance Education system was set in 1996 and was financed by the PHARE Multi-country Programme for Distance Education. The result was the establishing of the seven regional centres (IDESC, CNODESC, BV-DESC, the DE centre at the University of Bucharest, the DE centre at the “Lucian Blaga” University in Sibiu, the DE centre at the West University in Timisoara and the DE centre of the CODECS Foundation in Bucharest). Simultaneously with the creation and the development of the infrastructure of these centres, several state and private universities in the Romanian higher education system set their own Distance education centres and departments.

In 1996-1999, the Romanian Distance Education system faced a crisis because of the failure in reaching a collaboration and a standardization of the already existing centres at a national level. The only coherent development at a regional level was accomplished by the creation of the academic Distance Education consortium TREND (Trans-Regional Network in Distance Education), composed by the ODL centres set with PHARE financing in Iasi, Brasov and Cluj (IDESC, BV-DESC and CNODESC).

The TREND, which was created by the three PHARE centres, is based on common quality standards. An ample exchange of experience was systematically made between the TREND partners. A number of projects in which TREND and other regional PHARE centres from Central and Eastern Europe were partners, have been elaborated. One particular project was dedicated to the implementation and adaptation for Romania of the ENVIMAN course (from the PHARE CMD project). Unfortunately, the project has not been approved so far within the Leonardo da Vinci EU program. Later, TREND received as partners three more centres: CSIDD of the "Dunarea de Jos" University in Galati, the Centre for DE of the "Stefan cel Mare" University in Suceava and the DE Department of The "1 Decembrie 1918" University in Alba Iulia.

The activity of all the existing DE centres in state or private universities in Romania is under the jurisdiction of the Law of the Education nr.84/1995, subsequently modified by the Government Decision 1214/2000, of the decisions released by the university senates and of their own organizational and functioning regulations.

The national central organization that imposed the quality and functioning standards is CNEEA (The National Council for Academic Education and Accreditation). The coordination program of this organization also standardizes the e-Learning activity of the Distance Education departments and centres from these universities and colleges.

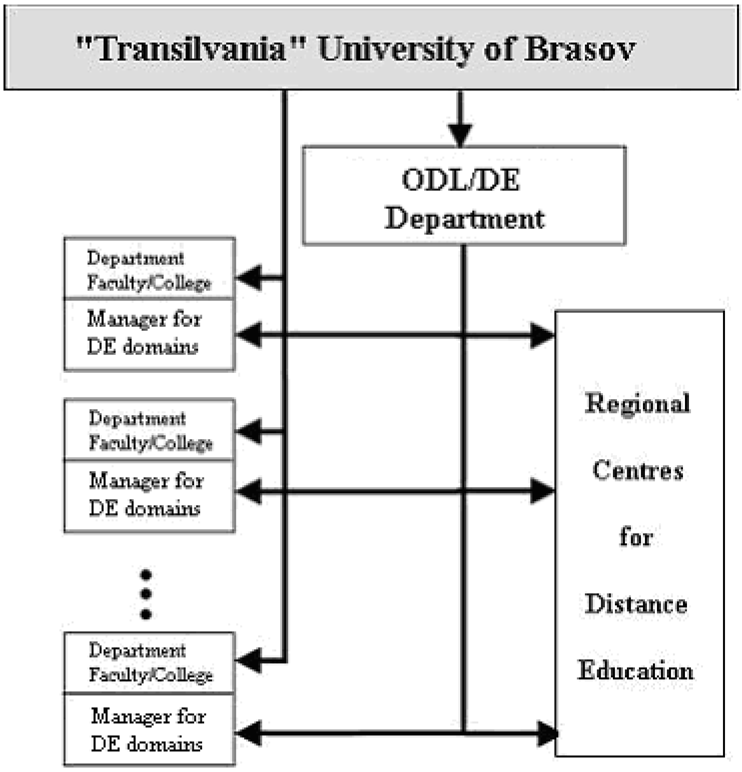

Figure 1. Departments of "Transilvania" University – DE structure

The applying of e-Learning in Romania: success or failure?

The modern educational technologies applied to the DE activity in Romania require the use of the e-Learning platforms.

The first such platform created exclusively in Romania belongs to the Centre for Multimedia Technologies and Distance Education (CTMED) from the Technical University in Cluj Napoca. The initial version, elaborated by the research team of CTMED composed by professors, researchers and students of the Electronics and Telecommunications Faculty, was elaborated in 1998 and was generically named ICE (Integrated Communication Environment). This platform, designed for e-Learning in Distance Education system, was meant to assure the e-Management of the DE centres and the communication between the participants through the Internet. The platform was aquired and evaluated by the teams of the TREND consortium in the same year, being financed by the PHARE Multi-country Programme for Distance Education, VET.

At that moment, the lack of legislation regarding the quality standards of the Romanian system lead to the cancellation of the distribution and use of this e-Learning platform by other centres and departments active in the field of DE. That was also the reason why, simultaneously with the development of this platform, local tendencies of setting other e-Learning environments appeared, in order to satisfy the punctual requests related to the e-Learning activity. The e-Learning systems of the University of Bucharest and of the "Dunarea de Jos" University in Galati are examples of such tendencies. The portal of the University of Bucharest, used as a basis for the e-Learning platform, represents a high level sample of technology offering educational services, including the following:

- homepage;
- calendar;
- chat;
- discussion forum;
- e-mail messages;
- courses;
- online testing;
- options;
- administration.

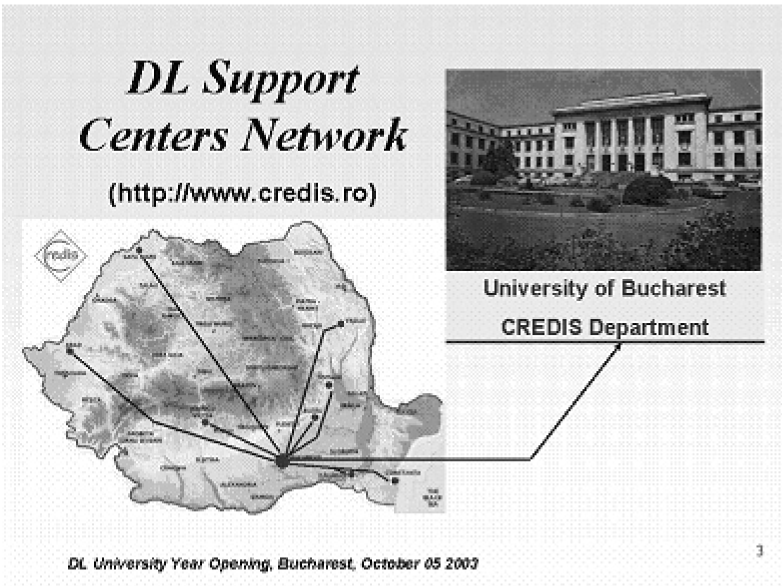

Figure 2. CREDIS co-operation system

The e-Learning platform elaborated by the "Dunarea de Jos" University has a totally different stucture. The CSIDD network of this university is supported by two servers:

- the Internet/Intranet connection server;
- the web server, having a public IP, which hosts course materials, interactive presentations, useful documents and data for the students activity.

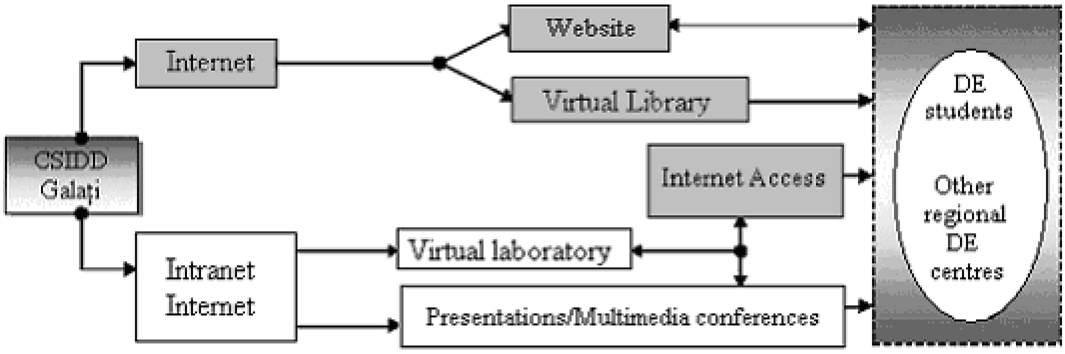

Figure 3. CISDD network block diagram

The following figure shows the organizing and functioning of the DE courses delivery through a TV channel.

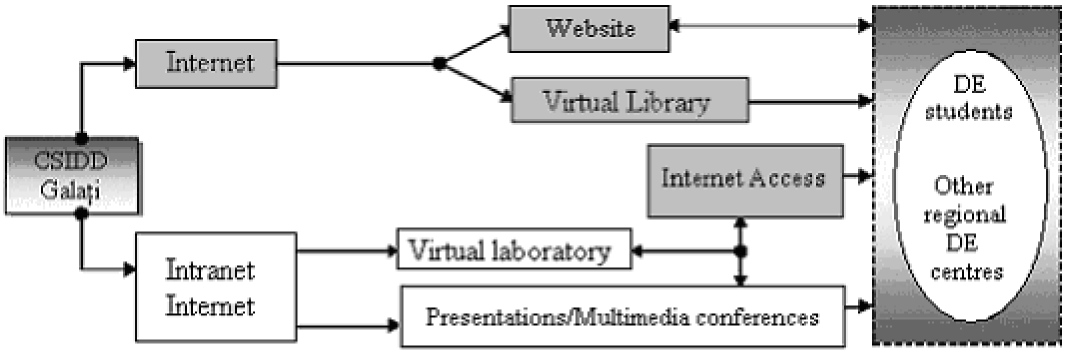

Figure 4. CISDD broadcasting diagram

The new version of the ICE e-Learning platform, named IeL (Integrated environment for distance Learning) enjoyed a limited success regarding the number of sold units. This new platform is used in present by the Technical University and the "Babes-Bolyai" University (The Faculty of Arts) in Cluj-Napoca and the "1 Decembrie 1918" University in Alba Iulia.

This platform has the following structure:

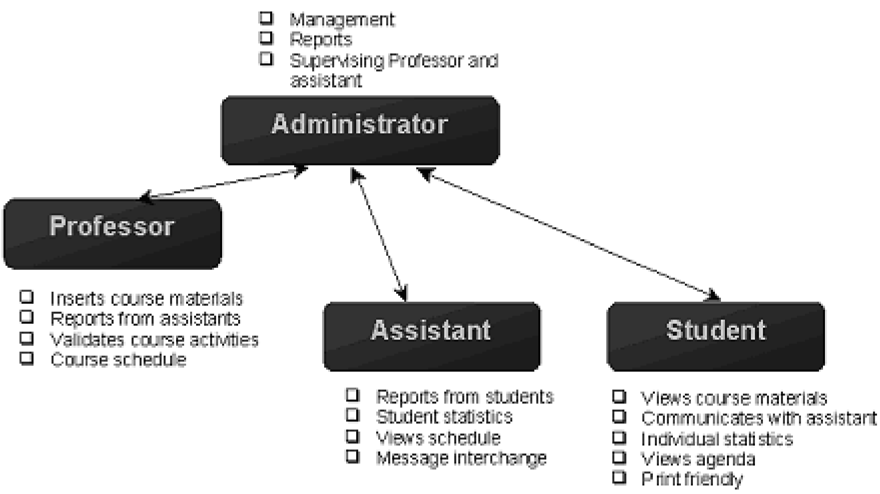

Figure 5. Course Builder block diagram

A recent study concerning the DE service providers in the Romanian state and private universities showed that 97% of them have their own websites with presentation pages, but only 23% use e-Learning platforms. Among those who use e-Learning platforms, only 15% obey the quality and functionality standards similar to those assured by high level e-Learning platforms (WebCT, FirstClass, Blackboard, etc). Looking at the dinamic development of the e-Learning platforms in Romania, the study concludes that the tendency of modernizing the DE system is, however, a succes.

Conclusions

Even if the system faces a certain inertia of the managerial teams of the universities in using e-Learning platforms in the DE educational process, the modern educational technologies such as online courses, virtual laboratories, discussion forums, chat and online testing, like many other functional components of e-Learning platforms, are more and more used in the DE centres activity.

As the infrastructure requiered for the using of e-Learning platforms already exists in most universities and colleges, the only barrier against the decision of aquiering such products by the DE centres that remains is the inadaptability of the teachers and tutors related to the requests of the modern education, as well as the lack of experience in using the PC or the Internet of the students.

Fortunately, both causes can be easily repaired by the participation of the above in intensive and flexible programs ment to contribute to a better knowledge and understanding of the great opportunities offered by the large implementation of the modern educational technologies.

References

1. Technical University of Sofia & Technical University of Cluj-Napoca VLE-ECADELL course, Phare Distance Learning News, Issue no. 8
2. Heriot-Watt University (1999) Learning About Open Learning – ICBL Course of European Training Foundation
3. M. VAZIRGIANNIS, I. KOSTALAS AND T. SELLIS (1999) *Specifying and Authoring Multimedia Scenarios,* IEEE MultiMedia, vol.6, No.3 July-September, pp. 24-37
4. N. HIRZALLA, B.FALCHUK AND A. KARMOUCH (1995) *A Temporal Model for Interactive Multimedia Scenarios,* IEEE MultiMedia, vol.2, No.3, Fall, pp. 24-31
5. A. VLAICU, B. ORZA, V. MESAROS, V. DOBROTA (1988) *A Modern Multimedia Communication Environment for Distance Learning Applications*, Proc. of the 3rd International Conference on Multimedia Technology and Digital Telecommunication Services (ICOMT '98), Budapest, Hungary, 28-30 October
6. A. VLAICU (1998) *Communication Infrastructure for Distance Education*, Proc. of the "Advanced Educational Technologies" Tempus S-JEP-12518-97 Intensive Course, Tg-Mures, 8 October
7. A. VLAICU, V. MESAROS, B. ORZA, D. PURCEA, T. MOLNAR AND A. PALL (1999) *Multimedia Communication Environment for Distance Education Applications*, Proc. of Computers and Advanced Technology in Education – CATE'99, Philadelphia/USA, May 6-8
8. A. VLAICU, V. MESAROS, T. MOLNAR AND D. PURCEA (1999) *Communication Environment for Distance Learning*, Proc. of Teaching and Training in a Networked World - International Council for Distance and Open Education (ICDE), Vienna/Austria, June 20-24
9. K. TAKAHASHI AND E. YANA (2000) *A Hypermedia Environment for Global Collaboration*, IEEE MultiMedia, vol.7, No.4, October-December, pp. 36-47
10. CREDIS – University of Bucharest, Distance Learning Department, *Presentation (About Us)*, 2002, http://www.credis.ro/en/prez/prez.asp
11. IDESC – "Alexandru Ioan Cuza" University (2002) http://stoner.phys.uaic.ro/IDESC/idesc.php
12. CTMED – Technical University of Cluj-Napoca, Distance Educations (CNODESC Centre) (2003) http://193.226.17.2/adi/ctmed/ctmed_htm/index_e.htm
13. CONSTANTIN HUTANU, COSMIN PORUMB, BOGDAN ORZA, SERGIU GORDEA, MIRCEA ROMANTAN, SORIN CRISTEA, AUREL VLAICU (2003) *Integrated Environment for Distance Learning – IeL*, EDEN 2003 Annual Conference, "The Quality Dialogue", Rodos, 15-18 June, 561-565

14. CONSTANTIN HUTANU, BOGDAN ORZA, VLAICU AUREL, MOISE ACHIM (2004) *Online learning using an original e-Learning platform*, International Carphatian Control Conference, Zakopane, Poland, May 25-28, 2004 (paper accepted in Proceeding of Conference)

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ENCOURAGING THE DEVELOPMENT OF DISTANCE EDUCATION? THE ROLE OF THE EUROPEAN UNION

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Introduction

The European Union committed itself to 'encouraging the development of distance education' in Article 126 of the Treaty of Maastricht, drafted in 1991. The signatories of the Treaty of Rome in 1957 had not envisaged a role for education in the European Community, nevertheless, through a combination of action programmes, legal judgements and strategic developments over the years, education and training came to occupy a key role in the EU's Lisbon strategy to make Europe the most competitive economy in the world (CEC, 2000). The year 2004 is an appropriate time to take stock of the position of open distance learning (ODL) in the European Union. A new constitution for Europe is currently under discussion in the member states; in May, ten new states will join the European Union. Following elections in June, a new Commission and parliament will take office. In March 2004, the Commission launched its proposals for the next generation of education and training programmes starting in 2006 (CEC, 2004a). This paper reviews the background to how ODL became enshrined in the core treaty of the European Union, and questions what role, if any, has ODL to play in the European union of the twenty-five member states in 2004. Is the European Union still committed to 'encouraging the development of distance education'; or has distance education been developed to such an extent that it no longer needs any further active encouragement?

How did distance education enter the EU policy mainstream?

While it is generally stated that the importance of ODL for the European Community was first recognised in 1987 by the European parliament when it adopted a resolution on the Open Universities (European Parliament, 1987), the idea of some form of European institute for distance education had been on the agenda for many years. The Council of Europe had proposed the establishment of a European Television University (or a European Inter-University Institute for the Development of Multimedia Distant Study Systems) in 1971. However, the idea was ahead of its time and the proposal was shelved following failure to agree on the location of the Institute in either Milton Keynes, Tübingen, or the City of Florence (Seabright and Nickolmann, 1992: 2). The influential 1973 Janne report had mentioned the potential of the OU model in responding to the need for permanent education and recommended that the Community should set up a specialised body (a European Open University) for the purpose of promoting the mass media and new technology in the context of what was then termed 'permanent education' (CEC, 1973). The proposal to set up a European institute re-emerged from time to time over the following decade, however, the Commission only formally considered the possibility following the 1987 parliamentary resolution.

The Parliamentary resolution was based on a report drawn up by MEP Mrs Winifred Ewing (Ewing Report, 1987). It is clear from the Report that the four Open Universities in existence (UKOU, UNED, FernU, and OUNL) had established a position of some influence. The report summarises the basic goal of the OUs as:

> to provide a second chance or a second path to higher education for adults who do not wish to enter full-time education, or who cannot do so on account of family and/or work commitments. In the process, open universities aim both at self-fulfilment of the individual and more broadly at contributing to economic prosperity and social progress (Ewing Report, 1987: 8).

The resolution highlighted the potential of OUs and distance education to serve the need for adult education and training in Europe, especially among the disadvantaged as well as their contribution to

European integration through teaching languages. Member States were urged to support OUs and other national ODL initiatives, and to tackle obstacles and barriers to participation posed by high fees and fee differentials, customs regulations on cross-border distribution of course materials, and recognition of qualifications. The Commission was called on to promote OUs through preparing reports, disseminating information, and involving OUs in programmes such as COMETT, ERASMUS and DELTA. Finally, a key recommendation was a call to investigate the feasibility of establishing a European Open University.

It was the proposal to initiate a European Open University which had a galvanising effect on the newly founded European Association of Distance Teaching Universities (EADTU) which quickly mustered a successful lobby to persuade the Commission to work through existing institutions, in particular the European Open University Network established by EADTU, rather than setting up a new separate institution (Field, 1998, Tait, 1996). Following an initiative of the Irish presidency in 1990, the Commission produced, with the assistance of representatives of the ODL networks and institutions, a number of reports on distance learning in the European Community culminating in November 1991 with the *Memorandum on Open Distance Learning* (CEC, 1991). The Memorandum drew heavily on the report of the IRDAC committee, which had identified significant skills shortages in Europe, to support its call for Community action in distance education (IRDAC, 1991). Earlier that year, the commitment to encouraging the development of distance education had been inserted into the draft Maastricht Treaty (Corbett, 1993: 304).

How did ODL come to occupy this central position? To a certain extent the explanation for the elevation of distance education to the forefront of EU policy lies in the coalition of three development streams: the emergence of distance education as a 'respectable' form of higher education in the 1970s; the role of the new information technologies in transforming society and economies; and the increasing concern within the European Union with the completion of the internal market to safeguard competitiveness, and the need to create a people's Europe of citizens committed to the aims of the Union.

By the 1970s, there were signs that distance education was becoming a respectable form of education, as 'the best providers, both public and private, wanted to offer accessible educational opportunities, based on quality materials, leading to reputable qualifications' (Rumble, 2001: 228). This period saw the establishment in Europe in rapid succession of open universities, dual mode institutions and consortia of distance education. By 1990, it appeared that only Greece and Luxembourg lacked some form of distance education.

The extent of technological change between the 1950s and the 1980s cannot be underestimated. The world economy moved from the industrial society based on mass production and mechanical systems, to the information society based on electronic systems and flexibilisation. The years after 1957 were characterised by massive leaps in technology. Large-scale mainframe computers had developed in the 1940s; by 1958, IBM's Watson Research Centre was experimenting with computer aided instruction teletype and terminals to schools.[1] In 1960, the PLATO initiative using 'teaching machines' was initiated at the University of Illinois, and Echo, the first communications satellite was launched. By 1969, the ARPANET system had been developed which allowed researchers at UCLA and SRI International at Menlo Park California to communicate, a system which would eventually evolve into the internet[2]. The first email message was sent in 1971, and in 1979, the first proprietary online service was launched (Blackhurst and Edyburn, 2000). The introduction of relatively cheap microcomputers and PCs by the end of the 1980s together with the potential to link remote computers together had at last made the possibility of using technology to both enhance educational practice and to widen access seem feasible. At the same time, technological change had created profound changes in the nature of work, creating at the same time, massive job losses in the traditional sectors, and substantial skills shortages in the new sectors.

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[1] Consumer Electronics Association Digital America http://www.ce.org/publicat…ces/digital_america/chronology accessed January 2004.

[2] ibid.

The development of EU education and training policy has been fuelled by constant concerns with competition from the United States and Japan as well as coping with the effect of technological change on the structure of industry and commerce. Significantly, the Treaty of Rome was signed in 1957, the same year the Soviet Union launched the Sputnik, leading to fears of deficits in science and technological skills (Blackhurst and Edyburn, 2000, Green, 1997). With respect to the new technologies, the Commission's 1971 guidelines on vocational training had referred to the use of modern teaching methodologies (correspondence courses, programmed instruction, use of computers in education and training, in the context of improving teaching methods) however it was not until 1978 that a stream of policy making on the impact of new technologies on education and training was initiated following the European Council Meeting in Bonn. The Council and Ministers of Education agreed in 1981 that 'the introduction of new information technologies (NITs) has profound implications for education systems, particularly as regards general education curricula and teacher training, the training of technicians, and the organisation and methods of education. Affirmative action in this respect should be envisaged to enable all age groups in society to face up to the social and economic challenges involved.' (CEC, 1986: 73). The Commission was called on to make recommendations on 'ways of extending education and training opportunities for adults by exploiting the potential of the new information technology' (CEC, 1986: 74). The Commission's 'Education policy for Europe' highlighted the role of NITs in education and training as a means of combating worsening employment, and competition with the USA and Japan in the technology sector (CEC, 1982: 25). In 1982, the European Parliament passed a resolution on the introduction of NITs in education, and the need for cooperation between the Member States and the Commission. The Council adopted resolutions in 1983 concerning measures relating to new information technologies in vocational training and general education (CEC, 1986: 81-84). In November 1986 the Council agreed a programme for 1987-88 focusing on four strategic areas: incorporation of new information technologies in teaching practice and school curricula; training of teachers and trainers; software, hardware and courseware systems; and economic implications of NITs in education and development strategies (CEC, 1989: 27). By 1987, 'spectacular development' was recorded in all the Member States 'as regards the introduction of NIT into schools including equipment, training of teachers, and production of educational software' (CEC, 1987).

Despite the level of Community interest and activity in the NITs in education and training, distance education continued to hold a peripheral status and was rarely mentioned. However, between 1985 and 1987, arising from changes in Community policy driven by preparations for the single market, a series of programmes aimed at higher education were introduced which were to have significant impact on the development of distance education in Europe. The EUROTECNET programme introduced in 1985 supported a project aimed at examining open learning and the new technologies. The COMETT programme was aimed at cooperation between higher education and industry and included as one of its objectives to give a European dimension to cooperation between universities and enterprises in training relating to innovation and the development and application of new technologies. While distance education was not mentioned specifically in the objectives of the programme, nevertheless the emphasis on the use and application of multimedia and new technologies in education and training created an opening for distance education institutions and others wishing to adopt distance education to apply for funding. The programme served to stimulate the formation of partnerships and consortia among existing distance education organisations established to take advantage of the prospects of relatively significant amounts of funding for joint projects and activities. Another programme DELTA (Developing European Learning Through Technological Advance) focused on the technological development of distance education. The DELTA programme was designed to foster European collaborative research on alternative learning technologies (networks, satellites, IT based training products) as well as to test possibilities for European cooperation (Van den Brande, 1993). Finally, the ERASMUS programme although not specifically aimed at supporting distance education, provided funding to the EADTU to set up joint course development committees from which emerged a number of courses such as 'What is Europe?'

By the time of the publication of the ODL memorandum, a critical mass of distance education institutions had been established at national level, and a number of transnational networks had been established: the EADTU (European Association of Distance Teaching Universities); SATURN drawn from members of EADTU as well as industry; two satellite networks: EuroSTEP and EuroPACE; and

EDEN the European Distance Education Network, which drew members from the Central and Eastern Europe as well as the EU member states. There were many contacts and consultations between the Commission and the networks between 1989 and 1991 and there is no doubt that the networks had significant influence on Commission proposals at that time.

After Maastricht

Following the Maastricht Treaty, the Commission proposed a new generation of programmes aimed at coordinating and simplifying the programme structure. The Socrates programme, launched in 1995 included a specific action aimed at supporting open distance learning, while large-scale technology-based projects were funded under the research framework programmes. The evaluation of the first phase of the ODL action commented on the changing technologies, including the use of the internet, which had altered the focus of the actions over the course of the programme (CEC, 2001). The report suggested, without any further elaboration, that the definition of ODL had proved an obstacle to the participation of some countries, based as it was on Anglo-Saxon and Nordic approaches to ODL. Overall, some €33 million was expended on 166 projects under the ODL action in the period, with greater participation from traditional universities and schools than ODL institutions. This trend continued in the second phase of Socrates, where the Minerva action supported ODL and ICT in education. Projects under the Minerva action received funding of €31.65 million in the four years 2000-3003, although annual funding dropped from €10 million in 2000 (4.3% of the total) to €6.9 million (2.6% of the total) in 2003 (CEC, 2004b). The reduction in expenditure is accounted for by the declining rate of acceptance of proposals. In 2000, 183 proposals were received, of which 73 (40%) were accepted. In 2003, of the 299 pre-proposals, just 30 (10%) were successful. Nevertheless, the evaluation report rated the Minerva action as 'relevant and effective. It responds perfectly to the programme objective of encouraging innovation in the development of teaching practices and materials.' (CEC, 2004b: 26). While acknowledging the rise in number of project proposals submitted there was no comment or explanation of the low success rates of these proposals. An examination of the institutions involved in these partnerships shows only one fifth of projects had partners or coordinators from ODL institutions.

The results of the consultative exercise in 2003 found little support for the Minerva programme, with one Ministry source quoted as saying 'Minerva as an action should be discontinued. There is a wide range of European and national programmes providing serious funding for ICT and it is not evident that Minerva has delivered real added value' (Pole Universitaire Europeen, 2004: 102). Indeed, the funding available under the Sixth Framework is far in excess of that available under Minerva. The budgets for the eight technology enhanced learning projects selected under the 2004 Sixth Framework ranged from €600k to €9 million[3], compared with a range of €100k to €760k for the 2003 round of Minerva projects[4]. Although whether this is an argument to drop the smaller, less technology focused projects is debatable.

Between 1994 and 2000 the Phare programme supported the 'Multi-Country Distance Education Programmes', aimed at promoting the use of ODL approaches in the Central and Eastern European Countries. This programme funded a network of forty study centres throughout the countries, the development of expertise, and the production of course modules. However, the evaluation found that while much had been achieved by the programme, the shift in political emphasis from assisting the Phare countries in modernising their education structures to preparing their systems to meet the *acquis communautaire* in the context of accession to the Union meant that many developments encountered difficulties in continuing in the absence of a dedicated funding programme (Steinbeis Transfer Centre, 2001). Instead, the accession countries were expected to compete with the other Member States for funding under the Socrates, Leonardo and Framework programmes (MacKeogh and Baumeister, 2000).

[3] http://www.cordis.lu/ist/directorate_e/telearn/fp6

[4] Socrates Compendium 2003 Minerva http://europa.eu.int/comm/education/programmes/socrates/minerva/resour_en.html

After Lisbon

The conclusions of the Lisbon Council meeting in March 2000 have had far reaching consequences for EU education policy (Hingel, 2001: 14). According to the Director General of DG Education and Culture 'at Lisbon the Heads of State and Government brought education and training policy out of the background where they had been hiding for thirty years, and presented them with the challenges they have to face' (Van der Pas, 2002: 6). In addition to the usual challenges of globalisation, competition and demographic change, large numbers of adults had not completed second level education, and less than 10% of the population were taking part in further education or training (Van der Pas, 2002: 2). The Lisbon conclusions set explicit aims and guidelines which Member States were expected to adopt in their education policies by 2010 including: increasing per capita investment in human resources; reduction by 50% of 18-24 year olds with lower secondary education who are not in further education; developing a European framework to identify new basic skills (IT skills, foreign languages, technological culture, entrepreneurship and social skills) to be provided through lifelong learning.

At the end of 2003 the European Parliament and Council adopted the *e*Learning action Programme 2004-2006 'for the improvement of the quality and accessibility of European education and training systems through the effective use of information and communication technologies.'(CEC, 2003). The specific areas of intervention include promoting digital literacy 'in particular for those who, owing to their geographical location, social situation or special needs do not have easy access to these technologies'; European virtual campuses with a view 'to better integration of the virtual dimension in higher education to encourage the development of new organisational models for virtual campuses and for virtual mobility'; etwinning of schools and training of teachers; transversal actions (studies, conferences, monitoring actions).

Conclusions

Has the EU succeeded in encouraging the development of distance education in Europe to the extent that no further action is required? It would appear that the Commission considers that this is the case since the plans for the new generation of action programmes in education and training published in March 2004, while proposing an 'ICT action' make no provisions for an action on ODL or indeed eLearning (CEC, 2004a). Analysis of EU policies highlights an interesting evolution in thinking from the early 1990s (when ODL was seen as one approach to providing lifelong learning opportunities) to the current focus on eLearning as the vehicle to radically reform the entire education and training system to cope with the demands of the new knowledge society. In the early to mid-1990s, open distance learning (ODL) was in the ascendant with reports, conferences, seminars, and EU and national action programmes designed to stimulate the adoption of ODL throughout the Community, and later to the candidate countries. Yet, there were subtle signals that the traditional form of ODL, with its focus on widening access to students off campus was disappearing from the agenda as ODL methods were adopted and incorporated into traditional education systems. By 2000, the term elearning had virtually replaced ODL in European union discourse, as the technology element of ODL became dominant and the focus switched to schools and campus-based education and training.

Despite the protestations that the new eLearning drive has recognised 'the need to move beyond the technocratic view of technology and education' (Reding, 2003) there is little evidence to show that this is actually the reality. The new ICT action will once again focus on 'innovative' uses of the new technologies, while the other actions in the proposed programmes have no specific proposals to meet the special needs of adult students studying at a distance from the home campus. There are good arguments to support the multi-million Euro programmes testing out high-risk next generation technologies which may never be implemented as happened with most of the DELTA projects. However, does this mean that there is no space to encourage testing and embedding good pedagogical practice through using the affordable, accessible technologies which are available to current ODL practitioners and students operating in the world of today? It is acknowledged that many national governments are funding precisely such efforts (for example the Higher Education Authority in Ireland) on a national level. However, the scope for the European dimension and transnational exchange of ideas and expertise is thereby reduced if not lost entirely.

The ICTs have transformed many aspects of economic and social life in the latter part of the twentieth century and it is clear that education must prepare students to work in a society that requires technological literacy. However, there are real concerns that the introduction of the ICTs in distance education will lead to a digital divide, and will serve to increase, rather than reduce, social exclusion. The issue of cost and pedagogical effectiveness of the new technologies is still a matter for debate, and there is by no means any certainty that students will universally welcome elearning approaches (MacKeogh, 2003). There is therefore a tension between policy makers imposing innovation from a top down perspective and the concerns of potential adopters – institutions, teachers and students. The successful adoption of ICTs in education requires a receptive environment which includes access to the technology, expertise and efficacy, and attitudes to learning with technology. It is suggested that much more needs to be done to resolve the most appropriate use of technology in distance education, and also to demonstrate that innovation means more than just using technology. The European Union has certainly encouraged experimenting with technology in education, however it is less clear whether it has effectively encouraged the use of distance education in the Community.

References

1. BLACKHURST, A., AND EDYBURN, E. (2000) *A brief history of special education technology* Special Education Practice. 2(1): 21-36
2. CEC (1973) *For a community education policy*, Bulletin of the European Communities supplement 10/73 Luxembourg: OOPEC
3. CEC (1982) *An education policy for Europe 2nd Edition* Luxembourg: CEC
4. CEC (1986) *European Educational Policy Statements 2nd Edition* Luxembourg: Office for Official Publications of the European Communities
5. CEC (1987) *Social Europe: Developments in the introduction of new information technologies in education* Supplement 2/87 Luxembourg: CEC
6. CEC (1989) *Social Europe: Activities of the Commission of the European Communities in the fields of education, training and youth policy during 1987 and 1988: A contribution to the Standing Conference of European Ministers for Education held in Istanbul in October 1989 elaborated by the Task Force Human Resources, Education, Training and Youth*. Supplement 8/89 Brussels: CEC
7. CEC (1991) *Open distance learning in the European Community, Memorandum on open distance learning in the European Community, Task Force Human Resources, Education, Training, Youth, COM (91) 388 final* Brussels: Commission of European Communities
8. CEC (2000) Presidency Conclusions: Lisbon European Council 23 and 24 March 2000 http://ue.eu.int/newsroom/ Accessed 12 March 2004
9. CEC (2001) *Final Report from the Commission on the implementation of the Socrates programme 1995-1999 COM(2001)75* Final Brussels 12 February 2001
10. CEC (2003) Decision No 2318/2003/EC of the European Parliament and of the Council of 5 December 2003 adopting a multiannual programme (2004 to 2006) for the effective integration of information and communication technologies in education and training systems in Europe (eLearning Programme) OJ L345/9 31 December 2003
11. CEC (2004a) *Communication from the Commission: the new generation of community education and training programmes after 2006 COM(2004) 156* Final Brussels 9 March 2004
12. CEC (2004b) *Report from the Commission: Interim evaluation report on the results achieved and on the qualitative and quantitative aspects of the implementation of the second phase of the Community action programme in the field of education 'Socrates' COM(2004)* 153 Final Brussels 8 March 2004
13. CORBETT, R. (1993) *The treaty of Maastricht: from conception to ratification* London: Longman
14. EUROPEAN PARLIAMENT (1987) *European Parliament Resolution of 10 July 1987 on Open Universities in the European Community Session Doc A2-0069/87 OJ 0133*

15. EWING REPORT (1987) *Report on Open Universities in the European Community drawn up on behalf of the Committee on Youth,Culture, Education, Information and Sport, rapporteur Mrs Winifred Ewing (A2-69/87)* Luxembourg: Office for Official Publications of the European Communities

16. FIELD, J. (1998) *European dimensions: Education, training and the European Union London*: Jessica Kingsley Publishers

17. GREEN, A. (1997) *Education, Globalization and the Nation State* London: Macmillan Press.

18. HINGEL, A.J. (2001) *Education policies and European governance*: Contribution to the Interservice Groups on European Governance European Commission http://europa.eu.int/comm/governance/areas/group12/contribution_education_en.pdf Accessed 4 February 2004

19. IRDAC (1991) *Skill shortages in Europe: IRDAC opinion* Brussels: CEC/Industrial Research and Development Advisory Committee of the European Communities

20. MACKEOGH, K. (2003) *Student perceptions of the use of ICTs in European education: Report of a survey* Dublin: Oscail - Dublin City University (also available online http://www.oscail.ie/picture.htm

21. MACKEOGH, K., AND BAUMEISTER, H.-P. (2000) *Policies and practice in open and distance learning: the Phare multi-country programme for distance education 1995-1999.* Paper presented at Research and Innovation in Open and Distance Learning: EDEN Prague Workshop 16-17 March 2000. European Distance Education Network 13-16

22. POLE UNIVERSITAIRE EUROPEEN (2004) *Analyse des résultats de la consultation Européene sur le dévelopment futur des programmes de l'Union Européene dans les domaines de l'education, de la formation et de la jeunesse aprés 2006.* Contrat No 2003-2184 Brussels: CEC

23. REDING, V. (2003) *Commissioner Reding's speech at Learntec*, Karlsruhe, 4 February 2003: 'Is e-learning going mainstream? The Perspective of the EC' http://www.elearningeuropa.info/doc.php Accessed 6 February 2003

24. POLE UNIVERSITAIRE EUROPEEN (2004) *Analyse des résultats de la consultation Européene sur le dévelopment futur des programmes de l'Union Européene dans les domaines de l'education, de la formation et de la jeunesse aprés 2006.* Contrat No 2003-2184 Brussels: CEC

25. RUMBLE, G. (2001) *Just how relevant is E-education to global educational needs?* Open Learning. 16(3): 223-232

26. SEABRIGHT, V., AND NICKOLMANN, F., EDS. (1992) *Distance Education in Europe: Studies and recommendations by the Council of Europe*. Amsterdam: SATURN/Council of Europe

27. STEINBEIS TRANSFER CENTRE. (2001) *Evaluation of the Phare Multi-Country Distance Education Programme (ref ETF/01/PHA/0001)* Reutlingen: Steinbeis Transfer Centre

28. VAN DEN BRANDE, L. (1993) *Research and development on learning telematics in the European Community* Journal of Computer Assisted Learning. 9(2): 75-85

29. VAN DER PAS, N. (2002) *Does the EU need and education and training policy?* Keynote paper read to Institute of European Affairs, Dublin 16 April 2002 http://www.iiea.com/keynotes/20020416-vanderpas.html Accessed 12 March 2004

USING TECHNOLOGY TO PROMOTE LEARNING ACROSS AN ENLARGED EUROPEAN UNION: EXPERIENCE EMERGING ACROSS THE NEW EUROPE

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Abstract

This paper summarises the aims and goals of the ALPINE project, a project involving partners in 20 European countries. It examines how the project used technology and further to enhance project learning and the problems and opportunities created by this approach. The paper refers to the work of one of its working groups, the ICT and Community outreach group. The paper shows how providers of adult learning in universities can come together and form new partnerships which themselves can promote learning by creating new open, distance and e-learning opportunities.

Background

Developing a Europe of knowledge is an essential factor for economic development, for social and human growth and for consolidating and enriching European citizenship. Since the 1990's the emergence of a European strategy to develop and implement a coherent and comprehensive strategy for lifelong learning has raised new questions for higher education. The strategy raises questions about the role of universities and other higher education establishments in developing lifelong learning and how they might provide for the needs of adults of all age groups and from different backgrounds.

The 'Adults Learning and Participating in Education' project, known as ALPINE, recognises the need to involve more adult learners in higher education and to find new and innovative ways for involvement. The project set out to examine the existing provision for adults in European higher education and to determine the barriers which prevent adults from participating. It sought to determine how issues in increasing and widening participation are being addressed in twenty European countries and to report on new ways to enable adults to take part. The findings are reported in a book [1] and in an e-manual [2]. The aims and goals of the ALPINE project are closely related to European Commission thinking [3-8] on strategies and practical measures for lifelong learning. The project benefited from expertise in twenty European countries. The ALPINE Project is a three year European funded Socrates (Gruntvig) Project beginning in May 2001 and completing in June 2004. The project has 35 partners from 20 countries (including 8 new EU members joining May 2004 and a further 2 applicant countries).

Most adult education policy makers, managers, researchers, teachers and students are currently not familiar with the expanding field of adult education outside their own countries. There is a growing demand for analyses that describe the field authoritatively and that identify good practice, while also engaging in a theoretical critique of the transformation of adult education and of its contribution to lifelong learning generally.

The research outputs of the project presented have generated interest, both from practitioners developing educational policies and practice and from academic researchers working in the broad field of lifelong learning.

The ALPINE Book

The book begins by examining existing European perspectives on lifelong learning and the problems and possibilities in increasing and widening adult participation in higher education institutions across

Europe. It then presents in detail the situation in each of the participating countries as seen by national experts there. Each national chapter sets out to examine, as far as it can, how the provision for adults is organised in higher education institutions, the barriers which prevent adults participating in higher education there (including the problems of particular adult groups) and the policies and practices adopted at the national and institutional levels, which seek to involve more adults. Each chapter highlights examples of innovative practice, including special initiatives for specific disadvantaged groups where possible. While many of the problems faced by adults across Europe are similar, the ways of dealing with them vary considerably. The concluding chapter provides an overview of the issues and problems. It summarises the special problems experienced by adult students in higher education institutions across central and western Europe and seeks to draw general conclusions on the possible ways of overcoming these. As well as the European audience, the content of this book provides useful information for adult education planners, researchers, teachers and students worldwide.

The ALPINE e-manual of good practice

The e-manual of good practice looks in greater detail at the practical issues in increasing and widening participation for adults in European higher education institutions. These issues, including summaries of key points and case studies of good practice, can be found on the ALPINE Project Web site: www.qub.ac.uk/alpine.

The issues that are re-examined in this case include the curriculum appropriate for adult students, adult student support and guidance, community outreach, the use of information and communication technology (ICT) as a tool to reach adults, engaging non-traditional groups, adult teaching, and learning language and culture for adults. Several other key issues such as assessment and accreditation, funding of adult learning etc. might also have been added to the list, but given the restriction on time and funding, and the expertise within the group, it was decided to focus on the key themes above.

This manual presents information on good practice for managers and teachers who have a role in developing adult provision in higher education institutions. It should also be of value to policy makers and administrators with responsibility in adult higher learning, staff of national agencies with a role to play in increasing adult participation in higher education institutions, staff trainers and indeed anyone with an interest in widening participation in the higher education sector.

Together, the manual and book provide a compendium of ideas for increasing and widening participation for adults in European higher education institutions. They show how countries, and their individual higher education institutions, are increasing adult provision. This includes meeting the needs of underrepresented groups of adults and highlights the many problems that have still to be overcome. It is hoped that these twin resources will assist higher education institutions to manage the process of change in increasing the numbers of adult students more effectively. It should also improve the quality of provision for adult students in European higher education institutions generally.

Project management & methodology

The process of working was established at the projects first meeting of all the partners in Belfast in May 2001. The project had six face-to-face meetings at Queen’s University Belfast, Northern Ireland, UK, the University of Debrecen, Hungary, Lund University, Sweden, The University of Tartu, Estonia, the University of Macedonia, Thessaloniki, Greece and Stirling University, Scotland, UK.

A series of dissemination seminars have subsequently been organised in Tartu University, Estonia, Bratislava University of Economics, Slovakia, University of Craiova, Romania, University of Chemical Technology and Metallurgy, Sofia, Bulgaria, University of Limerick, Ireland, and the University of Helsinki, Finland. These seminars will be completed by the end of June 2004.

The Project Director, based at the Institute of Lifelong Learning at Queen’s University Belfast, provided overall project co-ordination. Ongoing e-mail contact was maintained between the project partners on both academic and financial matters throughout the project. A project web-site and an e-mail group list were established to communicate with the partners. The web-site included general project information including information about each project partner and their university, information about project meetings, and follow up reports from meetings. Links with other relevant sites such as the home university of each partner and the Commission's web sites were established. All the information on the web-site was available for anyone to view.

At its first meeting in Belfast, the project members agreed a method for gathering data for the book and manual were discussed. It was agreed that the ALPINE book would comprise individual chapters from each participating country who would gather data and write a national report on participation in adult learning in its universities. Guidelines for writing reports were drawn up and agreed at the meeting and these guidelines were subsequently reviewed at subsequent project meetings over a two-year period. The e-manual would comprise of six working groups each with a group leader who would be responsible for the overall management of group activities between meetings – for example, apportioning of tasks, communication with members, providing support and encouragement to members etc.

The target group of the study

It was also thought to be important to define a common understanding of what was meant by the term 'adult' in the context of universities. It was agreed to examine provision for students who had completed their initial education followed by a period when they had not been involved in formal education. The kind of education provision examined was that geared towards the non-traditional learner which might include both vocational and non-vocational provision, i.e. courses where the motive was to develop skills and knowledge for work, or for personal development, or for social and community development. It was also felt that groups which had traditionally suffered disadvantage, such as those experiencing rural isolation or immigrants, should be a particular focus of the study as relatively little information has been published in this field. The project partners used existing information that was readily available in their countries as there was insufficient time and resources to carry out new field research. It was also possible to drawn on experience from another European study which focussed on the recent development of university continuing education in Europe [9] Where possible relevant information was integrated into the present book in order to present as broad a picture as possible of adults in higher education in the national and European contexts.

Rationale for widening participation

Raising people's educational level is an essential requirement for creating a successful transition to a knowledge-based society and its achievement has major implications for the involvement of adults in universities. Lifelong learning closely links with a wide range of policy goals including economic and social advancement. These include, for example, providing skills for the labour market, reducing poverty, assisting community development, enhancing citizenship, and promoting social and cultural development.

The EU has acknowledged the importance of promoting lifelong learning through widening participation in education. The Memorandum on Lifelong Learning [3] notes:

"Lifelong learning is no longer just one aspect of education and training; it must become the guiding principle for provision and participation across the full continuum of learning contexts. The coming decade must see the implementation of this vision. All those living in Europe, without exception, should have equal opportunities to adjust to the demands of social and economic change and to participate actively in the shaping of Europe's future." [3, p.3].

The emergence of lifelong learning onto the European policy agenda has undoubtedly influenced the development of access to higher education. The importance of changing higher education in order to promote greater equity through wider access was noted at the UNESCO World Conference on Higher Education. The forward to the Conference noted:

"It is now clear that, to fulfil its mission, higher education must change radically, by becoming organically flexible, and at the same time more diverse in its institutions, its structures, its curricula, and the nature and forms of its programmes and delivery systems." [11, p.2].

The ALPINE study sets out to answer questions about how a wider participation in lifelong learning might be achieved, through involving more adults in universities, particularly adults from excluded groups.

Project evaluation

Provision for internal project evaluation was built into the ALPINE project proposal. Two external consultants (one from the Finnish Council for Directors of Continuing Education and the other from the Continuing Professional Development section of the University of Turku, Finland) were engaged to provide guidance and support and to evaluate the success of the project on an ongoing process. The evaluation process highlighted both the successes and problems which arose and makes suggestions on how the project management might be improved for the future [10].

Two evaluation questionnaires were sent out to project members (in April 2002 and again in March 2003). A response rate of 78% was achieved on the first survey with a slightly higher figure in the second survey.) The project evaluators note (p.6) that partners who did not answer were largely those who might be classified as drop-out partners who had not participated in the project activities. A final evaluation meeting of all the partners was held during a dissemination conference in Stirling, Scotland in December 2003 and both positive aspects and unsuccessful elements were discussed and analysed.

Virtual & real-life communication

The Alpine project used a blend of face-to-face meetings with ongoing use of virtual communication between meetings to further the project aims. The face-to-face meetings each succeeded in focusing on critical issues at different stages of the process and were a factor in determining the success of the project. As most of the work in a project like ALPINE has to be done between the face-to-face meetings, so the use of time between meetings becomes crucial. The project evaluation paid particular attention to methods of communication and use of time both in meetings and between meetings using virtual communication. The project evaluation showed a very positive picture of commitment with 73% of project members indicated they were satisfied with the work that has been done between meetings.

The role of group leaders in promoting activities had an important impact on the group work. Most of the group leaders made contact with group members, using e-mail to discuss day-to-day issues. The main issues that the working groups discussed between meetings were objectives, content and the working process related to the specific tasks of the group.

Between meetings all of the communication between partners was using virtual communication methods such as e-mail and the project web-site. The project members commented on the high level of good communication between the project manager and the partners with 89% describing it as excellent or very good. In particular, they commented on the openness of discussion. The project partners were, however, more critical about communication between themselves. While some indicated it was at a good or excellent level (40%), others indicated that it could have been better (48% of respondents) and a small number (12%) felt it had not been good.

Participants were asked about the work of other groups in the project. 44% of respondents indicated that they had very little knowledge about what was going on in other groups. The apparent lack of knowledge calls into question the benefits of using the web-site as an exclusive means of communicating information about the work of other groups.

The project website was seen as useful, with 70% of the project members indicating it was 'very good' or 'excellent'. The website had clear information and offered an opportunity for sharing information. The website was also seen as a vehicle for wider dissemination of progress and information arising from the project. Some felt that the web-site had been mainly 'process' orientated and could have been more ‘outcome’-orientated. Websites can be successful both as a forum for sharing information and views and supporting progress between partners or for presenting outcomes. While the ALPINE website supported the development of the ALPINE project, its limitations was its lack of attention to dissemination features during the project.

Improving learning

The aims of the project were to find ways of improving and developing educational practices, to find new ways of integrating adult education within the university and to strengthen learning opportunities for adult learners. The project also offered an opportunity for learning to happen in a European context by bringing people together from different countries to share knowledge and experience.

In the ALPINE survey about 34% felt they had been able to share their knowledge and expertise. A significant number felt they had only been partly able to share their experience (54%) while 12% felt that the sharing was insufficient. It would seem that a number of participants would have welcomed a greater opportunity for sharing knowledge. One of the problems was that sharing knowledge using the website and e-mail had its limitations. Members’ knowledge of written English was not necessarily enough to overcome all the barriers of communication.

While well-organised meetings are one way of sharing information another is improving the virtual learning environments for dissemination purposes – for example, through establishing discussion groups and by developing an interactive web-site. The survey showed that while the use of technology to communicate messages was generally seen as good, some partners would have liked more innovative use of e-mail lists, use of ‘net meetings’ and ‘video conferencing.’

ICT & community outreach in European universities

The ICT and community outreach (CO) group was one of six working groups that examined the role of ICT and community outreach in widening access to universities for adults. The group examined the various meaning of the concepts of ICT and community outreach and produced a series of reports focussing on developments within each participating country. These reports can be accessed on the project website www.qub.ac.uk./alpine.

Obstacles that hinder adults from participating more actively in higher education vary from country to country and within each country. There are a wide range of issues which can arise. Lack of money, availability of suitable courses, feeling too old for studying, or considering oneself not suitable for higher education are just some of the issues which can emerge. Another set of issues relate to the flexible or non-flexible nature of the course. The simplest solution is for universities to organise adult education together with its ordinary teaching activities. Some universities use this approach. However, many universities are more flexible in approach, organising adult orientated courses at times to suit an adult audience such as in the evenings or at weekends or through traditional distance learning methods. These flexible-learning approaches can be even further extended through ICT-based teaching and community outreach (CO) activities that make university adult education even more flexible and accessible.

ICT-based teaching and learning raises a number of questions and controversies. On the one hand, it helps breaking down barriers between traditional and adult-oriented university education and on the other it creates barriers between those who have access to e-learning and those that have not. CO is also a costly activity for the university.

ICT and CO are one of the most efficient ways of widening participation of adults in higher education The following are a summary of the key findings on ICT and adult learning arising from the ALPINE project:

- The development of ICT and web-based courses can reach new groups of adult learners especially through the eWorld.

- Although ICT courses are time consuming and costly to prepare and support, they can bring new groups of adult learners into universities.
- Research and practice in ICT-based teaching in universities show that it is an especially suitable learning method for adult learners, providing better access and qualitatively better learning results.
- Delivering courses in regions provides opportunities for co-operation with local training institutions.
- Web-based learning based solely on self-study is not the only option. Combining CO activities with ICT-based teaching (or blended learning) is also an alternative. Many adult students like face-to-face teaching and are happy to find time to travel to meet fellow students.
- In deciding whether or not to offer ICT-based courses to adult students, the opportunity for the learner to use the appropriate technology should be considered.
- Neither ICT nor CO can overcome attitudinal problems related to adult participation.
- Offering ICT courses may help reduce the fear that some adults have about universities. Introductory HE courses and a good online service provision can provide opportunities for overcoming problems o attitude.
- ICT and CO can be effective delivery methods, especially in isolated regions and for language minorities living over a wide geographical area.
- The 5th generation of eLearning focuses *on what, where and when* together with a flexible learning model which is characterised by *time, pace and space*. Materials which encourage interactive delivery can provide an opportunity to overcome obstacles bringing adults into HE.

Conclusion

The ALPINE project has shown that the use of technology in European projects has many benefits. As well as improving adult education provision in Europe, it can assist with the development of a common understanding that will help promote greater integration in Europe. However, a number of factors can affect success such as language & culture, level of development within individual countries and appropriate funding to carry out tasks. The task for the future will be to further develop new technology to enable teachers and adult learners to benefit more fully from experience across Europe.

Reference*s*

1. MARK, R., POUGET, M., & THOMAS, E. (2004) Adults in Higher Education: learning from experience in the wider Europe Berne, Peter Lang AG
2. MARK, R., MOORE, P. A., & VALK, A. (2004) The Alpine Manual of Good Practice http//www.qub.ac.uk/alpine
3. EUROPEAN COMMISSION (2000) *Memorandum on lifelong learning*. Commission Staff Working Papers. 30.10.2000. SEK (2000) 1832. Brussels
4. EUROPEAN COMMISSION (2001) e-Learning – Designing tomorrow's education. What's new in e-Learning, 2001. Brussels 25.5.2000 KIM (2000) 318 COM (01), final. Available at: http://europa.eu.int/comm./education/elearning/wn2001_05/
5. EUROPEAN COMMISSION (2001) Making a European Area of Lifelong Learning a Reality. Available at: http://europa.eu.int/comm/education/policies/lll/life/index_en.html
6. EUROPEAN COMMISSION (2001) European e-Learning Summit Declaration, COM (01) 18/5/2001, final. Available at: http://europa.eu.int/comm/education/programmes/elearning/summit.pdf
7. EUROPEAN COMMISSION (2002) European report on Quality Indicators for Lifelong Learning, Brussels, June 2002
8. EUROPEAN COMMISSION (2002) e-Learning Action Plan. COM (02)

9. OSBORNE, M., & THOMAS, E. (2003) Lifelong Learning in a Changing Continent. Leicester: National Institute for Adult & Continuing Education

10. SEPPÄLÄ, K., & VAINIO, M. (2004) A Step-by-Step Approach to Leaning, ALPINE Project Evaluation Report, University of Turku, Finland. (unpublished report)

11. UNESCO (1998) The World Conference on Higher Education in the Twenty-first Century: Vision and Action, UNESCO Headquarters in Paris, from 5-9 October 1998

12. http://portal.unesco.org/education/ev.php?URL_ID=1935&URL_DO=DO_TOPIC&URL_SECTION=201

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GLOBALIZATION, MODERNIZATION AND RURAL INCLUSION: THE ROLE OF COMMUNITY BASED E-LEARNING IN ADDRESSING REGIONAL DEVELOPMENT

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Background

The changes in employment and economic performance in recent years throughout Europe need to be related to changes in social structure and demographic composition. These macro-economic trends are also affected by and reflect significant regional disparities. The existence of a significant geographical periphery excluded from a developed core is a major factor inhibiting the equal sharing of the benefits of growth and learning.

An identified weakness in equitable European development is the tendency to concentrate resources in metropolitan centres and to minimize the creation of wider access for many categories traditionally excluded from mainstream participation. The development of e-learning methods and technologies offers a significant opportunity to extend the benefits of learning and development to a whole set of new actors and groups. This paper looks at how this has been done with reference to a community originated and developed multi-education centre in the south-east of Ireland.

Inclusion and Rights

A socio-economically healthy Europe will ensure that rights are equally available to all and that the benefits of learning are accessed and managed in a bottom-up fashion. The evidence of recent times can show, however, that European rights are in fact increasingly restricted. Even in the midst of its 2004 expansion with ten new Member States, these rights are sometimes seen to be available only to European citizens and not to the millions of external workers, refugees and asylum seekers who have arrived in Europe in ever greater numbers. The extension of notions of equality of rights of participation, citizenship and access to all citizens (and indeed non-citizens) is now a fundamental question for European social policy. It also goes to the core of practical applied programmes for the management of learning at local as well as national levels.

The Supiot Report[1] identified key areas where progress needed to be made in the context of an equitable European employment policy. These are:

1. Reinforcement of the right of free movement of labour and extension of that right to non-Union nationals legally resident in the European Union.
2. Resolution of the issue of trade union rights at Union level.
3. The need for a European framework for information and consultation for companies operating in the single market.
4. Recognition of the role of non-governmental organizations in the formulation and implementation of social policy.
5. Pursuit of action at Union level to combat discrimination.
6. Implementation of the fundamental principle of adaptation of work to the needs of the worker.

[1] Supiot, A. (2001) *Beyond Employment: Changes in Work and the Future of Employment Law in Europe,* Oxford: University Press.

Change, Globalization and the Irish Experience

This strategic vision for an equitable and progressive Europe faces many barriers. Among these are those of regional underdevelopment and exclusion based on peripheral location. Evidently, regional imbalance does not occur in a vacuum. Underdevelopment of employment and services is integrally linked to historic, economic and political factors that serve to concentrate wealth in a few centres of metropolitan advantage. Overcoming this barrier is a key task of the learning society and has also been a central element in Irish socio-economic policy in recent years.

Ireland has been in many respects one of the most disadvantaged and peripheral regions in Europe. Its experience of colonialism and poverty reinforced a deep sense of exclusion. The rapid economic growth and change of recent years has however changed this paradigm. One of the central elements in this transformation process has been the emphasis placed on learning, education and enhanced access to knowledge. Coupled with its status as one of the most open economies in the EU, Ireland now stands at a significant vantage point in developing new learning strategies (traditional, employer-based and community-based).

The change process in Irish society is similar to that experienced by other societies undergoing the dual processes of industrialization and integration into a world market economy. That this process commenced several centuries previously with the impact of colonization, expropriation and plantation does add originality to the Irish experience – especially in a specifically European context.

In its economic aspect, Irish society remained on the periphery of economic development for many decades after formal independence in 1922. Such industry as existed functioned behind protectionist walls while the hemorrhage of emigration exported millions of citizens who could find neither jobs nor status in their own country.

The reversal of these trends is relatively recent. Economic development, the creation of jobs and the reversal of emigration have been due to a variety of factors. The positive roles played by enhanced education, social partnership, improved accountability and community development need to be acknowledged. On the other hand, the fact that these improvements were also often reactions to external stimuli and pressures pinpoints the sometimes subsidiary and derivative nature of Irish social and economic policy formulation.

Ireland exists now as part of a wider world. Its trends and characteristics mirror those of other societies. Its challenges and opportunities echo those of other nations undergoing similar processes of social transformation. As it once exported its own people, Irish society now receives those from the underdeveloped world.

Decades of deprivation, emigration, political violence, sexism, unemployment and disadvantage are not overturned by a few years of prosperity. The specific nature of Irish social dislocation intersects and is organically connected with more widely recognized aspects of the globalization process.

E-Learning and Regional Opportunity

Globalization is the latest stage of a process that began with the age of explorations and the "opening" of the wider world to the impact of European expansion, commerce and colonization. The global supremacy of a market form of production and distribution means that we cannot view Irish economic development in isolation from wider international trends and issues.

The fact remains however that modern Irish society is displaying worrying levels of uneven development and disturbing levels of documented inequality, poverty and discrimination. Environmental degradation, homelessness, two-tier social service provision, absence of planning, asset stripping of public services and blind reliance on ever-increasing consumption patterns are but some of the indices of current social challenges.

Irish society is open, adaptable and flexible. It has benefited (thanks to language and affinity) from its connection to educational institutions and learning technologies in the United States. It has, through its diaspora, been at the centre of learning processes where it can observe and understand the real nature of the global economy. In a fundamental way, its collective experience enables Irish society to understand the voices of global impoverishment and injustice. In no small way, Irish society also finds itself at a centre of debates on the value of work in the context of the future direction of the European Union.

Membership of the European Union has had a profound effect on the sensibility and structure of Irish social institutions. This has had both negative and positive aspects. On the one hand, there has been a culture of subsidy and unilinear economic expansion. On the other hand, the European Union's emphasis on a social market model and partnership finds a ready resonance.

At another level, the European Union, through its specific funds and Community Initiative programmes, has allowed the creation of community to community linkages across the Union where much learning and exchange has occurred. This influx of money, ideas and standards has propelled Irish society to a point where it has had to address the educational, training and social needs of its citizens as of right in their country of birth for the first time since the establishment of the State.

Ireland's traditional educational structures are largely derivative and inherited from colonial British models. Indigenous traditions of learning were not valued under colonial rule. Since independence, the state has had to confront this heritage – together with its own self-imposed concession of educational policy to the Church. The divorce between academic and technical education, the rigid demarcation of subjects based on gender and the underdevelopment of science and technology are examples of this.

Recent years have seen a radical re-orientation with the State promoting new curricula, adult education, on-job re-training and an enthusiastic acceptance of the possibilities inherent in advanced technologies. Traditional learning establishments have embraced this policy in different ways. A key element has been the drive to relate education to sustainable employment creation and to promote employability and flexibility in learning contexts.

While the opportunities offered by enhanced distance learning and e-learning techniques have been adopted in some environments, this process has not been matched by an overhaul of traditional structures or by a clear approach to funding. The relationship between education and the economy has been addressed but there is still a vigorous debate about whether education should prepare for employability or for critical thinking (if not both).

The emergence of innovative and community based learning however has had an immediate impact. It has allowed a fresh discussion around issues of:

- Social inclusion
- Improved access
- Economic development
- Environmental sustainability
- Balanced regional development.

Dunhill Multi-Education Centre: a Community Learning Example

DFBA Community Enterprises Ltd. is a rural development company with an electoral mandate and a brief to encourage a bottom-up philosophy of community co-operation in its designated area of east County Waterford (some 25 km from Waterford City). This local community displays, in microcosm, all those issues of peripheral location and remoteness from decision-making centres. In addition, it has seen the demographic hemorrhage of emigration and the lack of sustainable economic development.

Founded in 1992, its mission is to "*help develop our community economically, culturally and socially by harnessing the skills and resources available*". Today, DFBA Community Enterprises Ltd. has expanded and developed into a cluster of ten added-value projects that include economic, cultural, heritage, environmental and social elements of community development. By tapping into the talents of its people it has developed a set of flagship projects designed to make rural Ireland into a vibrant, progressive, and exciting place that will attract and retain young families by adequately catering for their needs within a local, national, European and global context.

This rural development company recognized that its region would continue to experience disadvantage unless innovative measures were taken to develop its community in a sustainable way. From the outset this meant a community directed emphasis on economic development, job creation, incubator-firms, ecological perspectives and tourism. It also meant a strong emphasis on technologically advanced methods of learning, education and instruction.

Dunhill Multi-Education Centre is a community owned educational institution which has developed from this policy. It was established to enable people to get the full benefits and power of an educated mind in all aspects of their lives: at work, at home, at play. It also aims to provide equal access to learning where all will have the opportunity to acquire and develop the skills needed to participate in today’s knowledge based society. Dunhill Multi-Education centre has been guided by three key principles:

- Access
- Opportunity
- Excellence.

The mission of the centre is to provide a hub of learning excellence, to create opportunities for people to succeed and facilitate access to education for all groups. This centre, established by local community volunteers in a rural area, has the objective to promote a multi-project approach to rural regeneration. It has been extensively supported by regional and national agencies. To date its learning focus has been on courses about environmental preservation, enterprise creation, cultural-social development, computer skills and disability-related rehabilitation programs.

The Dunhill Multi-Education Centre was established in November 2000. It has the latest technological capacities to provide continuous learning programs including adult education, re-training, community development and ECDL. Its multimedia centre facilities (including broad band access, fibre optic cable linkage, video-conferencing, interactive internet based learning platforms, etc.) have enabled it to substantially expand its remit as one of the foremost community based learning facilities in Ireland. The linkage to enterprise creation, social inclusion, accrediting educational institutions, international perspectives, rural development and innovative course provision have made it a particularly attractive partner for other community based learning centres, innovative universities and transnational learning projects.

Dunhill Multi-Education Centre now comprises a:

- State of the art video-conferencing centre
- Dedicated environmental library
- Recognized FAS-Net College E-Learning Centre (internet based learning courses)
- Recognized outreach centre of the National College of Ireland, Dublin (courses in Management Supervision and Management/Employee Relations)
- Designated adult education centre for National University of Ireland, Cork
- Recognized European outreach centre of the University of Wisconsin – Stout.

The centre has also acquired new capacity through participation in EU leader and Interreg II funded projects. It plans to build on these links in meeting regional learning needs while at the same time extending its already significant networks of international projects and contacts.

Community control means that learning and educational initiatives are democratized and benchmarked against established needs. It also means a new emphasis on collaboration with universities, employers and State agencies to ensure cross-sectoral mutual advantage. The technology has opened many possibilities. But the vision is a community centred one. In time it is hoped that this vision will result in a Europe-wide network of community based learning centres (with a particular emphasis on peripheral regions and economically marginalized areas) where academic excellence, advanced flexible learning technologies and innovative courses will enable all citizens to earn best practice in and for their own communities.

Dunhill Multi-Education centre looks forward to playing a part in the construction of this network as an integral part of its local mission.

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USE OF DISTANCE AND E-LEARNING TO SUCCESSFULLY WIDEN ACCESS TO HIGHER EDUCATION FOR MATURE STUDENTS IN RURAL AREAS IN THE NORTH EAST OF ENGLAND

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Introduction

Northumbria University operates the Higher Education Foundation Course (HEFC), which is the oldest and largest access to HE course in the North East region of England and parts of Cumbria in the UK. It has a long established track record of widening access to learning and also to contributing to the successful performance of mature students at Higher Education. Building upon the success of HEFC delivered in on a traditional classroom basis, for over 3 years now HEFC has been successfully transformed into distance/e-learning format, thus further widening participation by providing study opportunities to those unable to attend classes on a regular basis.

Profile of Higher Education Foundation Course

Key Facts

It was developed in 1981 as an access course route between Newcastle College and the then Newcastle Polytechnic (Northumbria University) and has grown to 10 FE colleges and schools in the HEFC Consortium which deliver HEFC across the NE region and Carlisle. It is moderated and validated by Northumbria University and leads to a dual award – University Foundation Certificate and QAA recognised National Access to HE Award.

There are around 1700 mature students enrolled on average each year who cite many reasons for study such as a first step back into study, personal or career enhancement as well as to gain access to HE. HEFC is highly regarded by local employers, e.g. Local NHS utilise the HEFC as part of a day release training programme for its own employees

HEFC Flexible Curriculum Structure and Delivery

HEFC has over the years developed a very flexible curriculum structure as well as flexible delivery modes which have enabled more mature students to successfully combine study with work and/or family commitments. Moreover, again in response to student demands and needs, more vocational subjects such as Health Studies and level 2 units have been developed and added to the menu of subjects on offer.

The HEFC is a subject based, fully unitised access to HE course with over 25 academic and vocational subjects on offer including preparatory level 2 study skills and key skills units available. There are multiple entry points – September, January, April, and summer school delivery, full & part time and fast track modes of study, distance/e-learning, blended models of delivery and now opportunities for mixed mode of study. Moreover, there is also credit for partial completion so students can take bite sized units of learning. As they can take 5 years (although most complete in 2 years) to complete the course, it is possible for students to 'step on/off/on' the programme to combine study with work and other commitments.

Progression to HE of HEFC students

HEFC is highly regarded by HE Admissions Tutors, particularly in the north east of England. The numbers of HEFC students progressing to HE have grown steadily over last 8 years and there are around 300+ students now progressing to Northumbria University. In total around 450 students progress to HE each year with typical progression destinations – nursing, teaching, social work. There has been evidence this year of students also progressing on to Foundation degrees in local colleges.

Performance of HEFC Students Graduating from Northumbria

HEFC students progressing to Northumbria have been tracked over the past 8 years. As can be seen from the table of results, HEFC students generally outperform their peers on this evidence the HEFC is clearly fit for purpose in terms of preparing students for HE.

Classification	1999/2000 Entry	1998/1999 Entry	1997/1998 Entry	1996/1997 Entry	1995/1996 Entry
First	10% (7%)	11% (7%)	12% (7%)	8% (6%)	14% (7%)
2i	55% (41%)	46% (38%)	44% (40%)	45% (39%)	51% (39%)
2ii	33% (37%)	34% (40%)	38% (39%)	39% (41%)	31% (39%)
Third	1% (6%)	45 (6%)	2% (6%)	7% (8%)	5% (8%)
Pass	1% (9%)	5% (9%)	4% (9%)	1% (6%)	- (7%)

Notes
Brackets indicate Northumbria average
Failure rate averaged as 3% comparable with Northumbria average
Non continuation rate of around 13% better than the HEFCE Benchmark for Northumbria mature students of 16%

HEFC Distance/e-Learning Project 2000-2004

Introduction

This was a HEFCE/LSC funded Widening Participation Development Project aimed at mature students. Its aim was to widen participation in rural areas of Northumberland to those unable to undertake study via traditional classroom based delivery through work, family commitments or geographical location. This was to be achieved by transforming a very successful access to HE course (Higher Education Foundation Course) into distance and e-learning delivery format.

HEFC D/e-Learning an Overview of Key Activities 2000-2004

There was a phased rolling programme of development of HEFC subject modules undergoing transformation into distance and e-learning format. Initially the materials were produced by enthusiastic FE tutors in a variety of web, CD ROM and paper based media formats. However, it became apparent that there was a need for technical expertise to support and take the developmental process forward, to develop a standardized design and to ensure that materials produced were DDA compliant and accessibility issues were addressed. The model for development of materials was thus refined to one in which tutors provide the technical team with academic content who then develop this into e-learning materials. This has proved to be an extremely successful model particularly from the increased involvement of tutors – who in the past were deterred by their own lack of technical IT skills. Tutors are now coming forward to work with the Team to develop e-learning versions of their subjects. To date 6 subjects have now been successfully piloted, evaluated and validated with over 100 students and 6 further subjects are in various stages of production, including the HE TOOLBOX – an innovative study skills package for preparation at HE level.

Latterly materials have been migrated onto Blackboard, the University's VLE. Whilst in future this will be the main vehicle for delivery and provide a structure for the course delivery, it will continue to be supported by CD ROM and paper based material as appropriate for the subject and activity. It is envisaged that the range of communication tools and other features can be effectively used to enhance student support and the learning experience and facilitate better communication between students and staff also students and students. We are also in the process of utilizing video and WAG and other new technology, again as appropriate, to enhance the learning experience for students and put a human face to the material. Moreover, in the short term it is not envisaged that it will become a wholly online course with only electronic based tutor and student support as there is evidence that the 'human' support factor either by face to face or phone contact has been a key feature of the projects success in terms of retention and achievement (see below).

Developing effective systems for staff and student support was another major component of the project. After each pilot run evaluation feedback from staff and students was fed into the developmental process and thus the support structures are constantly being refined.

A **snapshot** of various aspects of the project now follows:

Profile of a typical HEFC D/e-Learning Student

HEFC DL student is likely to be a female aged between 25 and 40 with part time or full time work commitments and most also have childcare responsibilities. The student is likely to be new to HEFC and have access to a computer at home. Typically the student will be studying for range of reasons – return to learn, career enhancement, progression to HE (to teaching/nursing usually) or HE study via distance learning through the Open University.

Student Views of HEFC D/e-Learning

Over the duration of the project students were regularly asked to evaluate a range of aspects of their study experience. For example their rating of the learning materials has been consistently high and their views on the advantages and disadvantages of distance compared with traditional classroom based delivery were typically:

Advantages	Disadvantages
• flexibility	• isolation from peers/tutor
• self paced – manage own time	• time management – self motivation
• fits in with work commitments & care responsibilities	• technical problems
• avoids travel	

Student feedback was thus fed into the developmental process leading to refinements in both the student induction and support mechanisms in place and also the development and production of the e-learning materials.

Support for HEFC D/e-Learning Students

Students are initiated onto the course by their tutor with a face-to-face group Induction session. Those who are unable to make this induction are either given a one-to-one or a telephone induction. A Student Handbook and Induction pack for HEFC DL study has been developed and used successfully by those involved with HEFC via traditional study as well as DL students and tutors. This pack includes a preparatory study skills course, including time management etc., encourages setting up study circles and also serves as a general course handbook. It also outlines the types of support available for students.

Regular contact by tutors and support for students is offered in a variety of ways, including email, telephone, letter, the use of the HEFC website and message board (soon to be replaced with use of Blackboard and VLE communication features). Scheduled face-to-face group tutorials are offered on Saturday mornings and/or on a one-to-one ad hoc basis as required. Moreover, students are advised about the importance of making use of written feedback on assignments as part of the learning process.

Support for HEFC D/e-Learning Tutors

A Staff handbook for HEFC Distance Learning has been developed which in addition to course and subject information, outlines support mechanisms in place for staff and also disseminates examples of best practice in terms of supporting students. There is also the Distance Learning Tutors Forum – in real and virtual formats – where tutors involved in the DL delivery, meet on a regular basis. The Mentoring system in place, where experienced staff mentor tutors new to DL delivery has been successful as have the numerous staff development and training events particularly in relation to use of the VLE Blackboard which have been well attended. Moreover, the support by Technical Team has been extremely significant in both materials development and providing technical support to tutors by answering technical queries for example raised by themselves or their students.

Additional Benefits of HEFC D/e-Learning

The e-learning materials have been successfully utilized by colleges to support irregular attendees – shift workers – on traditional classroom based delivery. There was evidence from the third and final pilot year that students were combining traditional based study with DL mode of study.

HEFC D/e-Learning Results 2000-2003

	Retention Rate % of those Registered	**Achievement Rate % of those Registered**	**Withdrawal Rate**	**Failure Rate**
Traditional	77%	72%	23%	5%
DL Pilot 2000/01	77%	77%	23%	0%
DL Pilot 2001/02	79%	73%	21%	6%
DL Pilot 2002/03	78%	78%	22%	0%

Conclusions

In terms of its original aim, the results would suggest that the project has been successful in terms of high rates of retention and achievement. Destination data has been difficult to obtain but based on exit questionnaires, information supplied by students would suggest that most continue on to further study at either FE or HE levels. Another research project is planned to explore progression in more detail. Generally, compared to many Distance/e-learning courses, these are very encouraging results which also have parity with HEFC via traditional classroom based delivery. There are possibly several reasons for this relating to an overall high quality learning experience, including:

- Enthusiastic and very supportive tutors, very experienced in delivering HEFC via traditional mode. Most but not all contributed to the development of materials themselves and so were highly motivated to ensure that distance learning worked well.
- However, during second and third pilot runs new tutors who had not contributed to the materials joined the project and were able to use the materials and support the students just as effectively.
- Enthusiastic and highly motivated students – for many students on the pilot, distance/e-learning was their only study option.
- High quality learning materials and high quality student support mechanisms. These were both rated very highly by students.
- Students having appropriate levels of IT on entry to the course.

- Students having access to computers at home.
- High quality IAG and induction sessions.
- Effective staff support mechanisms in place particularly from the technical team.

This is not an exhaustive list and further research is currently being undertaken to try to determine in more detail the reasons for the projects success. One interesting further feature to emerge so far is that it was generally perceived that the support structures in place for students which were developed and honed over the 3-year life span of the original development project have been a crucial ingredient of the success. In particular, whilst various forms of electronic support are built in, it was the ‘human touch’ – whether by face-to-face contact (planned or ad hoc) or by phone contact – which all staff agreed was the significant feature.

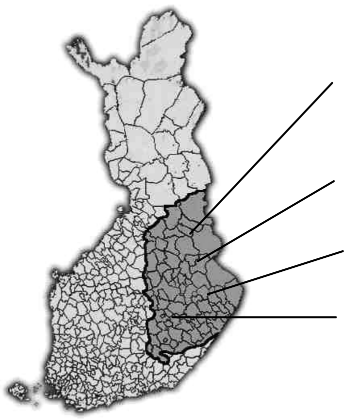
Some Current and Planned Future Activity

In addition to the research described above it is planned to:

- Fully integrate the learning materials within the University VLE platform Blackboard.
- Realise the potential of HEFC via e-learning for providing support to undergraduates with diverse pedagogic needs and academic or study skills gaps.
- Further develop distributed delivery model to widening partcipation to those without pc at home – make HEFC available online in outreach & community centres, libraries etc.
- Undertake Research – gather student progression and destination data & map student demand for online HE.
- Develop a range of progression pathways, underpinned by HEFC online/e-learning materials.
  - online foundation certificate/international foundation
  - work based learning access to HE route
  - access to foundation degrees/HND’s.

FINLAND EDUCATIONAL NETWORK
COMBINING PRESENT AND NEW FORCES AS PARTS OF A ROBUST, APT AND EDUCATIONALLY EQUAL EASTERN FINLAND

Anni Virnes, Eastern Finland Distance Learning Network
Leena Suonio, Eastern Finland Educational Network, Finland



1. Background

In Eastern Finland there is a strong need to seek for new, flexible forms of education to enhance know-how, implement educational equality and prevent social exclusion.

Northern Savo Upper Secondary Distance School 1997-1999

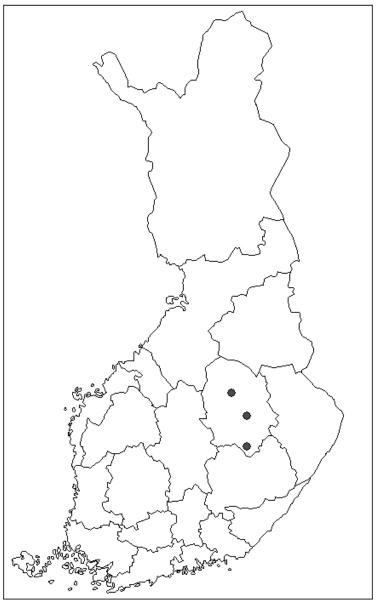
In 1997 three upper secondary schools for adults (Iisalmi, Kuopio and Varkaus) started a pilot distance learning project coordinated by the National Board of Education. The experiences gained from this preliminary project in Northern Savo created a good basis for further development of distance education and expanding it to cover the whole of Eastern Finland. To combine forces a strong and dynamic cooperative network was essential. This network aims for increasing know-how and regional educational supply to improve educational quality and accessibility.

Eastern Finland Distance Learning Network 2000-2003

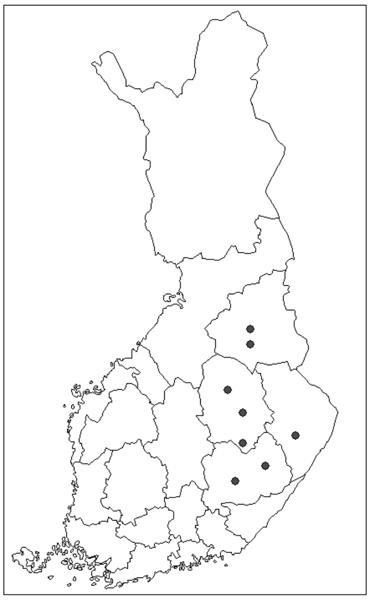
Eastern Finland Distance Learning project was launched in the year 2000. There were eight cooperating schools involved in this project. As a result, an educational cooperative network was established in order to develop a flexible and individual distance learning method. One of the main goals was to further develop operations models and services to promote and diversify distance learning. E.g. common course offerings, portal and learning environment, evaluation methods, reporting results, content production, teacher training and distance learning methods. Teamwork was used in cooperation within the operative and educational field.

Common course offerings were acquired by means of centralization and specialization, which resulted in a versatile and individual syllabus. In addition to periodical distance learning courses, new common course offerings were developed where one can study a certain subject at one's own pace. This enables students to take upper secondary school courses in a flexible and versatile way. A personal syllabus is created for each student individually based on the common course offerings. Studying mostly consists of guided autonomous learning in an open learning environment. The learning process is guided by means of multiple media.

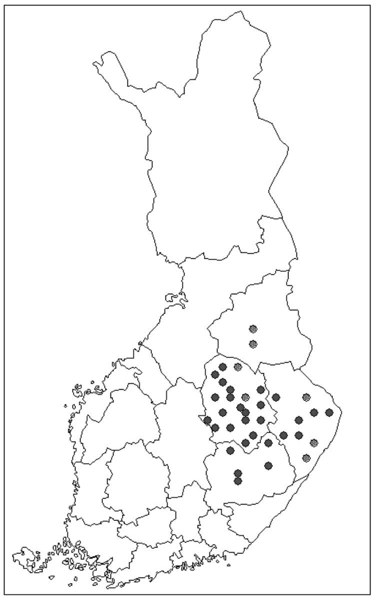
1997-2000
Northern Savo Upper Secondary Distance School
(230–387 students)



2000-2003
Eastern Finland Distance Learning Network
(573–785 students)



2004-2006
Eastern Finland Educational Network



It can be stated that distance learning has become an established part of education and schools are developing further into versatile learning centres. The project had a positive effect on the image and future prospects of the schools involved. It also had a positive impact on the professional skills of the teachers and the quality of education.

To the teachers, being involved in the distance learning project has been a question of new pedagogical thinking. It has also required a change in attitudes. The project resulted in improved ADP-skills and networking skills. The project increased the amount of further training for teachers. On the other hand, it increased the work load. One of the main pedagogical realizations was student-oriented learning process, which also resulted in changes in the more traditional ways of teaching. According to our inquiries teachers over the age of 50 had a more positive attitude to new educational culture and were eager to meet new challenges.

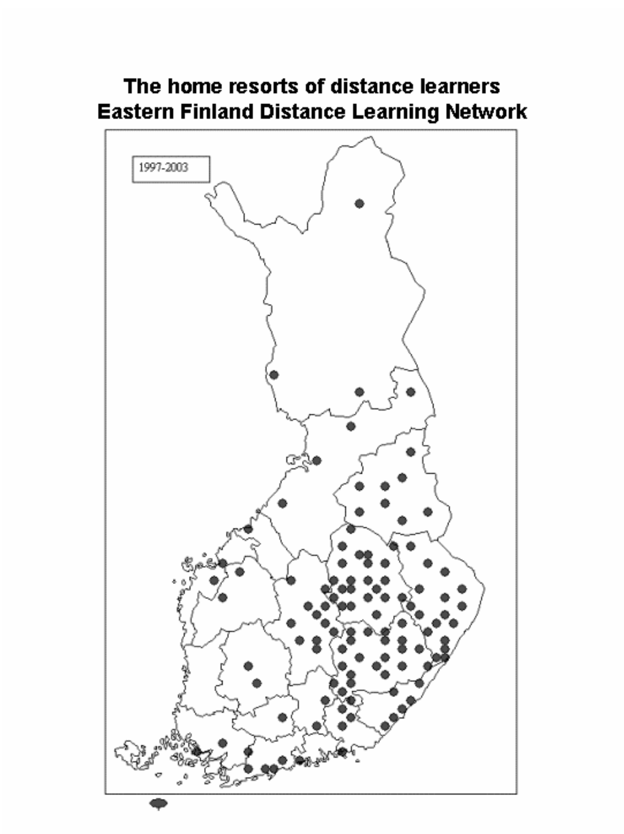
Pedagogical realizations:

- student-oriented learning process and its guidance / new concept of teaching
- guidance as human encounters
- from control to encounters, from control to trust
- success in distance studies irrelevant of age

A working teacher training model was launched as a result of common further development and the experiences gained. Problems in the training process arose from heterogeneous capabilities and lack of both technical resources and pedagogical models at hand, as well as shortage of qualified trainers and blocks in attitude. It was proved that further training for teachers should be periodical and closely connected to the responsibilities of the teachers. Collegial networks seem to be of vital importance. A successful process combines all of the following factors: pedagogy, technical skills and working communities.

Students found the distance learning method a new chance for self-development, further studies and meeting the challenges of working life. Willingness to change and success in distance studies is irrelevant of age. Commitment and self-direction are essential in distance studies. Measures have been taken to prevent and decrease the amount of drop-outs by efficient process guidance.

A flexible, dynamic, team-oriented network was established. Cooperation has lead to openness and the birth of a new operational culture both in education and administration. This has become visible in the operational culture in schools e.g. increased cooperation between teachers. As a result, new networks and regional projects were born, e.g. cooperation between universities, publishers and soft/hardware suppliers.



Achievements and results

Eastern Finland Distance Learning Network 2000-2003:
app. 2000 distance learners
app. 130 municipalities
app. 200 exams taken (matriculation examination / high school diplomas)
app. 11 400 distance learning courses taken

Common course offerings 2003-04: 435 courses, 100 of which at one's own pace.

Studies at one's own pace: e.g. Russian, Spanish, Italian, French, German, Finnish for foreigners, advanced mathematics, mathematics, physics, chemistry, hygiene, PE, ethics, psychology, other advanced courses in general studies.

Web-based course enrolment, guidance and feedback.

2. Eastern Finland Educational Network

2.1 Starting point

Eastern Finland Distance Learning Network was found to be working well and regionally significant. There was a general agreement that the operational model and the experience gained were worth putting to a wider use.

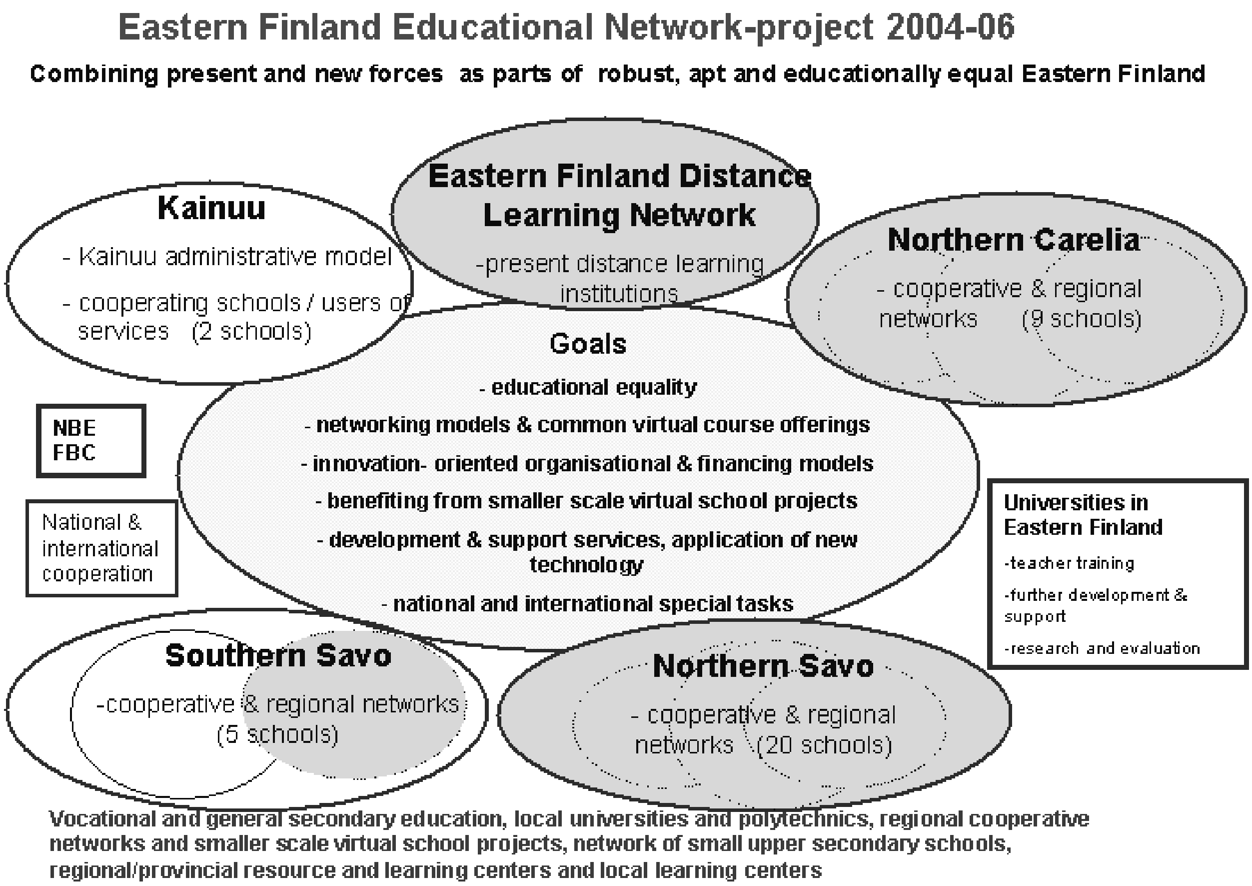
Further development in distance education and network expansion are of vital importance when considering both regional educational needs and the challenges set by decreasing population and changes in industries and demographical structure. Technological development, experiences gained from distance learning and media expertise create new opportunities to support small upper secondary schools.

The present and the future teaching staff have to face rapid advances in technology and new networking educational culture which demand new types of professional skills. In collaboration with Eastern Finland universities support and education can be developed further to meet the needs of teachers within the network. Practical aspects and models for e-learning are offered in teacher training, which encourage qualified teachers to settle in rural schools.

The challenges of the expanding network and developing it further to create an Eastern Finland educational network can be met by means of regional individualization where present developers work as leaders spreading their know-how to groups of new parties. One of the aims is to gather the expertise from smaller virtual school projects and other networking projects and put it to a wider use.

Why networking?

- European context: educational quality, accessibility and opening up to society
- Common policy objectives
  - government policy 2003: Supporting small upper secondary schools, securing distance learning, enhancing inter-school cooperation
  - educational strategies and plans
- To enable the fulfilment of the basic mission of schools in times of scarce resources
- New opportunities, challenges and tasks
  - individual and versatile educational services
  - new methods and learning environments
- New operational culture
  - openness, cooperation, new concept of teaching, learning organisation



2.2 Project goals

1. Supporting small upper secondary schools
   - combining cooperational networks and start-up
   - strengthening expertise within each school and benefiting from it by means of expanded network
   - versatile syllabus
2. Combining Eastern Finland Educational Network and groups of developers
   - common web-based forum/portal (courses, content, tools)
   - organisational and financial models which support innovation and networking
   - further pedagogical development of web-based courses and focus on quality
   - regional networking models/pedagogical networks in education and guidance
3. Individual, flexible and regionally sufficient educational services
   - common course offerings
   - further development in distance education and regionalization
   - enhancing facilities for post-graduate studies and working life by means of cooperation in upper secondary education
4. New concept of teaching and changing operational culture, further training for teachers, practical training
   - interaction between universities and upper secondary education, e.g. familiarizing with e-learning and new working environment

2.3 Project description

The project aims for combining regional operational networks in order to create an Eastern Finland Educational Network. These networks specialize according to their own expertise for the benefit of the whole network. Each network has their own contact persons and subject-based pedagogical team leaders. This supports the forming of subject-based pedagogical network and groups of developers who produce and develop contents and materials for common use.

Previous web-based materials are used to create learning objects. These learning objects are then used to build templates based on the new curriculum and the idea of process learning. This process enforces the quality of web-based learning and enhances learner-centered approach.

Common course offerings combine the syllabuses in schools with the ones of distance learning institutions. Additionally, new operational models are developed for upper secondary school education, which is carried out regionally or in a centralized way. Regional starting points and needs are considered. Common course offerings prerequisite common rules and regulations including local guidance. Each school names a key person and local counsellors. Training for these tasks is offered in a practical context when courses are guided in collaboration between tutors from various schools within the network. Simultaneously tutors gain practical training in guiding the learning process on the web.

The network increases educational opportunities for adults with the help of local e-learning centres. In collaboration with universities and partners necessary developing and support services are provided. A service portal is constructed to deliver common support services, contents and courses. Furthermore, a content pool is constructed where common course contents are restored irrespective of learning environment. For this purpose a classified database and delivery system are created.

A wide range of courses and contents requires flexible and sustainable organisational and financial models. A stable operational model will be created during the project. The Eastern Finland Educational Network will be connected with the national and the international networks.

Eastern Finland Educational Network –action plan

	2004	2005	2006
Environment -web-page, media, tools	introduction & initiation	active use & further development	operations models
Networking -organizing, cooperation, tasks, curriculum	-team building -cooperation models -task planning & implementation	-active team work -implementation & further development, new curriculum	operations models
Course offerings -common course offerings: network & regional level -guidance model	-need analysis, organizing & introduction -introduction & further development	-application & further development -developing operations & financing model	operations models
Content production -common material pool -learning objects & course templates	-classification & introduction -courses >learning objects -guidance framework	-further development of pools -learning object production	operations models
Teacher training -key persons/counselors -principals & team leaders	-guidance models/practice -leadership/teams & projects	-guidance models/practice -content production -leadership/teamwork	training models
Evaluation and quality -project, network, web-based learning	-evaluation scheme, starting point evaluation -focus on quality	-active use -common quality concept	results quality orientation
Reporting	-information scheme	-active use	reporting results

3. Summing up

Inkeri Rissanen (teacher):

“Sometimes the project felt like chaos and if I had known at the beginning what will follow I wouldn’t have had the courage to come along. Now that I look back, I realize how much this project has enriched school life. Many new issues may first seem compulsory but surrounded by a gentle and supporting atmosphere I have noticed that small bits develop into a new kind of school which is not tied to strict timetables in small classrooms. Trust and responsibility have increased. We former teachers, now tutors, should not carry our students on our shoulders but keep them in our hearts. It’s our duty to lead the students to understand that only they can teach themselves. We can guide them to find the necessary resources and the wings that take them to their goals.”

Jenna Jokinen (student):

“Now that I have been taking distance studies for about a year, I can state that I’ve made a good decision when I dared to start. Distance learning is not as difficult as I first thought. In fact I have noticed that I can concentrate on my studies much better that in a noisy classroom.

I don’t take exams at school either because I could arrange a place to take the tests near my home. I live near the prison in Sukeva and I got the permission from the prison governer to take my tests there. I have a test supervisor who is responsible for organising the tests. Everything has worked really well.

I also take plenty of other than compulsory courses, for instance foreign languages. I get guidance in German and Italian from Kuopio. I particularly enjoy studying foreign languages. In spring I will take a course in Spanish – I can hardly wait.”

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HOME CARE IN EUROPE: COMBATING SOCIAL EXCLUSION THROUGH APEL/VALIDATION ON A DISTANCE LEARNING COURSE IN THE CARE SECTOR

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Kate Sevón and Helen Hellberg, Swedish Agency for Flexible Learning, Sweden

Introduction

At the start of this millennium, the EU Council announced in Lisbon its aim of becoming the most dynamic knowledge based economy in the world through the creation of better jobs and greater social cohesion. Lifelong learning is a vital tool for such capacity building, and distance and e-learning an important vehicle for reaching out to those previously excluded from traditional learning opportunities. The focus of this paper will be the description of an international project, 'Home Care in Europe', that has at its core, the aim of combating social exclusion through offering learning opportunities (via distance and e-learning) in the care sector. This is a sector that, despite its fundamental social value, includes many poorly paid workers who have received little in the way of formal education. The project is particularly aimed at those working or intending to work in domiciliary care of the elderly, an area where the need for workers is growing throughout Europe, and where there is a significant shortage of trained labour in many countries. Members of the international partnership (funded by Leonardo) are between them producing a distance learning course which will offer flexible, high quality training for those working with elderly people in their homes. There are five countries involved – Sweden, Finland, Italy, Wales (United Kingdom) and Hungary, and while there will be variations in the way the programme will be used in the different countries depending on local conditions, there will be a common core which will enable those who have completed the course in one state to transfer their skills to another European country and to have this experience recognised. We will focus on three aspects of the project, 'Home Care in Europe' in this paper, and demonstrate how each of them meets the aim of capacity building at a European level. The project aims to achieve this, first by the nature of the learners that are being targeted, second by the use of flexible learning, and third by the inclusion of APEL (Accreditation of Prior Experience and Learning), also known in some countries as validation or recognition of prior learning, in the design of the project.

Social Exclusion

The main target group of potential learners in this project are those who are already working in the care sector, both paid workers and those whose experiences are as unpaid carers, particularly of elderly relatives. By targeting this particular group of learners we are accessing those who are least likely to be able to avail themselves of lifelong learning opportunities, namely working-class women, often middle-aged, with little formal education. When they are in employment, this is a group who often have few opportunities for any kind of training or lifelong learning experiences, other than at the most basic level. As Jackson (2003) says, referring to women who work as care assistants within the British National Health Service

> 'Working-class women, then, and especially those in minority ethnic groups, are likely to find themselves structurally located in their work, with little opportunity to enhance learning. (…) It is likely to be disempowered groups and individuals, including working-class women, who find themselves structurally located in a basic skills agenda set by institutions such as the NHS' (Jackson 2003, p. 377)

Employers as a whole are not likely to offer learning opportunities of quality to those who are on the lowest rungs of the employment ladder within the sector, in part because there is often a shortage of workers who are willing to carry out these jobs at the wage levels typically available, and employers may not wish to offer training that will encourage hard-to-replace workers to seek alternative jobs! When they are offered some opportunities they are likely to be as Jackson says, of the most basic sort, and often taking the form of specific training rather than more empowering learning opportunities. In contrast the Home Care in Europe project is designing a genuine learning programme, not just basic job training. Although it will develop and foster skills needed for a particular work environment, it will, in addition, encourage the development of self-esteem, creativity and independence and act as a springboard that will enable learners to progress onto further learning opportunities of their choice.

It is likely that in addition to those working in the sector, some of those accessing the programmes will do so because of their experience as unpaid carers within the homes, often of their own elderly relatives. There is evidence within the UK context and others (Pascall 1997) that this is a group who have generally been severely disadvantaged both in employment terms and in being able to access learning opportunities. When they are in a position to enter employment, for instance after the death of the person for whom they have been caring for, they are likely to be ill-prepared for employment in terms of conventional experiences and qualifications, and also lacking in self-confidence and necessary contacts if they have been tied to caring responsibilities within the home for several years. By offering flexible learning opportunities and acknowledgement of the value of the informal experiences gained through caring (see later), the provision of the Home Care project is well-tailored to meet the needs of this group.

In several of the countries involved in the project the learners targeted are likely to include recent migrants. In some European countries migrants constitute a significant part of the labour force in this area of work, and in other contexts they will be particularly targeted for the project. Migrants are again a group who face major problems of social exclusion in many European countries (Walters and Freda 1999) and also encounter serious obstacles when trying to gain employment commensurate with their qualifications and experiences (Clayton 2001). The rate of unemployment is likely to be higher than indicated by official figures, with older married women in particular often settling for a housewife role. In many European countries, migrants, particularly recent migrants, have great difficulty in obtaining employment, and are likely to be found in poorer paid sectors where there is a shortage of labour. They have difficulty in having their previous qualifications recognised by employers, and may also find it difficult to access suitable educational courses. For some, limited language abilities and lack of cultural familiarity will create additional difficulties, as well as the discrimination which they will encounter in many countries. While some European countries have significant provision in helping migrants find suitable work, and will also offer training, in other countries they are largely left to their own devices and have to compete with others for limited learning and training opportunities.

It can be seen therefore that in targeting women, carers, and recent migrants, the Home Care project should contribute to capacity building by offering lifelong learning opportunities to those generally excluded from these.

Flexible learning

Many of the above groups will be currently excluded from most learning opportunities that are available because of the inflexible ways in which most courses are delivered. Those already employed within the domiciliary care sector may frequently be working unsocial hours, making it very difficult for them to attend classes held during the day or even in the evening or week-end on a regular basis. Those who are unpaid carers within their own homes face even greater difficulties in accessing classes at local colleges if they have no relief care. Even when the timing of classes is not a problem, location may be. In rural areas there may be no courses available in a nearby location, and many potential learners may not have access to private transport to get them to the nearest centre. Older women in particular are less likely to be able to drive than most groups of the population, and where there are family cars these may often be needed by other members of the family. Public transport in rural areas has declined in many European countries over the last two decades (Francis and Henderson 1992), and although car ownership has increased, those who do not have access to their own vehicles are probably more isolated from social and educational opportunities now than they used to be. In urban areas, there may be more public transport available but in some countries women and those from other ethnic minorities may not feel comfortable using it after dark (Jackson 2003).

The above reasons are some of those why it was decided that the Home Care in Europe course should be delivered as a flexible, distance and e-learning course. By offering flexible learning solutions in the programme the learners will be able to choose the time, place, tempo and structure of her/his studies. Another reason was of course the particular experience and expertise of the lead partner (CFL) in the development of such courses. With the increasing importance of ICT within the daily lives of many European citizens it can be seen as a valuable way of bridging lifelong learning and social inclusion (Osborn, Gallagher and Cloonan 1999). It is also of particular value for learners in rural communities (Cannell and Hewitt 2003.) However, it is important that a distance learning course if it is to attract those with little recent experiences of education is designed to be as accessible as possible (WCAG priority 1) including, for instance, those who have dyslexic problems or poor literacy skills. Building on partners' previous experience the Home Care in Europe-course will be modularised and will include learning objects, many of which are not text-based. Examples of these will be given in the conference presentation.

Another issue that needs to be considered is that ICT may be gender biased. Gunn et al (2002) have pointed out that women may be less comfortable, and have less access to ICT than men. There is anecdotal evidence that even in households where there is a computer and web access, not all members of the family have equal access to the equipment or the skills to use it. In households with children, parents, and mothers in particular may in fact rarely use the home computer. However, it is likely that this is a temporary phenomenon as the use of ICT becomes more and more widespread in homes and workplaces throughout Europe, and across the whole population regardless of age and gender. In some European countries local 'learning centres' – meeting places where adult students can get both support and technical resources for their studies – are established. Nevertheless, we are aware that at the present time access to ICT varies considerably across the five countries involved, and both a paper-based and web-based format for the course are being developed.

The design of the course material is a crucial issue and considerable attention is being paid to this. It is likely that the learners recruited to this course will generally not have much previous experience of using ICT. Previous research (Barrakett 2001, Selwyn, Gorrard and Furlong 2003) has indicated that on the whole, those who follow courses using ICT tend to be those who have already used the technology rather than those for whom it is new.

> '…ICT increases educational activity among those social groups who we know are more likely already to be learners rather than widening participation to those who have previously not taken part in formal or informal learning.' (Selwyn, Gorrard and Furlong p. 20)

An important feature of the project therefore is the design of the course which will be accessible and appealing to all, especially to those who might not see computers as being for them. Examples of these will be given in the conference presentation.

APEL/Validation

A central feature of the project is the inclusion of APEL/validation at the design stage of the course. We strongly believe that learning can, and does, take place outside formal learning environments and that this learning should be recognised and accredited. As the European Memorandum for Lifelong Learning (European Commission 2000) states

> 'until now *formal* education has dominated policy thinking, shaping the ways in which education and training are provided and colouring people's understandings of what counts as learning' (p. 8).

However as the memorandum also says, formal education is only one mode of learning among three, the other two being non-formal education and informal education. Non-formal education includes all learning activities that do not lead to formalised certificates, and informal education is learning that takes place in everyday life and may not be intentional or even recognised as learning. Increasingly, all these forms of learning, although different, are recognised as having equal value in their own right. Accepting this view has major implications for social justice and equity as it is a way of recognising and valuing diverse learning forms that have traditionally had no status at all in academic contexts. Not surprisingly, in most European countries, although the APEL rhetoric may be accepted, the practice lags behind and relatively few individuals and institutions engage with the process to any major extent. There is a clear need as others (Cleary, Whittaker and Gallagher 2001) have indicated for increased resources across Europe to support the use of APEL. Where there has been development, it has mainly been as university level, with the use of APEL still being limited at other educational levels. It has also proved easier to accredit non-formal learning for instance that carried out in the workplace, than informal learning gained in the home or in the community (Evans and Kersh 2003).

The particular groups that we are focusing on in this project have much to gain from the inclusion of APEL as an integral part of the project. Many are women who will have gained relevant experiences of caring in the home, but the skills acquired through this will largely have gone unrecognised by any learning institution. Even less likely to be recognised are the skills of women migrants. As Clayton (2001) says in her paper on the recognition of prior learning in the training of women immigrants

> '…in many cases women's abilities are still undervalued, partly from a lack of appreciation of the potential of women immigrants, and partly because many women themselves do not recognise the values of their skills, abilities and experience. This lack of recognition by women themselves may be because they may not have been valued in their country of origin; they may not have received vocational guidance in the host country; and they may suffer low self-esteem as a result of their experience of immigration.' (p. 81)

The tendency to ignore learning that has taken place outside traditional contexts is found both by individuals themselves, and by institutions who clearly have their own vested interests. The process of accrediting this type of 'tacit' learning means that, in the first place, it has to be recognised and accorded value by the individual learners themselves. Whereas a conventional student generally learns what they are given and recognises it as *public* knowledge, an applicant for APEL/validation has to transform *private* knowledge and skills acquired through undetermined experiences into *public* learning in order to gain the benefits associated with the latter type of learning. This demands a substantial level of self-consciousness and reflection that does not come easily to many. It also involves the applicant in a degree of negotiation with a learning institution in order to gain what may be seen as a privilege but should more appropriately be considered a right. Research findings show that individuals who have undergone this process gain confidence, and are more likely to continue with their learning. For instance Evans and Kersh (2003), summarising their findings from a study of 60 different learners in London say

> 'The case studies considered show that high recognition of adults' skills and competences is associated with a number of positive outcomes such as increased confidence, self-assurance, motivation to develop new skills as well as higher involvement and active social interaction in a learning or workplace environment.'(p. 121)

However Evans and Kersh supplement this with a caveat as their study showed that applicants who had their APEL claims rejected tended to lose confidence and become more isolated and socially excluded than they were before embarking on learning. This demonstrates the importance of individual support and advice to students going through the APEL process so that this can be avoided.

A particular challenge we face in the Home Care in Europe project is the need to make it possible for applicants to produce APEL/validation claims through the medium of distance learning. We are drawing on materials already produced by other projects, for example the Social Inclusion through APEL project (Cleary, Whittaker and Gallacher (2001)), and producing written guidance for learners, institutions and employers on the process of making claims. We are also experimenting with the format used for making claims so that they are not over reliant on individuals having good written skills – crucial given the type of learners we will be attracting.

The inclusion of APEL/validation as part of this project is one of the major ways in which the project can be seen as contributing to capacity building. By devising the means for recognising the skills that already exist in this particular group we will be developing both the capacity of individuals, and also the social group to which they belong. We are particularly interested in what Whittaker, Cleary and Gallacher (2002) refer to as 'the transformative dimension of APEL', and the ways it can facilitate social inclusion. We see this as an area where there is still much development work to be carried out, of which the work for this project is a part.

Conclusion

The need to increase the capacity of individuals and through these of communities is paramount in Europe, particularly in its enlarged form. Workers in the domiciliary sector, despite the social value of the work they do have been offered few meaningful learning opportunities that they can easily access. In delivering learning to socially excluded groups, and by using appropriately flexible methods, and incorporating the recognition of different sorts of previous learning, the Home Care in Europe project offers a radical approach to capacity building. Finally, in sharing tasks and expertises among very different organisation in five European states we are also as the team working on the project building capacity in our own organisations and cultures. It is hoped that the benefits from this will ultimately accrue to learners.

References

1. BARRAKETT, J., (2001*) Equity Online? The Use of Communications and Information Technology in Higher Education*, In Researching Widening Access: international perspectives conference, Glasgow: Centre for Research in Lifelong Learning
2. CANNELL, P. AND HEWITT, L. (2003) *Working with partners in the community – the experience of the Open Road programme in Dumfries and Galloway*, In Experiential: Community: Workbased: Researching Learning outside the Academy, Glasgow, Centre for Research in Lifelong Learning
3. CLAYTON, P. (2001) *Hidden Treasure: the development of European concepts concerning recognition of prior qualifications and competencies in the vocational training of women immigrants*, In Researching Widening Access: international perspectives conference, Glasgow: Centre for Research in Lifelong Learning
4. CLEARY, P., WHITTAKER, R. AND GALLACHER, J. (2001) *Social Inclusion through APEL: The Learners' Perspective – National Report for Scotland prepared for the EC*: Socrates-Grundtvig Project, Glasgow: Centre for Research in Lifelong Learning
5. EUROPEAN COMMISSION (2000) European Memorandum for Lifelong Learning
6. EVANS, K. AND KERSH, N. (2003) *Recognition of Tacit Skills and Knowledge in Work Re-entry: modelling of learning processes and outcomes*, In Experiential: Community: Workbased: Researching Learning outside the Academy, Glasgow, Centre for Research in Learning Learning
7. FRANCIS, D. AND HENDERSON, P. (1992) Working with Rural Communities. Macmillan: London
8. GUNN, C., FRENCH, S., MCLEOD, H., MCSPORAN, M. AND CONOLE, G. (2002) *Gender issues in computer-supported learning.* Alt-J vol. 10, part 1, pp 32-44
9. JACKSON, S. (2003) *Lifelong earning: working-class women and lifelong learning.* Gender and Education, vol. 15, no. 4
10. OSBORN, M., GALLAGHER, J. AND CLOONAN, M. (1999) Researching Lifelong Learning: an introductory briefing. Glasgow, Centre for Research in Lifelong Learning
11. PASCALL, G. (1997) Social Policy: a new feminist analysis. London: Routledge
12. SELWIN, N. GORARD, S. AND FURLONG, J. (2003) *How do adults use ICTs for learning?* Adults Learning, vol. 15, no. 3 pp 18-21

13. WALTERS N. AND FREDA. B. (1999) The Refugee Partnership Project Report: A Comparative Study of Bosnian, Kurdish, Somali and Senegalese Communities in the UK, Germany, Denmark and Italy. School of Educational Studies, University of Surrey

14. WCAG: Web Content Accessibility Guidelines 1.0 see http://www.w3.org/TR/WAI-WEBCONTENT/

15. WHITTAKER, R., CLEARY, P. AND GALLACHER, J. (2002) *Accreditation of prior experiential learning: an altered state of learning?* In R. Edwards, P. Gray, B. Morgan-Klein, Murphy, M. and Tett, L. 'Cultures, communities and citizens: the altered states of adult education?', SCUTREA conference, University of Stirling, Scotland

LEARN MORE BY SPENDING LESS TIME IN SCHOOL? FLEXIBLE AND ELEARNING METHODS AS A MEANS TO SUPPORT REGIONAL AND LOCAL DEVELOPMENT

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Abstract

Can learning become more efficient and individually targeted when designed by flexible eLearning methods?

Open and distance learning in the sparsely populated province of Jämtland has its roots in the early 1990s. This paper deals with some of the results of methods developed during the last three years. The project has served several parts of the educational system – both upper secondary education and training for young people and adult education. In many cases both systems have been mixed. Flexible education can facilitate individual learning to meet very specific needs. After more than ten years ODL has brought added value to life and made a difference for many people – both as individuals and in the service to citizens and local companies in remote areas.

Background

The Foundation of Knowledge and Competence (KK-stiftelsen) has given financial support for the development and further achievements of the Networked Upper Secondary School (from now on called NVG) in the province of Jämtland in the middle of Sweden. A final phase was implemented in the period of 2001-2003 and was focused on flexible learning.

The general idea of flexible learning within NVG is:
individually adapted learning based on the personal responsibility of the student, broad ICT-use and that the learning activities are partially independent of time and place.

It can be said to operate on three levels as

- flexible studies – student level
- flexible teaching – teacher level
- flexible education – organisational level

Upper secondary education in Sweden and adult education – an introduction[1]

Every municipality in Sweden is required by law to offer all students who have completed compulsory school an upper secondary education. In principle, students also have a right to receive their first choice of program. Upper secondary education is free and a non-compulsory form of school.

The right to begin an upper secondary school program applies up to and including the calendar year in which the student turns 20.

Swedish upper secondary school gives students the basic skills needed to live and work in the community, and prepares them for further study.

[1] Swedish Upper Secondary School http://www.skolutveckling.se

National Program

As of 2000, there are 17 national programs, all of which are 3-year programs. The programs provide a broad general education and eligibility to study at the university or post-secondary level. Thus the school system offers both education and training.

The programs are:

- Child and Recreation/Recreational, Educational and Social Activities
- Construction/Construction, Building, Painting, Metalwork
- Electrical Engineering/Automation, Electronics, Electrical- and Computer Technology
- Energy/Operation and Maintenance, Marine Technology, Heating, Ventilation and Sanitation
- Arts/Art and Design, Dance, Music and Theatre
- Vehicle Engineering/Aeronautics, Coachwork, Motor Vehicle Mechanics and Engineering, Transport
- Business and Administration/Business and Services, Travel and Tourism
- Handicrafts/Various trades and crafts
- Hotel, Restaurant and Catering/Hotel, Restaurant and Catering Services
- Industry/Local specializations, country-wide recruiting
- Foods/Local specializations, country-wide recruiting
- Media/Media Production, Printing Technology
- Use of Natural Resources/Local specializations
- Natural Science/Mathematics and Computer Sciences, Environmental Science, Natural Sciences
- Health Care/No national specializations
- Social Science/Economics, Liberal Arts, Social Sciences, Languages
- Technology/Local specializations

There are also specially designed programs and individual programs.

Every program comprises 2 500 upper secondary credits. The guaranteed number of instruction hours varies from program to program. For Natural Science, Social Science, and the Arts, the total is 2 180 hours, and for other programs 2 370. All of the national programs include the eight core subjects of: English, the Arts, Physical Education and Health, Mathematics, General Science, Social Studies, Swedish (or Swedish as a Second Language) and Religion. Together, the core subjects add up to 750 credits. Credits aquired by distance educational programs are given the same value as "traditional" courses.

Upper secondary education for adults

Adult education is a special state initiative. Students aged 20 or older may attend municipal adult education (Komvux) programs at the upper secondary level, an option being chosen more and more. Komvux also offers continuing education programs that provide the student with specialized knowledge and skills in a particular occupational field. Adult upper secondary education and the regular upper secondary school for youths share the same syllabi and also the same curriculum.

Six different development paths in NVG

As shown above the combined profile of the upper secondary schools to deliver both theoretical education and vocational training means that it has a very important role on the local labour market. NVG is a very good example of best practice ICT supported flexible learning or ODL, covering six somewhat different parts – meeting the needs of the local society:

1. The Social Sciences program supported by ICT
2. The Health Care program at a distance
3. The Course Market
4. ICT tools
5. Teacher training and in service training of staff
6. Organisational and administrative matters

SPIT – Learn more spending less time in school?

The most traditional program engaged in NVG is SPIT. It offers a university preparatory program of three years. In Östersund the Palmcrantz school has focused on project studies for longer or shorter periods throughout the school year. Most of the time the students spend three days organised by ordinary lesson work with two days for individual and/or group work or at home if needed. These studies are cross curricular and make rather intensive use of ICT for communication, collaboration and presentations.

The students witness that they are very satisfied with their studies and that they get a more comprehensive understanding through the wholistic apporoach. They aslo maintain that they get better prepared for university studies and that they save time as the different subjects are integrated in the projects.

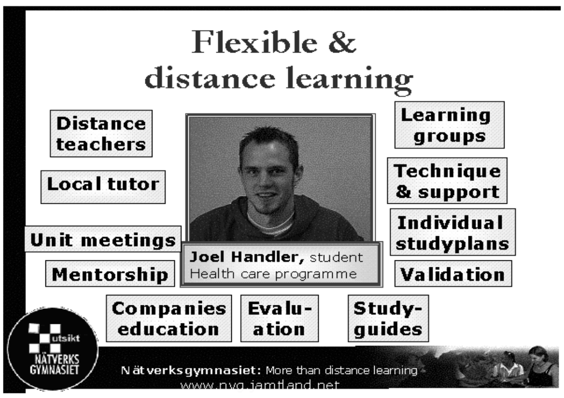
As Edström[2] has shown both students and teachers experience a more personal study situation. The transactional distance between teacher and students is often shorter in ICT supported courses of projects.

Best practice maintaining and developing local health care education

Another path to cover specific needs is the development of the Health Care program at a distance. This training program offers a vocation as assistant nurse if the whole program is chosen.

At many study centres throughout the province students gather to communicate and collaborate through e-mail and videoconferences. According to the individual situation of the learner validation is used to offer course content, which enables the student to reach his/her goal at an own pace and place. NVG has thus created a further development of what Carl Holmberg has pointed out as scarce – individual solutions.[3]

The situation of the student is illustrated like this:



[2] Rolf Edström Flexible Education in the Upper Secondary School: Extended Classrooms and a Decreased Transactional Distance Doctoral thesis, Uppsala Universitet

[3] Holmberg, C (2003) Mångfald kräver mångfald Artikel i Per Distans Nr 3 2003 eller http://www.sverd.org

The result is a strengthened infrastructure in small towns and villages. It also contributes to the labour market for local companies, since the students acquire computer skills. They also might want to take other vocational courses once they got used to the idea of becoming a student.

ICT educational tools and study centres in a regional strategy

The province early developed its own First Class conference support system. This now has a coverage that is higher than any other example in Sweden. This is unique and made more efficient by new linked tools such as online evaluation, short video clips or entire web based courses etc. This advanced First Class system is the technical infrastructure on which the network of study centres in the province is built. Though the study centres are not part of the original NVG project it facilitates easy to use technical help with updated advanced tools suitable for mature eLearning use, demanded by users who can formulate their needs.

The course market

The idea behind the course market was the fact that the province needed to share their teacher staff as well as the costs for development of learning material. For some courses too few students signed up in each municipality. But if the course offer was turned into a flexible one using ICT methods, it could be defended as a cost.

So seven municipal bodies divide the responsibility for course production among them and display their products on an open online market. It is also possible for other municipalities in other parts of the country to register their courses. The courses are categorized and searchable for whoever is looking for a course. Online registration is possible, and counselling is offered by phone or face to face. Different municipalities take the responsibility for tutoring.

More than 130 courses are offered. There is a great diversity of subjects and courses – languages, science courses, health care etc.

Costs for tutoring, development and support systems need to be covered in a well designed system of agreements between the different municipalities. This means that co-operation is a paramount concern and a decisive success factor. Their mechanism for sharing costs, displaying the courses in an intelligible way, counselling etc. still needs elaborating[4] but the overall impression is that NVG has created a model for sharing development costs and further the diversity of courses offered.

Organisational matters

After more than ten years of experience there are many things learned in the areas of school leadership and organisation facilitating pedagogical change. The end result was an agenda of 21 items, here presented in somewhat shorter list:

- Flexible learning can be used in combinations with classroom based courses as well as with distance courses
- Flexible learning is a key factor of development for students with special needs.
- The contact between students and teachers becomes much closer when flexible learning methods are used
- Learning can get very individualised through flexible methods
- Communication through computers (e-mail and fora) can strengthen "silent" students
- Flexible learning paves the way for creative students
- Tutoring is a new job in the schools teams in many schools

[4] Erica Sahlin, En utomståendes betraktelser – Utvärdering Nätverksgymnasiet Jämtland 2001-2003

- Co-operation and team work are decisive in the professional development among the teachers
- School management is important both as owner of the development process and as support for and facilitators of change
- Sometimes there is a need to make teachers use digital equipment even if they don't see the need for it at first glance just to convince them that they have the ability and power to succeed
- Teacher training is the single most important factor to bring staff on board the development process
- Don't organise too much, but make possible for teacher to meet and discuss thus enabling a smooth platform for teacher co-operation

Their own book

In December 2003 NVG published a book called "Flexible learning"[5] in which almost all teachers and tutors involved on 256 pages depicted their versions of flexible learning. It illustrates that there is no relation between the age of the teacher and his or her attitude towards development of flexible methods. Somewhat unexpectedly young colleagues often have more difficulties to adopt than their older team members. This indicates that readiness for change might be more common among teachers who have their own platform of experience to relate to. The book promises a very strong impact on professional discussions as it shows solutions and models easy to copy in everyday educational life. It has a very special value as a true handbook for teachers and school managers by colleague teachers and leaders.

Summary

The work of NVG has meant that a whole new model has been created for schools and educational units interested in development of learner autonomy, flexible learning and eLearning. The last phase of NVG brought new results in the fields of validation of former training, collaboration using ICT and organisation of independent learning. It has indicated new structures supporting individualisation among both young and adult learners and it has brought a deeper understanding of the interaction between learners, tutors and teachers. It has also offered new ways for educational institutions to respond to local and regional needs of learning and skills in local labour markets.

Last but not least – teacher and staff training are of paramount importance since flexible learning is first of all a question about fundamental values!

References

1. ROLF EDSTRÖM (2002) *Flexible Education in the Upper Secondary School: Extended Classrooms and a Decreased Transactional Distance,* Doctoral thesis, Uppsala University
2. CARL HOLMBERG (2003) *Mångfald kräver mångfald* Article in Per Distans Nr 3 2003 http://www.sverd.org
3. ERICA SAHLIN (2003) En utomståendes betraktelser – Utvärdering Nätverksgymnasiet Jämtland 2001-2003
4. MONICA SANDSTRÖM et al (2003) Flexibelt lärande Nätverksgymnasiet, Bräcke

[5] Flexibelt lärande Nätverksgymnasiet, Bräcke 2003

DISTANCE EDUCATION PERSPECTIVES: TEACHING ENGLISH LANGUAGE IN TOURISM STUDIES AT THE UNED (SPAIN)

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Introduction

Tourism is one of the most important economical activities in Spain, and it has been since the late 1940s. The people who worked in the tourism industry back then did not have a formal education to prepare them for their work. Little by little, small private schools started turning up that provided the needed training and professional preparation for the workers of the tourism industry. The Ministry of Education also established the first hotel, restaurant and tourism school in 1944, the *Escuela Superior de Hosteleria y Turismo,* and later, in 1963, the Ministry of Information and Tourism founded the *Escuela Oficial de Turismo* in Madrid, which offered the highest level degree available in the Tourism field. That was where all students attending private schools had to pass their final exam.

This school was world-wide well-known, however, it took a long time before universities created an actual 3-year degree (Diplomatura) in Tourism. This did not happen until 1996, and nowadays most universities in Spain offer the possibility of Tourism studies (Degree, Master's or even Doctorate).

Background

One of the universities with a Degree in Tourism is the UNED. This is the largest distance university in Europe. It combines distance teaching with a unique network of "centros asociados", which is a system that offers students the option of going to actual classes with the so-called "tutors", hired especially for that purpose. They work in those associated study centres all over Spain and the world. Tutors serve as information bridges for the communication of needs and doubts of the students with the lecturers or professors. They prepare the programmes and the subject materials at the university's headquarters and go to the associated centers some times a year to personally give lectures and to be members of the examinations board. They also have to correct the exams back at the headquarters.

The first year of the Tourism degree at the UNED started in the 2002/2003 school course, with a very successful number of students. As a matter of fact, more than 4000 people registered in that first year.

One of the required 1st year subjects was a 10 credit English Language course. Our challenge was offering a language course without much teacher-student personal contact especially in the field of Tourism, where English played such an important role. Another influencial factor was the large number of students that were enrolled in the subject.

English Language in Tourism Studies

To teach the subject of English Language, we used "traditional" printed materials, such as books, workbooks, etc. (with audio CD), and some complementary radio and television programmes per year. Furthermore, for the distance learning, thanks to the university's WebCT, virtual courses were used and telematic tutorials were provided.

The tools: The WebCT

The Virtual Courses include various types of learning materials such as:

- Communication tools which allow access to the tutor at any time of the day (e-mail, chats, conversations in real time, and discussion forums) where the students can ask questions, read other students' inquiries, and check the answers the tutors have given to other questions that have been presented. These communication mechanisms will also be the ideal place for the tutor to present aspects that are considered relevant to the course.

- Unlimited access to their own knowledge acquisition and assesments made by the professor at any moment throughtout the course.
- Updated information about the class.
- Exams, projects, and self evaluation tests.
- A glossary of terms which can be accessed independently or through links from content pages of the Virtual Course.
- Didactic study material organized by topics, content units, etc. This material is not available anywhere else, and it follows up and clarifies the material presented in the textbook. The students are able to study the material that must be covered throughout the course by following the book and they can also review the information available in the Virtual Courses which permits the access to different contents (videos, annimations, outlines, orientations, etc.) if they desire, free of charge. All these resources will enable them to better understand and learn all aspects of the subject.
- The possibility of carrying out group projects without having to go anywhere.

The use of the Communication Tools allows access to the so-called *Telematic Tutorial* which provides the possibility of working with the tutor through the computer at any time or place. The *Telematic Tutorial* does not interfere with the access to the traditional in-person tutorial in the associated centres, so the students can take advantage of both options simultaneously.

During this school year, all of the students enrolled at UNED for the courses and degrees mentioned below have been able to carry out their studies on the network. This option does not, however, exclude the possibility of attending the tutorials in the Associaded Centre, on the contrary, these telematic tutorials at the UNED back up the classes and they are free for the students.

For each telematic course subject offered in every Associated Centre there is a unique class with its own forum. This is where the professors and tutors will respond to the students' inquiries and comments.

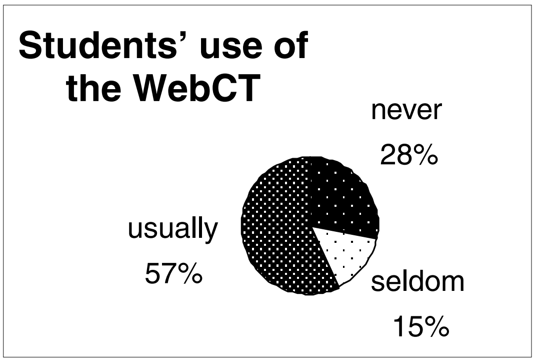
The access to this tutorial module and to the Virtual Courses, which are more services provided by the distance university, will be carried out through the portal of UNED. A user ID and password that can be obtained at the Virtual Secretary (the UNED portal) is necessary to access these. This ID and password will also permit access to other services like academic files consultation and UNED student e-mail.

The Web CT of the subject of *English Language I* offers:

- A self-evaluation test where the students can find out if they have at least the upper intermediate level of English which is required to sign up for this class. This test is carried out by the professors of the course thanks to Hotpotatoes software.
- Content module. This is where the class program and summary of the main contents in the text are presented. Módulo de evaluación.
- Calendar. This is where the most important dates are indicated for the deadlines of written essays, projects, exams, etc.
- Evaluation. It shows examples of distance evaluation tests and final exams, as well as the results.
- Important information (last minute changes, exams, etc.)
- Forum. It is divided into several forums according to the students' interests and needs.
- Chats. Students can share some sessions with their tutors and teachers.

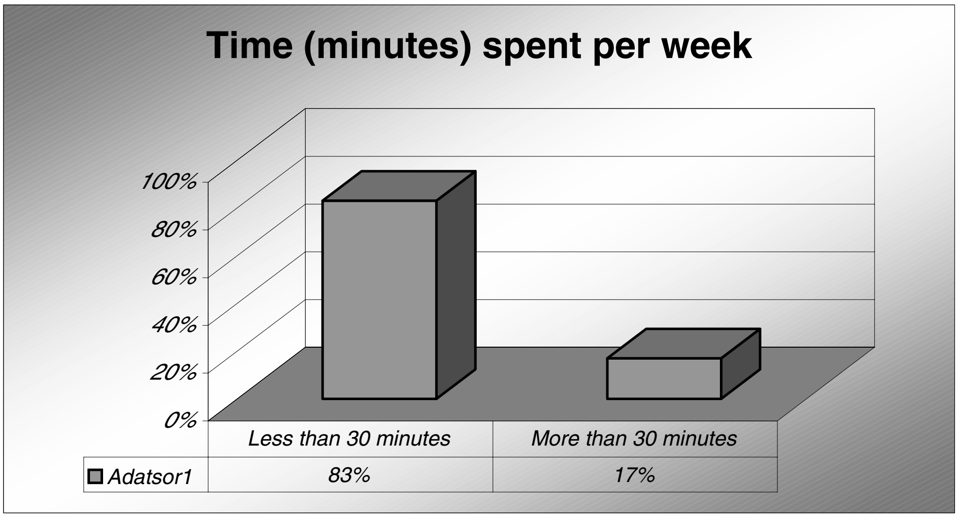
Actual use of the WebCT

Lectures can see the number of times the students and tutors have visited the site, and the length of their virtual work every time. From those data we can create the following figures:



28% of the students were never connected to the Internet. 15% of the students used the WebCT less than three times during the academic year.

From the 57% who used the Web of the English Language Subjetct regularly, only 17% spend more than 30 minutes a week there. Most of them visited the forums, e-mails and consulted the evaluation module.



However, they developed parallel web-pages to share notes, exams, results, etc.

Regarding tutors, 82% of them looked at the information given through the WebCt at least once a week. However they used to send personal e-mails to the lecturer or professor in charge of the subject, instead of participating in the WebCT's forums and chats.

Problems found

Technical problems

Since some lecturers were reluctant to work with the WebCT, at the beginning, there was an intern that was responsible for entering the content on the Web. UNED also offered all the teaching staff WebCT administration courses so they would be able to modify contents and use all the tools with ease. These classes could be attended in person or via the web. Not all the teachers wanted to go to these trainings or follow them through the network so they always depended on the intern. This created many problems, since this person might make some errors due to the lack of knowledge related to the subject he or she was working with. When the teachers assisted by interns realized the mistake in the virtual pages, they had to wait for some weeks until the mistakes could be corrected. This caused misunderstandings and conflict with students.

In this particular subject (English), only 2 of the 4 lecturers went to these training courses, so they were the ones in charge of using the system, which gave them extra work and conflicts within the team.

Grading system

The grading system was very time consuming as at the beginning there were problems with the computer system that the teachers were not aware of. Even though all the assignments, comments, etc. were supposed to be noted in the evaluation module, in reality, it was not possible since there were too many (two distance evaluation tests, two semester exams, plus one more in September for those who had not passed before the summer), and since it was required to introduce the quarter exam results for each four month term (4 times a year for 4000 students maximum) there was not time to do the same thing with the practice distance evaluations that were corrected by the tutors and the professors at the central headquarters.

Problems

Since touristic activity is mostly oral, it seems logical that the English Language exams would be oral as well as written. The oral testing could be done by the tutors but we found the problem that not all of the associated centres had tutors for this subject, and it would not be fair to make the students travel from remote locations just to carry out this type of exam. Another possibility was to give an oral exam the same day as the written one but it was not possible for such a large number of students since it would make the testing go on for days with one teacher exclusively dedicated to this task. Yet another possibility was to use videoconferencing, but not all the associated centers had this system available and it was not technically perfected to the point where it would guarentee the audio quality necessary for this type of test.

The result of all of this is that we cannot establish an oral exam at this time. It would be possible, however, with less than 1000 students. It is not only complicated to perform tests of oral expression, but it is also impossible to asses the students' oral comprension, which is something that would seem to be easy. Oral comprehension testing would be possible with well prepared examination rooms containing quality sound equipment, which is not the case, so there would be complaints by the students that recordings cannot be heard adequately. For now, what we have done is to include written and recorded situations in the materials which show examples of oral language usage in typical communicative situations in the world of tourism so the students at least have access to a frame of reference. We also use a self-made CD-ROM with three levels of difficulty, which is dealing with the most common situations in the tourism and service industry.

Problems related to the access to information

Equal opportunities do not exist, since even though the students acquire an identification number when they register for the virtual courses, less than half of them have access to the internet at their homes, which creates a disadvantage for people who cannot afford to have internet or computer access at home. If there are last minute notices on line or other information which is usually communicated through our computer network, these students are not able to find out about it.

- Some tutors have the same problems, so their virtual tutoring is not effective.
- There is insufficient human contact for all students.
- Some of the students have a very low English level which affects their performance in general and they feel very shy to participate in chats, forums, etc.

Problems to cope with the different ways of access to information

The majority of students used the communication tools of the WebCT, but not only. They send an average of 300 e-mails (not to mention letters and telephone calls) to the lecturers' personal addresses to get help to solve their problems. In addition, every week 600 new entries to the WebCT forums could be seen. This was an overwealming work for the lecturers in charge and there was an unavoidable delay in answering all the requests.

Advantages

- The WebCT makes possible a continuous contact among all the members of the educational community, whereas "normal" classes are limited in time and place. Students are in contact at night, at the weekend, etc, and tutors and teachers are able to reach them from their own homes at any time.
- Distance teaching provides equal opportunities to all students regardless of their economic or geographical situation, and physical limitations. Many blind people are studying tourism at UNED, and will be able to, for instance, work at a hotel or travel agency. The same experience we have with people who are in jail and study very hard at UNED to be able to find a job once they finish their time in prison.
- Thanks to the WebCT students practice their written language skills as well as train their capacity for autonomous learning. Students write compositions and they send them to each other for peer-reviewing thanks to a given colour correction code. Before submitting their written work to their teachers, it must have been reviewed by at least three people, and therefore, corrected at least three times. Students also communicate among themselves for working on projects, such as producing a touristic booklet, offering a specific trip for a difficult or special client, etc.

Future plans

- We are now working on improving the teaching materials for the future, making them more interactive and trying to solve the problem of training oral skills. We are designing an on-line English tutoring system, called I-PETER (Bárcena & Read, 2002), which has already proved to be very useful in the teaching of general English (English Philology). If this works, we could also help students feel in contact with their teachers and tutors.
- At the same time, we are trying to test and evaluate other available materials on the market for the study of this subject. For this purpose, we have produced an evaluation (Varela, 1998) check-list considering three main criteria: pedagogical, technical and functional. Some of the pedagogic criteria are the following:
- Does the programme/ CD include a demonstration?
- Is the content of the course appropriate for the students?
- Are the objectives of the programme being made clear?
- Are the instructions brief and clearly explained, thus allowing the student and the teacher to understand what each of them has to do?

- Is the level of language equivalent to that specified?
- Is the level of language appropriate to adults?
- Is it designed for use solely by individuals or does it permit usage by groups?
- Is it able to be used in an independent manner or is some written back-up support needed?
- How is the input received?
- If the answer is incorrect, is there an explanation offered, are clues given?
- How many re-attempts are permitted?
- If the response is correct is the student automatically moved on to the next exercise? Is he/she offered a reward? Is there a record of the time taken, errors committed, number of attempts, etc.?
- Whenever the programme is started, does the programme follow the same procedure or is there an element of chance involved?
- Is there sufficient quantity and variety of practical exercises?
- Does it lack spelling or content errors?
- Does the teacher have access to the students daily progress or errors?
- Can the students follow their own learning progress?
- Is there an option to work with either British or American English?
- Does it present the different settings of the Tourism industry?
- Is it possible to make recordings, allowing the comparison of pronunciation and intonation?
- Does it present socio-cultural information of the English Speaking Countries?
- Does it lack any possible forms of discrimination?
- Does it include a glossary or dictionary?
- Does it equally promote the four linguistic skills?

References

1. BARCENA, E., READ, T., BARROS, B. & VERDEJO, M. F. (2002) T-PETER: *Modelling Personalised Diagnosis and Material Selection for an On-line English Course*. Advances in Artificial Intelligence, Berlin, Spinger-Verlag
2. VARELA, R. (1998) *Evaluación de Software Educativo. Enseñanza*. Salamanca: Universidad de Salamanca

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E-LEARNING BY DOING: DESIGN AND IMPLEMENTATION IN A SPANISH SAVINGS BANK

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Introduction: learn *about* or learn *to do*?

In the field of corporate education there is an important gap between what people learn in courses (either at a distance or not) and the activities they perform in their daily work. Some authors have called this the *knowing-doing gap* (see Pfeffer and Sutton, 2000). We have observed frequently that this gap is a major source of complain in corporate education settings.

The main reason of this knowing-doing gap is what we call *infocentrism*, which is a wrong interpretation of what learning is. Infocentrism says that learning is a kind of information system: knowledge is transmitted to learners through lectures and/or accessed through readings; then learners must retain this knowledge; and finally professors organize tests of knowledge retention that we call exams.[1] In good educational settings, exercises and case studies are also performed. Implicitly, the infocentric perspective makes the hypothesis that if knowledge is transmitted properly (i.e. contents are clear) then application (practice) is obvious. As a matter of fact this hypothesis is falsified. Hence the knowing-doing gap.

What is missed in infocentric and technocentric perspectives is a right interpretation on how people learn, and in particular on how people learn and develop skills and competences. This discussion is clarified if we make some distinctions on learning. Jerome Bruner made the distinction between *learn about* and *learn to be*, to which we have added *learn to do*. We have then three kinds of learning:

- Learn *about*... (e.g. negotiation, communication, history, medicine, software design, etc.);
- Learn *to do*... (e.g. how to negotiate, how to communicate well, how to run a research in history, how to diagnose ills, how to design a software, etc.);
- Learn *to be*... (e.g. a negotiator, a communicator, a researcher in the field of history, a doctor, a software designer, etc.).

One can love history and be interested in medicine or in human communication. By reading books on this topics, attending conferences, doing infocentric design based courses (online or face-to-face), etc., one can learn a lot *about* history, medicine, and human communication, but that does not mean that one will be able to do research in history, to diagnose ills, or to communicate effectively. In other words, one will not be able to *do*.

Following the same logic, if one has been running successfully a first research in history, has diagnosed some simple ills, or has solved a communicational problem, that does not mean that one will be considered a historian, a doctor, or a professional in the field of human communication. In other words, one will be able to do, but one will not yet *be* (a professional recognized as such by one's peers). To reach this level one must be involved in recurrent practice inside the proper professional community (historians, doctors, human communication practitioners, etc.).

Having in mind these learning distinctions and the knowing-doing gap, we can say that one of the causes of this gap is that the huge majority of corporate e-learning systems satisfy only the "learn about" kind of learning, and that people and companies expect at least "learn to do". Educational practices needed in order to "learn about" are not sufficient when one needs "learn to do". Hence an important miscommunication between supply and demand in professional, continuous, and corporate education. One can observe this confusion in face-to-face training and even more in e-learning.

[1] To be rigorous, we should write here "information" rather than "knowledge" (see Brown and Duguid, 2000).

Of course, to “learn about” things and topics is necessary. Maybe the majority of what we learn consciously in life is “about” things. But in the field of corporate education we need a new kind of educational practices in order to allow people “learn to do” and “learn to be”. In this paper we will describe a powerful learning design that will allow us to make people “learn to do” and therefore make a substantial contribution to close the knowing-doing gap.

Our pedagogical framework

Not surprisingly, we have been influenced by John Dewey’s ideas on learning by doing (Dewey, 1933) and by Jean Piaget’s ideas on constructivism (Piaget, 1985; Piaget, 1992). We build also on pedagogical perspectives such as constructionism (Papert, 1990; Harel & Papert, 1991), and in the work of Vygotsky (1985).

Constructivism is based on the assumption that knowledge is created by learners, rather than transmitted by teachers like information in a pipeline, and that they discover and *construct* meaning from their environments. Constructionism suggests that learners are particularly likely to create knowledge when they are actively engaged in *making* something that is also personally meaningful and that they can *share with others*, such as video games, robots, computer animations, written stories or, closer to corporate education, e-commerce Web sites or a bank’s branch business plan. Constructionism is also close to the work of Vygotsky, in the sense that learning is a *social* process and stems from cooperative activities, from making something collectively. Moreover, Vygotsky states that effective learning occurs when this process happens within transactions between learners and members of their culture more experienced than them, hence leading to concepts like coaching, mentoring, etc. This is why Vygotsky’s ideas are often called *social constructivism*.

On the basis of these powerful ideas we have now a first framework for educational design in order to allow people to “learn to do”. Summarizing this framework we can say that “learning to do” needs a learning by doing environment where students make things collectively tackling problems under the guidance of experienced practitioners, where they can share ideas with others hence working in teams, where coaching helps students to perform what they have to do, where lecturing and readings gives people the information they need to perform their learning activities.

Nevertheless, if we want to make people “learn to do”, course design based on the above educational framework will not be sufficient. Of course people need to learn by doing, but this “doing” must also be significant, i.e. activities that deal with important issues for learners. In corporate training environments, significant activities are those that are related to learners’ daily work practices. We call this the *everyday coping* of learners with the subject of the course. By “everyday coping” – which is a concept we have adapted from Hubert Dreyfus’ interpretation of Heideggerian philosophy (Dreyfus, 1991; Wrathall and Malpas, 2000) – we mean the way learners cope every day with some subject or topic, the way they face it every day at the workplace.[2] Therefore, if one wants to close the knowing-doing gap the main question for learning design should be: *what is the learners’ everyday coping with regard of the subject of the course?*

Therefore, the structure of a course based on our pedagical framework is a sequence of activities for which information and knowledge come in support of these activities, rather than a sequence of “pieces of content” with exercises and case studies in order to apply the content. The spinal column of a course is a sequence of mini cases based on the learners’ daily work and the way they cope every day with these situations, or a real project they have to plan and manage. Learners will access information and knowledge *from* the activities they are involved in.

In the next sections we will show how these ideas were implemented in an e-learning project.

[2] Hubert Dreyfus calls *skillful coping* not only the way people deals with daily work situations, but mainly the smooth and unobtrusive responsiveness to those situations (Wrathall and Malpas, 2000).

The Virtaula project

La Caixa is one of the most important Spanish financial institutions. It is a savings bank that has around 20 000 employees, spread all over Spain, and that has a strong reputation of commitment in the training of its employees.

Over the last years la Caixa has recruited many new employees (around 5000) in order to replace people going into retirement and to ensure the expansion of the bank all over Spain. New employees must do a compulsory training programme that has to be done during their first year at la Caixa. This programme includes management skills such as communication and negotiation, and courses typical of the banking profession such as investments, taxes, insurance, etc. In the past, the training of the new employees was done face to face and on a traditional distance training delivery mode (printed materials plus post office). But in the new scenario this was too much expensive. Moreover, it became impossible to update the material and that was a big handicap in a changing environment like financial services. Therefore, the Human Resources Department of the bank decided to move to e-learning, launching then the Virtaula project.[3]

Virtaula started in January 2000 with two virtual classrooms of 25 new employees and one online tutor (or coach/trainer) each.[4] The statistics of the e-learning platform show that there are now more than 5000 *active* users (new employees, branch managers, financial services' advisors, online and face to face trainers, …).[5] As we have said, the first target of this e-learning project were the new employees of the bank. Nevertheless, as top management started to see that e-learning was a successful move, new target audiences were included, e.g. branch managers (there are around 4 500 branches at la Caixa), financial services' consultants, internal virtual trainers, etc. In this paper we will focus only on the training of the new employees, which is the most important e-learning community of the bank.

At the beginning of the project the design of the new employees' e-learning material did not encourage learner-tutor interaction, neither learner-learner interaction. Moreover, new employees complained that the learning material was "boring" and "not very practical". Thus, in September 2001, we suggested to redesign the learning material having two goals in mind: a) learning activities should be interactive in nature, and b) to reduce the gap between what is taught in training courses and the real situations that la Caixa employees face at their workplaces (in other words, to close the knowing-doing gap). The Virtaula project manager at la Caixa agreed on this suggestion, but only for the courses focused on banking profession skills.

Course design

How can one structure a course around a sequence of activities and how can we design significant activities? Using participative course design methods, the design team worked with end-users of Virtaula, i.e. new employees and their managers. For instance, when designing a course on insurance for new employees, we asked them: what is the everyday coping of la Caixa's new employees on insurance? The answer helped us to focus on the skills that new employees must come to master when dealing with insurance (for instance, to sell an insurance that takes care of customers' concerns). Then we asked for recurrent situations faced by the new employees in this field, which led us to write a sequence of mini cases. At the end of each mini case, learners have to answer questions like: "what would you do in this situation?", "what kind of products can you offer to this client?", "what would be your advice to this customer?", etc. Answers must generally be sent to a forum for discussion with the online classroom colleagues, moderated by their online tutor. Relevant information in order to perform these activities is suggested to learners (which they can access on the Web pages of the courses).

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[3] It is important to notice that in order to run and manage Virtaula, la Caixa works with various e-learning providers and mainly with GEC S.A., a company owned by the Open University of Catalonia – UOC – devoted to corporate e-learning.

[4] Online tutors are Caixa's employees, generally branch managers (the bank has almost 1 000 people who perform training tasks in addition to their daily tasks). They are face to face trainers who, voluntarily, became online trainers.

[5] By "active" users we mean people who connect to the system at least two hours a week.

The research we have done on the uses and results of Virtaula (see next section) showed that our pedagogical framework is of much help for a "learn to do" design, hence to close the knowing-doing gap.

Evaluation: research methodology

During the year 2002 we have directed a research team who performed a study on how people were using Virtaula, what they appreciated and what was going wrong. Data came from the statistics of the Virtaula e-learning platform, the analysis of what people were saying in electronic forums, and from semi-structured interviews we have done with 129 Virtaula users (of about 4000 at that time). Our interpretations, conclusions and suggestions for future work are based on the "triangulation" of the information obtained from these three "channels".

To interview the new employees, we choose a sample of 2% of this population (n=3162), i.e. 63 people selected according to their geographical distribution, age, genre, and educational background. For several reasons we could interview only 53 people, i.e. 1.7% of the new employees. But we could interview all their online tutors (42 people) because we benefited from a workshop session where we were able to run simultaneous focus groups with them. The results of these focus groups were then presented and discussed with the online tutors.

We used the techniques called "convergent interviews" and "structured focus groups" (Dick, 1998a; Dick, 1998b) to run the different interviews. The topics we wanted to know about were: the ability of the courses to close the knowing-doing gap, the use learners made of communicational virtual spaces and tools (forums, chats, etc.), the quality of the online tutoring, the quality of the technology (e-learning platform, Internet connectivity, etc.), and their suggestions in order to improve Virtaula.

Results and interpretations

Indeed, one of the main consensus of Virtaula was the usefulness of the courses designed with our pedagogical framework for the new employees' daily work. When answering the questions "What was the better of Virtaula?", spontaneoulsly almost all of them declared that their courses were among the best things of this project.[6] To the questions "Which was the best (and the worst) course and why?", they said that the courses, and in particular the cases they had to discuss in, were very useful because they related directly with their daily work. They did not perceive these courses as theoretical ones, but rather as training that *helped them to anticipate situations that really happen to them*. We have even observed that the knowledge material (that we have we called "documentation"), designed to help them to perform the activities (i.e. the spinal column of a course), was so useful that many new employees continue to use it as such, prefering it to the documentation they have in their offices.

These results were confirmed by the online tutors. Moreover, because the courses were interactive in nature, the online tutors did not complain anymore of the lack of employees' participation. Instead, they complained that they had too many messages to read!

On the contrary, the courses which had the worse evaluation were those designed with the infocentric paradigm, the courses that we were not allowed to redesign (i.e. communication, negotiation, etc.). These courses were perceived as too theoretical, too long, "learning by reading" education, etc.

On the other hand, people said that the value of the technology lay in the flexibility of their personnel organisation of time in order to work with Virtaula. The possibility to avoid geographical distance did not seem the most important issue to them. Instead, they valued above all the ability to access "when I want and from where I am". Having said that, everybody stated that face-to-face learning is still essential. In particular to discuss problematic situations (breakdowns), because a very interactive conversation is much more easy to run face-to-face than via asynchronous conversation tools (e-mail, forum, etc.). Moreover, people declared that face-to-face learning should be entirely devoted to discuss

[6] All of them with the exception of a man who was "new" at la Caixa, but who had three years of experience in another bank.

their practice as la Caixa employees. In these discussions, lecturing should be strictly limited to giving them the knowledge they need to understand their practice and the problems they face.

Conclusions

We are committed to close the gap between what people learn in courses and the activities they perform in their daily work. The main reason of this knowing-doing gap is an infocentric perspective on how people learn. In order to solve this problem we first make an important distinction between learn *about*, learn *to do*, and learn *to be*, focusing then on course design aimed at make people learn to do. To do this we build mainly on the work of Piaget, Vygotsky, Seymour Papert, and Hubert Dreyfus, in order to create a pedagogical framework that allows us to design "learn to do" courses. These are courses structured as a sequence of activities, where information and knowledge help learners to perform these activities, where tutoring give feedback when needed and moderate discussions on learners "answers" to the activities.

We have implemented our pedagogical framework and its consequent "learn to do" design in Virtaula, an important e-learning project at la Caixa (one of the most important Spanish financial institutions). The research we have done in order to evaluate Virtaula showed the usefulness of the courses designed with our pedagogical framework for la Caixa employees' daily work. We can then assert that we have found a way to design courses that make people learn to do, hence closing the knowing-doing gap. Moreover, we have done this in an e-learning setting. Nevertheless, we found also that in order to ensure that the knowing-doing gap is really closed, part of the courses should remain face-to-face.

Our research on the evaluation of Virtaula also showed that there are two main directions of development for this project: learning chunks[7], and communities of practice. These developments are currently being implemented in Virtaula and future research will be done in order to evaluate its usefulness for la Caixa employees. Because the final goal of corporate education and training (either ICT-based or not) is not learning *per se*, but to give support to people when they are at work.

References

1. BROWN, J. S. AND DUGUID, P. (2000) The social life of information, Harvard Business School Press
2. DEWEY J. (1933) How we think, Regnery, Chicago
3. DICK, B. (1998a) *Convergent interviewing: a technique for qualitative data collection* [On line]. URL: http://www.scu.edu.au/schools/gcm/ar/arp/iview.html [last access: february 2004]
4. DICK, B. (1998b) *Structured focus groups* [On line]. URL: http://www.scu.edu.au/schools/gcm/ar/arp/focus.html [last access: february 2004]
5. DREYFUS, H. L. (1991) Being-in-the-World, MIT Press, Cambridge, Ma.
6. HAREL, I. AND PAPERT, S., (Eds.) (1991) Constructionism, Norwood, NJ: Ablex
7. PAPERT S. (1990) *A critique of technocentrism in thinking about the school of the future*, E&L Memo N° 2, Epistemology and Learning Group, MIT Media Laboratory
8. PFEFFER, J. AND SUTTON, R. (2000) The Knowing-Doing Gap, Harvard Business School Press, Boston (Ma)
9. PIAGET J. (1985) Psychologie et Pédagogie, Gallimard (Collection Folio), Paris
10. PIAGET, J. (1992) La naissance de l'intelligence chez l'enfant, Delachaux & Niestle, Paris
11. VYGOTSKY L. (1985) Pensée et Langage, La Dispute, Paris

[7] Learning chunks are pieces of explicit knowledge that people can process in one hour (average). They are designed to help people respond to problematic situations when there is time pressure. This corporate learning product is based on the two following observations: at work people *do not have time*, and people learn a lot when they access the knowledge they need *when they need it*.

12. WRATHALL, M. AND MALPAS, J. (2000) Heidegger, Coping, and Cognitive science: Essays in Honor of Hubert L. Dreyfus (Volume 2), MIT Press, Cambridge, Ma.

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E-LEARNING AND E-BUSINESS: THE NEED FOR SMEs TO WORK SMARTER IN THE NEW EUROPE

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Introduction

Within the discourse on the information society, the e-economy and the importance of innovation, ICTs are seen as major tools with the potential of fundamentally changing business behaviour and company strategies (European Commission, 2001). The main aims of this paper are to:

1. Explore and critically evaluate the link between e-learning and e-business, and in particular the link between business growth and capacity building through e-learning technologies and methodologies.
2. Propose an e-learning roadmap to assist SMEs in attaining their full growth potential through capacity building.
3. Refer to research carried out in Irish and Canadian SMEs with experience of e-learning and draw conclusions from this research.

SMEs in Europe

The Observatory of European SMEs (2000) estimates there are over 20 million enterprises classified as SMEs which provide employment for over 120 million people. SMEs are defined on the basis of the number of employees in the enterprise, and defined as all enterprises employing less than 250 employees. Within SMEs, the following size classes are distinguished:

- Micro enterprises: employing less than 10 employees
- Small enterprises: employing between 10-49 employees
- Medium enterprises: employing between 50-249 employees

According to the Observatory nearly 19 million of these SMEs employ less than 10 persons and are thus classified as micro enterprises. The importance of SMEs in Europe cannot be underestimated, where they comprise nearly two thirds of total employment. The following table gives an indication of the importance of SMEs in the EU and in other economies:

SMEs	EU	USA	Japan
	%	%	%
Micro	34	11	n/a
Small	19	19	n/a
Medium sized	13	16	n/a
Total	66	46	33
No. employees per enterprise	6	19	10

Source: Estimated by EIM Business & Policy Research, estimates based on Eurostat's SME Database, and OECD: Economic Outlook, No.65 June 2001.

In relation to new EU entrants, research suggests that the average enterprise size tends to converge towards Europe in general. The above table suggests that SMEs are more or less the backbone of the EU economy and cannot be ignored in the debates around European competitiveness in the digital age.

SMEs and eBusiness – European competitiveness and inhibitors

In May 2001 the European Commission launched its GoDigital initiative and invited member states to promote ICT and e-business skills in European SMEs. This initiative was reinforced at the Lisbon Summit (2000) where the European Union set itself the target of becoming the world's most competitive and dynamic knowledge-based economy within ten years. This aim strongly depends on European SMEs ability to harness the potential offered by ICT. The eEurope Action Plan commits the EU to achieving this ambitious goal. Since research has shown that company size is one of the significant factors influencing ICT adoption (Pierson, 2002), this paper argues that since SMEs, particularly micro enterprise, are slow at developing and adopting e-business technology, SMEs will be even slower to adopt e-learning methodologies and strategies for skills acquisition and upskilling for competitive advantage. The paper further argues that an innovative and inclusive approach is required to engage SMEs in the e-learning process.

One of the key variables in company competitiveness is internet use and web site access. European micro enterprises are slow to embrace new technology, as illustrated in the following table:

Internet connectivity of micro-enterprise (DTI, 2002)

Internet	SWE	DEU	AUS	ITA	USA	GBR	IRL	JPN	CAN	FRA
2002	75%	74%	59%	59%	56%	50%	45%	42%	38%	38%

A study of Irish SMEs (1998) identified some of the barriers to the use of ICTs including – time constraints, resource constraints, cost and fear. One of the central issues raised in this paper is that the factors identified in a number of Irish studies (Chambers of Commerce of Ireland, 1998, UCD study 2003) are representative of SMEs in Europe as a whole (Europe GoDigital Final Report 2002, Pierson, 2002, Sambrook, 2003). Effective use of ICTs will be a major determinant of economic competitive advantage (DTI, 1998). However, the lack of proficiency in the constructive use of Information Technology has been identified as one of the major constraints on SME growth. It is worth noting that the third Annual Report of the European Observatory (1998) referred to the most promising applications for SMEs, which included distance learning.

The case of micro-enterprise Owner Managers: short on time, finance and expertise

Sambrook (2003) points out that much research about learning in the workplace occurs in large organisations. She defines e-learning as any learning activity supported by information and communication technologies. Sambrook argues that while e-learning often offers a solution to training problems especially for SMEs, this solution can also create barriers to learning – such as lack of hardware, fear of technology, and learner isolation. She further argues that with the increasing pressure to enhance learning and the achievement of competitive advantage is of equal importance to small companies as it is to large companies.

Key findings identified in a recent international literature review (Goodbody Economic Consultants 2002) as part of a study on the development of entrepreneurship in Ireland, highlight the factors that drive entrepreneurs to grow their business and are seen to arise from a combination of personal goals, organisational and business development skills and external opportunity. All of these compete for resources and commitment within a SME environment.

The same study (2002) confirms that the personality traits of Irish entrepreneurs differ little from their international counterparts. Experience and research has shown that while Owner Managers typically have the drive, determination and expertise to start a business, and to bring their specific expertise to the project, they are reluctant to acknowledge and address possible deficiencies in overall business and technology skills which will hamper their business growth. O'Kane and Immink (2001) note that the management skills of the entrepreneur become more important as the business grows, particularly in the area of capacity building.

Given these constraints, how can the entrepreneur address these? Most enterprise agencies offer "chalk and talk" management development options with short courses on key areas such as Sales & Marketing, Book-keeping and Finance and Human Resources. However, frequently participation levels are low with one of the main reasons offered being lack of time. This paper proposes that e-learning would appear to be an ideal solution to the Owner Manager dilemma facing the challenge of growing the business. Another obstacle for the Owner Manager in accessing business development training is financial resources in an environment where typically training budgets do not exist. e-learning can provide a cost effective alternative.

The Irish National Development Plan 2000-2006, specifically addresses the fact that if the national potential to generate new micro-enterprises and to expand existing businesses in the sector is to be realised, new business skills and enhanced management capabilities are required. Funding is made available to support agencies operating in the sector to focus "increasingly on internal capacity building and new business and technology skills" (NDP 2000-2006). Again e-learning would appear to be an ideal mechanism to achieve this economic goal – particularly in light of the overall emphasis within the Plan (and consequently on Government policy) on improved communications and eCommerce Strategy. Nevertheless, the most recent research examined (UCD 2003) indicates that, while entrepreneurs have embraced the new technologies for research purposes, they remain reluctant to acknowledge their applicability to training and capacity building, with 60% of all respondents surveyed stating that they would be unwilling to use e-learning.

SMEs and eLearning – the roadmap to competitive advantage

e-Business in Europe is at a critical stage. For Europe to become the most competitive knowledge based economy, European enterprise needs to embrace e-learning technologies and methodologies to gain the necessary skills for competitive advantage and growth. An even greater issue identified by the Observatory of European SMEs (2002) involves high tech SMEs and skill shortages particularly in e-business professionals represent the top barrier to development. However, interestingly the research also shows that high tech firms are comparably more active in terms of training than other businesses, which would indicate a greater openness to e-learning within this sector. There is undoubtedly a lesson here for their peer groups in other sectors.

This paper proposes a roadmap for European SMEs to assist them to make a significant contribution to the goal of becoming the most competitive economy. In developing this roadmap, three barriers must be overcome:

1. SMEs need to come to terms with the inhibitors which are posed by ICT
2. SMEs need to embrace and exploit the opportunities offered by ICT
3. SMEs need to acknowledge their deficiencies in business skills and seek to address these by harnessing the new technologies and methodologies available through e-learning

Hyland and Matlay (1997) identified the barriers to training for SMEs, mainly timing and lack of relevant provision. Matlay (2000) identified factors directly affecting the provision of training in small firms as the market position of the firm, prevailing economic conditions and the availability of relevant training. According to Sambrook (2003) access to learning, training and development in small organisations is a major issue and one which new learning technologies could solve. Sambrook argues that e-learning offers "any time, any place any how". While this paper agrees with Sambrook's view, nonetheless it is argued that SMEs need to overcome the ICT barriers before they can engage in and avail of e-learning technologies in a meaningful way.

There is ample research on the barriers for SMEs in their use of ICT. In Ireland several recent studies support the above mentioned European findings. For example, the Chambers of Commerce of Ireland study (1998) found that there is a natural resistance among SMEs to IT usage, and that basic skills are the main requirement of SMEs. Training must be inexpensive, involve the minimum amount of time and be linked to individual company objectives. The findings of this Irish report provide evidence in support of a case for e-learning in SMEs. The research found that Irish SMEs would be interested in training where:

- The training is offered on the company's own premises
- The programme is inexpensive
- The programme is offered on a 'work-friendly' schedule

A core argument of this paper, therefore, is that e-learning is a most suitable methodology for training delivery and skills development for SMEs.

An interesting comparative pilot study carried out in 2001 involved a sample of Irish and Canadian SMEs and investigated their uptake and attitude to a business skills development course delivered through e-learning. The results showed that participating micro enterprises required an initial orientation session to introduce them to the e-learning experience. The research highlighted the need for ICT compatibility to deliver the modules on-line. Most importantly the research highlighted the importance of tutor involvement where they need to be seen to be part of the broader learning support environment including on-going workshops and the support of broader training and development intervention. In the Irish pilot project, Irish and Canadian tutors were involved interchangeably with Irish and Canadian companies. Localization of material and support and culture emerged as an issue in this project.

Conclusions

This paper has argued:

1. The links between e-business and e-learning needs to be exploited to assist Europe achieve its GoDigital aims.
2. The ICT inhibitors for SMEs need to be addressed and overcome before companies in the sector can realistically benefit from e-learning technologies and achieve their full growth potential.

We conclude that there are significant opportunities to be exploited by SMEs in Europe through the use of e-learning, in enhancing business development skills, which in turn will assist Europe in the achievement of its economic goal. While eLearning has the potential to deliver solutions to European SMEs, it is worth introducing a note of caution. Sharma and Maleyeff (2003) highlight some unplanned and unanticipated consequences that are likely to be encountered as the internet is increasingly used in education and training. The problems are classified into three categories:

- Judgement, which may impact effective decision making
- Distance, which affects interpersonal relationships
- Ethics, where the internet can blur the line between ethical and non-ethical transactions

Sambrook (2003) further identifies significant barriers to e-learning including the lack of hardware and software and management attitudes.

It is clear, therefore, that key inhibitors still exist in this area – notably the resistance of Owner Mangers to both training and to the new technologies. The challenge for entrepreneur educators is to seek to resolve these and to promote the benefits of e-learning which will enable European SMEs to work smarter and to develop a competitive advantage within the context of the Global Economy.

References

1. An Assessment of the Current Attitudes and Perceptions among the Target Market towards Venturepoint with a View to Developing an Appropriate Sales and Marketing Strategy (2003), unpublished report, UCD Marketing Development Programme, Dublin
2. Business in the Information Age: international Benchmarking Study (2002), London: DTI
3. eBusiness and ICT skills in Europe (2002), eEurope GoDigital Final Report
4. SME Database (2001), EIM Business & Policy Research Eurostat
5. Entrepreneurship in Ireland (2002) Goodbody Economic Consultants, Dublin

6. Enterprises in Europe, (2000) 6th report, EU Commission, Luxembourg
7. HYLAND, T. & MATLAY, H. (1997) *Small Businesses, Training Needs and VET provision*, Journal of Education and Work, vol. 10 no. 2, pp 129-139
8. MATLAY, H. (2000) *Enterprise & Small Business*, Harlow, Pearson Education, Financial Times, Prentice Hall, Englewood Cliffs, NJ, Training and the Small Firm, edited. CARTER, S. and JONES EVANS, D.
9. Moving into the Information Age, (1998) London: DTI
10. National Development Plan 2000 – 2006, (2000) Government Publications, Dublin
11. Observatory of European SMEs (1998) no. 2
12. Observatory of European SMEs (2000) no. 4
13. Observatory of European SMEs (2002) no. 6
14. OECD Outlook (2001) no. 65
15. O'KANE, B & IMMINCK, R., (2001) *Starting a Business in Ireland,* Oaktree Press, Cork.
16. PIERSON, J. (2002) *There's no business like small business: the use and meaning of ICT for microenterprises*, eLearning euro.info
17. Qualitative Evaluation of eLearning for Business Innovation and Growth in Ireland, (2001), unpublished report, Training & Evalution Services Ltd., Dublin.
18. SAMBROOK, S. (2003) *eLearning and Small Organisations*, Journal of Education and Training vol. 45 no. 8, pp506-516
19. Small Business & the Internet: the Irish Experience, Report under the ADAPT Prism Project (1998), Chambers of Commerce of Ireland, Dublin
20. SHARMA, P., & MALAYEFF, J. (2003) *Internet Education: Potential Problems and Solutions,* The International Journal of Education Management, vol. 17, no. 1 pp19-25

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E-LEARNING AND E-ADVICE – AN EXPLORATION OF THE PROCESS OF PARTNERSHIP IN EXTENDING THE BOUNDARIES OF LEARNING FOR SMALL BUSINESSES

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Introduction

This paper seeks to explore the development of a learning toolkit for e-workers. The context of the toolkit is a trans-national project funded by the EU under the Leonardo da Vinci programme involving three main partners – a pre-1992 university in the UK, a professional university in Holland and a Spanish partnership encompassing an enterprise training agency and a software development company. The paper describes how the different interests of the three principal partners have emerged during the design phase and how these have been reconciled through the use of an evaluation planning process. At the time of writing the project is currently in the learning design phase.

Three perspectives

The development of the partnership sought to identify key resources for the project. It should not therefore have been of any great surprise that the partners brought not only their specific sets of expertise but also their own perspectives derived from this expertise and their experiences.

Client or learner orientation

The client perspective or client orientation was best represented by a focus on the specific needs of the users themselves and on a conception of the users in terms of a distinctive personality profile. The identification of the e-scan instrument as a potential diagnostic component sought to embed a specific set of learner's needs within the toolkit based on a given relationship between personality factors and business success. The e-scan tool was derived by Driessen and Zwart and is widely used in Holland as a framework for providing business advice to entrepreneurs. From this perspective the learning tool was intended provided an extension of an existing business support process into the domain of e-learning.

Learning or pedagogic perspective

Learning or pedagogic orientation was represented by a focus on the learning process and in particular the concept of planned learning. The model of work based learning provided by City University draws heavily from the work of Kolb in terms of a cyclical approach, together with both Schon and Argyris in relation to the contribution of the organisation or work context. Although offering the capacity for a partnership between the learner, the educational provider and the employer, the work based learning model (Boud) assumes a level of organisational sophistication and intentionality in which the needs of the specific or individual learner are framed (or constrained) by broader set or organisational objectives.

Technological orientation

At this stage the impact of the technological orientation remains relatively small. To date this has focused on the need to develop an open source approach in terms of ensuring interoperability between existing VLEs. In addition concern has been shared about the budgetary limitations of the overall project and their potential impact on interactivity.

To some extent these orientations can be seen in terms of Ryan's three quality issues the learner orientation being concerned with the use of existing materials, the learning orientation being concerned with development and the technological orientation concentrating on the environment itself. In terms of the overall contribution of these three perspectives it is possible to view the technological orientation as providing boundaries within which the toolkit can be created. On the other hand the learner and learning orientations could be seen as directly competing ideologies.

Competing ideologies

The debate between learner centred and learning centred approaches provided a useful opportunity to explore the nature of the toolkit and develop an appropriate methodology. At one level this debate was expressed as concern over diversity of the client group at another it reflected a conflict between didactic and constructivist philosophies.

The preferred diagnostic instrument within the client orientation, whilst relevant to the business domain was based on a given interpretation of the entrepreneurial personality. Two distinct strands of criticism emerged – not only was the idea of an entrepreneurial personality itself a contested space – Chell's 1992 work in this area illustrates the problematic nature of the definition and current research (Lewis 2004) indicates the issue is still live – but the notion that any given profile could adequately reflect the diversity of the target group (in terms of, for example, location, nationality, business sector, gender or stage of business development) was also challenged on the grounds of stereotyping. At best this was a sceptical approach to the usefulness of the instrument, at worst it was expressed as a complete hostility to the creation of any categories of learner which would direct their learning.

In response to this criticism attention was drawn to the rather optimistic and, perhaps, insubstantial nature of the learning model within work based learning. In the absence of a large employer the question of a work based curriculum remained nebulous and open to interpretation by the educational provider. At best this criticism sought answer on behalf of the clients as to what benefit this approach would provide, at worst the criticism was expressed as a wholesale hostility to learning either as a concept of as a valid term within entrepreneurship.

These two opposing camps could be reduced to a dualistic interpretation or two partial or inadequate interpretations of the learning model. On the one hand the client orientation gives us the learner clearly located in his or her work domain but without an obvious model of learning – a concrete learner constrained within the process of business development. On the other hand the learning orientation gives us a process without an actor – the learner exists only as an abstraction – a generic learner located in a generic learning environment but without any meaningful relationship to his or her work activity.

In the absence of work activity on the one hand and educational content on the other the learning domain is open but potentially sterile and it is at this point that some form of meta modelling is required to integrate these two opposing perspectives.

This integration was provided through the use of an evaluation model. Atwell et al (2003) conducted a survey of e-learning projects funded via the Leonardo programme. Their results provided several useful examples of partial or one dimensional approaches to learning as a result they developed a range of recommendations for evaluation which are now being suggested to recipients of funding. Although the idea of evaluation provoked some negative responses (such as "not yet") the evaluation model provided mechanism through which different elements of the project could be reconciled and most importantly through which different perspectives both recognised and utilised.

The evaluation model

Table 1 illustrates how the project seeks to operationalise each of the recommendations. In developing a clear evidence base project partners were forced to examine not only their own preferred orientation but also the potential relationship between these as equally valid concerns. The model whilst simplistic (almost in the form of a checklist) provides both the focus and the scope to enable different orientations to be meaningfully combined.

Table 1

Recommendation	Comments	Evidence base
Recommendation No. 1: A clear understanding of what we are talking about when we discuss eLearning is needed	The boundaries of e-learning and e-advice remain problematic. The decision to adopt a formal methodology and review the role of the adviser in terms of a learning coach mean that it is now possible to extend the definition of e-learning to the domain of business advice.	The outcome is a definition of the role of the business adviser as learning coach within a virtual environment. This definition must take account of both the role of an on line tutor and its relationship to that of a more traditional business adviser
Recommendation No. 2: Programmes aiming at eLearning should be based on the idea of learner orientation.	The ability to import a range of competency models to the toolkit as part of the learning planning process allows for individual learner orientation within a self selected framework. A range of instruments have been created to enable learner's to interface with these models. No single tool or model is designated as fulfilling all the learner's needs but guidance is available on making an informed choice.	The notion of self managed learning is supported by a range of tools which allow the learner access to their own personal learning needs and processes. At the same time the toolkit is capable of importing publicly available competency frameworks as and when these may be of use.
Recommendation No. 3: Projects in eLearning have to document a clear and transparent learning philosophy which determines the main direction of the project.	The learning philosophy is broadly constructivist and the use of repertory grid mechanism as a component within the toolkit enables the use of an explicit conversational methodology. This philosophy informs rather than dictates the project since the direction is determined to a great extent by the learners and their advisers.	The constructivist paradigm is explicit in the use of the tools and I the development of the learning advisers. It is not yet transparent within the learning toolkit although it remains implicit.
Recommendation No. 4: Projects in eLearning should train the teachers and trainers	This is one of the most significant aspects of the project and the development of learning advisers is now a cornerstone of the project itself	The use of a modified version City University's certificate in on-line tutoring is now an integral part of the project.
Recommendation No. 5: Design and development of project aiming at eLearning should include a focus on pedagogy and communications.	The use of an explicit pedagogic model enables the project to focus on both the development of tools and the relationship which govern their use. In a context of maximum flexibility the pedagogy must enable varieties of use within a set of definable relationships	The evidence base id the toolkit itself and the guidance provided as to how components can be used. The outcome of effective use for the individual is a workable learning plan. At a broader level the outcome is of a self sustaining and self managing learning community

Recommendation No. 6: Projects aiming at eLearning should regard evaluation as one of their most important tasks	The evaluation model is represented to some extent in this table and the evaluation process forms an integral part of the project.	A more detailed set of indicators needs to be developed in terms of each recommendation and each perceived stakeholder group
Recommendation No. 7: Projects aiming at eLearning should widen target groups and exploit new contents whilst using innovative pedagogical ideas.	The extension of the project to encompass business advisers represents a broadening of the initial client group. They key development in terms of widening access becomes possible as a second stage activity in which current learners are available to mentors to extend use of the toolkit.	The long term development of a community of learners represents the only realistic sense in which this project meets the needs of widening participation. The translation of learning conversations could be claimed as innovation but the extent of usage remains the best indicator of the toolkit's pedagogic value.
Recommendation No. 8: Projects aiming at eLearning should reflect on new partnership models that allow more energy to be spent in developing common ideas and contents instead of spending too much energy on management and bureaucracy.	The development of the partnership as a pedagogic entity had been shaped by the partners own diverse views and interests. These exchanges are available and the result, in terms of an explicit commitment to the toolkit development is part of the project resource	The ability to represent the development of the project in this paper, together with records of the actual debates provides a useful example of a learning partnership at work. In addition a periodic review process within the Leonardo da Vinci programme captures progress on this issue.
Recommendation No. 9: Projects aiming at eLearning should reflect the need to generate sustainable results and their dissemination is one important tool to support sustainability.	Consideration of the role of learning advisers and the resources (particularly time) required has lead to the development of a 2 stage model in which learners from phase1 become volunteer advisers or coaches within a phase 2 development.	Sustainability as an educational tool can be achieved by integration within existing programmes. More importantly the project seeks to develop a sustainable use for the tool as part of the business development or business support mechanisms. To this extent the success of the toolkit in terms of business benefits will need to be demonstrated to national and regional business support agencies.
Recommendation No. 10: Programmes aiming on eLearning should reflect on the possibilities of the development of Open Source software and of standards	The development of open source software remains a key component of the project as does the need for interoperability across platforms	An interoperability study has been completed and further technical work on the choice of an appropriate platform is being documented
Other evaluation issues	This section was included in the template to identify possible additional issues – at this stage the lack o employer involvement has been identified as a possible limitation for the learners	The need to develop a specific mechanism to engage employers in SME's both as a means of providing support, creating work based learning opportunities and developing a mechanism to evaluate benefits

Impact of the evaluation model

The main impact of the evaluation model can be seen in a number of ways. Perhaps the most obvious is in the ability to enable the combination of different orientations. The main benefit of the model is that it recognises the learning, learner and technological orientations as equally valid and all contributing to a valid project. In this way it explicitly rejects technological determinism and implicitly avoids the problems associated with content driven educational products.

A second effect has been to focus attention on roles and relationships within the environment especially the role of the adviser. From being peripheral the role of tutor/adviser has become a central component of the project and their development n essential component of the learning process. This creates a transformation in the nature of the advisory relationship from simple adviser (didactic) to that of a mentor and learning coach.

A further need has been to develop a methodology based on the roles and shared ownership the conversational methodology was chosen as most appropriate as it remains open to negotiation in individual and collective level. The conversational approach is not fixed in terms of either process or outcomes – i.e. it represents a learning paradigm rather than a fixed set of rules. The conversational methodology developed by Harri-Augstein and Thomas (nn) provides a framework which can encompass both didactic and more open approaches to learning. Existing or public frameworks can be made available without being seen as asset of given outcomes or processes. This is largely achieved through a focus o the learner's own self-generated purposes. At this stage the methodology remains implicit from a learner's perspective – there remain valid concerns about making the pedagogy overt and thus overloading the toolkit with educational rather than vocational content.

Outstanding issues

The initial work based learning model contains an explicit commitment to employer involvement in the learning process. The idea that "work is the curriculum" (Boud) is predicated on a process of negotiation with the employer to determine the range of learning activities that can be made available. To some extent the model of the learner within SME's tends to simply assume that the variety of learning activities will be available. This is not necessarily the case and a mechanism has yet to be developed to ensure adequate employer involvement in the learning process.

Sustainability in a business development context also remains a key issue. Whilst the majority of Leonardo projects are self contained within an educational context this project seeks to develop business benefits and as such one strand of sustainability must be to seek support from the existing business development community. In order to do this the evaluation process will need to demonstrate not only the viability of the environment as a self managed learning but in terms of business outputs (turnover, employment generated business longevity etc.) all these factors need to be build into the evaluation model.

Conclusions

The evaluation model has been of great benefit in resolving the differences of perspective. At the same time it is no more than a series of recommendations it does not, in itself, provide a coherent view of e-learning – that is very much left to the developers. Collaboration in the sense of a successful Leonardo partnership is alluded to but collaborative design between learners and learning designers remains very much in the background. The intention of this project is to explore how to create a role for the learner in designing and developing the toolkit for their own use and in the longer term to develop a partnership with the adviser in managing the learning environment.

References

1. RYAN, S. Developing user managed learning environments – three quality issues
2. BOUD, D. & SOLOMON, N. (EDS.) (2001) Work-Based Learning: A New Higher Education?
3. MARTYN P. DRIESSEN, PETER S. ZWART The role of the entrepreneur in small business success: the Entrepreneurship Scan
4. ELIZABETH CHELL, JEAN HAWORTH, SALLY BREARLEY The Entrepreneurial Personality: Concepts, Cases, and Categories 1991
5. PATRICIA LEWIS (2004) *Developing an entrepreneurial identity,* International journal of Entrepreneurship and Innovation, February
6. ATTWELL, G., DIRCKINCK-HOLMFELD, L., FABIAN, P., KARPATI, A., & LITTING, P. (2003) *E-learning in Europe – results and recommendations,* Impuls 10
7. LAURIE F. THOMAS AND E. SHEILA HARRI-AUGSTEIN *Self-organised learning foundations of a conversational science for psychology*

ENGINEERING ON PRECIOUS STONES AND METALS DISTANCE EDUCATION ENABLES COOPERATION OF UNIVERSITY, SOCIETY AND INDUSTRY IN RURAL AREAS

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Background and aim

According to the Swedish National Agency for Higher Education and its proposition about post-secondary vocational training in cooperation with enterprise, university and society, the idea of creating a new education was formed at the Department of Environmental Engineering at Luleå University of Technology together with a private company in the branch of precious stones and metals.

The region needs to increase its concentration on higher education and university education in cooperation with society and industry. There is also an immense need of development of infrastructure in the region as well as competence development on ICT. There is furthermore a great need of developing a functioning model of flexible and distance education, which could support regional development.

The project started in 2001. Step one was carried out in 2002 containing a teacher-training course in pedagogy and methodology in distance education. Step two includes the vocational training. It is about 400 km between the university and the village of Lannavaara, where the company "Kristallen AB" is situated. The students who applied are spread all over the country. Some of the students and the teachers live in the village. Some students and teachers live and work in Luleå. Some of the students live in the south of Sweden, and travel to Lannavaara for face-to-face-activities. Most of the vocational training was thus to be performed as distance education, both of theoretical and practical work. The pilot courses started last autumn and the training will be completed in 2005. The students as well as the teachers will have high performance on the technique after the education, as they will use a couple of computer-based programmes every day for communication, lectures, document handling etc.

The full programme for the students will lead to a Bachelor's Degree in Precious Stones and Metal Engineering. The education will support the geology education and applied science of geology at the university. The aim is also to help developing one of the specific products of "Kristallen AB", i.e. education at different levels, and to give another dimension of competence to the employees. A new craft and profession will be established after the full education. After the education as a Technician on Precious stones and metals the students will be able to start a business of their own or continue with studies towards a Master's degree or to become a goldsmith or a silversmith.

We also believe that the region will benefit from the education, as the study centres of the region will be strengthened with developed infrastructure. Teaching and learning facilities will be more efficiently used as a sophisticated infrastructure is being installed. For the community of Kiruna the development of infrastructure might increase the amount of students. We believe that the education will help improving and developing education outside the town of Kiruna. This vocational education is unique not only for the region and the university but also for Sweden.

Method

Higher education within the fields of precious stones and metals means a joint activity between university, society and enterprise. The teacher-training phase is aiming at developing models and methods for education and teaching at a distance for practical engineer work and handy craft mixed with theoretic modules. The intention of the vocational education is to strengthen and broaden research and education within the fields of lithology and gemmology. Luleå University of Technology will have a unique education, which will help widening the network of society, industry and university.

The expansion of the infrastructure and the additional higher education will make it easier for Kristallen AB to take advantage of the resources of the company, and develop its potentials. The company will be able to broaden its networking and to cooperate more easily with the university and other parts of the Northern countries.

In order to fulfil the aims of the project we started with competence development of the teaching staff. A teachers' course in DE contained methodology and pedagogy in distance teaching with the stress on methodology and technical use, communication and distance dialogue, and production of a study guide following the course literature. Specialists and teachers were to become more efficient in their distance teaching, more competent in using different technical means, and the aim was also to increase their teaching competence. After the course, the evaluation showed that they had achieved a good platform for developing their own courses.

The vocational education is a blend of face-to-face-sessions and distance teaching, and contains in all 16 separate courses. The students meet their teachers in real-time on-line via a computerised tool called MarratechPro, and on site, either at the university or at the course site in the village. They are able to use on-line facilities even for practical work. The tool also gives access to recorded lessons. There is also an LMS, the learning management system Class Fronter, to use for document handling, information, chat, etc. For their learning support they have a study-guide connected to the course literature, produced according to "guided didactic conversation", "simulated two way communication" and "tutorial in print" (Holmberg, Bååth, Rowntree).

Within the project work the aim is to connect the regional capital of Kiruna and the village of Lannavaara with the university through computer network and create a model for synchronous learning at a distance. That means, that the road will be levelled for flexible learning and collaboration with the university and industry.

Three sub-projects

The project is built on three sub-projects, teacher training in distance education methodology, the development of the infrastructure for distance education and the development and carrying out the vocational training.

The teacher training

In order to carry out a good education at a distance including practical and theoretical modules, the teacher-training course showed to be of great value as few of the teachers were not used to teach at a distance, did not have adequate knowledge on the technique, and had very little or no knowledge in producing distance teaching material. This teacher-training course contained both pedagogical and practical methodology when using distance-bridging tools. Mentoring before the start of the courses as well as during the pilot courses is going on in order to give the teachers and instructors the best help for carrying out their distance modules. There is also support available for producing and creating study-guides and other teaching materials.

The infrastructure

At Luleå University of Technology there has been used tested technology and work models for managing distance-bridging work methods. One of the tools, MarratechPro, demands broadband, but is a very useful tool with many facilities for online and offline teaching and learning. The models will be developed in order to comprehend practical work, which has not yet been used to a large extend. During the autumn of 2003 the university introduced a new LMS to be used throughout the university departments and their courses, both distance and in campus courses. On behalf of this pilot vocational training the infrastructure in the region has been developed. For instance the village of Lannavaara has been given possibility to introduce broadband, which is necessary for the specific technical tools.

The vocational training

The third step has been to develop and start a vocational training at higher education level of 80 Swedish credits (120 ECTS). Each course will give 5 Swedish credits (7,5 ECTS). All of them include theoretic studies together with practical and laboratory work. This will put an extra dimension to the performance of distance teaching. It will be possible for the students to extend the education to university engineering exam. After the education and a certain amount of practical work the students will be able to work as technicians within the field of precious stones and metals, either as employed or as SME entrepreneurs, producing jewellery and decorations of their own or other people's design. The students registered come from all over the country. There have also been inquiries from other countries, but these first courses are only available in Swedish, although there are plans for preparing an English version, too.

Distance bridging facilities

The first two pilot courses started, however, without the necessary means to bridge distance. The infrastructure at Lannavaara was not finished until the end of December 2003. A new LMS for the university was decided for last October, which the teachers and the students had to become familiar with. Thus the first two courses started with existing facilities such as studio videoconferences – for which the students in Lannvaara had to travel 50-70 km to attend – and e-mail. Teachers and students had face-to-face sessions and classroom teaching. The computerised video programme, MarratechPro, and the new LMS were not available until the third course.

Some of the students preferred to study from home. Therefore the study-guide and instructions were prepared for net-based production together with recorded lessons. FAQs are answered both via the LMS and via e-mail dialogue and discussions in the videoconference meeting room.

When the infrastructure improved, the teachers and students could have a much better means for communication and meetings. MarratechPro has many teaching facilities, and the students will be able to meet online from their own study or in the classroom wherever they are, discuss and present material and findings. There is a whiteboard where they can show pictures, texts, etc and use Internet. They can point and write in each other's texts, and get immediate feed back. They see each other all the time and there is also a chat function both for the use for the whole group, or private. One of the many good functions with MarratechPro is that sessions can be recorded, which is suitable in different situations, for instance when a student cannot attend a scheduled session, or for the evaluation.

Results

As the vocational education only is at its second phase of four, we cannot yet read any specific results, but for that of the students' remarks, which are on the whole positive. There are few dropouts, and the few ones depend on private reasons. The teacher training has turned into mentorship, as they feel insecure about the technique. The students seem to have adopted the LMS, and are using it for reading and collecting information and guidance. At the start of the third course, there were seven new students from the Guild of Arts and Crafts. This means a broadening of vocational training for practitioners of Arts and Crafts, and forms an extra training of a distance group with somewhat different goals and needs. This also means a start of Distance Education in other parts of the rural area in which these students live. They have not met this type of education before, and they find the contents and way of studying interesting and supportive.

The network of industry and the university is being enlarged, as the capital of the region; the enterprise and students have received another possibility for bridging distances and another facility for offering higher education. Kristallen AB is strengthening its position internationally, as they have been noticed by media, and have inquiries from all over the world. The development of the infrastructure will give possibilities for people in a very rural area to reach education, to maintain their profession, and live and work in a place they love. The knowledge about gems and precious metals will be broadened.

Conclusion

Teacher training is necessary for being able to plan for, develop and perform distance teaching and education. This vocational training has already shown that students could imagine moving to the course site, in this specific education to the village of Lannavaara, but would prefer studying and working from home. Probably this is an extraordinary situation, as the course site is placed about 400 km from the university, and 1000 km from some of the students. The teachers and instructors had very little knowledge about distance learning and teaching and were not familiar with new technology, particularly as there was introduced a new LMS to be used.

The participants of the teacher-training course received knowledge in different types of supportive functions for teaching and learning at a distance. They also received knowledge in how technical facilities could be of best use for distance bridging teaching and learning, and they realised what is important to have in mind when producing their own material for distance studies.

The students will have a completely new education, which is not yet available in Sweden. The students are building up a good familiarity with new technology for communication and networking, as well as for education. They are some steps closer a final exam, which will enable employment or development of their own enterprises.

The region is becoming a good model for net-based teaching and learning. The viable infrastructure could be better used, though, but is being developed and improved. Broadband has been installed at a specific course site with specific needs of infrastructure. High capacity on computers is needed and access for the students and teachers is being universal. People in rural areas have often been left out, when it comes to digitalisation, mobile connections and infrastructure. Small rural villages also need to be connected to the world. This project will make this come true.

References

1. BÅÅTH, JOHN Handbok för distansutbildare, 1996
2. FERRER, FRANCESC, et al. *Virtual Communication and Interaction: Key Elements for Teacher Training Today,* paper, Conference Proceedings, EDEN Open Classroom Conference, Barcelona, 2000
3. HOLMBERG, BÖRJE Theory and Practice of Distance Education, 1995
4. LEA, MARTHA *A Tutor's Role, More Than Councelling?,* paper, Conference Proceedings, EDEN Open Classroom Conference, Barcelona, 2000
5. O'CONNOR, J. & SEYMOR, J. Training with NLP, 1999
6. PAULSEN, MORTEN FLATE Nettbasert utdanning – erfaringer og visjoner, 2001
7. PAULSEN, MORTEN FLATE Online Education, 2003
8. ROWNTREE, DEREK Preparing Materials for Open, Distance and Flexible Learning, 2002
9. STERNER, R. Klassrummet och mötesrummet på distans, 1997
10. The Swedish Defence Forces, HQ, Pedagogiska grunder, 2001

LEGAL ASPECTS OF E-LEARNING IN THE INFORMATION SOCIETY

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Introduction

More and more universities optimise their education by e-learning. Advanced multimedia-technologies simplify the compilation of comprehensive texts and audiovisual materials into learning objects. The possibilities for using learning objects are seen in the blended learning and distance learning area, in conventional lectures, as an added value, or as self-study courses. Standardization of learning objects enables industrial development and exploitation on the global market. There are increasing tendencies to exchange learning objects in frameworks of international cooperations of universities involved in e-learning activities.

Certain aspects of law need to be observed from their development to their exploitation. Infringement of the respective law may result in compensation of damages or even suspension of the e-learning training. Obligations of intellectual property rights such as copyright, patent, trademark and design issues have to be considered. Other issues arise from privacy concerning students, and labour law concerning the scientific staff. Additionally relevant to digital distance education is the online service provider liability.

The project *el.la – eLarning and Law*[1] has set up an information platform on the world wide web which provides information in laymen's terms that may be helpful for university educators and others to comply with legal aspects of digital distance education in Germany. In the following, the project and the characteristics of the user group will be introduced. Hereafter, we will set out some relevant legal aspects of the current amendments of copyright law in the European Community and their meaning for digital distance education.

el.la – e-Learning and Law

The information platform *el.la* has been online since the beginning of the year. Legal information is given in chapters about intellectual property, privacy and labour law concerning scientific staffs. The chapters are completed with literature references and hyperlinks. In addition, there are texts of law, law reports, law dictionaries, checklists, and modal contracts available by crosslinks. The presentation of legal information intends to prevent infringements and preserve personal rights.

The project *el.la* was carried out by the Institute of Informatics Oldenburg (OFFIS)[2] since 2002, directed by Prof. Dr. Jürgen Taeger, Chair of Private Law, Commercial and Business Law and Legal Informatics, Oldenburg University, and is financed by the Ministry for Science and Culture of the Federal State of Lower Saxony. The information platform will achieve its preliminary final version by the end of 2004. The project is imbedded in the e-Learning Academic Network of Lower Saxony,[3] which aims at supporting universities of Lower Saxony to implement preexisting and new structures of multimedia in teaching, undergraduate study and continuing education.

[1] The information platform *el.la – e-learning and law* is designed as the virtual university 'Uni-Lernstadt'. http://www.uni-lernstadt.de.
[2] http://www.offis.de.
[3] http://www.elan-niedersachsen.de

Characteristics of the user groups

The main user groups are universities and institutes all over Germany. The reason for this is that the information offer is specialized to e-learning-activities in the university area. Nevertheless, the legal information is also generally applicable to several other scopes of e-learning and usages of new media technologies.

Countries of origin

The users come from the whole German language area. The reason for the interest from users in Switzerland and Austria results from comparable national copyright laws in these countries. Particularly Austrian copyright law is comparable with German copyright law in respect to harmonising intellectual property legislation within the framework of EC rules. Both countries were currently passing new copyright acts, including exemptions for digital distance education.

New copyright law for the digital age

The history of copyright has always been a story of legal responses to the progress of digital technologies. The issues addressed in this context were referred to as the "digital agenda" in the two 1996 WIPO-Treaties.[4] These treaties contain legal standards to ensure that the balance of rights between copyright owners and users will be carried forward into the digital age.

The first amendment for getting in line with the legal standards of the WIPO-Treaties was the 1998 Digital Millenium Copyright Act (DMCA)[5] in the USA. The so-called TEACH-Act[6] which accredited non-profit educational institutions for transmitting copyright protected materials for teaching was based on this DMCA.

Following this, the European Parliament passed the Directive of the European Parliament and the Council on the Harmonisation of Certain Aspects of Copyrights in the Information Society[7] in 2001, i.e. the InfoSoc-Directive. Its main features are the introduction of the public's right to know, bringing in line the right of reproduction with digital acts, harmonising the right to control distribution of works incorporated in a tangible article such as CD-ROMs, and introducing legal protection of anti-copy devices as part of consumer protection. In contrast to this enlargement of the scope of the author's rights, the Member States are allowed to establish limitations and exemptions in the public interest, particularly for the purpose of teaching and scientific research. Pursuant amendments of copyright came into force in 2003 in Germany and Austria.[8] In the following, the main improvements concerning digital distance education will be introduced.

Introduction of a right to make available to the public

This right is defined as the exclusive right to authorise or prohibit making copyright protected material available to the public in such a way that members of the public may access them from a place and at a time individually chosen by them.[9] The term "making available to the public" means transmitting copyright protected material via internet or posting protected content or files on the internet. Posting in the intranet also affects the right of communication to the public if it is accessible by a multiplicity of users. In former laws of both countries, the right of the author to authorise or to prohibit these acts was

[4] WIPO Copyright Treaty (WCT), Dec. 20, 1996. http://www.wipo.int.

[5] http://ethics.csc.ncsu.edu/intellectual/electronic/dmca.

[6] For more information about this legislation cf. http://www.lib.ncsu.edu/scc/legislative/teachkit/act_text.html; Crew, K. D., New Copyright Law for Distance Education: The Meaning and Importance of the TEACH Act. http://www.ala.org.

[7] Directive of the European Parliament and of the Council on the Harmonisation of Certain Aspects of Copyrights in the Information Society, 2001/29/EC. http://europa.eu.int/eur-lex/en/index.html.

[8] German Act on Regulating of Copyright in the Information Society, BGBl. I, No. 46, 2003 (G); Austrian Copyright Amendment, öBGBl. I, No.32 , 2003 (G).

[9] Article 3 InfoSoc-Directive, cf. rf. 7; Section 18a Copyright Act of Austria (öUrhG), 2003 (G), http://www.medien-recht.com/pdf/UrhG 2003.pdf; Section 19a Copyright Act of Germany (UrhG), 2003 (G), http://bundesrecht.juris.de/bundesrecht/urhg/.

undisputed without having to express it. More important is the fact that this new right is now expressly mentioned in exemptions for education, thus guaranteeing legal certainty for educators.

Making information available for educational and research purposes

German law has established limitations on the right of reproduction and of the right of making available to the public permission for a single use of pre-existing copyright-protected works for the purpose of illustrating, teaching, or scientific research, as long as the source is cited, and to the extent of non-commercial purpose, on the condition of fair compensation to the copyright holder claimed by a collecting society.[10] The former law limited use of copyright-protected materials to the member of a school class; teaching at universities was not included. Now the use of protected material in access-controlled parts of a university's intranet is included. The lawful use is limited to small parts of a work or works of small size such as graphics and single articles from periodicals. School books, learning software and films do not fall under this exemption. Unfortunately, but without express mentioning, no long-term retention of useful instructional material by tutors is allowed; the exemption of the reproduction right is limited in this context to the storage for transmitting in the current course. Finally, the exemption for teaching is earmarked with an expiration date of late 2006. In Austrian law, a corresponding exemption for universities exists.[11] In the former Austrian law, the exemption was not limited to non-commercial use. The directive determining the non-commercial nature of the activity as such, irrespective of the organisational structure of the educational institution. It gains in importance concerning postgraduate and continuing studies liable for cost. It is assumed that cost covering tuition fees is a non-commercial act.

On-line delivery by public libraries

Libraries of universities and other public libraries are interested in on-line delivery of digital copies of chunks of books or other documents. In compliance with the provison of the InfoSoc-Directive, German and Austrian law translated exemptions for internal use for the benefit of libraries to replace or preserve works of their own collections.[12] Moreover, the directive made available works of their collection for students for the purpose of research or private study solely on dedicated terminals in the libraries themselves,[13] indicating that online-delivery is not included in library benefits. Notwithstanding, the exemption of private use includes in both countries copies made by another natural person on request.[14] Unlike in Austrian law, the exemption in German law also includes digital copies free of charge. The explanatory note of the German parliament clarified that fees to the extent of necessary costs are free of charge. Pursuant to the fair use doctrine of the German Federal Court of Justice, any delivery of copies constitutes a claim of remuneration for the author claimed by a collecting society.[15] Critics object that this does not take into account recital 40 of the directive, which states that no exemption for benefits to libraries or other non-profit establishments should cover digital on-line delivery.

Legal protection against circumvention of anti-copy-devices versus consumer protection

Opportunities to distribute protected material via the internet necessitates legal protection against cirumvention of technical protection measures such as encryption or scrambling. On the other hand, the Member States should ensure that right holders make the protected material available to the beneficiary using an exemption constraining education exemptions provided in their national law. These provisions are literally translated into German copyright law. The copyright act does not contain any specification on how the right holder has to enable lawful use to a beneficiary. Notably, the right holder is not obliged to enable the digital use, for instance of copyright protected text incorporated in a CD-Rom for teaching purposes. Here, analogue methods such as prints would be sufficient.

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[10] Article 5 (3a) and Recitals 14 and 34 InfoSoc-Directive, cf. rf. 7, Section 52 a Copyright Act of Germany (UrhG), 2003, cf. rf. 9.

[11] Section 42 (6) öUrhG (G), cf. rf 9.

[12] Article 5 (3) (a), (c), (o) InfoSoc-Directive, cf. rf. 7, Section 53 (2) UrhG, cf. rf. 9.

[13] Article 5 (3) (n) InfoSoc-Directive, cf. rf. 7.

[14] Section 42a öUrhG and Section 53 (2) UrhG, cf. rf. 9.

[15] German Federal Court of Justice, Case No. I ZR 118/96.

Legal development in acceding countries of Central and Eastern europe

The transformation process to private enterprise since 1989 has accompanied legal development in intellectual property legislation in the countries of Central and Eastern Europe. It turns out, that newly founded states developed a new actual copyright law with a high standard of dependence on international and European legal standards. For instance, Slovenia has translated the standards of the draft of the InfoSoc-Directive primarily in 1997. Hungary did the same in 1999.

Most of the former socialistic countries possessed a various standard of copyright law which does not correspond to the progress of multimedia technologies. Due to this, European Commission passed the PHARE-Programme[16] of Intellectual Property for Central and Eastern European countries dealing with harmonising intellectual property legislations within the framework of EC rules, the so-called acquis communautaire. In sum, all countries have established the new right of making information available to the public and reassessed the reproduction right to digital copies with exemption of temporary storages. Moreover, all countries stated exemptions for teaching and scientific research in the form of a legal licence such as that found in German law or as a free use without payment.[17] In most instances, transmitting or making available works in online courses is not included; the exemptions are mostly limited to face-to-face teaching.

Furthermore, copyright acts of most countries state exemptions for internal use for the benefit of libraries to replace or preserve works in their own collections. In certain countries, the exemption includes making copies on request for a person's private use or for single education or scientific use.[18] Apart from this provision, certain domestic copyright laws do not allow digital copies to be made by another person.[19] Accordingly, no legal certainty for trans-border on-line delivery exists.

Impact of national distance education exemptions abroad

Legal issues arise in an international context if, for instance, educational institutions transmit courses to students in other countries. Which country's law determines the ownership of the instructional material that is either self-created or preexisting? Which country's law determines whether licence terms are valid and how they should interpreted? Which country's law determines the scope of the copyright owner's right and whether the acts of the educational intitution constitute infringements? And which country's court would have jurisdiction?

These questions are far from clear. Under the existing law doctrine, the question of authorship and ownership are determined by the law of the work's country of origin. The scope of rights and exemptions, i.e. what acts constitute infringement is determined by the law of the country where the act took place, the so-called principle of territoriality. This principle is useful to the traditional analogue world, but in digital environments it becomes less clear where the relevant act took place. In the case of digital transmitting is it the country where the transmitting is organised, where the server is located, where the student is enrolled or where the transmission is received? There are no definitive answers. Finally, it is left to a court decision and that is why copyright owners and users have an interest in the scope of exemptions or statutory licensing rules adopted in foreign laws.

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[16] http://europa.eu.int/comm/enlargement/pas/phare/; http://www.aidaa.org/aidaa/default.html.

[17] Cf. Section 35 (4) Copyright Act of Hungary, Section 19 Copyright Act of Estonia, Section 19, 21 Copyright Act of Latvia, Section 22 Copyright Act of Lithuania, Section 30 Copyright Act of the Czech Republic, Section 27, 28 ,29 Copyright Act of Poland, Section 47, 49, 50 Copyright Act of Slovenia, Section 23 Copyright Act of the Slovak Republic, http://www.aidaa.org/aidaa/default.html.

[18] Section 20 Copyright Act of Estonia, Section 23 Copyright Act of Lithuania, cf. rf. 17.

[19] Section 35 (3) Copyright Act of Hungary, cf. rf. 17.

Conclusion and Recommendations

As the forgoing outline has made clear, not all problems created by the information age have been solved by the latest amendments of European and national copyright law. The amendment of at least German copyright law could be useful as a model for other countries examining these issues.

Standards as a statutory legal language to guarantee legal certainty for digital distance education are needed for:

- Ownership and employment,
- Eligibility for protection and the choice of domestic law,
- Scope of the copyright owner's right,
- Scope of exemptions,
- Rights management by collecting societies,
- Validity and interpretation of licence terms.

In practice, each educator engaged in e-learning activities should acquire a pragmatic approach to check the obligations of respective legal rules of the domestic law and keep in mind the law of foreign countries. That is why every country in the European Community should provide information about legal aspects of e-learning concerning their domestic law.

References

1. VON BERNUTH, WOLF (2003) *Streitpunkt – der Regelungsgehalt des § 52a UrhG,* in: Zeitschrift für Urheber- und Medienrecht (2003), 438-444
2. DREIER, THOMAS; NOLTE, GEORG (2003) *Digitales Urheberrecht – Das Gesetz zur Regelung des Urheberrechts in der Informationsgesellschaft,* in: Informatik Spektrum, 26 (2003), 327-336
3. DREIER, THOMAS; SCHULZE, GERNOT (2004) *Urheberrechtsgesetz mit Urheberrechtswahrnehmungsgesetz, Kunsturhebergesetz, Urheberrecht im Einigungsvertrag,* München
4. JARUKAITIS, IRMANTAS (2004) *Implementation of the New EU Regulatory Framework for Electronic Communication in Lithuania,* in: Taeger, Jürgen; Wiebe, Andreas (Ed.), Informatik – Wirtschaft – Recht – Regulierung in der Wissensgesellschaft, Festschrift für Wolfgang Kilian, Baden-Baden, 463-478
5. LOEWENHEIM, ULRICH (Ed.) (2004) *Urheberrecht im Informationszeitalter,* Festschrift für Wilhelm Nordemann, München
6. MONETTI, ANN L. (2003) *Universities and Intellectual Property: Ownership and Exploitation,* Oxford
7. TAEGER; JÜRGEN; HORN, JANINE; NGO, TRONG LUAN (2003) *Rechtsfragen des eLearning: el.la – ein Wissensportal für Hochschulen,* in: DelFI 2003: Tagungsband der 1. e-Learning Fachtagung Informatik, GI Lecture Notes in Informatics, Bonn, 190-194
8. U.S. COPYRIGHT OFFICE (1999) *Report on Copyright and Distance Education,* Washington D.C., http://www.copyright.gov/reports/de_rprt.pdf
9. VERCKEN, GILLES (1996) *Practical Guide to Copyright for Multimedia Producers,* Luxembourg
10. WALTER, MICHEL M. (2003) *Urheberrechtsgesetz – UrhG-Novelle 2003,* Wien
11. WANDTKE, ARTUR-AXEL (1997) *Urheberrecht in Mittel- und Osteuropa: Bulgarien, Polen, Rumänien, Russische Föderation, Slowenien,* Teil 1, Berlin
12. WANDTKE, ARTUR-AXEL (2002) *Urheberrecht in Mittel- und Osteuropa: Estland, Lettland, Litauen, Tschechien, Ukraine, Ungarn,* Teil 2, Berlin

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RION – LEGAL INFORMATICS ONLINE
A CALL FOR EUROPEAN COOPERATION

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Abstract

The research project "RION – Legal Informatics Online" created the merger of eight German universities into a virtual campus with multimedia course offerings in information law. Information law, covering topics such as internet law and dealing with concepts like harmonized law of European e-commerce, is an interdisciplinary challenge for lawyers, computer scientists and economists alike. It seems especially suitable to be linked with European e-learning concepts. The research project developed and tested concepts for e.g. the virtual mediation of e-commerce law while utilizing a legal information system that linked academic texts and data banks with judicial decision publications and legal texts in a full-text, hypermedia form. In addition, constructive seminars developed and organized by tutors were carried out using a modern didactic concept. The results of the research project are a well-suited German contribution to the field of information law e-learning as part of a European cooperation. The following will describe the concept of the research project.

1. The State of Legal Informatics

Legal Informatics is a legal discipline, not a computer science one. In the 80s, after the topic was taken on as a fundamental legal science that studied the legal thought process and decisions resulting from the automation of judicial and administrative activities, it is today understood as the study of the prerequisites, uses, and consequences of using information and communication technology [1, 2]. Its purpose today is therefore understood as the legal implications of computer usage in the economy and society as well as the implications of the digitalization of this respective information.

An important field of legal informatics whose meaning continues to grow is internet law [3, 4, 5]. This is also involved with the legal issues of e-commerce (which for the most part are legislated according to European law), as well as with worldwide copyright problems or the multi-faceted data protection aspects of the internet. These are just a few examples of the many highlights from the large field of internet legal issues.

2. The Research Project RION – Legal Informatics Online

2.1 Developing the Goal

With this definition in mind, the RION project was carried out as an information law project, and conducted at the University of Oldenburg from March 2001 to December 2003 in cooperation with eight other universities, overseen by Professor Dr. Taeger and Professor Dr. Schinzel. The project's mission and goal was the adequate development and testing of internet-supported e-learning concepts as a means to mediate information law contents in university teaching [6].

2.2 The Virtual Campus

2.2.1 The Organizational-Technical Solution

The project was sponsored with a national funding of € 1,6 million by the German Ministry for Education and Research. This was used to create a virtual campus with multimedia course offerings of information law, which provided a multitude of interesting experiences and insights [7].

As a legal topic at the junction between information technology and jurisprudence, legal informatics deals not only with various current legal questions, but also demands cooperation between lawyers, computer scientists, and economists. It was a central idea of the research project to create an interdisciplinary virtual course offering as a means of reaching the widest, most academically heterogeneous audience with a wide variety of learning and teaching experiences. Doing this, the participating universities were able to integrate these courses into their respective legal, computer science, and economics course offerings.

The Hyperwave eLearning Suite was agreed upon as an effective interdisciplinary learning platform. On one hand, it enabled the technical organization of a virtual campus, while simultaneously offering valuable experiences in regard to the didactic possibilities of virtual cooperation as well as their evaluation. Gender aspects of the different ways men and women learn could be observed and taken into consideration from the beginning [8].

The main focus of the virtual campus and the Hyperwave eLearning Suite was the realization of virtual seminars. A central device here was a judicial information system (JIRI) developed for the campus. For orientation and ideas for speech topics, respective technical publications were available to the students. These were put together by program tutors, and contained descriptions of learning goals and “self control” questions. These developed the actual basis for the technical knowledge needed in the virtual seminars, and were suitable for the learning needs of beginners and advanced students alike. The modular technical literature strove especially for a connection between traditional and interactive learning, and was supplemented by data banks with relevant literature citations as well as legal decisions and law in full text, all allowing a systematic inquiry and investigation.

Because all teaching materials in the information system were hypermedially connected, the users were provided with a connection to the learning management system (LMS), able to navigate quickly and clearly, and had access to modern teaching materials. Furthermore, they were also able to try out new methods, conduct focused discussions on new developments, and experience net-supported consultations. This was of particular excitement and interest for the students.

The considerable effort and time needed for creating the electronic materials was explained by the additional step of not only including these materials from the participating universities in electronic form, but in the conventional “in person” form as well [http://www.uni-oldenburg.de/fk2/InstRW/7525.html]. With this, the virtual campus included the additional and supporting effects of traditional teaching.

The Hyperwave eLearning Suite, along with its ability to adequately facilitate course content, also facilitated the necessary communication between students and tutors. On the one hand, a discussion forum allowed e.g. finished works to be asynchronously discussed, while on the other hand, chat rooms allowed synchronous discussions. Virtual office hours were additionally available. The system enjoyed a high level of acceptance from the students, and proved itself to be problem-free after the introductory course on how to use it was taken.

Looking at the entire picture, we see that the Hyperwave eLearning Suite is a software displaying a virtual university with an entrance, study room and café, in which courses can be taken like they would at a conventional university. Its greatest advantage is that it is free of charge for universities. However, its use does require (for a fee) a schooling for the respective universities’ administration. Its customization is possible through access to the program code, which allows its functionality to be extended. The functions already available are quite inclusive even without further extension. Course administration, student administration, asynchronous forums, chat rooms, e-mail, or library resources are all included in the offer.

Parallel to the Hyperwave eLearning Suite, a so-called JurMOO (MOO = MUD object oriented, MUD = Multi User Domain) was implemented. This also represents a virtual world in which teachers can participate in seminars, moderated group discussions, and workshops. The JurMOO represents a string of software-connected web sites that can be described as “rooms”, “characters”, and “objects”. The user can “enter” the room, read the corresponding description, talk with the people in the room, and search for people, rooms, and objects. The geographic metaphor is used merely to structure the interaction. The parallel installation of the Hyperwave eLearning Suite and JurMOO allowed continued findings on appropriate technical solutions for virtual university cooperation [9, 10, 14].

2.2.2 The Contents and Didactic Features of the Teaching and Learning Concepts

In the summer semester of 2002, the first virtual seminar on legal matters in e-commerce was offered on the virtual campus. It displayed numerous similarities with conventional seminars, and challenged the students to devise presentations on topics such as "domain law" and "internet liability". An asynchronous discussion with tutors on the learning platforms followed. A top priority of this first seminar was mastering the use of the learning platform by both students and teachers.

Following this, the seminar concept was changed. In the winter semester of 2002/2003, the first online seminars on internet law were offered in multiple locations. Here, students of the participating universities as well as guest students had the opportunity to work inter-disciplinarily with students at other locations, all without having to be in the same location. The support from tutors proved to be a central and indispensable element of the virtual seminars, offering technical support, advice, and consultation wherever needed. In spite of its integration of multiple regions, the seminar was able to be integrated into the curriculum of all participating universities, allowing students to earn credit points at their home universities for their participation.

The challenge for the students taking part in the 2002/2003 seminar was to establish a position on legal questions arising in a virtual start-up business of the new economy. The students were not just expected to compose written papers, but also had to consult the company on difficult legal issues given by the tutors, and created based upon complex technical everyday matters. Appropriate solutions were often found only through inter-disciplinary cooperation with students at other universities. The assignments, along with the numerous teaching materials, literature references, legal decisions, and judicial texts were made available by the already-mentioned judicial information system.

Student works were subsequently placed on the online seminar learning platform. Here, other students along with the tutors could insert their comments. In the forum, which was integrated into the learning platform specifically for this purpose, students could conduct asynchronous discussions with one another and/or with tutors. Here, heterogeneous information needs of the participants with various backgrounds could be addressed, and controversial legal issues could be brought to light from various perspectives. Additionally, the students/study groups had to defend their works in a synchronous chat session. For this, the JurMOO was used [9, 11, 14]. The students met here four times in virtual seminar rooms to discuss their results in a chat session moderated by tutors.

During the entire seminar, students were intensively counseled on both a topic-oriented as well as a technical level. Topic-oriented counseling was conducted by tutors having knowledge in the corresponding field of internet law [5]. Virtual office hours, available at all times, quickly answered every question sent by e-mail. Students received a technical instruction guide familiarizing them with the use of the learning platform. A contact person among the tutors was available for any questions concerning this as well. This person's sole responsibility was ensuring a smooth functioning of all technical details. Personal counseling in a virtual seminar required a high amount of resources; however, this was essential for such a project [12]. It can't be stated enough that the success of virtual teaching seminars is highly dependant on the technical expertise of tutors. Therefore, no corners should be cut on spending for personal costs or qualifications of tutors for virtual seminars.

A project-specific, didactic matter was the background of the seminar's concept: A network-oriented communication of information law content according to a *constructive* learning concept. Since the 90s, the didactic has increasingly switched from an *instructive* to a *constructive* approach. Instructive methods assume a rigid canon of knowledge to be conveyed without providing the students with options or freedom to develop their own ideas. Constructive learning theories view learning as an active process that aims to achieve meaning through the construction and interpretation of knowledge [13]. Learning is seen as a situation/context-related process that is mostly directed by students and embedded in interaction. Through the implementation of such constructive learning concepts into academic cultures known for having a strong tendency towards instructive education (here, law and computer science), the research project RION strove to develop guidelines that would achieve a change from instructive teaching content to a cooperative and therefore constructive learning concept. With this in mind, already-existing cooperative approaches in legal education were readily referred to. This helped indicate just how great the need is for cooperative learning concepts in traditionally instructive fields such as law.

Student interest in an online seminar was huge in all participating locations. Due to this, the following semesters saw the possibility to develop the field of legal informatics through virtual seminars with intensive tutor consultation, all while using modern, constructive-oriented learning methods.

3. Key Conclusions on eLearning

The research project showed that the implementation of a virtual campus for conducting virtual teaching seminars possesses a technical, content, and didactic component. Of these, the didactic component is of special interest, as it includes all questions of university knowledge conveyance based on eLearning concepts.

The research project recommended asynchronous chat as an adequate basic form for virtual teaching. Compared to the synchronous chat, it was preferred not only by the teachers, but the students as well. Asynchronous chat allowed the use of documents while drafting discussion reports, which met the academic needs of all participants the best. Synchronous chat, on the other hand, found poorer results in technical discussions, as the high technical requirements needed to create an appropriate seminar form were not able to be justified. The synchronous chat was therefore more suited for virtual office hours or for answering organizational questions.

Of special interest in virtual teaching is the care and instruction of students. It is not only their obligation to ensure the use of campus technical resources, but also to pave the way for the achievement of content-based learning results and success. This goal begins with the costly setup of multimedia teaching materials that must be seen as an adequate information source and an actual help. The main problem of virtual teaching is found in finding suitable didactic concepts that are appropriate for internet-supported teaching and learning forms. The constructive learning method seems to meet the needs and interests of both the students, and in connection with this, the continued tendency in society towards greater freedom and autonomy entitlement in learning by means of the internet. Nevertheless, there is still a great deal to research regarding this idea.

4. Key Conclusions for European Cooperation

The research project collected a valuable wealth of experiences and materials. It would be especially valuable if it were to be integrated as a German entry into a European University concept for virtual teaching in legal informatics and e-commerce.

A European political foundation has already been laid for this. Article 149 of the EU Treaty states:

> "The Community shall contribute to the development of quality education by encouraging cooperation between Member States and, if necessary, by supporting and supplementing their action, while fully respecting the responsibility of the Member States for the content of teaching and the organization of education systems and their cultural and linguistic diversity."

E-learning is a meaningful instrument for the European Commission in realizing this goal. This is seen in the many sponsorship programs supporting e-learning cooperations throughout Europe such as the new eLearning-Program 2004-2006. The Bologna Proceedings, that with the announcement in 1999 by the European Education Minister is to create a unified European university realm by the year 2010, also has the goal of a system of unified university degrees, aims for mobility of European students, and hopes to achieve a high level of university education. This demands unified European learning concepts that can only be developed through European research projects. The well-harmonized internet law would be quite appropriate for just this.

There can be no doubt that the future of academic education and continued education lies in European cooperation. We are ready for cooperation. All those interested and potential partners are welcome at any time.

Literature

1. KILIAN, W. (2001) *Warum Rechtsinformatik*? CR, p. 132.
2. BIZER, J. (2004) *Vom Eros der Fragestellung: Die Rechtsinformatik auf der Suche nach ihrem Gegenstand,* in: Taeger, J./Wiebe, A. (Hrsg.), Informatik-Wirtschaft-Recht, Regulierung in der Wissensgesellschaft, Festschrift für Kilian, Baden-Baden, p. 39
3. TAEGER, J. *Veränderung des rechtlichen Institutsgefüges durch die Neuen Medien*, in: Schneidewind/Truscheit/Steingräber (Hrsg.), Nachhaltige Informationsgesellschaft, Marburg 2000, pp. 225-257
4. TAEGER, J. (2001) *Rechtlicher Regelungsrahmen des Elektronischen Geschäftsverkehrs,* in: Horster (Hrsg.), Elektronische Geschäftsprozesse, Höhenkirchen, pp. 459-470
5. TAEGER, J./GOLDMANN, E./LINKHORST, A./SEILER, W. Internetrecht, Oldenburg 2003
6. TAEGER, J. (2003) *Virtuelle Lehre in den Rechtswissenschaften*, in: Einblicke 19 37, pp. 16-18 [http://www.uni-oldenburg.de/presse/einblicke/37/taeger.pdf]
7. SCHINZEL, B./TAEGER, J./DREIER, T./GORNY, P./HOLZNAGEL, B. Rechtsinformatik-Online, XXXX 2004
8. SCHINZEL, B. *Gendersensitive Ansätze für Lehre und Lernen mit Neuen Medien*, in: Schinzel et al., (Hrsg.), Ausgewählte Studien der Begleitforschung zum Projekt Rechtsinformatik Online, p. 28 [http://mod.iig.uni-freiburg.de/publikationen/rion2003.pdf]
9. NETT, B. et al. (2002) *Tailoring Educational Elements for Academic Teaching – The JurMOO*, in: Proceedings of the Information Science and IT Education Conference IS 2002, Cork, June 19th-21th, p. 1151
10. NETT, B./RÖHR, F./BERSZINSKI, S. *Konzeption für den Einsatz von JurMOO zur virtuellen Unterstützung eines Rechtsinformatikseminars*, in: Schinzel et al., (Hrsg.), Ausgewählte Studien der Begleitforschung zum Projekt Rechtsinformatik Online, pg. 8 [http://mod.iig.uni-freiburg.de/publikationen/rion2003.pdf]
11. STINGL, B./REMMELE, B. (2002) *Das JurMOO – Kommunikation und Kooperation in der virtuellen Seminarunterstützung,* in: Virtueller Campus, Münster
12. STINGL, B. *Virtuelle Begleitung in Hochschulseminaren,* in: Schinzel et al. (Hrsg.), Ausgewählte Studien der Begleitforschung zum Projekt Rechtsinformatik Online, p. 26 [http://mod.iig.uni-freiburg.de/publikationen/rion 2003.pdf]
13. HUBER, B. / REMMELE, B. (2001) *Ein Fall fürs Internet. Didaktische Überlegungen zu einem kooperativen Lernkonzept für eine instruktionistische Fachkultur*, in: Wagner, E. /Kindt, M. (Hrsg.) Virtueller Campus. Szenarien – Strategien – Studium, Bd. 14, Münster et al. pp. 275-284
14. GERHARDT, D. (2004) *RION und EULISP: Virtual education in legal informatics*, in: Proceedings of the Third EDEN Research Workshop, March 4-6, Oldenburg, pp. 260-265

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APPLICATION OF THE NEW EU COPYRIGHT LAWS TO E-LEARNING

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E-learning is the ideal vehicle for modernisation and capacity building in the new Europe

With the wide range of capacity in education within the new Europe and the increased demand by all citizens to participate in the whole community, e-learning is the perfect vehicle to impart specialist knowledge to students wherever they may be.

E-learning will move from an optional extra attached to a contact taught course, or part of a basically contact based qualification to the only medium of instruction for many courses. A class will have 6 from Finland 3 from Malta, 1 from Hungary, and 4 from Ireland. From the north and south, east and west students will be in one class. They may never meet in person, never give their lecturer a delicious Pacific Rose apple but they will complete their specialist qualification in a skill area needed for the new Europe.

This is the ideal for e-learning in the EU.

What is needed to achieve this goal?

Technical capacity: The technical systems are here. Many have access to broad-band and even dial-up can carry excellent e-learning.

Pedagogy: Teaching methodologies are well up to the challenge. A well run on-line tutorial, either synchronous or a-synchronous can be even better than a vis-a-vis meeting.

Societal attitudes: Younger students have grown up with the net so the use of the screen comes naturally to them. Many lecturers are comfortable with the concept. Most students will even be able to pay in a single currency.

Research and reference resources: All distance teaching with hugely dispersed students will require a new approach to research and library services. It will not be possible to refer a student to a chapter in a book or tell them to read a few well-chosen articles. Lecturers and more especially the course manager will need to ensure the resources are in the student's hand. Here is a problem:

How do we get reading, reference and research material to our 'true' distance student?

We know they may not have easy access to a conventional library. We can not assume a student in Hajdúnánás will have access to the same library services as one in this city, likewise a student in Ghawex may not have the same library access as her cousin in Msida.

The solution may look easy. We can scan the article, copy the book chapter and send it on CD or have it on our server. In one sense this is right, the use of good OCR technology (the excellent ABBYY product is the best in the business) can bring the 3 MB page to a 50 kb pdf. We can use e-books (if they exist in the subject area) and we can use on-line journals.

We do however need to consider copyright.

The uniform European approach to copyright

The aim of the EU harmonisation copyright directives is to ensure a uniform approach to copyright issues across the new Europe: (1). The EU is committed to the new digital economy: (2), education is the key to this, so e-learning friendly rules are necessary: (3).

To what extent are these goals reflected in reality?

(1) Uniform approach to copyright within the EU: Research on the implementation on the European Copyright Directive [1] shows that while the directive is based on an international treaty [2] and that the directive is even more prescriptive on uniform implementation, the actual local legislation is extremely varied. The biggest challenge is on the imposition of Technological Protection Measures (TPM's). Some countries require the removal to TPM's to facilitate legitimate use, (Denmark) some permit the removal (Germany) and some impose imprisonment if someone has the temerity to try to exercise their EUCD given fair use rights by removing a TPM (Austria). Together with other variations and also the different approach to other parts of the directive, we truly have the Heinz 57 varieties[1] of the 'uniform' approach to e-copyright.

(2) The EU is committed to the new digital economy: The EU says and maybe believes it is committed to the digital economy [3]. Most eurocrats and politicians believe in the concept. However, it is not enough to rely on a mere belief. Distance education needs specific action to enable the digital economy in education.

(3) Are the new rules e-learning friendly? The EU copyright rules and their transformation into local laws have produced a 'varied result and at best do nothing to help and at worst may be said to make things worse'.

What exactly is the problem?

We need to be able to do in digital form what we can today in print. If we could by law, by fee or by contract send a paper copy of an article or chapter to a distance student then we ought to be able to send it by electronic means.

If we are permitted certain exceptions to the copyright rights of authors or owners for private study or for education purposes, then we should be able to exercise these rights in a digital environment, even if the owners do not want us to.

If copyright owners make reference material only available in a certain media or only by specific contracts, then we must have the same ability to exercise our fair use and education rights as we had in the old media.

If we see something on the net we should be able to use the work as if it were a print work.

The problem is that copyright owners are placing copyright material behind thin technical barriers, some to protect the material (encryption) and some to extort value from geographical differences (DVD region locking software). The EUCD laws describe these barriers as TPMs (with one exception so far) [4] and in most cases, they not only have the protection of the civil law, but also the coercive power of the state behind them by way of criminal enforcement including imprisonment. Here the criminal law enforces a private right. It matters not that the intended use was legitimate. Copyright owners need make only some attempt to protect their works and the state is empowered to take action against the student or the educator who wants to make an extract available for e-learning.

This is not alarmist, just look at Dmitry Sklyarov [5] who was arrested and imprisoned by the FBI for just talking about his Russian developed program to crack the thin protection on Adobe e-book software. We now have this legislation in Europe. We need to be aware of the potential risk to e-learning it poses.

Copyright owners are placing the same restrictions of use in the digital environment as they write on the imprint page of paper journals and books. We all know the:

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[1] A concept beloved of my Air and Space Law lecturer at University College, London, Professor Bin Cheng.

"All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the publisher."

We all read these words as including:

"Copying is permitted in the exercise of your fair use rights and education rights given by legislation."

In the digital environment many EU countries' legislation have changed the rules. Apart from the Netherlands 'non-media specific' rights, other laws see digital copies as something different from a paper copy. By using a different machine to copy a work and to send it to the student we somehow have so radically changed our practice we are placed under a super restrictive legal regime.

Additionally, where we receive the work by contract, if we still have and exercise the legal fair use and education use rights, the publisher is free to terminate continuing access to the material. "we don't like your attitude, we are terminating your subscription"[2].

Is DRM the answer?

Many European law-makers including Denmark and the Netherlands see Digital Rights Management (DRM) as the solution to arguments about TPMs. If DRM allows educational access anyway then all is fine. With Digital Rights Management all copyright access by a user is logged and a 'small' payment is made immediately. Alternatively the use may be recorded and the payments made by quarterly or annual wash-up. TPMs prevent unauthorised copying or sending but everyone is happy because the material is with the student.

- *Issue 1*: There are many DRM proposals and standards. Most are proprietary systems of copyright owners, all are too complex and none have got off the ground. I first saw proposals for internet micro payments (say 20 cents for a once only access to an article) in 1993. The closest thing 11 years later is pay-pal and it is not even close. How long will DRM take to mature?
- *Issue 2*: Greed. Like the charging for boring on-line e-tunes music at € 1 per song, the cost of access to an on-line newspaper article for research for this paper was € 10.00. No thanks.

Digital Rights Management is the answer but as *analogue* Digital Rights Management (see below).

The Internet

The legislation in Finland requires users of material from the internet to ensure, by positive action, that material they propose to copy is a 'legal' copy by contacting the owner. There is no such obligation where the source is paper based. This is just like

"if it is in print it must be true, if it is on-line it must be untrustworthy".

For a student in Finland going to use the net for research they will have to contact all copyright owners of the material they see on the web (note, not for print sources). The same applies to a teaching institution in Finland wishing to use the web as reference material. They will need extensive, expensive and exhaustive copyright clearance action? This may be a challenge for where it wishes to join those EU countries who can provide full e-learning capacity to the new Europe.

Another problem with the net is that pages change quickly. While that may be a good thing in that it may mean the page is up to date, often the page changes completely or simply disappears. In full asynchronous e-learning by distance, the whole course is prepared in advance. Where a web page is taught to, the lecturer/course designer needs to ensure the student is looking at the same page that they are. We need to be able to copy the whole page. You all will now accept that copyright law applies to the

[2] This was the response to our library a year after the (American) publisher was made aware that we exercise our statutory 3% three-page multiple copying educational right.

electronic environment just as the print. Copying a whole work (the whole website) is almost never permitted under even the most generous education friendly regimes. So we cannot protect against 'link rot'.

Google caches whole sites. Why cannot we do that for education purposes? How are they allowed to do this? Well they just do. No one complains. It is still illegal in almost every jurisdiction.

What is needed here is an education exception to permit caching web sites for the life of a course. This is what I proposed for the New Zealand version of the EUCD legislation and I am pleased to say that the government has adopted it as policy [6] and it will be in the draft law due out in July. It will be interesting to see if any content owners object to the concept when the draft is open for public submissions. None did in the early consultation.

Where does this leave Europe in developing new capacity for e-learning to in the enlarged EU?

While all countries could teach by using their own lecturer written course material, use of the web as reference material would be prohibited or at best limited by 'link rot'.

Print original reference material (paper journals and paper books), under legislation currently available, may not be able to be sent on-line or even by CD. The new digitisation and e-distribution rights have impacted on this. At best they would have to go by snail-mail. That loses the advantage of e-learning, especially for the new student who had a PC at their kindergarten and who googles every question. These e-savy students will reject the old paper way, as hard as that idea is to accept for us old hands. Education without readings, without references, without research is not education at all.

What could happen?

If Europe cannot easily provide a full e-learning environment, then other countries will. Globalisation is here. Fortress Europe is a fortress no more in the electronic age. Today's student is a citizen of the world as much as they are a citizen of Europe. Good e-learning is still good e-learning irrespective of the nationality of the institution behind the server behind the wires behind the students screen. Global and international subjects will be equally well taught by any reputable institution. And where the student wants a full e-learning service, they may well look to an institution outside of Europe.

What model can work?

I come from a 100% e-learning tertiary (university level) degree granting institution, The Open Polytechnic of New Zealand. Our e-courses are 100% on-line. I will explore our legislative and contract based environment to example one model working in the e-learning environment.

E-Journals: We use one journal aggregator. We pay for our library research access and lecturer access. We also pay for student on-line access. Payment is based on last year's usage and is prospective. We also have an agreement that we can use printouts from the service as a basis to make copies for our paper based distance courses where the student numbers are below 400.

Paper journals and published books: We have a Reproduction Rights Organisation (RRO) licence that permits us making one copy per student of one article from a journal, one chapter or 10% of a published book (the greater of) where the original copied from was on paper. The copy may be paper or digital and may be delivered on a secure, student ID logged in, electronic system (our student extranet). We pay € 6.00 per Equivalent Full Time Student (EFTS) per year.

Newspapers: We have a licence at under € 1.00 per EFTS for one article per student for print and electronic access.

Web access and copying: New Zealand law [7] permits making copies of 3% or 3 pages from a work for educational purposes. A web site is a work and a page is what you can scroll. This is helpful for print access to web resources and meets our print needs. Our e-learning needs are met in part by live access and our other needs will be met by the proposed legislation change. It may be that 'anticipating' this law change would be a 'no risk' option.

> 1 Section 44 (3) of the New Zealand Copyright Act 1994
> 3) Copyright in a literary, dramatic, or musical work or the typographical arrangement of a published edition is not infringed by the copying of part of the work or edition if —
> (a) The copying is done by means of a reprographic process or by any other means; and
> (b) The copying is done for an educational purpose; and
> (c) The copying is done by or on behalf of an educational establishment; and
> (d) One or more copies of part of the work or edition is or are made on any one occasion; and
> (e) No charge is made for the supply of a copy to any student or other person who is to receive, is receiving, or has received a lesson; and
> Subject to subsection (4) of this section, —
> f) (ii) On and after the 1st day of January 1998, the copying is of no more than the greater of 3 percent of the work or edition or 3 pages of the work or edition

Direct clearances/general approvals: My office obtains general clearances and pays for specific clearances where our needs exceed the 10% or one chapter rule. In many cases these are technical 'non-commercial' publications.

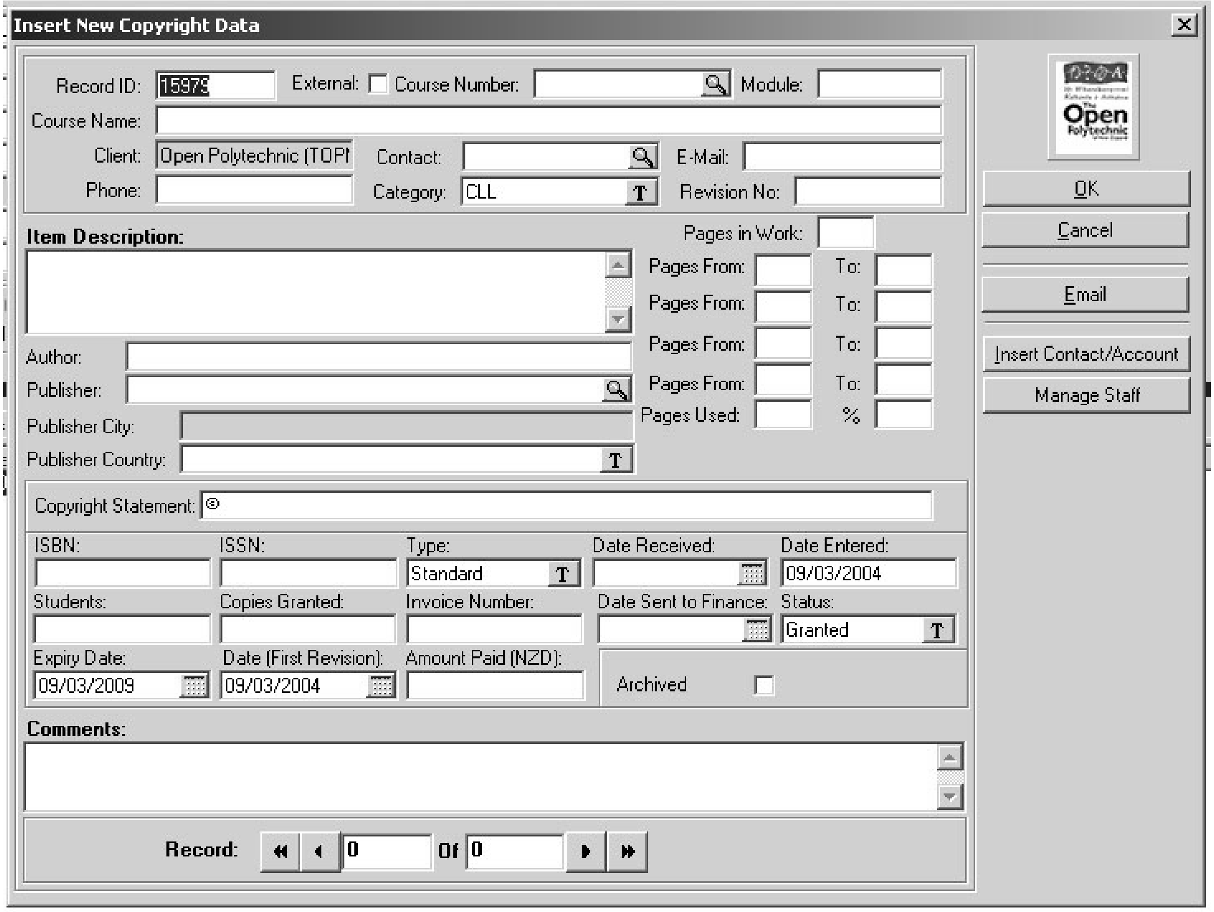
Recording of use: Our RRO licence requires us to submit to a survey of usage (records to be kept at photocopiers) once every 4 years and obliges us to also supply a detailed record of 'course pack' copying at the same interval.

In fact my office records 100% of our copyright usage down to the full bibliographic record, the course detail and student numbers.

This detailed record enabled me to negotiate down the demands from the newspaper rights organisation to about a quarter of the original demand. I was able to prove our use was very much less that they had imagined. The price is still proportionately unreasonable but in real terms low enough to pay for the convenience, at least in the short term.

We record our usage on our Customer Relationship Management (CRM) system specially modified for our copyright usage. The product is called SalesLogix and is used by our call centre and student (phone) contact staff and our marketing department. We have about 16,000 copyright clearances covering 30,000 students (6,500 Equivalent Full Time)

Here is a screen shot of the data entry screen of our copyright recording program.



You see the detail that is recorded it is a quick and easy data entry job and meets all our compliance and contractual obligations. This is Digital Rights Management in a manual or analogue form. The system has the ability to calculate fee per page per publisher, per title or even per author and can even generate payments. Here we can be sure an author gets paid for copyright use of their material! Currently our licence is a blanket cover rather than a transactional one like the US CCC system but we are ready for the near future.

If you see this as a challenge, try the challenge of not being able to use reference material in your e-learning. THAT is a real challenge. Remember, if you are preparing course packs you should record and publish full bibliographic material anyway. You will already have your course name. With this data you will have the screen almost complete already.

What is the minimum that needs to be done to empower Europe as a ‘full service’ e-learning provider to empower the new Europe?

1. Technological Protection Measures must be able to be legally circumvented for legitimate use and the owners of the TPM’s must provide to educators the necessary decryption tools.
2. Full use of the net (free internet) for educational use including caching for the life of the course must be enabled.
3. Educational copyright institutional users must keep full records of electronic copyright usage for rights management purposes and reasonable payment (similar to paper copying fees) for educational usage must be paid.
4. Contracts for electronic resources must be deemed to incorporate ‘fair educational use’ provisions.
5. TPM’s and DRM (private commercial rights) must not be enforceable by criminal sanctions.
6. Any DRM regime must not include any more than basic use and no personal details shall be kept. Individual; rights to privacy should be protected.

The EU copyright directives will impact on everyone's activities in the e-learning environment. The issue needs considering now. It will be much harder later when your rector, chief executive or proctor asks you for an explanation of why your expensive flagship e-learning programme has been stopped by a court injunction on behalf of some copyright owners.

References

1. IAN BROWN (2003) *Foundation for Intellectual Property Research report on national implementation of the EUCD,* http://www.fipr.org/copyright/guide/
2. WORLD INTELLECTUAL PROPERTY ORGANISATION (1996) Internet Treaty, http:/www.wipo.org 20 Dec 1996
3. THE EUROPEAN COMMISSION (2000) The e-Europe 2002 Action Plan and 'Information Society Technology' Programme (1998-2002) no. IST-2000-28606
4. IAN BROWN (2003) *Denmark allows decryption of DVD's for use on Linux machines and permits DVD region circumvention* http://www.fipr.org/copyright/guide/denmark.htm
5. *US v. ElcomSoft & Sklyarov (2001)* accessed (2004) http://ukcdr.org/issues/sklyarov/
6. NEW ZEALAND GOVERNMENT (2003) Digital Technology and the Copyright Act 1994: Policy Recommendations http://www.med.govt.nz/buslt/int_prop/digital/cabinet/index.html
7. NEW ZEALAND GOVERNMENT (2004) Copyright Act 1994, section 44(3) http://www.legislation.govt.nz/browse_vw.asp?content-set=pal_statutes

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FROM AN AUSTRALIAN – POLISH EXPERIMENT TO EMDEL PROJECT LEONARDO DA VINCI, 2001-2004

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Introduction to Ethics online

Teaching ethics is not a new idea. It can be done in many forms, as a separate subject or as an additional topic to existing subjects (e.g. Basic ICT, Information Systems). It is not a trivial task to prepare the course in Ethics which can be offered in different countries, at different universities or colleges and for different students profiles. First of all the aims of studying Ethics must be defined and accepted by philosophers from different institutions and countries.

It was confirmed in the discussion performed online that the course will give students the opportunity to:

- Discover ways of acting that are worthy of choice and of discerning those that are unworthy of choice.
- Answer the questions that open up an ethical issue for fruitful discussion, for example, What? Why? How? Who? When? Where? What are the foreseeable effects? What are the viable alternatives?
- Learn the ethical implications of traditional beliefs and observances.
- Establish a body of information about the ethical issues and the debates surrounding them.
- Learn the skills of research, analysis and discussion, appropriate to the study of ethical issues and decision-making.

Secondly, objectives of studying about ethics were also formulated. The course would enable the students to:

- Exercise greater sensitivity, reflection and method in moral decision-making with regards to personal, professional, societal, national and global issues.
- Contrast ethical perspectives on selected issues.
- Analyse the contributions of religious beliefs and values to traditional and/or contemporary ethical debates.
- Understand the sources and role of authority in ethical debate.
- Learn and improve upon the skills of research, analysis and discussion about ethical issues and decision-making.

Using Internet in learning and teaching gives much more autonomous learning, offers a much wider set of study materials [2] and also enables to open and moderate an international forum. But before opening the course for the public the methods of building the course online must be chosen.

Ethics online has been conceived and developed after two teachers from Australia and Poland met each other in the WCCE 2001, held in Copenhagen, Denmark.

One of the most important tasks was to propose a course which could have been used for teaching ethics to engineers at ICT departments at Polish universities of technology and also for teaching ethics at Australian universities. In case of engineers the main goals of teaching ethics are to stimulate the ethical imagination of engineers; help engineers to recognise ethical issues; help engineers to analyse key ethical concepts and principles relevant to engineering practice; help engineers deal with disagreement, ambiguity and vagueness; encourage engineers to take ethical responsibility seriously [1]. However, there is no single right answer to most engineering ethical problems. There is no Newtonian law of ethical behaviour in a dynamic changing technological situation [3]. That is why not only contents of the course should be well designed but also pedagogical techniques should be properly chosen.

Building the course online while there is a distance between the course builders needs to develop an easy accessible environment which supports collecting materials, exchanging ideas, discussing details of the course delivery procedure. In the very beginning e-mail was used for the course building purpose. In this case monitoring the whole process was difficult and complicated. That is why the dedicated environment was developed and tested. The main purposes of the system were collecting materials and exchanging ideas between the course producers (content developers, teachers, system administrators, course providers). The course builder was mainly used for collecting materials, links and exchanging ideas. It should be stressed that BOARD was mostly used for communication and FORUM was used rather rare. The course builder is located at http://www.dec.pg.gda.pl/pro/tepe/.

While an enormous amount of online resources can be found for an online course, the most difficult and significant task for the course developers seems to be inventing an assignments procedure and assessment criteria. Both must be carefully designed and precisely presented to make the course participants classification clear.

The work that must be done in order to fulfil the course requirements is divided into 4 parts:

1. Journals (8-10) – 20%
2. Research Essay – 25%
3. Debate-Group Oral Presentation – 30%
4. Course Project – 25%

The original content of the course concerning the assignments procedure and the assessment criteria are described [8].

This course has been built as an open source proposal for those who would like to join the project and to work at the constantly improving resources. The course is located at http://www.dec.pg.gda.pl/ethics/.

EMDEL project – goals and objectives

The main goal of the project EMDEL (European Model for Distance Education and Learning) is the realisation of an European Teletraining System which, from what already has been produced, could immediately start a process of co-operation at the level of production and organisation of distance training services. Besides, it should lead to the reduction of costs, the harmonisation of local systems and the rapid increase in the offer of formative courses.

The main objectives of the project are following:

1. Production of an on-line Catalogue "Showcase of Distance Learning Modules", which will contain a list and a description of the products partners' interesting at transnational level, collected in their "Diatheque" by the partners. The creation of the Catalogue will give both the trainers and the managers of Distance learning systems the possibility to know what the offer is on the market regarding distance learning modules and their ways of utilisation [9].
2. Production and share of a basic software programme for the assessment of customer satisfaction and quality of the products [10].
3. Exchange of the best products realised by the partners and post production (translation, adaptation and diffusion).
4. Virtual mobility through on-line utilisation of Distance Learning Modules installed on the servers of the partners' net mainly by allowing the utilisation of distance training products in the original language to a person living in a partner country without an action of post production and by having at one's disposal services of support and accompanying both locally and on line (in the original language) thanks to the presence of tutors operating in local systems.

5. Dissemination, through the presentation of a model of realisation, of an European Teletraining Network to demonstrate the concrete possibilities of construction, starting from an existent distance training system based locally but with transnational connections. The dissemination also aims at extending the number of agencies of distance training which want to co-operate for the maintenance of the catalogue and for the increase of the exchange of products.

Exchanging the best products

In objective 3 the main problem was to develop a special template for the product exchange. In the EMDEL project the following courses were proposed by partners for adaptation:

TUSCANY REGION (Italy)
Communication to All Fields 1-2 (n° 728 and 729)
Working with Collegues (n°724 and 746)
From Manager to Tutor (n° 735)

VOX (Norway)
Konsept – Interactive resources in social science
STUDIT, English modules 1-6 – Contemporary Competence in Tertiary Studies
The Gateway to ICT – The Gateway to ICT, a world of possibilities

UNIVERSITY OF LIEGE – LABSET (Belgium)
FORMADIS – Concept of on-line course
FORMASUP – Pedagogical strategies, methods of assessment
Experimentation and Evaluation of On-line Course

UNIVERSITY OF SZEGED (Hungary)
LI_EN-2 (English Intermediate)
LI-GE-02 (German Intermediate)

GDANSK UNIVERSITY OF TECHNOLOGY (Poland)
TeleCAD – Teleworkers training for CAD systems users
EEA – English for Environmental Awareness
Ethics on-line

DISTUM (Sweden)
S1001 Spanish, step 1
S1004 English B
S1012 Swedish A

KAUNAS CENTER (Lithuania)
EUROLI – European Law and Institutions
ADIS – Disables Adults' Integration into the Labour Market
TELECOTTAGES

The final list of the products exchange is shown in Table 1.

Table 1: Products exchange table

COPYRIGHTS OWNER	DL MODULE	ADAPTATOR
Gdańsk University of Technology and MacKillop Catholic College, Australia	Ethics on line	Vox Toscany Region
LabSET	Needs Analysis/FORMASUP – Pedagogical strategies, methods and assessment	Kaunas University of Technology
Kaunas University of Technology	Telecottages	Gdańsk University of Technology
Kaunas University of Technology	Telecottages	LabSet
VOX	STUDIT – Contemporary Competence in tertiary studies	Swedish Agency for Flexible Learning
	Konsept – Interactive resources in social science	University of Szeged

In order to enable legal exchange of the products special agreements were signed by owners and adaptators. The proposed agreement between Australian and Polish institutions covered the following issues:

- Details of commercialisation
- Copyright
- Right of reproduction
- Copy and reproduction rights of third persons
- Pricing
- Compensation for the sale of partner modules
- Making use in the own institution
- Warranty/Liability
- Jurisdiction clause

Summary

At this stage it is difficult to calculate profits of proposed procedure of exchanging products. On the other hand, it is obvious that producing courses starting not from the scratch is much cheaper. What is more, the adaptators can concentrate on the process of post production and it is possible to make the product more rich and valuable.

Having tested the procedure for exchanging courses, several institutions involved in the EMDEL project decided to exchange new products. Kaunas University of Technology will adopt Ethics online and Gdansk University of Technology will translate the course “Use of Information Technologies in Management of Human Resources”, developed by the Business Competence Centre at Kaunas University of Technology. Originally, the course is located in WebCT, and in order to enable the most convenient way of adaptation, the WebCT environment will be offered in a Polish pilot course.

Finally, the results of subproject 3 in Polish case are located at the address http://www.dec.pg.gda.pl/pro/leonardo/emdel/ and the welcome page is shown in Figure 1.

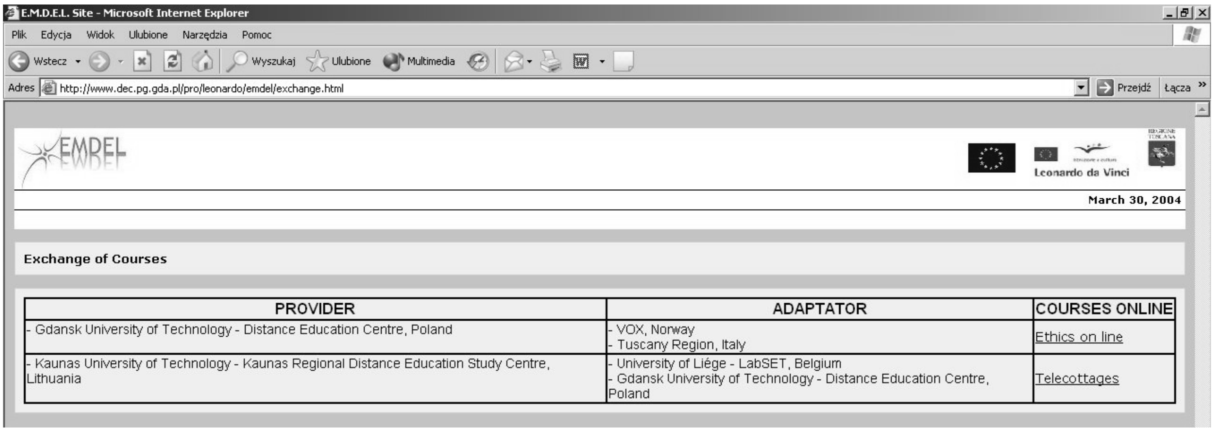

Figure 1. Welcome page of “exchange courses ” subproject (DECTUG case)

References

1. BARROSO, P. AND JESUS DIAZ DEL CAMPO AND WECKERT, J. (2001) *Teaching Computer Ethics: A Comparative Study*, Proceedings of ETHICOMP 2001, pp. 215-222
2. GRABOWSKA, A. (2001) *Teaching Philosophy of Ethics online,* online at http://dec.dec.pg.gda.pl/ethics/ accessed 20.07.2002
3. RABINS, M. J. (1998) *Teaching Engineering Ethics to Undergraduate Why? What? How?* Science and Engineering Ethics, 4, pp. 291-301
4. RAHANU, H. AND TURNER, E. (2001) *Is Using Distance Learning Approach Applicable to Teaching Ethics to Business and Computer Science Students?*, Proceedings of ETHICOMP 2001, pp. 155-163
5. TURNER, E. AND ROBERTS. P. (2001*) Teaching Ethics to IT Students in Higher Education: Provision, Perspective and Practice,* Proceedings of ETHICOMP 2001, pp. 223-231
6. SMITH, M. (2001) *Teaching BioInfoEthics: Preparing Students for Decision-Making in Research, Practice, and Public Policy,* Proceedings of ETHICOMP 2001, pp. 192-195
7. ŻUROWSKA-KRAKOWSKA, G. AND SIKORSKI (2001) *Teaching ethics in information technologies,* Proceedings of ETHICOMP 2001, pp. 205-213
8. GRABOWSKA A., NAGABUSHAN PRATHIBA (2002) *Building Ethics Online Course. Australian and Polish Case Study.* W: Proceedings. The Transformation of Organisations in the Information Age: Social and Ethical Implications. ETHICOMP 2002. Lisbon. Portugal, 13-15 November 2002. Ed: Universidade Lusiada de Lisbona pp. 531-543
9. EMDEL PROJECT WEB SITE (2004) http://www.emdel.org/
10. GRABOWSKA A. (2003) *Searching for evaluation procedures for Web based courses – cases from EU projects.* W: Proceedings. 12th EDEN Annual Conference. The Quality Dialogue. Integrating Quality Cultures in Flexible, Distance and eLearning. Rhodos. Greece, 15-18 June 2003.
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LESSONS LEARNT FROM THE FIRST SCHOOL+ MICROCOSMOS PILOT REGARDING EDUCATIONAL INNOVATION[1]

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Abstract

This paper summarises the main results of the first School+ Microcomos pilot carried out in the five consortium's schools placed in five European Countries. The main aim of this pilot was to provide information to improve the first version of the platform and to explore issues related to the development of parallel organisational and symbolic technologies in order to re-engineer the school environment to meet the challenge of educating learning citizens in the IS. As results of our research this paper focuses on the main achievements and difficulties now-a-days' schools are facing to be able to introduce major changes to cope with the educational demands of a knowledge and technology-driven society.

Background

The conceptual framework of School+ stipulates that the integration of ICT into the school curriculum must be understood within the context of educational change. Research consistently shows that technology by itself does not produce a *mega-change* in teaching and learning practices (Ringstaff and Kelley, 2002). In a similar direction the use of digital tools does not necessarily imply the implementation of fundamental changes in the teaching and learning processes (Cuban, 2001; Schofield and Davidson, 2001; Ringstaff and Kelley, 2002; Kozman, 2003). Even in distance education environments, technologies are often used in ways that simply reinforce the prevailing cultural beliefs about education in which "teaching is telling learning is listening, and knowledge is what is in books[2]" (Cuban, 1992: 27). So, it is important not only to design, develop and implement technological tools to improve teaching and learning experiences, but also to have a clear understanding of its pedagogical implications.

The learning environment necessary to fostering the human and social capacity development for students to become active learners and citizens in the Knowledge Society highly need sound educational practices. This context requires a deep reconsideration of what accounts as school knowledge, and a profound revision of school space, time and organizational structures (Hargreaves, 2003).

From this comprehensive approach to school's innovations related to the use of digital tools, in this paper we point out the main lessons learnt from the first implementation of a digital platform: School+ Microcomos, along with the approach the consortium agreed and shared as the most convenient to achieve the projects' objective of helping to build tomorrow's schools.

[1] Project partially supported by the European Commission under the "Information Society Technologies (IST)" programme. Action-line: School of Tomorrow. September 1st 2001- August 31st 2004. School+ consortium is integrated by four Higher Education institutions (the University of Barcelona – Spain, Neuman Institut – Istrael, Oulu Universit – Finland and Karlova University – Czech Republic), five secondary schools (IES Bernat Metge – Spain, Ellinogermaniki Agogi S. A. – Greece, Alliance High School of Haifa – Israel, Oulunsalo Secondary School – Finland, Gymnazium F. X. Saldy – Czech Republic) and an SME (ExtremeMedia Solutions Ltd. – Greece)

[2] Or now-a-days in digital materials or Internet.

School+ aims to contribute to the improvement of European education by designing, developing, demonstrating and evaluating a comprehensive teaching and learning environment. This learning environment is the result of the integration of a progressive educational perspective and an ICT system to ensure that schools (teachers, students, parents, etc.) acquire and develop knowledge and skills required both by future and present citizens of the information society.

This paper seems especially relevant in the particular moment we are experiencing in an enlarge European Union. The entrance of ten new member countries with highly diversified educational culture and technological development levels represents considerable challenges. In this context, distance education can be envisioned as a way of overcoming traditional schools problems and approaching students and teachers to the Information Society. However, distance education has to deal with all the challenges faced by technologically enriched teaching and learning environments – such as the one represented by School+ project – and, in the compulsory schools years, with the fundamental question fostering students autonomy and predisposition to learn.

Process Overview

The content of this paper derives from five of case studies conducted in five secondary schools in order to implement and assess the first School+ Microcosmos pilot. An important part of the studies was aimed to identify the technological limitations, find the bugs and malfunctioning of the platform and inform the second technical specification report. A not less significant part was meant to reveal the educational changes brought about by School+ project, its contribution to students' learning, and its main limitations.

As it is easy to understand, teachers and students faced a good deal of technical problems derived from the early stage of development of School+ Microcosmos platform. All of them were very conveniently reported and taken into account for the second School+ Microcosmos release. Thus, in the following paragraphs we will focus on the main achievements brought about the *organisational and symbolic technologies* developed by schools during the first pilot.

This pilot was implemented through the following combination of actions and strategies:

1. Planning of the implementation process of the collaborative activities in participating school. As an umbrella-topic to develop the collaborative activity among the five participating schools was *the roles of water in human life.*
2. Implementation of the collaborative activities in participating schools, using inquiry-driven approach.
3. Assessment of the implementation of the collaborative activities using case study approach.
4. Elaboration of a case study report by each consortium's school.
5. Elaboration of a comparative study which includes results from each particular case study.

These actions and strategies were translated into a work plan with detailed guidelines for partners to undertake it.

Contents and methodology

As agreed[3], each consortium's school had to define a broad question about the topic "water" previously chosen. After that all of the participants, including both students and teachers, would construct more questions and problems to analyse. The initial idea was to identify what kind of knowledge was necessary to solve all questions raised. From this start, each school had to define a set of questions and problems to be inquired. Every school had something different to do in mind than traditional classes. Most of them worked on a set of questions to be inquired by students and only some schools added methodologies based on problem-centred project or dilemma-centred project.

[3] This work was done in a previous phase of the Project and is reflected in the report: *Collaborative learning activities report*.

As an example, some of the questions to be inquired were:

1. What does water represent in different cultures?
2. What changes has water produced in the history of human beings?
3. Why is water a source of musical inspiration?
4. When and where did the first molecule of water appear?
5. Why don't people consider water important?
6. Why is water so important for human life?

However, not every school could carry out a very different teaching and learning practice from normal classes. In fact, some schools combined lessons, field tests and assignments defined by teachers in order to help to search information. In this sense, the methodological approach was different from one school to another. While some of them completely broke the subject approach, others considered questions or problems to be resolved from subject-specific viewpoints.

In this sense, each school tried to implement some innovation depending on their possibilities and following their traditional pedagogical culture. In general, subject-centred approach was combined with a more active pupils-centred pedagogy perspective, where students had some autonomy to derive research processes according to their interests and findings.

A good amount of time was used in team working in every school, but it was not always this kind of activity that contributed to build knowledge the most, especially if its characteristics were essentially lacking in debates or discussions among students. In general, the group work consisted in dividing tasks, for example: searching for information, making summaries, designing web pages, etc; discussions about how to carry out such tasks were less common.

Time and space

School time and space have been identified as one of the most persistence characteristics of the basic schooling "grammar" (Tiack and Tobin, 1994). In our case, schools made a big effort to reorganise school time and space in order to provide students a more challenging and engaging learning environment. In general, the schedule was divided into flexible blocks trying to skip the typical 45-50 minutes per subject, depending on the necessities of the tasks at hand. However, in those schools which decided to follow a subject-based approach some subject-specific lessons (from 50 minutes to one hour approximately) were reserved for its special assignments. These assignments were given to the whole class, but otherwise the pupils were allowed to work on their projects in their own desired order. Some schools planned visits outside school, which were made within the school time or using extra time.

Thus, administration of time required some arrangements and rescheduling from the normal school timetable. Obviously, these arrangements engaged changes in the rest of the school's groups. So, this flexibility represented an exceptional situation, specially planned for this first pilot. In most countries, making this flexibility sustainable means not only involvement of whole school staff, but also the educational administration.

Something similar happened related to space organisation. In general, all spaces at school, not only classrooms, were used when they were necessary (library and computer room mainly). Even more, some schools visited institutions to reach valid information for researching. Obviously, it was a new approach to use scholar spaces. Classrooms were used along with libraries, computer rooms, and outside places such as companies and institutions. Most places were used according to the students' decision. However, computer rooms were far the most used space. As happened with the flexible planning of time, to use space with such flexibility required special arrangements with the rest of the school's groups.

Students' learning process

The most important knowledge gained during the first pilot relates to a new way of working, marked by the discovery of a different relationship between teaching and learning. All of the difficulties experienced and the problems working with the new teaching and learning approaches (methodologies based on inquiry oriented projects, global research questions, research based methods, etc.) reflect how new this methodology was for both students and teachers.

When students are faced with inquiry-based, process-oriented and student-centred situations themselves, teachers, and sometimes researchers, find it difficult to establish the meaning of what they learn. According to Kemmis et al. (1977) most computer interactions face students with *recognition* tasks. Typically students learn from the text, and the *correctness* of their answers is judged in terms of the direct relationship between their response and the text as the perfect version. In our case, following Kemmis et al. (1977) typology, the proposed interaction for students – with different degrees of freedom – was *global reconstruction or intuitive understanding* and *constructive understanding*. In these kind of educational contexts answers generally involve prolonged activity, and control over interaction rests more on the student than on the programme. They create the opportunity for students to "get a feel" for an idea, to develop a sense of applicability for problem solving or diagnosis strategies, or to learn subtle recognition skills. The *constructive understanding interactions* are extremely open-ended and involve the student in the creation of fields of knowledge.

Even if all consortiums' schools agreed in implementing a shared pedagogical approach to foster *global reconstruction or intuitive understanding* and *constructive understanding*, all of them work on the same topic and use the same digital environment (School+ Microcosmos), the teaching and learning experience was rather different in each school and very much related to the school culture. Schools also reported improvements in the following matters:

- How to use computer and other electronic tools
- How to combine work of different subjects
- How to formulate questions
- Methodology to prepare questionnaires
- How to search information on the Internet (WWW)
- How to divide team work and organise different tasks

The general view was that the students gained a deeper understanding of the topic they studied and a greater involvement in the learning tasks.

Pedagogical, organisational and technological limitations

One of the most positive results of the pedagogical approach of the first pilot is related to the discovery of a new way of working to promote an alternative teaching and learning process. However, this discovery is countered by the fact that some participants lacked the knowledge and experience about how to work with this methodology (suggestion: project-oriented approach). A good deal of difficulties emerged from the implementation of new teaching methodologies and teachers and students found it difficult to determine how to promote an inquiry-oriented learning and overall how to break subject boundaries, along with the use of a new technical tool.

It is also important to mention the difficulty of allocating time to use the computer rooms and of maintaining more flexible times and spaces in the school structure. The regular routine of the school would place a great barrier to such flexibility. In fact, some schools had problems to break lesson blocks of 45 minutes and those blocks were a real obstacle to implement the new approach to teaching and learning along with curriculum requirement from administration and the use of a technical environment.

Time to prepare that kind of methodology in a collaborative manner among teachers was also an important barrier, especially in school where teachers are paid per number of lessons and extra time is not considered for preparation.

Main Conclusions

The central pedagogical results of this pilot can be summarised as follows:

- In most schools teachers' role was changed from a source of information transmission to a guide in the process of searching and selecting information and advisors in the learning process.
- The main role of students was to search and organise relevant information on different questions in order to complete work proposed by teachers. When students worked on a global research question they could define a more autonomous work.
- Methodology, depending on schools, was the result of a combination between traditional subject-centred approach and a more active pedagogy pupils-centred perspective, where students had some autonomy to derive research processes according to their interests.
- Continuous assessment of learning processes and a global evaluation of students through a product (primarily web pages, written reports, other digital materials as "water game") were the two most innovative aspects of the evaluation process.
- The most important knowledge gained during the pilot activity relates to a new way of working, marked by the discovery of a different relationship between teaching and learning. In this sense: how to use computers, how to look for on line information, how to combine work of different subjects or how to formulate questions were the main results of learning.
- Schools found a great difficulty in reshaping schools' time and space. A more flexible managment of time and space is neccesary in the future. There were some problems that resulted from an insufficient number of teachers, computers and time in the computer room.
- Finally, the use of the School+ Microcosmos was quite limited due to the lateness of its implementation and its continual development during the testing period. Teachers and students had to learn how to use the tool in the course of the pilot study, which made it difficult for complete on-sight testing during the collaborative activity (this issue also made the parents' involvement more difficult).

References

1. CUBAN, L. (1992) *Curriculum stability and change.* In Jackson, Philip (ed.) Handbook of Research on Curriculum. American Educational Research Association
2. CUBAN, L. (2001) *Oversold & Underused. Computers in Classrooms*. Cambridge, MA: Harvard University Press
3. HARGREAVES, A. (2003) *Teaching in the knowledge society: education in the age of insecurity*. Buckingham [England]; Philadelphia: Open University
4. KEMMIS, S., ATKIN R., & WRIGHT E. (1977) *How do Students Learn? Centre for Applied Research in Education*. University of East Anglia: Occasional Publications nº 5. Norwich
5. KOZMAN, R. B. (2003) Technology, Innovation, and Educational Change – A Global Perspective. Washington, DC: ISTE
6. RINGSTAFF, C. AND KELLEY L. (2002) The Learning Return On Our Educational Technology Investment. A Review of Findings from Research. WestEd.
7. SCHOFIELD, J. & DAVIDSON, A. (2001) The Internet in School. Promise and problems. San FRancisco: IB-Jossey-Bass
8. TYACK, D. AND TOBIN, W. (1994) The "Grammar" of schooling: Why Has it Been so Hard to Change? *American Educational Research Journal*, Vol. 31/3, pp. 453-480

PROMOTING THE USE OF ICT IN PRIMARY SCHOOLS: THE ACTIV-E PROJECT

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1. Introduction

The conditions in experimenting and testing of new tools in education often produce exceptional results. But these results are, even much more often, difficult to be achieved in future times, in general and non-experimental situations.

We would dare to affirm that the introduction of ICT in schools, and in most levels of formal education, has to respond to teachers' individual interests who believe in the possibilities and the powerful resources ICT may provide to improve teaching and learning, in schools and out of them. Web-sites, online resources, multimedia materials have required big efforts only possible to get by personal motivations of encouraged teachers.

This could be one of the reasons why much successful experience does not occur or is not reproduced in other sectors of the educational community. Teachers' efforts should not be isolated and schools should be able to consider how to take profit of these successful developments.

During the last years, different observatories of e-learning and about the use of ICT in education have been developed, as local initiatives or as a broader partially funded consortium.

These observatories have published several reports of reference, which have been considered as benchmarks in the field: Astrolabio[1], e-Watch[2], DELOS[3], L-Change[4]. Some of them publish annual reports on the state of the art of e-learning in Europe. Analyzing some of their results, we might detect that the use and creation of websites for teachers and students at all levels is promoted, but few research is being done in the facilitation of their maintenance and management once the site is created.

2. ACTIV-e: Project description

Taking into account the previous considerations and other related issues, several educational institutions decided to work towards the aim of promoting the use of ICT in the primary school sector, making teachers without special motivation in it, come into the experience of designing, developing and using the school websites from a pedagogical point of view. By doing so, not only faculty but also directors and personnel in decision-making positions in the schools will be able to better consider why their institutions need a website for, which are the advantages and, how the use of ICT can contribute to the improvement of quality of education and pedagogical services.

The ACTIV-e project represents a multiphased, holistic project established to improve the management, effectiveness and uptake of web-site creation technologies by all levels within the primary education sector.

In general terms, the project aims at developing a reference tool for primary schools to use pedagogically their websites as promoting their use as an interface through which all educational community members can interact between them, taking profit of different levels of interaction (Moore, 1989; Swan, 2004). ACTIV-e intends to involve all members of the educational community (teachers,

[1] http://astrolabio.edulab.net and http://astrolabi.edulab.net
[2] http://www.eun.org/eun.org2/eun/en/index_ewatch.cfm
[3] http://www.education-observatories.net/delos
[4] http://www.education-observatories.net/lchange/index.pt

parents, management staff, and pupils) in the design, implementation and administration of the school web site. By doing so, **they will become autonomous and will manage information and online educational resources according to their own needs**.

In essence, ACTIV-e represents an interactive guide to web creation for all where the enormous potential of web page technology as a pedagogical tool is expressed through "end user" validation.

The project willing to cover the mentioned needs and has been partially funded by the European Commission under the Socrates Comenius Action 2.1 – "Training School Education Staff" programme. It started in October 2002 and will end in October 2004.

Project partnership is integrated by 2 universities, 3 ICT institutions and 8 primary schools, from 5 European countries: Universitat Oberta de Catalunya (Barcelona, ES), Open University (Milton Keynes, UK), CEIP Frederic Godàs (Lleida, ES), CEIP Sant Josep Oriol (Barcelona, ES), Menon Network (Brussels, BE), Kotka Continuing Education Centre-University of Helsinki (FI), ICT-Support Fosie Children and Youth Dept. (Malmö, SE), Augustenborg (SE), Söderkullaskolan (SE), Russell Street First School (UK), Longville Church of England School (UK).

The project web site (http://www.uoc.edu/in3/active) includes all the work developed: methodological framework, interview tools, reports, annexes and recommendations. A search engine allows users to look for guides, functionalities and download templates to implement functionalities.

2.1 Project objectives

ACTIV-e main goals are:

- To analyze the different functionalities and pedagogical possibilities and uses of primary schools web pages.
- To develop a system allowing deciding which information and educational services may a primary school offer through a web site.
- To recommend or create tools and guidelines on how to develop a website and make a pedagogical use of its functionalities according to the school needs (informative, pedagogical).
- To provide schools with guidelines so that they can manage their own web site according to their needs, at an institutional level but also from the point of view of teachers, parents and pupils.
- To cover primary schools new needs by developing templates and facilitating the creation of educational applications by themselves.
- To contribute to generate a debate on the pedagogical management of ICT tools in schools.
- To promote the use of virtual environments by teachers, pupils, and administrators in the primary school sector.

2.2 Objective related activities

- To provide on-line access to a comprehensive reference guide to the best available web-page applications suitable for the primary school sector. The reference site includes recommendations and instruction on implementation and suitability relative to intended didactic use.
- To facilitate an interactive use of the reference guide to provide targeted problem solving and guidance for specific user types and user environments within the sector.
- In conjunction with providers and clients, critically evaluate the functionality of existing guides and match these attributes to user requirements. Additionally, identify functionality/training deficits that provide areas for further development.
- To provide a procedural framework based on functionality which allows efficient incorporation of technology in a logical and comprehensible manner.

- To offer an interactive forum that permits ongoing discussion, debate and feedback, between providers, evaluators and users.
- To conduct continuous formal evaluation of user uptake and acceptance in order to understand and control the use of applications in a manner that maximizes effective development of the technology.
- To disseminate information, feedback, among all stakeholders to ensure that the program remains current and relevant and promotes interaction and uptake.

  In addition the project structure allows for the provision of a consultative forum, which incorporates feedback from client/user groups.

3. Methodology and developed tools

The following tasks have been undertaken up to now, together with those foreseen tasks until the end of the project.

a) Literature review

A detailed *review of literature* on the pedagogical use of websites in the primary schools sector was developed.

b) Survey on guides for the creation of school websites and assessment system

The partnership has focused an important part of its efforts in making and *inventory of guides for the creation of school websites*, by looking at existing ones in the Internet. The guides should be useful for different purposes, so the partnership evaluated them from a technological, pedagogical and functionality perspective. It was also taken into account the type of information they were providing, together with the target group (institution, students and teachers).

The guides are available on the project website. A search engine is implemented by classifying the guides into different categories, providing stakeholders with a comfortable access to the information of interest.

In parallel, an **assessment system** was developed, to get to know which were considered the most suitable guides for primary schools according to their needs. The system is basically based on a *checklist* to organize hierarchically the mentioned guides. As a previous task to this, a pilot test was developed. By doing so, a consensus was reached on criteria and assessment elements. A functionalities grid was filled in, and the guides were assessed according to defined criteria and in a scale of 1 to 5.

c) Inventory of other information, communication and educational functionalities included in European schools web pages

The partnership led a fieldwork on needs analysis in two phases: first, by listing the already existing functionalities, resources and information in school partner web pages; and secondly, by interviewing teachers in partner primary schools about possible new functionalities that might cover their needs.

In order to work up a summarized list of functions, they were classified into the three following categories: 1) *informational* 2) *exhibitional* and 3) *pedagogical* functions.

The validation of the above mentioned functionalities was carried out by collecting feedback from a sample of schools on their relevance, usefulness, appropriateness, as well as find out new functions which will better respond on the current and emerging school needs in creating and using web pages. An interview grid was prepared and face to face interviews to 20 primary school teachers were conducted. It included questions concerning the current status of the school website and “desired” functions of school website as well as the possible new functions of school website. In addition, there were questions concerning school’s future scenarios and future information strategy. The interviewed provided comments and suggestions which represented position of the school as a whole and not only a single person point of view.

A report on “Field research on functionalities in primary school web pages” was produced, describing the methodology and the results of this work.

d) Development of templates to create new functionalities

From the basis of the general and valuable result of all the worked developed within the project at this stage (Internet guidelines, existing functionalities, and desired or expected functionalities), 107 different templates have been defined and elaborated on e.g. general information about the school, information and access to school activities and pupils’ projects, access to resources and links to related institutions, and other schools, communication facilities, a parent’s area, educational resources in general, training the trainers resources, and resources and information about learning difficulties and education for the disabled.

Two kinds of templates have been developed: those showing how to incorporate the detected functionalities on web pages and in guides – that is, templates for the already existing functionalities; and those for generating templates for the functionalities with non-existing solution nowadays.

Templates are structured as follows: brief description and aims, source where resources can be got from, prerequisites needed for the end user, hardware and software needed to implement it, target group, a “how to do it”, and points to consider and recommendations.

- *Internal testing of these templates*

  Elaborated templates have been tested internally by all partnership, according to several criteria: level of complexity, ease of use, difficulty for a teacher or end user to implement it, etc.

- *External testing of these templates: dissemination through the project website and revision by external educational centres*

  The opinion of external users of the templates will be taken into consideration as a way to assess them externally. External users might be stakeholders who contact Activ-e through the project website or contact institutions of the partner primary schools.

Working dynamics have been carried out mainly online. There have been several face to face meetings but after defining project specifics objectives and get a consensus on the way to proceed, a virtual common working space have been implemented on the Internet. It is a restricted area for project partners in order to communicate and share working documents.

4. Results

Several outputs of the project have been totally fulfilled and the related objectives accomplished by the time this article is being written. Results are included in the related reports.

a) Survey on guides to create web pages

- *Number and type of guides*: 65 guides have been collected and presented in ACTIV-e Catalogue: 15 in Swedish language, 7 in Finnish language, 27 in English language, 9 in Spanish language, 7 in Catalan language.
- *Target group*: 27 guides are specifically designed to help teachers in developing web site and 19 are also targeted to pupils. In some cases the same guides are addressed two both of the above mentioned categories.
- *Function*: Most of the guides are designed to “Inform and Train” coherently with the aim of the survey which was to collect and classify guides which should help schools to design and create web pages and increase the awareness raising on this issue.
- *Prerequisites*: 39 guides out of 62 do not require any specific prerequisites (in terms of previous knowledge or skills) this is probably related to the fact that the guides are not

targeted to specific technical or ICT sectors. Seven guides have different entry levels (from the beginning to the advanced).

- *Didactic resources*: "Examples" are the most frequently didactical resources reported in the guides (52 out of 66). Activities, graphics/images, and summaries are presented in almost half of the guides.
- *Cognitive effort requested*: "Understanding" is the most frequent effort request by accessing the guides. Search, try, create and plan are requested in the majority of the guides; this can be related to the fact that the guides adopt an operational and concrete approach.

b) Field research on functionalities in primary school web pages

- *Most useful functions*: The informational function is the most common one in the studied cases, and was also considered the most useful, e.g. school's curriculum, pedagogical links, links to search engines and tools, encyclopaedias and word books. Also exhibitional and pedagogical functions were regarded as useful, for example, the possibility to publish school pictures, activities, and even a "virtual tour of the school". In addition, pupils having their work published online can motivate their progress.
- *"Desired" (missing) functions*: The main functions mentioned were pupils' work and pupils' home-pages, links, discussion areas, school activities and contact information. It is to be noted that the role of pedagogical function in school sites was questioned in one of the cases; teachers doubt if they would use it; lesson plans for others were considered more as showing off and open for poor interpretation. There was also an opinion that schools web pages need not include more than basic information; schools inner climate will not come out through web because pages does not tell you about people's personality. Some reasons for many schools not considering the desired function are lack of time, lack of competence, lack of people motivated and dedicated to the job, lack of tools and resources, and technical problems.
  - *Competencies available in schools*: In some schools many teachers are involved in ICT, in one way or another (e.g. making web-pages, working with digital video or digitally edited school magazine). But in few schools teachers are trained to develop web-pages, for example. Teachers felt that even if they are computer literate, their skills are not enough to work on the web. Some of them expressed their interest in becoming competent in this area.
  - *Maintenance and responsibility for www-pages*: In the studied schools web pages were maintained mainly by teachers. There is often one or more ICT-responsible teacher/s (ICT coordinator). Most of the respondents considered it important that school web pages are maintained by teachers of the own school, because that makes the pages look more like "the school itself". Especially co-operation with parents is regarded as essential.
  - *New functions of school web pages:* The following functions were considered of special relevance and importance to be included in primary schools websites: interaction between school and students at home; interaction between teachers, parents, pupils and other co-operators; share of experiences; marketing the school, teaching and learning resources (pupils' weekly homework onto the website, online tutorial system in which students can privately discuss with the tutor, student files or portfolios); and others: online promoting videos of the school, parents board for the fundraising groups, permanent mailbox for suggestions and complains; administrative information for teachers; opportunity to fill online forms in web.

5. Conclusions and further developments

The introduction of ICT in education, in the form of even small experience and specific materials, resources and activities developed by motivated individuals, has definitely an impact in organizations. Furthermore, these changes do not often relate to infrastructure, new technical devices or even to a completely different way of teaching and learning, but to the assumption of a different educational approach: "Rather than creating an entirely new pedagogy, the technology appears to be facilitating migration from one pedagogical approach to another"[5].

A research is being developed in order to evaluate the impact of the use of ACTIV-e tools in schools and primary educational centers. The partnership has been working on two different reports: "Changes in staff roles" and "Organizational changes" adopted by schools.

References

1. E-WATCH (2002) Education in e-Europe Public Policies for ICT in Schools. Policy report 2002, http://www.eun.org/eun.org2/eun/en/index_ewatch.cfm
2. L-CHANGE (2002) Change in European Education and Training systems related to IST. L-Change yearly Report 2001-2002 Middlesex University Press, UK.
3. FUNDACIO JAUME BOFILL, UNIVERSITAT OBERTA DE CATALUNYA (2000) Astrolabi Project, http://astrolabi.edulab.net
4. MOORE, M. G. (1989) *Three types of interaction,* American Journal of Distance Education/3/2, 1-6.
5. SHARP, J., POTER, J. ALLEN, J. AND LOVELESS, A. (2002) *Primacy ICT: Knowledge,* Understanding and Practice, Exeter: Learning Matters
6. SWEDISH EDUCATION MINISTRY (2000) *Internet pä gott och ont*
7. SWAN, K. (2004) *Issues of Interface.* In "Supporting the Learner in Distance Education and E-Learning", Proceedings of the 3rd. EDEN Research Workshop, Oldenburg: Bibliotheks- und Informationssystem der Universität Oldenburg
8. TELLA, S. ET AL. (2002) *Verkko opetuksessa – opettaja verkossa*. Helsinki: Edita

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[5] Change in European Education and Training systems related to IST.L-Change Yearly Report 2001-2002, page 7. Middlesex University Press, UK.

DISTANCE LEARNING AND TEACHERS' USE OF NEW TECHNOLOGIES IN GREEK PRIMARY SCHOOLS

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Introduction

For the past 50 years computers have had a profound effect on humans and have advanced our lives in immeasurable ways. The rapid development of technology over the years has also evoked important changes in education. Technological innovations and applications make their appearance in a lot of sectors of the educational process and information technology will continue changing rapidly in the next 10 to 15 years [9]. As a consequence, education technology has been a major focus of reform and policy at the federal, state, as well as at local levels, in an attempt to increase the availability of computers in classrooms and schools, to assist schools with Internet access, to provide resources and guidance for teacher training and to integrate schools into the "Information Society" [14]. This attempt has been coupled with initiatives aimed toward understanding the better way to use technology, in order to improve teaching and learning and training educators to use technology effectively. In this context, distance education acquires a very important role for teachers' professional development and the evolution of the educational system, as they should correspond successfully in the frequent and rapid changes of knowledge [4]. Nowadays distance education uses new technological methods such as personal computer, interactive multimedia and videoconference, which use audio and full motion video [11].

As the availability of computers and the Internet in schools and classrooms has grown [12, 15] and computers have been added to teachers' technology toolbox, so has interest the extent to which these technologies are being used from teachers. Moreover, existing research on education technology in Greece includes only a small number of studies. In view of the dearth of such data, the aim of the present study was twofold: to investigate (a) the attitudes of Greek Primary School teachers towards the contribution of distance education in their professional development, and (b) the extent to which they use the New Technology as an instructional tool in the educational procedure.

Methods

Subjects. A total of 66, randomly chosen Primary School Educators from Eastern Attica, Greece (mean age: 39.3±6.6 yr., teaching experience: 13.1±8 yr.) took part in the research. Table 1 shows the number of subjects examined, according to sex and specialty. The attendance in the research was voluntary. Participants were asked to read and complete the questionnaire carefully.

Table 1. Distribution of subjects examined as a function of sex and specialty.

Gender	Teachers	Other specialties	Total
Men	12	11	23
Women	33	10	43
Total	45	21	66

Instrument. A scale consisted of 6 items was developed in order to measure teachers' attitudes towards distance learning. Following the stem, "Distance Education and Learning is good-bad/ interesting-boring/ useful/ important-unimportant/ attractive-unattractive/ enjoyable-unenjoyable" teachers responded to the six items on a 7-point Likert-type scale (e.g. for interesting-boring: 7=extremely interesting, 1=extremely boring). According to factor and reliability analyses, the scale has proven to be both valid and reliable (Mean value: 4.98, % of Variance: 82.9, Cronbach's alpha: 0.96).

A questionnaire assessing the frequency with which teachers use technology at school and at home was administered for the purposes of the study. Specifically, three types of technology use were assessed: (1) classroom instruction, (2) preparation and administration, and (3) communication. Teachers were asked about their demographic characteristics (age, sex, etc.), about the availability of computer and Internet connection in school and at home, their knowledge of computer application, as well as how often they use the technology to conduct a number of preparatory and administrative tasks. Furthermore, they were asked about the barriers to the use of computers in the educational procedure.

Statistical analysis. Descriptive analysis was used and frequencies were calculated for all parameters. ANOVA and the chi-square test were used to identify differences between sexes.

Results

Distance Education. For the scale measuring teachers' attitudes towards distance learning mean score was calculated by dividing the mean values of the six items by the number of the items consisting the scale. Analysis of variance revealed no statistically significant differences on teachers' attitudes between specialties [Wilk's λ=0.98, F(2, 55)=0.68, p=0.51], sexes [Wilk's λ=0.95, F(2, 55)=1.4, p=0.26], or their interaction [Wilk's λ=0.90, F(2, 55)=2.9, p=0.06] (Table 2). Despite the positive attitude towards distance learning, only 47.5% of the teachers believe that a distance learning course can be applied successfully in Primary Education and contribute positively to the improvement of the educational procedure.

Table 2. Means and standard deviations of the scale of teachers' attitude toward Distance Learning.

		Gender	
		Women	Men
Teachers' attitude toward Distance Learning	Teachers	5.6±1.2	5.2±1.5
	Specialties	5.2±0.8	6.4±0.9

Computer use. Data analysis revealed that early all primary school teachers (98.5%) reported having computers available in their schools, while most of them (88%) had also a computer at home. Most teachers (84.6%) participated in professional development activities in the use of computers or the Internet. However, only 51% of them (45.5% of the total sample) used the computer to gather information for planning lessons. Furthermore, only 47.7% of the primary school teachers who had computers available in their schools used them for classroom instruction, without differences between sexes ($\chi2$=0.001, p>0.05). The percentage of teachers who used a computer for classroom instruction in a daily basis during the previous week was relatively low (Figure 1).

Internet access. 79.3% of schoolteachers with computers available at home had also Internet access and 70.7% had an e-mail account from the same place. 40% of those with technology available in school reported that their school had connection to ISP that they could use for Internet access, while only 24.6% of them had an e-mail account from the same place (Figure 2).

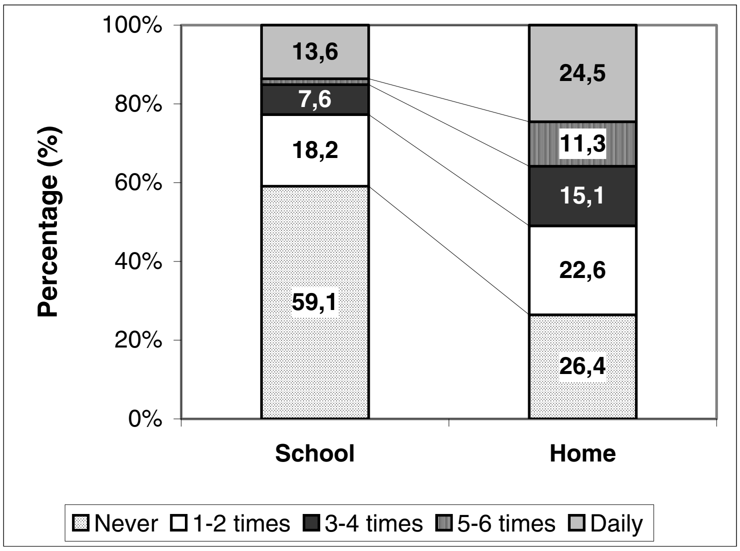

Figure 1. Primary School teachers use of technology for instruction (school) or gathering information (home) during the previous week

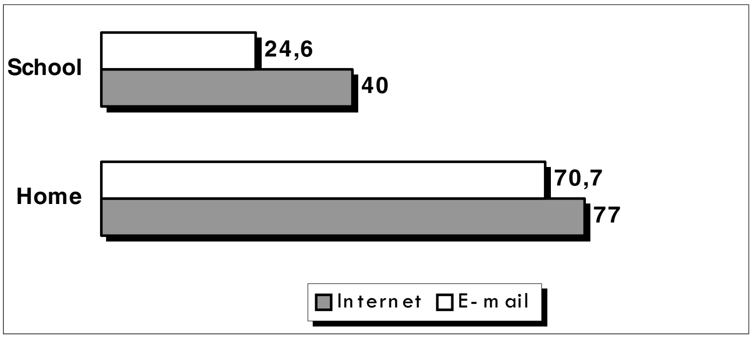

Figure 2. Internet and e-mail account availability of teachers at home and at school

The majority of the survey sample (68.3%) reported that were able to look for information via Internet, while a slightly lower percentage (61.7%) has sought information from data bases. However, only a small percentage of the teachers (21.7%) had used the Internet as a teaching tool in the classroom. 40.9% of the sample appreciated their ability in the utilization of computer as a communication tool as not satisfactory and only 9.1% characterized this ability as excellent (Figure 3).

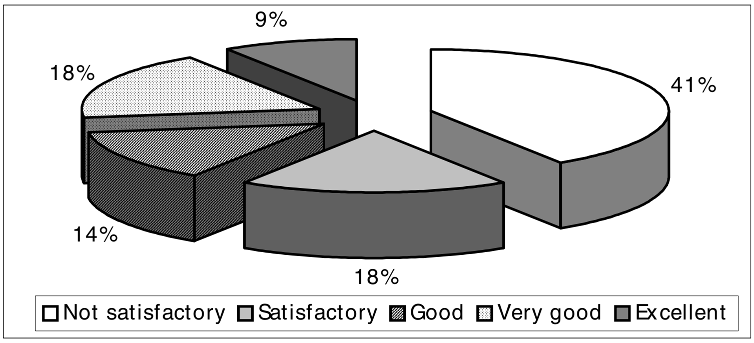

Figure 3. Perceived ability of the survey sample in the utilisation of computer as a communication tool

It is worthwhile to note that from the 53 teachers that allocated e-mail account from school or home, fifteen (40.5%) did not send any electronic message during last week, while 43.24% of them sent 1-10 electronic messages (Figure 4).

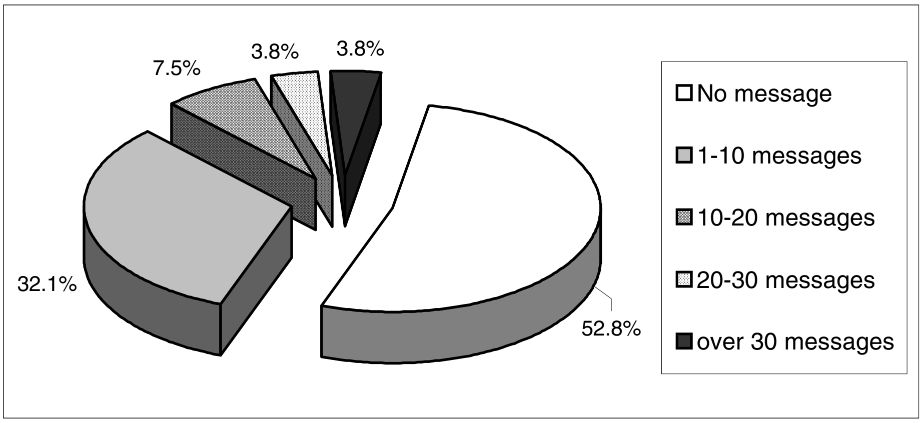

Figure 4. Electronic messages sent from the teachers during the previous week

Barriers to Teachers' Use of Technology. Certain characteristics of classrooms and schools, such as equipment, time, technical assistance, and leadership, may act as either barriers to or facilitators of technology use. The present survey indicated that the barriers to the use of computers and the Internet for instruction most frequently reported by public school teachers were insufficient knowledge (73.8%), not enough computers (69.2%), high cost of the equipment (63.1%), lack of time for teachers to learn how to use computers (55.4%) (Figure 5).

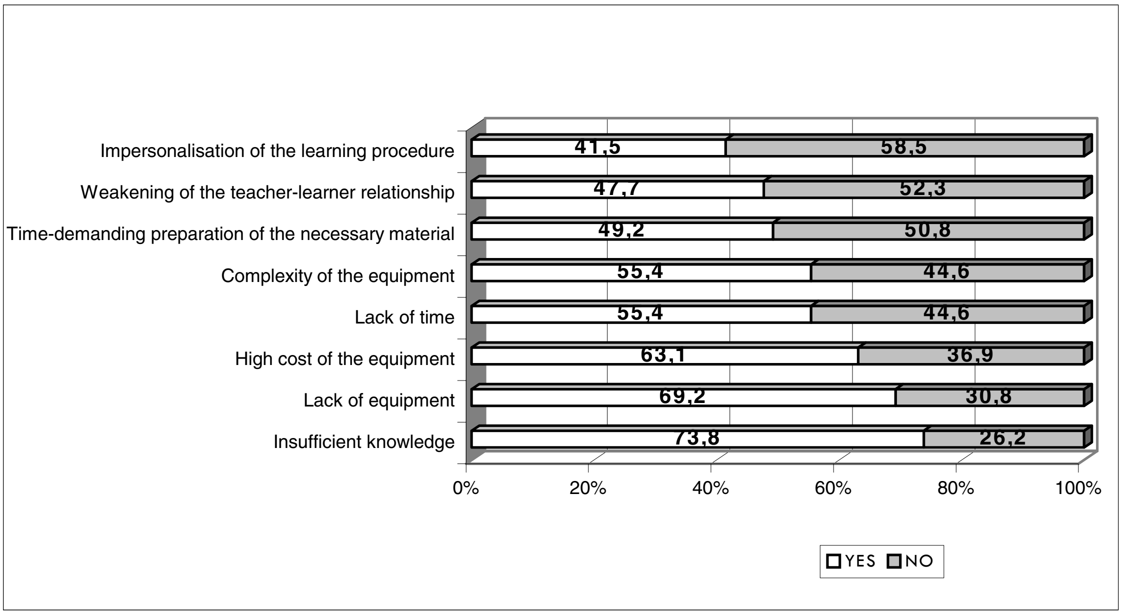

Figure 5. Barriers to Teachers' Use of Technology

Discussion / Conclusions

The incorporation of New Technologies into education is a necessity [6, 8]. Therefore, last years many countries made an attempt to integrate computers and the Internet into classroom instruction, in order to improve teaching [12]. In Greece, education technology has also been a major focus of policy at national level. There has been an attempt to increase the availability of computers and the Internet in classrooms and schools and to provide resources and guidance for teacher training, so that they can use New Technologies to their full pedagogical potential. In this context, we tried to investigate the attitudes of Greek Primary School teachers towards the contribution of distance education in their professional development, and the extent to which they use the New Technology as an instructional tool in the educational procedure.

The survey sample expressed a positive attitude towards distance learning, but only half of them believe that a distance learning course can be applied successfully in Primary Education and contribute positively to the improvement of the educational procedure. These results are in contrast with the findings by Antoniou et al. [1], whereby majority of Physical Education Teachers (73.5%) believed that a program of distance learning could be successfully applied in Physical Education.

The majority of the teachers have the necessary equipment and the indispensable technical knowledge in order to use the New Technologies. However, only a small percentage of the teachers (11.9%) uses the computers in a daily base for classroom instruction. It seems that a high percentage of teachers prefer not to use computers for preparatory or administrative tasks, even though over 90% of them have access to computers at schools. This is in accordance with the study of Czerniak and Lumpe [2], whereby only 16% of schoolteachers reported technology use in a daily basis at school. In contrast, our results contradict the findings by Drenoyianni and Selwood [5], who reported that the majority of English Primary School teachers (78.3%) used educational technology daily.

We further examined the barriers to teachers' use of technology for instructional purposes. Pelgrum [13] presents a list of ten factors considered by teachers as serious barriers to the use of computers and the Internet for instruction. Three factors were evaluated as more important: (i) insufficient numbers of computers, (ii) lack of adequate knowledge and (iii) difficulties in the incorporation procedure. Ely [7] similarly distinguishes as important factors for the application of New Technologies in the schools (i) the dissatisfaction for the existing situation, (ii) the existence of sufficient knowledge and abilities and (iii) the availability of economic resources. In an other research [3], the most important factors reported as barriers to the use of New Technologies in the classroom were: (i) the lack of necessary equipment and financing, (ii) the lack of time for the material production (time-demanding production), (iii) insufficient knowledge and (iv) the lack of technical support. In a Greek survey by Antoniou et al. [1], the barriers to the use of computers and the Internet for instruction indicated by Physical Education teachers were the lack of the necessary equipment, the high cost for its acquisition, but also the insufficient knowledge. The same factors were also revealed by the present research, with a different hierarchical order (insufficient knowledge; lack of necessary equipment; high cost of the equipment).

The feedback of the present study indicates that the potential of New Technologies has not yet been fully realized in Greek Primary Education and teachers' training for technology use should be intensified. This need for more professional development activities has also been underlined from teachers [10]. Finally, since the most frequently reported barrier to the use of computers and the Internet for instruction was insufficient knowledge, teachers' training for technology use should not be focused on computer application skills, but in topics concerning the pedagogic application of New Technologies in the classroom.

Literature

1. ANTONIOU, P., SISKOS, A., AND FARMAKIS, D. (2001) *Technical knowledge and psychological preparedness of Greek Physical Education Teachers regarding Distance Learning,* 1st Greek Congress of Open and Distance Education, Patras, Greece, 25-27 May
2. CZERNIAK, C., AND LUMPE, A.T. (1996) *Relationship between teacher beliefs and science education reform,* Journal of Science Teacher Education, 7 (4), 247-266
3. CZERNIAK, C., LUMPE, A., HANEY, J., AND BECK, J. (1999) *Teachers' beliefs about using educational technology in the science classroom,* International Journal of Educational technology, v1, n2 [ISSN 1327-7308]
4. DOYLE, C. (1996) *Information literacy, status report from the United States.* In: D. Booker (ed.), Learning for Life: Information literacy and the autonomous learner. Adelaide: University of South Australia
5. DRENOYIANNI, H., AND SELWOOD, I. (1998) *Conceptions or misconceptions? Primary teachers' perceptions and use of computers in the classroom,* Education and Information Technologies, 3, 87-99

6. EDELSON, D. C., PEA, R. D., AND GOMEZ, L. M. (1996) *The Collaboratory Notebook,* Communications of the ACM, 39 (4), 32-33
7. ELY, D. P., (1993) *Computers in schools and universities in the United States of America,* Educational Technology, 33 (9), 53–57
8. FLAKE, J. L. (1996) *The World Wide Web and Education,* Computers in the schools, 12 (1/2), 89-100
9. GROSS, R. (1995) *Defining the new mandate for distance learning in the 21st century,* Community College Journal, 66, 28-33
10. KYNIGOS, P., KARAGEORGOS, D., VAVOURAKI, A., AND GABRILIS, K. (2000) *The attitudes of the teachers of the program "Odysseus" towards the use of New Technologies in Education,* 2nd Greek Congress «Information and Communication Technologies in Education». Patras, Greece, May 2000
11. MAJDALANY, G., AND GUINEY, S. (1999) *Implementing Distance Learning in Urban Schools*, http://www.ed.gov/databases/ERIC_Didests/ED438338
12. PELGRUM, W. J., AND PLOMP, T. (1993) *The use of computers in education in 18 countries*, Studies in Educational Evaluation, 19, 101-125
13. PELGRUM, W. J. (2001) *Obstacles to the integration of ICT in education: results from a worldwide educational assessment*, Computers & Education, 37, 163–178
14. WEST, P. (1996) *Many governors touting technology as a magic bullet*, Education Week, 1, 22-23
15. WILLIAMS, C. (2000) *U.S. Department of Education, Washington*, DC: National Center for Education Statistics

THE NEED FOR A STRATEGIC THINKING ON SUSTAINABLE DIGITAL ENVIRONMENT FOR E-LEARNING

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1. e-Learning: from PC Based Learning to Internet Based Learning

E-Learning cannot nowadays be separated, conceptually, technologically and culturally from the Internet. This fact is strongly tied together with the radical transformation of IT in general that has become mainly internet-based and is continuously spreading due to technological changes such as the growing availability of broadband connection and due to cultural changes such as the growing dominance of network-based systems and infrastructures that renders the isolated PC station marginal and puts emphasis on the connectivity of the individual "nod" to a large and branched network.

Along these lines, e-learning has adopted in many ways these tendencies so that the environment in which learning takes places is commonly network based, and the nature of learning is commonly more collaborative and "networked" as it had been in the early days of Computer-Based learning.

The internet is often conceived by teachers, educators and decision makers as a neutral instrument that facilitates learning, and its active role in shaping and changing learning methods, patterns and possibilities is overlooked. The metaphor of "instrument" or "tool" can be traced back to the early IT times, when new technologies has offered themselves as potential "tools" available for educators that were conceived as simple, natural – sometimes trivial – extensions of familiar and well mastered tools (the PC as an extension of the pen-and-paper, the hypertext as an extension of the text, etc.). This metaphor is, however, limited and therefore misleading, and should be better replaced by that of "environment" in describing the Internet in the context of learning. Treating the Internet as an environment makes it possible to better describe its disposition to constantly become more encompassing and embrace more and more of our activities (that are taking place, using the same line of metaphors "in it"). Technologies such as Virtual Reality and 3D and other advanced visual simulations – and in the near future, possibly ubiquitous computing as well – will make the "environment" metaphor a genuine *fact* of (virtual) life.

Another meaningful development has to do with the fact that while until few years ago we could still relate to e-Learning as "just another possible way of learning", today it is clear that "e-Learning" is quickly becoming "learning". In other words, all processes of learning will either take place, in the foreseeable future, "in" the new virtual environment or at least be supported to large extent by it.

As an all-encompassing multi-media based, interactive environment, the Internet, and in the future "ubiquitous computing", is a strongly defining environment. In other words, it is an environment that the mere "use of" it, or rather "staying and acting in" it – has an impact on the user and the ability to redefine him/her or change ways he/she feels, thinks, behaves, relate to other and the world. This impact can be positive or negative from the perspective of learning and education. In other words, it can enhance the learning one wants to support or impede it or both, it can support some cognitive or personal development one wants to lead to or impede it (or both).

As "immersed in" the Internet environment, e-Learning programs will necessarily expose the learner to this impact either since simply requiting him/her to pass through the Internet in his/her way to the specific program, or encouraging through various links to surf the Internet in the search for relevant knowledge or information, or, more probably, by the fact that they themselves will necessarily reflect the unique nature of the Internet environment and hence transmit its impact. After all, is the "wisdom of the day" preached to designers of e-learning programs not to use the potential of the media, to respect its special nature, to "speak the media's language" as distinguished from the default scenario (for now) of continuing to use a book-based way of thinking which "speaks another language"?

Given these facts, experts, educators and policy makers dealing with designing and using e-learning cannot ignore anymore the “added value” or “impact”, negative or positive, of the medium or its users, their character, their cognition and on culture in general. They cannot also ignore the relationships of this impact to the desired aims of learning and education – either on the micro level in a specific program, or on the macro level – on the aims of the whole development process we try to enhance through education. The problem is therefore relevant both to designers and writers of e-Learning programs as well as to policy makers.

To give a blatant example:

We cannot anymore ignore the questions: Does the hypertextual and “jumpy” nature of the Internet erode linearity and hence rationality (as some researchers believe)? If it does – do we not have here a Trojan horse in the most basic foundation of Internet based e-Learning (assuming that we still want to enhance rational, scientific and critical thinking through our learning programs). And if we do have such a Trojan horse: what we are going to do about it- if at all?

The unavoidable nature of this question becomes obvious once we speak about “digital illiteracies”, a discourse that has become very popular recently. We now realize (as some researchers recently have) that there seems to be a contradiction between the more traditional (and rationality based) “skills” like the ability to focus, to be critical on the one hand and the new “skills” indigenous to the new medium; for example deciphering of “audio visual” or “quickly changing” messages on the other hand. It seems that there is a negative correlation between these two categories of skills: adult and older children do better in the first, while young kids do better in the last. If this is indeed the case, we are about to face a very big dilemma or at least a problem.

And there are many other similar questions: Does the definition of “truth” exist as valid in the new digital culture – given the legitimacy of fake identities or even fake information and institutions compatible with these definitions as basic to rationality and science?

Are the “new social skills” necessary to get along on the Internet (for example the ability to get involved with a person that “does not really exist” [in terms of the old world] and thus maybe not deserving respect) compatible with social norms we expect in the “real world” (treating anybody with basic respect for example)?

And we could go on…

2. The Double-Edged Impact of the Internet

Since we are used to thinking about the Internet as the epitome of “progress” and hence we basically positively emphasize some of its dangers from the perspective of basic educational and learning aims and values in a more systematic way. We will then balance the picture by pointing also to some positive derivatives of the same characteristics of the Internet.

When thinking about the dangers of the new digital environment, four levels of dangers come to mind. Each of them is more tacit and probably longer-term and more dangerous in its impact than the previous one:

1. Relatively easy diffusion of dangerous-immoral information (Nazi websites, websites instructing how to prepare a briefcase nuclear bomb or how to kill your classmates...) and easier accessibility of immoral agents (pedophiles... terrorists...) to “naïve” end-users.
2. The erosion of the ability to distinguish between “fake” and “virtual” on the one hand and “real” or “true” on the other (or even the erosion of the differences themselves between these two ontic/epistemic categories) on three dimensions: agents, bodies and information; a fact which opens the scene to easy frauds (fake lovers, fake universities, fake knowledge) and maybe to some extent to the “legitimating of fraud” (is a love affair between a virtual user and one with “real” identity an act of fraud and deceit or does if fall within the rules of the game and is therefore legitimate?).

3. The exponential enhancement of “big brother(s)” ability to influence users’ views, set of minds and activities by:
   a. Biased filtering of information, for example by designing search engines so that they will show first in links lists those addresses that best serve the interest of a certain (paying or powerful) party.
   b. Tracking, managing and controlling all net information related to each individual user and thus being able to have extensive direct (by decrees) or indirect (by aggressive sophisticated, individually tailored advertisement) control on individuals’ lives.
4. The deep and longer term impact on the user’s personality and social structures that in many cases might stem from the use of the Internet (the saturation of the self, the “derationalization” of users’ cognition, the death of the traditional (Aristotelian) narrative – essential to the formation of our identities as individuals and groups, the fragmentation and instrumentalisation of human relationships, the breaking up of geographical communities.

As claimed, the Internet is quickly becoming *the major* environment of our lives, work, relationships and hence learning. In the near future with the advance of ubiquitous computing, the digital “coming out of the box” and conquering the physical environment – it will become *the only* environment of our lives. This new environment (being multimedia, becoming quickly three dimensional, adaptable and interactive) is enormously powerful in its impact on us, much more than the physical environment human beings have been living in since the dawn of humanity.

Now it is extremely important to realize that it is essentially *double edged* in its impact. Its actual and potential impact is and can be both negative and positive (when judged in the light of human values). Although above only its negative impact was emphasized, the same levels and kinds of functioning can have also meaningful positive impact. Thus on the first level, the Internet allows for the democratization of both the diffusion of information and knowledge and the creation of knowledge and (hence) the diffusion of power. On the second level, it allows much more room for playfulness in individual identities, and thus (maybe) also the enrichment of individuals’ lives. On the third level, the same functions that allow tracking by state and corporations can allow (if developed with the relevant aims in mind) the enhancement of self-knowledge by individual users and the augmentation of their ability to adapt their environment to their interests, performance styles and needs, and thus they can allow for much higher levels of self-expression and self-fulfillment. Concerning the fourth level, the breaking of old cognitive, social and identity models can (perhaps) also allow for a much larger range of freedom and hence self-direction and self-fulfillment in individual lives.

Thus we can draw two extreme scenarios concerning the impact of the Internet and the ubiquitous computing on our children’s lives: the Paradise and Hell scenarios. While it is not reasonable to believe that any one of these extreme scenarios will be fully realized, there is, either, no reason to believe that the default scenario of the development of the Internet and ubiquitous computing governed almost exclusively by unbalanced economic drives will be closer to the positive scenario. There is, therefore, an urgent need, especially among educators, developers and users of e-Learning programs as well decision makers for a strategic critical thinking on the development of “sustainable digital environment”.

We have to start analyzing seriously the “added value” of the environment of e-Learning (and as said above, learning in general as it is being conquered by e-Learning), assess it in light of the desired aims of learning and education and look for means to optimize it in light of these values. As claimed above, we have to do this complex thinking process at least on tow levels:

On the micro level – for each e-learning program (we have to ask ourselves as designers or developers of the program: is there (at least) a compatibility between the content and the messages we want to transmit through the program and the messages transmitted through the environment which supports it?) and

On the macro level – given the general aims of our educational and learning process and the values we would like them to transmit (explicitly or tacitly).

3. Aims of the Symposium at the EDEN Conference

a. To validate and elaborate on the above description of the challenges faced by educators and decision-makers with regards to strategic thinking about e-Learning, given the above analysis of the misconceptions involved in the introduction of the Internet into learning contexts.

b. To outline possible strategies for decision making, aimed at overcoming the challenges identified.

ADAPTIVE KNOWLEDGE TRANSFER IN E-LEARNING SETTINGS ON THE BASIS OF EYE TRACKING AND DYNAMIC BACKGROUND LIBRARY

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Motivation

Based on everyday experience when dealing with computers, we may state that many times users adopt their behaviour to the computer. However, the still existing barrier of many different user groups towards the computer technology indicates a strong need for user centred design of computer applications and hardware. Computer technology evolved over the decades and significant improvements in human-computer interaction have already been made. As observed in [Norman 1998], when new technology matures and has reached the transition point, the change from technology-driven products to customer-driven, human-centered products could and should be made. Possible application domains of user centred applications adaptable to emotions are manifold, for example in many dimensions adaptable e-learning systems, personalised counselling services, technical support, marketing applications, adaptable help systems and many others.

E-learning paradigms and implementations have brought many advantages to technology-based distance education. It is now possible to identify, analyse, track and monitor relevant aspects of instruction, such as different velocities, paths, or strategies of learning. There are also attempts to integrate adaptivity into e-learning based on effective reading speed [Ng, 2003]. According to [ADL 2001], the value of personalised instruction is measurable by means of its effectiveness, e.g. a learner in a classroom setting asks on average 0.1 questions an hour, whereas in an individual tutoring setting, a learner is required to answer about 120 questions an hour. Thus, students' learning performance may be enhanced significantly through individually tutored instruction: statistically over a big number of data a standard deviation of 2 units can be measured (for details see also [Bloom 1984]).

The presented research is focused on a new generation of adaptable knowledge transfer. This new and innovative approach strives to capture dynamically user behaviour based on real-time eye-tracking system. With merging the eye tracking methods with the proper content presentation the goal is to develop methods of how to individually impart knowledge to each single learner. Moreover, the predefined learning content modules should be dynamically linked to a background library providing additional and personalised information on the displayed learning content. Innovative solutions and an improved and more profound understanding are expected in various areas, as follows:

- improved knowledge of the users' behaviour in the field of human-computer interaction in general as well as related to the displayed learning contents
- improved and detailed course-progress tracking
- more detailed recording of the consumed learning content and cognitive processes of the user
- novel possibilities for identifying the most suitable media and content presentation within knowledge transfer environments
- identification of possible user problems and development of correction and adaptation mechanisms
- identification of problematic areas in the content flow and/or content structuring
- identification of the need for detailed additional information related to the learning content, more specific to the paragraphs accessed by the user

- use of collaborative filtering methods based on user behaviours and best practices suggestions in the learning process
- improved realization and presentation of the knowledge modules under consideration of user behaviour
- fine-grained content adaptation to the each particular user

Adaptivity and Personalisation in E-Learning Environments

Tracking the behaviour of users and analysing their learning progress are not new research issues, but were demonstrated in classic systems such as CLASS and PLATO (see [Crowell 1967] and [Modesitt 1974]). There are various technical solutions of adaptable systems, like shadowing [Hothi 1998], hiding links [Brusilovsky 1998] and stretch text among others [Boyle 1998]. There are also systems like [Sholion Wb+] that foster pedagogically structured learning contents. Modern user modelling techniques are important, as they allow systems to personalise the human-system interaction [Conlan et al. 2002]. Well-defined learner model standards and specifications, like PAPI (Public and Private Information for Learner – IEEE), IMS LIP (IMS Learner Information Package) or GESTALT (Getting Educational Systems Talking Across Leading-Edge Technologies) already exist. This brief introduction of some aspects in context exemplifies – and may also clarify – that adaptivity and personalisation constitute broad research fields with a relatively long history and a large number of significant results. However, much work is still to be done toward existent or emerging issues and challenges.

In this paper we want to strongly emphasise the need for profiling more finely-grained user information and – in agreement with [Conlan et al. 2002] – of structuring fine-grained, standardised, and adaptable learning objects. Current techniques are not able to derive fine-grained information about users' behaviour. Rather, they typically provide larger-grained information such as the monitoring of mouse clicks and mouse movements, and determining how long a user stays on a single page.

Adaptivity through Eye Tracking

AdeLE defines an innovative framework for enhancing adaptive and personalised knowledge transfer processes. This is done by exploding the advantages of merging real-time content tracking and real-time eye tracking technologies at the user's side of the system, and encompassing the functionality of a dynamic background library at the content delivery side. Let us describe which characteristics of eye tracking systems are relevant and useful to support the real-time user profiling mechanisms with the purpose of enhancing personalisation and adaptivity.

Very roughly, eye movements can be divided into two components: fixations and saccades. Fixations are periods of relative stability during which part of the visual scene is focused upon in the centre of the fovea [Jacob 1995]. During fixations, visual information is processed. Saccades are very rapid eye movements, which bring a new part of the visual scene into focus. During saccades, little or no visual processing can be achieved. Fixations last about 200 to 400 ms and exhibit velocities of around 100°/s. Saccades last about 25 to 100 ms and exhibit velocities of around 300°/s [Salvucci and Goldberg 2000]. The smaller eye movements and tremors, which occur during fixations, often have little meaning in higher-level analysis.

The fixation duration is the interval between the end of one saccade and the start of the next saccade. The gaze duration is the time spent on an object. Fixation and gaze duration are not indicative of attention per se, because one can also pay attention to objects, which do not lie in the foveal region. One must differentiate between the users' objective behaviour (eye movements), their latent cognitive operations, and their subjective impression [Galley 2001]. Saccadic velocity, which is closely related to saccadic amplitude and only assessable to eye tracking systems with high temporal resolution, can serve as an indicator for activation in the sense of tiredness or mental effort. Saccadic velocity is said to decrease with increasing tiredness and to increase with increasing task difficulty [Fritz et al. 1992]. Furthermore, blinks are interesting for our purpose. To blink means to close the eyes for a very short period to cover them with a thin film of tears [Galley 2001]. Blink velocity and frequency together with the eyelids' degree of openness can provide information on the user's tiredness level. Increasing tiredness is said to be indicated by increasing blink rate, decreasing blink velocity and decreasing degree of openness [Galley 2001].

In the AdeLE framework, the intention is to observe users' learning behaviour in real time by monitoring characteristics such as objects and areas of focus, time spent on objects, frequency of visits, and sequences in which content is consumed (see also [Preis and Mueller 2003]). It is hoped thus to gain an insight into the strategies which users apply when using an e-learning platform and to be able to detect patterns indicative of disorientation or other suboptimal learning strategies. In the context of user behaviour interpretation, it is very important not to rely exclusively on eye tracking data, but to supplement it with constant user feedback. It should be possible to suggest optimised strategies such as the best time to take a break. The ultimate goal of our approach is to assist users to improve their learning behaviour. The user will always retain the final say over whether to accept or reject the system's suggestions.

Different Eye-Tracking System Solutions and their Suitability for the Project

At present there are two types of eye-tracking systems on the market: outside-in systems and inside-out systems. Within this chapter we'll describe the characteristics of both systems. Advantages and disadvantages related to the requirements of this project will be outlined. More detailed information can be found in Duchowski (2003). See also Jacob (1995) and Galley (2001).

Outside-in systems are characterized by the fact that one or more cameras record the eye of the participant and trace the gaze in a scene through imaging algorithms. The cameras are positioned in front of the participant.

Advantages:

- cheap systems available
- can be integrated into the monitor and therefore basically invisible

Disadvantages:

- the head can't be moved a lot as it is fixed by a sort of head-rests
- small area to be measured
- visible cameras are likely to influence the participant
- calibration of the system is difficult and has to be done regularly

Inside-out systems are characterised by a special device that the participant has to wear on the head. The image of the eye is led into a mini-camera by using mirrors. This mini-camera records the eye and the actual line of vision is found out through imaging algorithms.

Advantages:

- movements of the head are compensated
- the area to be measured is theoretically endless

Disadvantages:

- the device on the head of the participant can influence his/her actions and performance
- expensive

For the purpose of our project outside-in systems seem to be more suitable, especially when considering that the intention is to provide an attentive work place and adaptable contents to a wide range of average users. Evidently, the price plays a decisive role. Survey of the existing systems has shown that the eye-tracking device can be integrated into a standard monitor (http://www.tobii.se). Due to the current trend of rapid technical progress, we expect that in the next few years it would be possible to build a low-cost but high-quality eye-tracking system based on standard hardware components which would be suitable for real-time analysis of eye-tracking information as described on this project.

The AdeLE Framework

The architecture of the AdeLE framework is shown in Figure 1. The core module is the Adaptive Semantic Knowledge Transfer Module (ASKTM). Taking a global view, the ASKTM coordinates all the surrounding modules and sends and requests information to and from them. The ASKTM compiles pieces of content and meta-information for delivery to the students. Separate interfaces are provided for the other two groups of users: content creators and trainers (or tutors). For media and platform-independence, the information is provided in an XML schema and can be transformed into various formats. Content delivery is shown in the upper left and lower left parts of Figure 1; XML-based interfaces for module intercommunication are also important for interoperability.

User-centred modules for advanced user profiling are shown in the upper right part of Figure 1. The core functionality for gaining enhanced and more precise user information is located in the combination of the Eye Tracking Module (ETM) and the Content Tracking Module (CTM). ETM in combination with CTM provides real time fine-grained data regarding the user's reading and learning behaviour. The ETM also gives the system hints about concentration, excitement, tiredness, and level of knowledge assimilation. The entire set of information of user interaction and behaviour is supplied to the User Information Module (UIM). The Interactive Dialog Module (IDM) allows users to set and change user profile settings actively. Further, the system also can proactively force user interaction. For example, the latter module can be used to verify and if necessary adjust any automatically inferred user information. If tiredness is suspected, IDM also may be used to suggest a short break or provide a relaxation exercise to the user.

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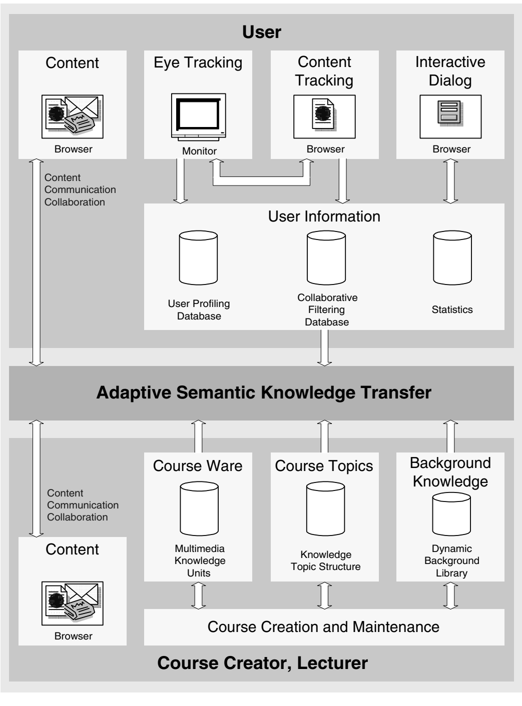

Figure 1: The architecture of the AdeLE framework

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The UIM encompasses three user information databases of different granularity: the User Profiling Database (UPD), Collaborative Filtering Database (CFD) and Statistics Database (SD). The UPD holds fine-grained information about a wide range of user interactions (e.g. sequences of scanned and viewed pieces of information) and more abstracted values of user behaviour types (e.g. level of gained expertise in certain subtopics). Similar user profiles or user behaviour types are grouped and managed in the CFD. Through collaborative filtering, the system can proactively suggest particular pieces of information in proper media by exploiting the collective knowledge of user groups and their behaviour. Finally, the SD manages abstracted information in a user-independent level. Course creators and administrators may use valuable information (e.g. identified problematic areas of courseware sections) without violating the privacy of individual learners. The learning process will be improved, because the system will create or deliver adapted content by means of tracked statistical data (e.g. by delivering more images/tables for learners that have problems with large and complicated texts).

Lecturer-centred modules for the course creation process are shown in the lower-right section of Figure 1. The Course Creation and Maintenance Module (CCMM) represents the core module for the entire course management and controls the Courseware Module (CM), the Course Topics Module (CTM) and Background Knowledge Module (BKM). Course creators and lecturers can set up and maintain courses as well as request statistics about their courses. The CM manages pieces of information in different media types and an extensive set of metadata. CM can either store pieces of information locally or just manage metadata and include remotely located sources by caching them. On the one hand, the CTM manages course content by just defining subsections using meta-descriptors, i.e. course creators only predefine subtopics and their relations at the time of course generation. At the time of learning users get dynamically proper and most recent pieces of information out from the pool of the CM. On the other hand, the CTM permits to manage a course topics structure and a thesaurus for providing automatically relations between subsections. The BKM dynamically provides additional information within the learning process and helps course creators to keep pace with most recent information.

Concluding Remarks

The proposed innovative user-centered compilation and presentation of learning contents and lessons and related background information provided from the static and dynamic background sources supports cognitive processes and problem solving. The AdeLE framework utilises the possibilities of evaluation and analysis of real-time eye tracking and content tracking to support adaptive teaching and learning in a technology-based e-learning environment.

Such adaptable systems could be applied for learning, especially in the sensible areas where 100% knowledge acquisition in required. Furthermore, the novel approach supports the identification of the level of expertise and provides tailored knowledge transfer and personalized knowledge management, being of value to corporate knowledge management systems. Based on the generalization of user behavior related to the learning contents, information is collected and applied for improvement of the learning content structuring, information flow, additional explanation, etc.

Potential target groups that could benefit from the presented ongoing research and proposed innovations based on eye-tracking supported real-time data capturing and adaptable systems are identified as follows:

- various end-users (100% knowledge acquisition i.e. aviation, traffic, different complex procedures, risk management, decision support, research on learning, etc.)
- eye-tracking system producers (to extend the system with dynamic real-time evaluation of contents)
- e-learning platform and knowledge management platform developers (to include these innovative approaches, and provide more adaptable platforms)
- content publishers (to improve structuring of the contents, to develop user-centered contents, to develop contents supporting various learning stiles)
- hardware producers (to develop low cost eye-tracking systems)

Thus, some results of the AdeLE project may contribute to find new ways of making advanced adaptive environments for teaching and learning feasible and affordable for institutions in a relative near future. Standardisation work regarding adaptivity and personalisation in e-learning is underway in well-known institutions such as ADL and IEEE. Standards as SCORM, IMS LIP, PAPI and GESTALT are making great contributions to this field, but as yet do not include mechanisms to describe the characteristics of real-time tracking systems. We hope that the AdeLE framework will assist in the enhancement of such standards.

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References

1. Advanced Distributed Learning Initiative: *The SCORM Overview*; Sharable Content Object Reference Model (SCORM), Version 1.2, Dodds, P. (ed), Oct. 2001, pp. 17-21
2. BLOOM, B. S. (1984) *The 2 Sigma Problem: The Search for Methods of Group Instruction as Effective as One-to-One Tutoring*; Educational Researcher, 13 (6) pp. 4-16
3. BOYLE C. F., ENCARNACION A. O. *MetaDoc: and Adaptive Reading System.* Adaptive Hypertext and Hypermedia, Kluwers Academic Publ., NL 1998
4. BRUSILOVSKY, P. *Methods and Techniques of Adaptive Hypermedia. Adaptive Hypertext and Hypermedia*; Kluwers Academic Publishers, The Netherlands 1998
5. CONLAN, O., DAGGER, D., WADE, V. *Towards a Standards-based Approach to e-Learning Personalization using Reusable Learning Objects*: E-Learn, 2002, pp. 210-217
6. FRITZ, A., GALLEY, N., GROETZNER, CH. (1992) *Zum Zusammenhang von Leistung, Aktivierung und Motivation bei Kindern mit unterschiedlichen Hirnfunktionsstörungen*; Zeitschrift für Neuropsychologie, 1, Heft 1, pp. 79-92
7. GALLEY, N. (2001) *Physiologische Grundlagen, Meßmethoden und Indikatorfunktion der okulomotorischen Aktivität*; In Frank Rösler (ed.): Enzyklopädie der Psychologie, 4, Grundlagen und Methoden der Psychophysiologie, pp. 237-315
8. GARCÍA-BARRIOS, V. M. (2001) *Dynamic Background Library: Learning on demand using Hyperwave eLearning Suite and xFIND*; Project at Institute for Information Systems and Computer Media (IICM), Graz University of Technology, Austria
9. GARCÍA-BARRIOS, V. M., GUETL, C., PIVEC, M. (2002) *Semantic Knowledge Factory: A New Way of Cognition Improvement for the Knowledge Management Process*; Proceedings of SITE2002, Nashville, USA
10. GUETL, C. (2001) *Approaches to Modern Knowledge Discovery for the Internet. An Approach to the Information Gathering and Organizing System xFIND (Extended Framework for INformation Discovery)*; PhD work at Graz University of Technology, Austria
11. HOTHI, J., HALL, W. (1998) *An Evaluation of Adapted Hypermedia Techniques Using Static User Modelling*; 2nd WS on Adaptive Hypertext and Hypermedia, USA
12. JACOB, R. J. K. (1995) *Eye tracking in advanced interface design*; In Advanced Interface Design and Virtual Environments, Oxford University Press, Oxford, pp. 258-288
13. JAIN, L. C., HOWLETT, R. J., ISCHALKARANJE, N. S., TONFONI, G. (2002) *Virtual Environments for Teaching & Learning*; World Scientific Publishing Co. Pte. Ltd.; Jain. L. C. (ed), Series of Innovative Intelligence, Vol. 1, Preface

14. MERCHANT, S. (2001) *Eye Movement Research in Aviation and Commercially Available Eye Trackers Today*; Eye Movement Summary – Assessing Human Visual Performance, Course at Department of Industrial Engineering, University of Iowa, USA
15. MODESITT, K. L. (1974) *An excellent mixture for PSI: Computer science, PLATO, knowledge levels*; Proceedings of the 1974 annual conference, ACM Press, pp. 89-94
16. NG M. H., HALL W., MAIER P., ARMSTRONG R. *Using Effective Reading Speed to Integrate Adaptivity into Web-Based Learning. Proceedings of 2nd International Conference on Adaptive Hypermedia and Adaptive Web Based Systems* 2347, pp. 428-431, Malaga, 2002, Spain
17. NORMAN D. (1998) *The Invisible Computer*. The MIT Press, ISBN 0-262-14065-9
18. PIVEC, M. (2000) *Knowledge Transfer in On-line Learning Environments*; PhD work at Graz University of Technology, Austria
19. PIVEC, M. *Eye-Tracking Supported E-Learning*; WS of Cognition and Learning Through Media-Communication for Advanced e-Learning, Berlin, Germany (2003), pp. 169-173
20. PREIS, A. M., MUELLER, H. (2003) *EyeTracking in Usability Research & Consulting: What Do the Eyes Reveal about Websites & their Users*; European Congress of Psychology: Psychology in Dialogue with Related Disciplines, Austria, p. 164
21. SALVUCCI, D. D., GOLDBERG, J. H. (2000) *Identifying Fixations and Saccades in Eye-tracking Protocols*; In Proceedings of the Eye Tracking Research and Applications Symposium, ACM Press, New York, pp. 71-78
22. http://scholion.ce.jku.at/index.htm, retrieved 06.03.2004

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QUALITY ASSESSMENT OF A HYPERMEDIA-BASED TEACHING MATERIAL WITH THE "INTERFACE" SYSTEM

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Budapest University of Technology and Economics, Hungary

Introduction

The application of computer-supported educational technologies is widespread but requires valid and reliable quality measures. These quality indicators help teachers evaluate and compare different titles and software developers improve their work with the help of this feedback.

While some of the current usability testing systems collect various performance measures, very few attempt to measure cognitive effort. The basic advantage of the methodology proposed in this paper lies in its capability of recording continuous on-line data characterising the user's actual mental effort derived from Heart Period Variability (HPV) simultaneously and synchronised with other characteristics of Human Computer Interaction (HCI). In this way a very detailed picture can be obtained which serves as a reliable basis for the deeper understanding and interpretation of mechanisms underlying HCI.

Elementary steps of HCI, like the different mental actions of users followed by a series of keystrokes and mouse-clicks, are the basic and usually critical components of using information technology systems. These steps can be modelled and analysed by experts, but empirical studies of real users' interaction often highlight new HCI problems or give more objective results than expert analyses. One of the key aspects of empirical methods is measuring *mental effort* as it is laid down e.g. in the international standard of software product evaluation (ISO/IEC 9126:1991). Hence we need methods capable of validly and reliably monitoring users' actual mental effort during these *elementary* steps, which make it possible to identify the relative weak points of the particular software interface.

To attain the above, a complex methodology was developed earlier at our department, by Prof. Lajos Izsó and his team, see [2, 3, 4].

This paper intends to provide an improved methodology with a current *case study* on a new area of educational software: a *hypermedia*-based teaching material. The experience gained in relation to this hypermedia-based CD can be transferred to the area of *web*-based applications. This transmission works because of the nature of hypermedia in general; however this particular CD was developed directly with the purpose of integrating it with a supporting web-site. (This concept was presented earlier [1] as well.)

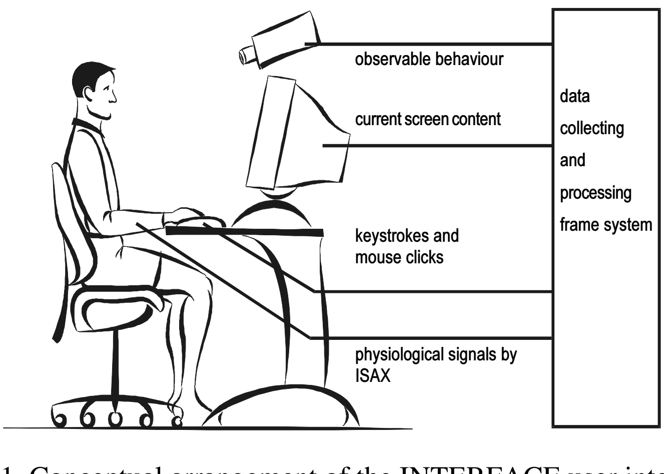

Figure 1. Conceptual arrangement of the INTERFACE user interface testing workstation

Short description of the INTERFACE methodology and workstation

Figure 1 shows the conceptual arrangement of the *INTERFACE (INTegrated Evaluation and Research Facilities for Assessing Computer-users' Efficiency) workstation.*

The method simultaneously investigates:

1. users'performance – based on speed, performance time, number of keystrokes and other possible appropriate performance measures;
2. users' behaviour and observable actions – based on the following two pictorial information: (1) the video recording of users' behaviour (acts, mimics, gestures etc.) during working with the given software interface, and (2) the video recording of the current screen content;
3. a special psycho-physiological parameter – the power spectrum of Heart Period Variance (HPV) – which is regarded as an objective measure of current mental effort and a reliable indicator of user state [2, 5, 6, 7].

In addition to observable elements of behaviour, the proposed complex method also includes more traditional questionnaires and interviews assessing mental models, subjective feelings and opinions of users about their perceived task difficulty and fatigue.

Recording these various data simultaneously requires a more sophisticated technical background than other empirical methods based on only personal observation or video recording. However, the application of this methodology is not much more complicated. It can be used to make traditional interviews and video analyses shorter and easier: synchronised data are available 10 minutes after recording, and the researcher can focus on replaying periods of high mental effort. Multiple channels enable researchers to concentrate on the channels that highlight the importance of various parts of the current event flow.

Naturally, it may not be necessary to evaluate all types of software products with this complex empirical method. However, in certain cases, it is worth investing in a deeper analysis to provide more detailed results or to present results in a more effective way than simpler methods are capable of.

Applying INTERFACE to multimedia system evaluation

We have used INTERFACE in various areas (e.g. mail systems, a directory assistant service, an architectural CAD, a WAP-based software). However, commercial sensitivities prevent publication of most of our findings. Therefore the following study is from a multimedia development project led by us. (NB Some minor pieces of our results from real industrial applications are available in [2]).

The case study presented in this section is from the quality assessment of a multimedia teaching package titled "Basics of Information Technology" (in Hungarian). It was developed in the framework of the Leonardo da Vinci Project "Developing and introducing multimedia teaching materials for vocational education" supported by the European Community (Contract N° HU/97/43022/PI/I.1.1.a/FPI.) [1, 4]. Károly Hercegfi, one of the authors, led the developer team; therefore he was thoroughly familiar with the concepts, the particular design elements and the planned HCI.

Methodology

The participants of the study were 25 students of two vocational secondary schools, who were performing learning sessions fitting to their studies with the help of the multimedia material. The students were informed that certain data were going to be recorded on them and were asked to allow placing ECG electrodes on their chest for recording HPV data with the data-collecting module of ISAX.

Each session had the following schedule:

1. Collecting data about the current user: (1) filling in a questionnaire with demographic data, academic records, familiarity with the computer and the Internet, etc.; (2) MBTI (Myers-Briggs

Type Indicator) psychological test to identify the cognitive style of the user. (The psychologists of our department were working on the localised adaptation of this test.)

2. 2-3 minutes' relaxation followed by a 2-3-minute period of mental arithmetic for "calibrating" curves depending on the heart rate variance.
3. Free browsing of the selected material for 5 minutes in order to get familiar with the style and controls of the CD.
4. Actual learning task: finding and learning two short sub-chapters in 10 minutes followed by a 2-minute knowledge-acquisition test. This part of the session aimed to have the students practise the typical usage of the material.
5. Searching task: finding short answers to 11 questions (20-25 minutes). This part of the session was the most important part for us. The sequence of the questions aimed to lead the users to the situations where various possible usability problems may occur.
6. Interview supported by playback (5 minutes).

Our main questions were what types of usability defects of the material lead to more serious problems, and what particular usability defects of the material caused more serious problems for various types of users. We were able to analyse the correlations of the rich data of the INTERFACE system (e.g. time data, number of clicks, recorded tracking data in the hypermedia space, etc.) together with data obtained from the questionnaires and psychological tests of the 1st step mentioned above.

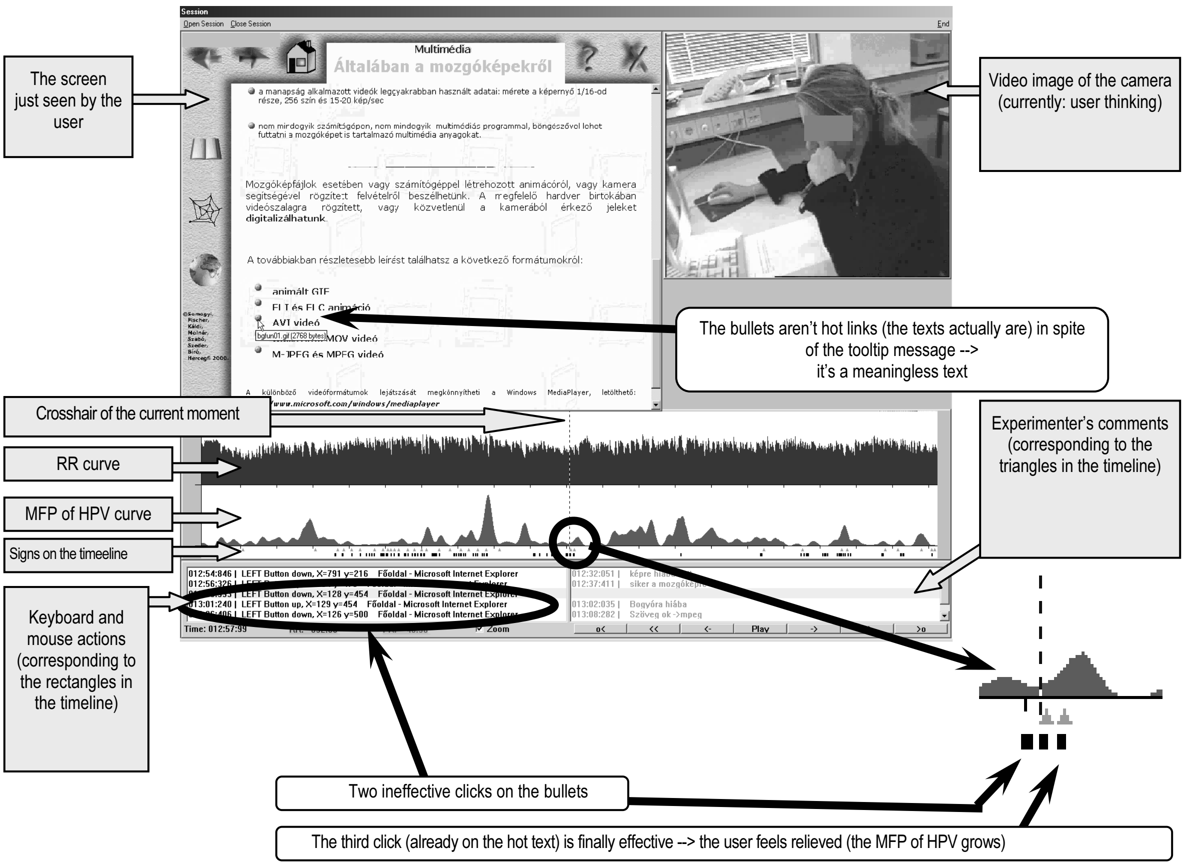

Figure 2. The INTERFACE Viewer screen; the Mid-Frequency Power (MFP) of Heart Period Variance (HPV) shows low values during high mental effort; immediately after the effort, the rebound effect can be seen clearly. The 6th user clicks on the bullets twice ineffectively, which resulted in a short period of unnecessary mental effort and losing valuable seconds.

A typical INTERFACE result screen of a relaxing user can be seen in Figure 2. The parts of the INTERFACE Viewer screen and the typical change of the heart rate variability between relaxation and high mental effort can also be seen in this figure.

Examples of user interface problems identified with the INTERFACE system

A recurring problem was that some objects the users expected to be hot links were not clickable. The users got confused, because earlier during the same multimedia session they encountered certain graphic objects that actually were hot links, whereas the related texts were not. Figure 2 and Figure 3 show examples of the opposite: here the objects (bullets and images, respectively) were logically expected to be hot links, but they were not. This inconsistency resulted in unnecessary loads on the users and waste of time. For example, the starting page of the chapter on Multimedia contains images that are not hot links. 53% of the participants clicked on the images first (ineffectively). They found the real hot links (the text instead of the images) after an average of 13.69 seconds' waste of time. The maximum delay was 80.5 sec.

In the last two figures, the difficulty of finding the scroll bar is demonstrated. The 6th and 11th users both discovered the scroll bar only after a helpless seven-minute trial-and-error searching. Figure 4 shows the 6th user, the quite similar records of the 11th user are not presented here. Although the 12th user struggled on in this trap for only two minutes, her heavy mental efforts are clearly seen in the related MFP profile in Figure 5. (The origin of the problem was the following: the first part of the long, scrollable page – using this screen resolution – looks like a complete page; the figure and its caption are at the bottom of the current screen, as it can be seen at the Figure 4.) The average waste of time caused by this problem is a little more than 1 minute.

An example for the individual differences concerning the effect of this problem is that the users with sensorial cognitive style found the solution with more difficulty than the users with intuitive cognitive style.

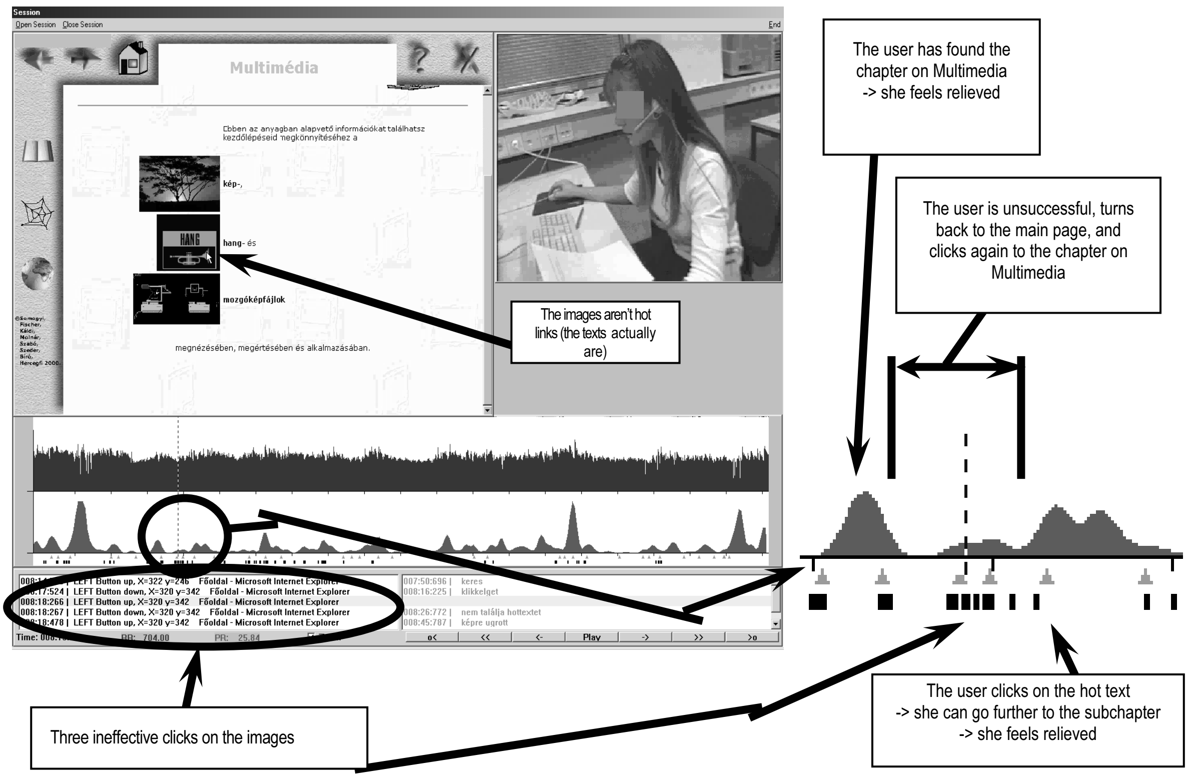

Figure 3. The 2nd user clicks on the images two times ineffectively, which resulted in a short period of unnecessary mental effort and losing several seconds

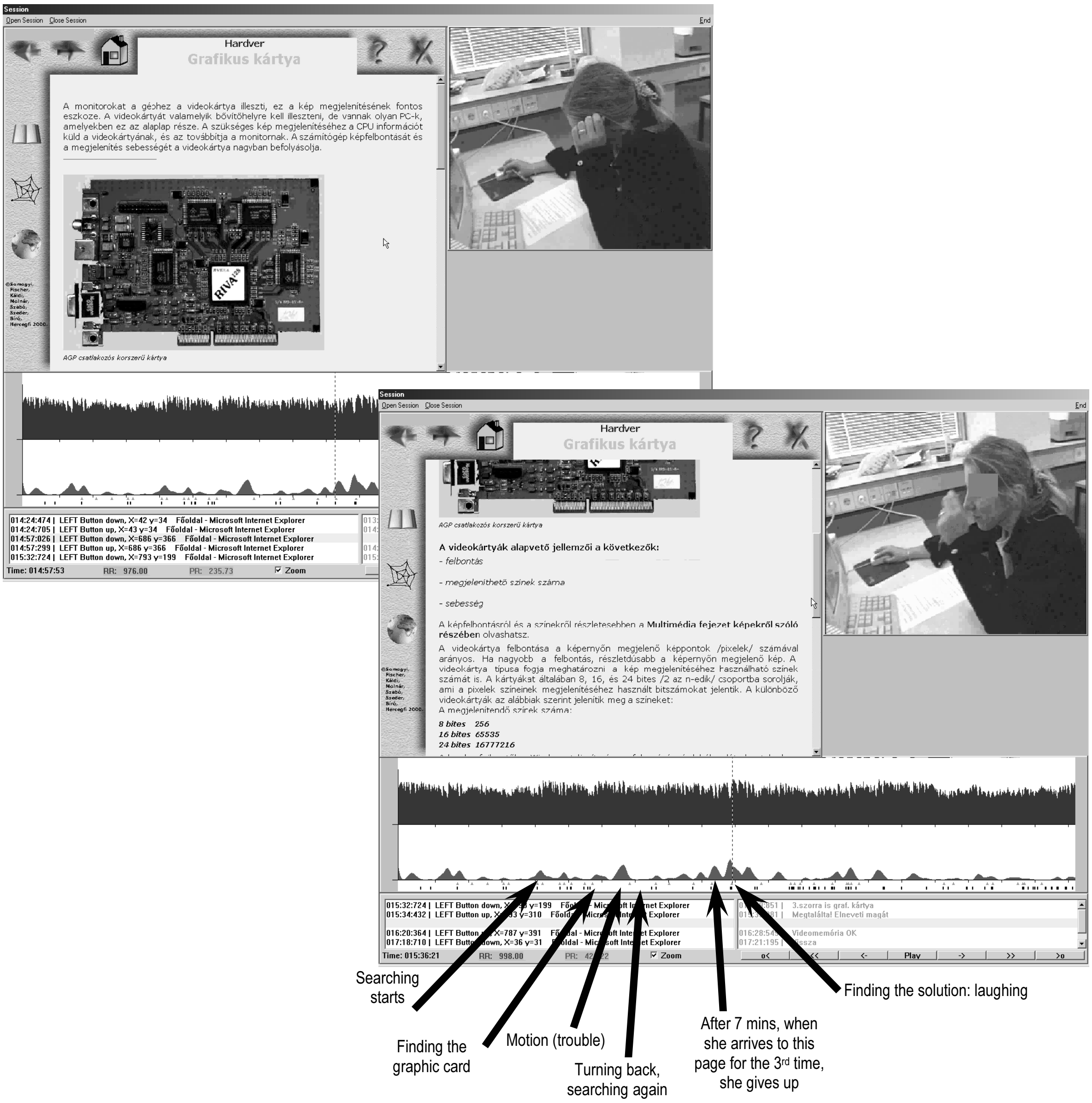

Figure 4. After a 7-minute ordeal, the 6th user gives it up, but immediately after that, she finally discovers the solution (the scroll bar) and laughs. The upper screen shows a moment when the user is in the state of giving up, while the lower screen presents the situation a bit later when she just found the scroll bar.

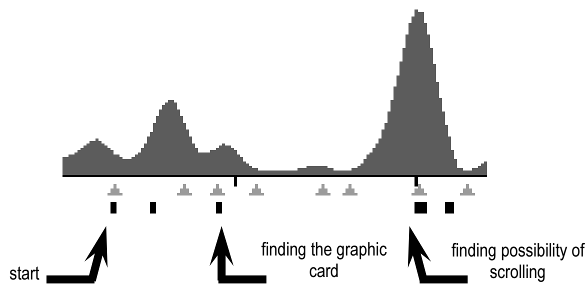

Figure 5. The 12th user in the same situation as the 6th user in Figure 4. Although she struggled only for two minutes, her heavy mental investments are clearly seen in the much suppressed MFP profile during the period from finding the graphic card till finding the possibility of scrolling.

Summary of experiences gained through the use of the INTERFACE system

Based on the results presented here as well as in related papers, it can be stated that the INTERFACE methodology in its present form is capable of identifying the relative weak points of the HCI. With this methodology and the related workstation, it was possible to study events occurring during the HCI in such detail and objectivity that would not have been possible using other methods presently known to us. The sophisticated heart period variance profile function integrated into the INTERFACE system is a powerful tool for monitoring events in such a narrow time frame that it can practically be considered as a time-continuous recording of relevant elementary events.

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References

1. HERCEGFI, K. (1999) *CD-ROM Based Multimedia Materials Integrated with Supporting Web-Sites.* EDEN 3rd Open Classroom Conference, Balatonfüred, Hungary. 1999 March 25-26
2. IZSÓ, L. (2001) *Developing Evaluation Methodologies for Human-computer Interaction*. Delft University Press. ISBN 90-407-2171-8, pp. 236, Delft, The Netherlands
3. IZSÓ, L., HERCEGFI, K. (2004) *HCI Group of the Department of Ergonomics and Psychology at the Budapest University of Technology and Economics*. Extended abstracts of CHI2004 conference (Vienna, Austria. 2004 April 24-29), chapter of HCI Overviews
4. IZSÓ, L., HERCEGFI, K., AND ERDŐS, E. L. (2000) *INTERFACE: A Methodology for Assessing Quality of Educational Multimedia Products Developed in the Frame of a Leonardo da Vinci Pilot Project*. Proceedings of EDEN 4th Open Classroom Conference (Barcelona, Spain. 2000 November 19-20) PP. 129-134
5. IZSÓ, L. AND LÁNG, E. (2000) *Heart Period Variability as Mental Effort Monitor in Human Computer Interaction*. Behaviour & Information Technology, Vol. 19, No. 4. pp. 297-306
6. IZSÓ, L., MISCHINGER, G. AND LÁNG, E. (1999) *Validating a new method for ergonomic evaluation of human-computer interfaces*. Periodica Polytechnica, Social and Management Sciences. Vol. 7, No. 2, pp. 119-134
7. MULDER, G. AND MULDER-HAJONIDES VAN DER MEULEN, W. R. E. H. (1973) *Mental load and the measurement of heart rate variability.* Ergonomics, 16, PP. 69-83

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STATISTICAL ANALYSIS OF STUDENT SATISFACTION ENQUIRY RELATED TO E-LEARNING CHALLENGE AT DENNIS GABOR COLLEGE

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E-learning project at Dennis Gabor College

Dennis Gabor College has been dealing with distance learning in Hungary and in the neighbouring countries since more than a decade. The number of enrolled students varies year to year, but actually the total number of students is some 13000. Over the 12 years of our existence, the technology of knowledge-transfer has been changed dramatically. At first we used only paper-based materials, video cassettes and floppy diskettes. Then in 1996 we transferred a lot of materials to CDs from the diskettes and from some paper-based materials because CD has 600 times more storing capacity than a normal floppy disk. Due to the high responsibility of dealing with very high number of students, we have to examine the penetration of the new media among our students with extreme care, and we can introduce the new media if the penetration is above 80%. In year 2000, the Internet penetration between our students reached this critical threshold. We published the teacher's PowerPoint presentations and some other documents on the Internet and we began to create our e-learning strategy. We are interested in using the latest technology achievements with an aim to disseminate the knowledge of information technology with maximum efficiency. That is why we are deeply interested in use of E-learning technology [1].

The precursor of the actual e-learning project was the multimedia project in our institute. Within the frame of this project we developed multimedia CDs, each of them covering one module in our curricula. Next to multimedia CDs, we published all of our lectures in HTML format on our website [5]. These HTML documents may serve as a basis for our e-learning content development.

SW and HW development

In 2003 we invested in a server park for hosting the e-learning frame system and the student administration and management system as well. This latter one is a Hungarian software product named "ETR" (Uniformed Student Registration System), which is supported by the Hungarian Education Ministry and, it is used by several universities in Hungary. We have adapted it especially to the conditions of distance-learning. As "ETR" registers the student's study credits and performances, it is very useful if it operates joined to the e-learning LMS. The students have to login only into "ETR", and they are also connected to the e-learning system. One of the most difficult tasks was the safe transfering of personal data from the old system to the new one.

In January 2003 we concluded a rent agreement with IBCNET Hungary in order to rent their IntraLearn system. We established an e-learning project with joint participation of our and IBCNET personnel [6]. In the early phase of this project a translation engine was developed in order to translate SCORM compatible word documents to IntraLearn format.

The IntraLearn frame system

IntraLearn is a usual e-learning frame system, with the same components as in the case of many other concurrent software. The main components are as follows: HTML documents with image, video and animation inserts, Forum, Chat, Agenda, Self-test, FAQ, References. Two different interfaces are proposed, one for the students and one for the personnel. The IntraLearn frame system was hosted on our server, however it can be hosted anywhere at a third place, too. We thought that when the frame system is hosted on our server, it may yield to easy data entering and modification.

It is an important decision where to host the frame system: on the server of supplier or on our own server. Now we think it is better if the frame system is hosted by the supplier. Naturally, there are a lot of facts influencing this decision: the bandwidth, the expertise of the staff and so on.

E-learning object development

The first question is to select the traditional teaching module or object which we wish to deal with in an e-learning environment. The selection depends on the introducing strategy. It is easy to make the selection when the teacher of a given module is enthusiastic about the e-learning application. Then we shall to analyze the needs of the college, e.g. the elective courses come first. Finally, we selected four modules to develop.

We prepared an MS Word and an MS FrontPage template sheet, with a definition of structural and formal elements of e-learning documents, with respect to correct data linking, image and video references. The principle was that these template sheets must conform to SCORM and LRN standards. Once the two template sheets were ready and acknowledged by the project team, the use of them became an obligatory guideline for all of our developing personnel. Our personnel developed three lectures using the MS Word template and one using the MS FrontPage template. We prepared short videos by Snagit and some animations with Flash. Images were generated from the source software and treated with MS Photo Editor.

All documents were saved on CDs, and then they were subject to a detailed verification process. The verified documents were entered into the frame system by specialized staff members. FAQ, references and other components were elaborated by the authors.

Experimental education with the participation of 120 students

In November-December 2003, we organised a test course series for voluntary students. A total of 120 students decided to take part in this experience in four different topics, that is to say an average of 30 students per course followed their studies by electronic way [2]. The courses were as follows:

- Spreadsheet methods with MS EXCEL
- Project management with MS PROJECT
- 3D modelling with CADKEY
- Computer graphics

The total number of received questionnaires was 33. We are convinced that this number of returned enquiries is too small for a general statistical evaluation; however, we suppose that this could serve as a guideline to understand the students' behaviour related to electronic learning. The main weakness of this test is the voluntarism of the students, as this way we tested only that part of the totality which was favourable of e-learning methods by default. That is why some criticism must be applied to too many positive opinions.

During the test period we established an agenda for the students, and we assured 2x2 hours/week of online chat for them. Next to the online chatting we assured a moderated forum in each topic. The students had the possibility to exchange their ideas and the concrete solutions of the discussed problem. At the end of the test period we organized an exam for the students with the same conditions as it is used in our traditional education. An average of 67% of success rate was obtained. The students were invited to fill in the enquiry sheet after finishing the exam.

The enquiry sheet

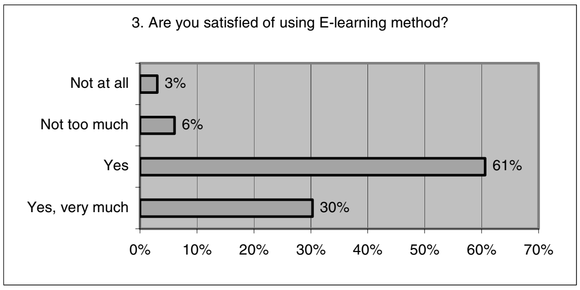
There were 17 questions on the enquiry sheet with 4 answers to each in the majority of cases. We used the experience of Bernath [3] and Guidorzi and Giovannini [4] when developing our enquiry sheet. The questions were targeting:

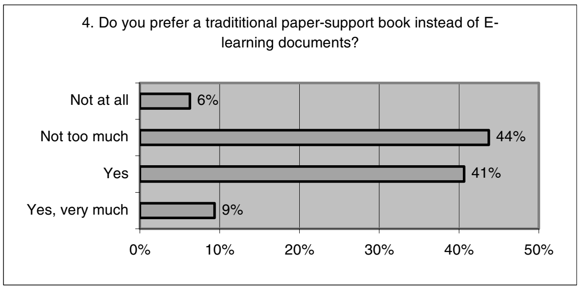
- the method of e-learning,
- the quality of the course,
- the HW/SW conditions
- and the quality of the tutor.

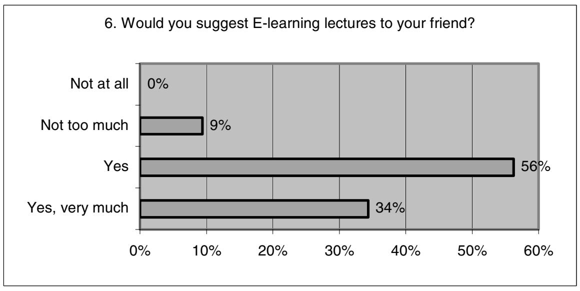
The 4 answers were classed as: yes, very much; yes; not too much; not at all. In aiming to check the seriousness of the answers, some control questions were inserted. The 17th question was reserved for any free remarks. As the answer to this question was not canalized within the above frames, their statistical analysis is not as exact as that of the others.

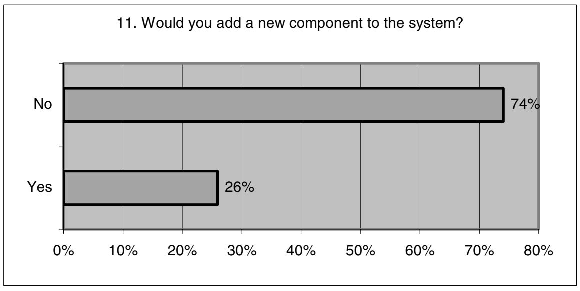
Analysis of answers to enquiry questions

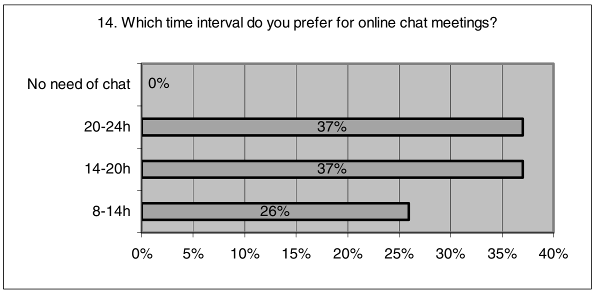
In the present paper the authors only deal with questions related to the methods of e-learning. See the students' answers in the diagrams below. On the horizontal axis of the diagram, see the percentage of answers.

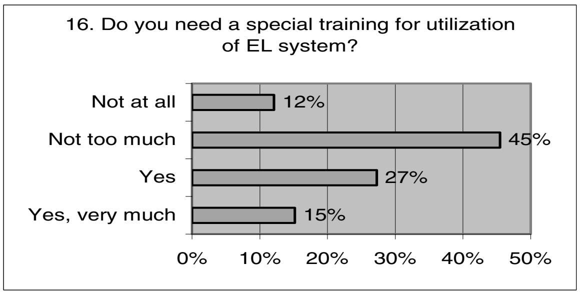


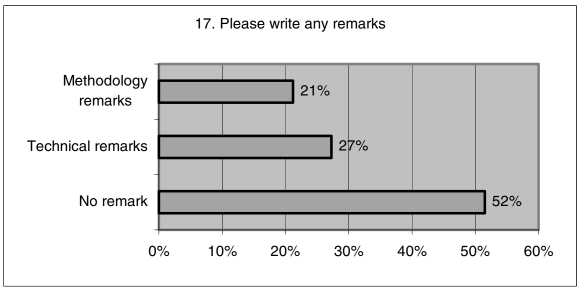


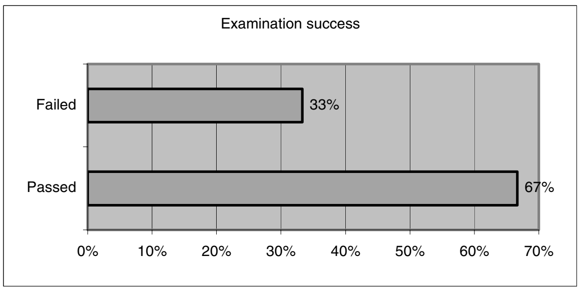












It can be concluded from the answers to questions No. 3, 4 and 6 that the majority of the participating students favoured the e-learning methods. Even the answer to question No. 4 is somewhat surprising, approximately 50% of the students do not require traditional paper-support book for e-learning lectures. It is certain that this ratio would be lower if the totality of students would be interviewed for this question. In this moment we think that in spite of high overheads we have to support the students by supplying proper books as well.

It should be noted that all failed exams were detected in one and the same topic over the total of four. Consequently, in this case there is some contextual or methodological problem with the course, which has to be identified and treated carefully.

It can be seen from the answer to the 17^{th} question that about one quarter of the responding students dealt with methodological problems. The majority of these remarks stated that the level of the examination was too high. Some of them claimed for other way of online communication such as videoconferencing. We do not pay too much attention to technical remarks, as these technical problems will be more and more eliminated during the development of the project.

The remark related to the too high level examination is closely related to the "Examination success" diagram. In normal cases 33% of failed candidates mean no important deviation from the average. But in our case all of the failed examinations were found in one module. Consequently, it is certain that there are other content or methodology related problems with this topic which require further detailed analysis. However, at a first glance, it seems that the learning objects of this module do not cover entirely the topic, and there was a considerable difference between the teaching and examining level.

Conclusion

Due to the relatively low number of enrolled students, the results of the enquiry have to be considered with certain precaution. It should be taken into consideration that volunteers were favourable to e-learning methods by default. In spite of the above weaknesses it can be concluded that:

- In the overwhelming majority of the cases, the students were favourable to e-learning methods.
- The traditional paper-support book is suggested to be used even with e-learning methods.
- The majority of students prefer the afternoon hours for online meetings.

Beyond the above experiment the main conclusion is that the introduction of e-learning system is a long procedure in a lively and ever changing environment. We may not interrupt or disturb the everyday activities and the customs of students. We have to tune the teachers very carefully for the content development so that they feel that it is fun to do.

References

1. S. ZÁRDA, G. BOGNÁR (2003) *Implementation Strategy of an E-learning System for a Population of 13000 students in Central Europe*, EDEN Annual Conference, Rhodes, pp 434-440
2. S. ZÁRDA (2002) *Student Autonomy in E-Learning,* EDEN Annual Conference, Granada, pp 386-390
3. U. BERNATH (2003) *Student Satisfaction in the Online Master of Distance Education (MDE),* EDEN Annual Conference, Rhodes, pp 195-200
4. R. GUIDORZI, M. L. GIOVANNINI (2003) *E-learning Tools in Higher Education: Users Opinions,* EDEN Annual Conference, Rhodes, pp 201-206
5. DENNIS GABOR COLLEGE HOMEPAGE: www.gdf.hu
6. IBCNET HOMEPAGE: www.ibcnet.hu

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DEFINITION OF A MODEL OF EX ANTE EVALUATION FOR ELEARNING PROJECT FINANCED BY ESF (EUROPEAN SOCIAL FUND)

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Introduction

The Training Experimentation Area of ISFOL, following the strategies of ESF 2000-2006, has engaged research activities and Technical Assistance in accordance with the Ministry of Welfare about training models connected with use of ICT (Information and Communication Technologies).

The fast development of ICT use in training has not facilitated the systemization/identification of a quality concept in a non-traditional environment (distance learning). The necessity to provide knowledge on this theme has been a priority of Training Experimentation Area of ISFOL.

More specifically, the Area has decided to elaborate an ex ante evaluation model to evaluate the quality (grid of quality indicators) that can be used in the selection phase of the ESF project proposal. In the same time the tool can be useful for those who plan and realise eLearning projects focusing on quality.

The methodological approach used has been divided in the following phases:

- Semantic analysis of EU, national and regional programming documents to point out the relationship between the knowledge society, distance learning and e-learning.
- Analysis and interpretation of actual strategies of specific regions that have presented the case study.
- Biblio-emero-web analysis of the quality concept in the training field.
- Drawing up of the ex-ante evaluation model with the indicators set.

The Complexity of an E-learning Project: The Process-Based Approach

This research is based on the awareness that each eLearning project involves the complexity on three different aspects: methodological, organisational and technological, which from the operational point of view are different strategies for the implementation of the projects. This diversity, also emerging in the case-studies examined in this research, however, involves two macro-categories of implementation models:

- Micro-projects linked to specific contexts, with the use of simplex technologies and lower implementation and management costs, and of professional profiles covering several roles in the context of the training process;
- Macro-projects on a large-scale, utilising complex technological solutions, with high implementation and management costs and specialised skills involved in specific roles.

The exploration of this complexity allows the identification of those factors describing quality in E-learning. This requires the adoption of a methodological approach to break down this complexity while also identifying the distinctive elements, with reference to each individual phase through which the E-learning project is defined.

The "process-based approach" type of interpretation has thus been selected, in order to describe the phenomenon in the main phases, such as: User Needs Analysis, Instructional Design and Development, Delivery, Monitoring, and Evaluation.

Quality of E-learning: A Definition for ESF-Financed Projects

The concept of quality in E-learning largely depends "on the type of application used, the context and nature of the interaction between students and the material, the other learners or the teacher/trainer."

The set-up of the *European Forum on the Quality of Vocational Training* and the European Commission's work in the E-learning Action Plan highlight two specific aspects of quality, distinct and in any case complementary that interpret quality in terms of:

- Capacity of the E-learning project to produce outputs coherent with the policy goals expressed by the institutional demand;
- Capacity of the E-learning project to produce outputs coherent with the goals of the project itself, through an adequate integration between the ITs utilised, the architecture of communications, and the actors of the process (students and learners).

On the basis of this re-interpretation, the study on which this paper is based defines quality as: the capacity/opportunity of producing outputs coherent with the goals defined by the institutional demand (external coherence), and with the goals of the training project according to the E-learning approach (internal coherence).

Following this specific meaning, the quality of an E-learning project is assessed in terms of:

- External coherence and thus in relation to the political and institutional context and in particular the training policies deriving from it,
- Internal coherence in relation to the specific operational context in the E-learning project, applied and responding to the specific needs of the users.

Therefore, in order to guarantee the quality of an E-learning project an ex-ante design and in-itinere monitoring of the external and internal coherence are required, in each phase of the process for the implementation of the project.

Ex-ante Evaluation of the Quality in E-learning within the ESF: A Proposed Model

The development of the evaluation culture has led to the awareness that the quality of a project and its training effectiveness can be measured through the outputs of learning and the capacity to respond to the objectives of the calls for proposals. The latter stress economic policy and social aims, and can be measured through indicators such as: job opportunities, impact on the employment and unemployment rates, re-qualification of workers, development of equal opportunities, and so on.

The programming and implementation of the ESF have certainly accelerated the evaluation processes, introducing the need to rationalise programming, and the implementation and accountability of training projects at the national level and within the various regional frameworks.

According to this approach, quality assessment becomes necessary at three stages:

- Ex ante, prior to the selection phase of the projects being eligible for ESF funding. In this context, the assessment of the quality should be concentrated on the existence of favourable conditions so as to achieve both policy and institutional goals (defined by the call for proposals/announcement) as well as project goals.
- In itinere, during the phase of implementation of the project. In this case, the focus will be on the monitoring of actions and in terms of intermediate results. This assessment is designed to guarantee the attainment of outputs coherent with the needs. This is the way to interpret the actions of ongoing project re-tuning, above all according to significant social, economic and technological changes occurring during the period when the project is implemented.
- Ex post, that is after the end of the project. In this case, the quality assessment will define the effectiveness of the project in terms of measuring the contribution offered by the project in providing solutions to policy and institutional needs and to the needs of the project audience.

With reference to the first stage, an ex-ante evaluation model is proposed to contribute to the development of a culture of quality in E-learning financed with public resources (EU, national, regional).

This goal is achieved by a methodological approach enhancing quality from the project-design stage and identifying the information factors for monitoring the entire lifecycle of a project, according to a whole continuum in which ex-ante evaluation is the starting point of a quality path, supported in itinere by monitoring and ex post by final evaluation.

The resulting model is aimed at two different categories of end-users, the ESF Management Authorities (MA) and promoting bodies

The development of the *ex-ante* evaluation model is a tree-structured analytical process, starting from the definition of six general Contexts for the project quality assessment and then making subsequent distinctions with the identification of some evaluation Dimensions for each Context.

Subsequently, each evaluation Dimension is arranged according to a series of Descriptors, which in turn include a series of Variables to which we can assign a qualitative/quantitative order.

The model provides two levels of evaluation:

- The first one for the quality characteristics of the Promoting Body;
- The second one for the quality characteristics of the project proposal.

The breakdown into two levels reflects the traditional ESF approach to the *ex-ante* evaluation of training projects, which tends to evaluate them by ensuring that each stage is preliminary to the next: the promoting body first, in terms of professional ability to implement the training projects, and subsequently, the specific project proposal.

All this, in the model of *ex-ante* evaluation, provides the identification of Evaluation Contexts, Dimensions, Descriptors/Indicators and Variables which can take into account this double aspect of the coherence and, in the end, of quality in E-learning.

First Level – Characteristics of Quality of the Promoting Body

This first level is the one most closely related to external coherence since it allows the MA to make an *ex-ante* evaluation on whether a certain body is able to guarantee a real contribution to attaining the policy goals stated in the call for proposals.

Within this approach, the model identifies the Evaluation Context as: “Characteristics describing the promoting body”, a series of evaluation dimensions aimed at facilitating the creation of the opinion. A series of descriptors/indicators provide an analysis not only of the formal levels of certification (accreditation or ‘ISO 9000’ certification) held by the body, but also specific factors in the experience of the promoting body that are able to guarantee the reliability in terms of outputs. It is a matter of evaluating, in relation to the objectives and strategy stated in the call for proposals, the outputs achieved by the body in the implementation of other projects, the competences and skills, and the partnership network it can activate. These aspects are an indispensable condition for the implementation of a project responding to the specific institutional demand.

In particular, the Evaluation Dimensions relative to the elements describing the promoting body are:

- Accreditation/certification of the promoting body or of the grouping, in case of partnership, in terms of number and types of accreditation and/or certification;
- Curriculum of the promoting body or of the grouping, in case of partnership, in terms of coherence of the experience with the strategies and goals set forth in the call for proposals;
- Curricula of the human resources involved in the implementation of the E-learning project, in terms of competences held and/or made available by the promoting body for the implementation of the project;

- Partnership, in terms of compliance of its qualitative and quantitative structure to the strategies stated in the call for proposals.

Second Level – Characteristics of Quality of the Proposal

The second level, which involves the quality of the project proposal, is mainly related to internal coherence, though in any case – as we stated below – not excluding external coherence. In this regard, the model proposes an analysis of the project highlighting the logical relationships between the methodological, organisational and technological aspects affecting the quality proposed (according to the given meaning) through a process-based interpretation. The phases, previously analysed, thus become Evaluation Contexts, in which specific logical relations are sought within each Context and between the various Contexts.

In this view of the process, the Evaluation Contests are described below.

- User Needs Analysis. This is the starting point of the second level. The analysis of this Context must enable us to evaluate the capacity of the project proposal to provide an operational interpretation, in terms of goals and results to attain, of the policy and institutional requirements envisaged in the call for proposals. The calls for proposals often express social needs (in terms of training needs) in a summary way. The interpretation of social needs is thus delegated to the training-supply system (promoting bodies) which, on the basis of a correct analysis must identify the project strategies best suited to solving the problems highlighted.
- The capacity of the proposal to identify and describe the training needs is analysed through the following Evaluation Dimensions:

  Identification of the need/problem, in terms of capacity of the promoting body to accurately identify the needs of the reference audience;

  Definition of the need, in terms of describing the reference-audience training gaps and the professional features of the socio-economic and organisational context in which the project should be applied, with particular focus on the choice of the E-learning procedures. This leads to a specific assessment of the capacity of the specific environment, as well as the target audience, to apply a project of this type in terms of familiarity and capacity of using ICT required by this training procedure.

- Instructional Design and Development. This is the Context showing the highly complementary relationship between internal and external coherence. With reference to the former, the specific dimensions and descriptors/indicators are identified, revealing the quality in the choice of the combination of teaching, technological, organisational and quality-management strategies and the compliance of this mix with the needs analysis (User Needs Analysis). With reference to external coherence, the model analyses the capacity of the general strategy (teaching, technology, organisation and quality control) to respond at the same time to more policy-related goals, correlated to the type of funding, such as ESF. This explains the specific evaluation dimensions involving, for example: the procedures of implementation of the ESF transversal goals, the sustainability of the project, and its degree of innovation and networking.
- The Evaluation Dimensions of this context are:
  - The general strategy of the project, in terms of choices (E-learning procedures, professional profiles to be trained) in order to respond to the needs and project goals;
  - The teaching strategy, in terms of coherence with the characteristics of the target audience and compliance of the teaching goals, the methodology adopted and the contents of the training;
  - The communications, technological and organisational strategy, in terms of the adequacy for the characteristics of the target audience, compliance and pertinence with the teaching goals and the training contents;
  - The quality control strategy, in terms of completeness of the procedures used for quality control of training products, services and tools;

- Sustainability, in terms of the capacity of the project to guarantee benefits in the medium-to-long term;
- Innovation, in terms of the capacity of the project to produce new solutions with respect to the reference context and the target audience;
- Networking, in terms of the capacity of the project to contribute to creating formal and informal networks;
- Transversal ESF objectives, in terms of compliance of the project to the 3 transversal objectives of the ESF;
- Policy and institutional objectives, in terms of coherence of the project with the objectives of national and regional training policy.

- Delivery. In this Context, mainly involving internal coherence, the model proposes an analysis targeted to the quality assessment of the service delivery in relation to the specific features of the target audience. Within an approach focussed on the client-user, the various actions and corresponding services must be designed in relation to the specific characteristics of the users. The basic idea is that the customisation of the service is a variable that determines the growth of quality in the delivery phase, which in turn significantly affects the quality of the final outputs. The Evaluation Dimensions of this Context are:
  - Promotion, in terms of coherence of the promotional/information action with respect to the target audience;
  - Selection, in terms of the adequacy of the procedures for the selection of participants with respect to the target audience;
  - Training guidance, in terms of the adequacy and coherence of the incoming and outgoing guidance system with respect to the end-users;
  - Teaching, in terms of the adequacy of the organisation of educational activities with respect to the target audience, the project deadlines and resources available.
- Monitoring. The model highlights the relevance of the design of a monitoring system aimed at responding to two aims. On the one hand, it guarantees the quality regulation and control of the process, and on the other it forms a dynamic information basis, supporting the final evaluation of the project. Achieving these two aims largely depends on the architecture of the system, and in particular, on the choice of the methods and tools used for the information analysis. The Evaluation Dimensions of this Context are:
  - The goals of the monitoring system, in terms of the significance of the monitoring strategy in relation to in-itinere quality control and to the final evaluation goals;
  - The methodologies and tools of analysis, in terms of the correctness of the method with respect to the monitoring of the process.
- Evaluation. This is the last phase of the process and consequently forms the Context concluding the model of *ex-ante evaluation* of quality in E-learning. The quality in this specific Context should be identified in terms of capacity of the project to assess the effectiveness of the outputs in relation to the target audience (internal coherence) and the goals of the call for proposals (external coherence). The evaluation of the outputs in terms of project costs and benefits is also important, and involves specific cost models for E-learning.

The costs of E-learning can be divided into three main categories: contents (texts or courses on-line), services (teacher, tutor and organisation), and infrastructures (hardware, software and Internet links). In traditional training, the costs for the contents are relatively low, since they are normally provided directly by the teacher. In E-learning, on the other hand, the costs for the service of online teachers will be lower with respect to traditional training, since the time required for the teacher is reduced drastically. These dynamics must obviously be taken into account in order to correctly evaluate the project. The three Evaluation Dimensions of this phase are:

- Evaluation of the process outputs on the end-users, in terms of the capacity to measure the effectiveness of the final outputs in the fulfilment of needs;

- Evaluation of outcomes on the political and institutional system, in terms of the capacity of evaluation to measure the impact of the final outputs;
- Outputs of the project in terms of costs and benefits, and in terms of efficiency of the training project with respect to the timing and costs.

References

1. BERTIN G. (1995) Valutazione e sapere sociologico Ed. Franco Angeli, Milano
2. FRUDÀ L. (1989) Le scale di atteggiamento nella ricerca sociale. Ed. EURoma – Editrice Universitaria di Roma – La Goliardica, Roma
3. ISFOL Struttura Nazionale di Valutazione FSE (2002) Linee guida per il monitoraggio e la valutazione del Fondo sociale europeo 2000-2006
4. ISFOL – Struttura Nazionale di Valutazione FSE (2002) Orientamenti metodologici per la valutazione del processo del processo di implementazione di programma
5. TRENTIN G, (1999) Telematica e formazione a distanza. Il caso Polaris. Ed. Franco Angeli, Milano

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TOWARDS A FRAMEWORK FOR EXPLORING SUCCESS FACTORS IN ONLINE LEARNING

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Abstract

This paper discusses a study based on the introduction of two online Masters programmes in the School of Computing at the University of Paisley, Scotland. As one of the courses was also taught in the traditional face-to-face (F2F) format comparison of the two teaching and learning methods was possible and revealed the online students as having achieved better results than the F2F students. We believe the online students achieved better pass rates as a result of the distinctive teaching and learning methods available in the online format. Given the number of variables in the situation, however, determining which factors contributed to the online students' success had to be based partly on anecdotal evidence primarily from the students themselves. This suggests a continuing need for investigation of online pedagogical elements such as teacher presence, learner control and enhanced learning opportunities provided by online learning. This paper will also introduce a tentative framework for exploring success factors in online learning that has been developed from experiences with the two online Masters programmes.

Introduction

The MSc Management of eBusiness and MSc IT with Web Technology are innovative part-time online/distance learning programmes offered by the School of Computing at the University of Paisley. The programmes provide the skills that modern managers need to understand and manage modern eBusinesses from both business and technical perspectives. The programmes are built on a framework of modules. The modules provide interactive learning through the use of self-assessment questions and multimedia activities and exercises. Each module comprises a number of units which cover a separate topic of the programme. The typical profile of the students taking the course is of a mature graduate in a senior management position within well-known national and multinational organisations where the role of the Internet and eBusiness is of major strategic importance.

The online distance learning environment has a major contribution to make to the educational requirements of the twenty-first century by encouraging general acceptance of the concept of knowledge as a vital element in social development and economic growth. To keep pace with changes in technology, and to meet the increasing demands of the knowledge-based economy will require a highly-skilled and educated workforce capable of working collaboratively to find solutions to diverse economic, social and environmental problems. The key to success is in large part continuing education, which means that online learning, with its open access and opportunities for active collaboration in an egalitarian environment, will have an important role to play in meeting the challenges of the future.

Comparing Online and Face-To-Face Learning

Much of the literature on comparing the effectiveness of distance learning with face-to-face (F2F) learning reveals "no significant difference in student learning and other outcome measures" (Meyer, 2002). Gagne and Shepherd's findings that the performance of F2F and online students taking the same MBA introductory accounting programme were similar and that "students' evaluations of the course were similar" supports Meyer's conclusion (Gagne and Shepherd, 2002).

A recent meta-analysis of selected studies from Russell's "No Significant Difference" and McGreal's "Significant Difference" annotated bibliographies reveals that distance education employing online support is as effective, and in some instances more effective, than F2F education when the academic performance of students is measured in terms of their examination results (Duffy, Gilbert, Kennedy and Kwong, 2002). The analysis also reveals that, while distance education employing online support does not obtain such favourable student satisfaction ratings as F2F education, it does appear to promote a higher level of student participation. The findings of the meta-analysis are qualified with reference to the conclusions in Phipps and Merisotis' 1999 report reviewing the effectiveness of distance learning. Both studies reached broadly similar conclusions on the effectiveness of distance learning although Phipps and Merisotis reported "more positive studies on student satisfaction". They were critical of the quality of the studies they reviewed; one criticism being that many of the studies investigated only part of a programme rather than the whole programme.

For the purposes of this study we have examined the results of four modules from the MSc programmes in order to compare the overall performance of the students taking the modules online as compared those students taking the modules in the more traditional F2F.

The Technologies for Global Commerce (TGC) module was taught in both the F2F and online delivery modes by the same teacher during the period 2000-2002. The module is offered on both MSc programmes where it is taught online to part-time students and also in F2F mode to full-time and part-time students. The results for the module for the period 2000-2002 are set out in Table 1.

Table 1: Results for the TGC module for the period 2000-2002

Table 1		2000			2001			2002	
		FT	PT	OL	FT	PT	OL	FT	OL
TGC	Count	81.0	24.0	7.0	103.0	5.0	28.0	37.0	18.0
	Average	62.2	61.5	70.1	54.8	53.2	57.7	54.7	61.6
	Maximum	80.0	75.0	83.0	69.0	64.0	77.0	75.0	78.0
	Minimum	19.0	38.0	58.0	18.0	20.0	25.0	9.0	31.0
	St Dev	10.0	10.6	7.8	10.5	16.7	13.2	16.3	11.1

Analysis of the results shows that the online students performed consistently better than both the full-time and part-time F2F students over the period 2000-2001. As a result we decided to amalgamate the part-time F2F students taking the TGC module with the part-time online students and from 2002 all part-time students took the module online. The 2002 results show that the average mark for the online students was 6.9% better than that of the students taking the module F2F.

The Information Systems Theory and Practice (ISTP) module was taught in both the F2F and online delivery modes by the same teacher during the period 2000-2002. The module was taught online to part-time students and also F2F to full-time and part-time students. The results for the module for the period 2000-2002 are set out in Table 2.

Table 2: Results of the ISTP module for the period 2000-2002

Table 2		2000		2001			2002	
		FT	OL	FT	PT	OL	FT	OL
ISTP	Count	24.0	10.0	48.0	20.0	12.0	63.0	18.0
	Average	54.7	63.9	57.5	57.0	62.1	57.2	58.2
	Maximum	70.0	75.0	70.0	71.0	72.0	76.0	70.0
	Minimum	26.0	53.0	30.0	25.0	54.0	20.0	25.0
	St Dev	11.3	6.4	7.8	8.9	5.9	11.3	9.4

Analysis of the results from the year 2000 revealed that the online students' average mark was 9.2% better than that of the full-time F2F students. As a result from 2001 delivery of the module for full-time F2F students was altered to a mixed mode format. Analysis of the results from the year 2001 revealed that the online students' average mark was 5.1% better than that of the part-time students and consequently from 2002 the part-time students have been taught in the online format. The results for 2002 show little difference now between cohorts.

The International Technology Management Module (ITM) was taught in both the F2F and online delivery modes by the same teacher in 2001 but in 2002 another teacher took over. The results for the module for the period 2001-2002 are set out in Table 3.

Table 3: Results of the ITM module for the period 2000-2002

Table 3		2001			2002	
		FT	PT	OL	FT	OL
ITM	Count	26.0	54.0	10.0	17.0	9.0
	Average	54.8	47.1	55.2	51.8	54.2
	Maximum	64.0	63.0	68.0	64.0	62.0
	Minimum	43.0	18.0	37.0	22.0	43.0
	St Dev	5.1	7.6	9.9	11.0	5.2

The online students achieved the best results in 2001 with their average mark being 8.1% better than that of the part-time students. As a result since 2002 the part-time ITM students have been taught in the online format.

The Fundamentals of Database Systems module was taught in 2002 in the online delivery mode by an experienced teacher from within the School who had previously taught the module F2F. The module was also taught in 2002 in the F2F mode by an equally experienced teacher from within the School. The module is offered to online, full-time and part-time students. The results for the module for 2002 are set out in Table 4.

Table 4: Results of the FDBS module for the year 2002

Table 4		2002		
		FT	PT	OL
FDBS	Count	33.0	5.0	14.0
	Average	53.8	52.6	64.6
	Maximum	86.0	67.0	87.0
	Minimum	4.0	34.0	41.0
	St Dev	23.5	13.0	15.9

Analysis of the students' results reveals that the online students achieved the best results with their marks being 10.8% better those of the full-time students and 12.0% better those of the part-time students.

Towards a Framework for Exploring Success Factors in Online Learning

As a result of the comparison study described in the previous section, as well as interviews and questionnaires conducted with online learning students the online learning research team within the School of Computing at the University of Paisley have devised an initial framework as a means of exploring success factors in online learning and is shown in Figure 1. The framework is divided into three levels: the technology level which is concerned with the use of information and communication technologies (ICT) in providing the means for online learning. The teaching and learning level has at its focus deep learning which is a key goal at postgraduate level. Finally, the personal level emphasises the role of the student and has at its focus student satisfaction which is a key goal of any programme provision whether at postgraduate or undergraduate level.

There is considered to be a strong link between ICT and flexibility within the teaching and learning level, since ICT does provide the means for students to access online resources and interact online at times that best suit their circumstances. However, it is considered that there is not a strong link between ICT and quality materials and resources, responsive tutors and interaction with other students since these can be adequately provided within a F2F learning environment. All of the elements within the teaching and learning level are considered to have a direct and strong link to providing a deep learning environment.

Within the personal level, deep learning is considered to have a strong and direct link to academic success, student motivation and enhancing career since students who have engaged in the subject matter at a deep level are more likely to succeed in assessments as well as being motivated in terms of expending time and effort in doing so. In addition, students are able to place the content and their learning within the context of their careers. In terms of satisfaction, relevant factors appear to be those that include successful and motivated students, as well as those who are able to enhance career opportunities as a result of their learning. These are usually key areas in the measurement of a programme's success.

This tentative framework has been explored with online students who have found it to be a useful means of exploring factors that have contributed to their success and the success of the online programmes. The next stage of the research is to explore each of the elements within the framework in more detail and develop the framework to a further level of detail. It is considered that the framework may eventually provide a means for online programme leaders, online tutors and even students to better understand what makes online learning successful and as a means understanding the different factors within the context of each other.

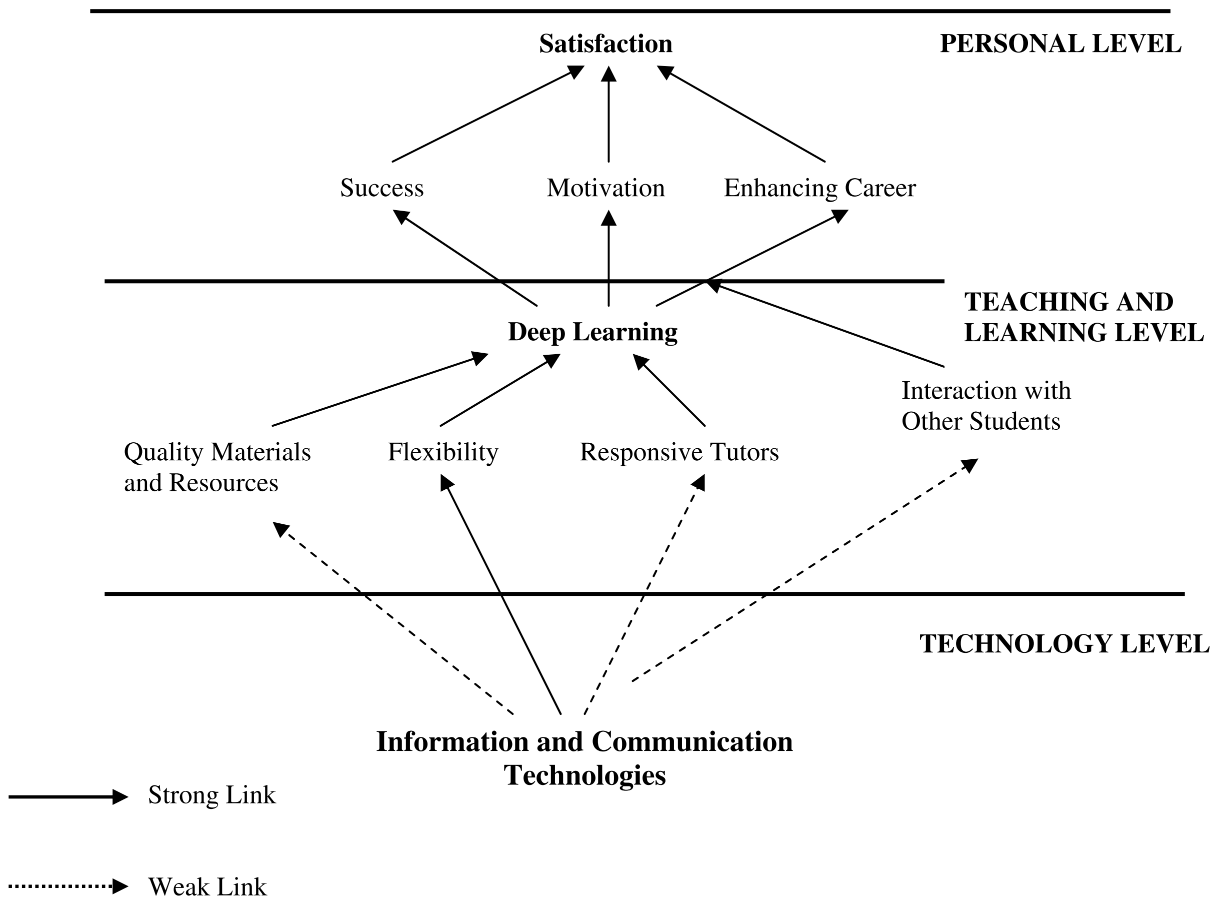

Figure 1: A Framework for Exploring Success Factors in Online Learning

Conclusion

The tentative framework described in the previous section has provided a possible means for exploring the different success factors in online learning. The analysis of the online students' overall results supports the conclusion that the online learning environment with its distinctive instructional processes contributes to the success which students studying in this medium enjoy when compared with those studying in the traditional classroom setting. The online medium enables students to control their learning, encourages active learning and enhances levels of teacher/student and student/student interaction as well as facilitating reflection on learning materials. Being time and place independent gives online learning a greater degree of flexibility as compared to the face-to-face situation. Within the module structure, students can determine their optimal study period and control their learning pace. Active participation, requiring students to formulate and present ideas coherently, enhances the learning process and improves students' comprehension and retention skills. The act of composing a written submission to either a formal tutorial conference or less formal students' discussion forum requires the contributor to carefully consider the content of his or her submission. In turn, the asynchronous nature of the medium makes for greater reflection on ideas and so enables participants to prepare thoughtful responses. This applies to teachers and students alike. From students' comments it is clear that motivation remains high in the online environment, with students reporting being motivated at the beginning of modules and remaining so throughout their duration. The students' satisfaction with the module materials also stems from their having found them useful and relevant in their professional capacities. Students who recently completed the online programmes indicated that they would undertake further online study as a result of their experience of the programmes. The high level of motivation coupled with good pass rates leads to the conclusion that the online environment offers students an enhanced educational experience. A reasonable assumption from this is that motivation as a function of enhanced interest makes for more successful learning. Further research required so that the framework can be improved and developed further and a more detailed set of factors identified and explored.

References

1. DUFFY, T., GILBERT, I., KENNEDY, D. AND KWONG, P. W. (2002) *Comparing Distance Education and Conventional Education: Observations from a Comparative Study of Post-Registration Nurses*, Association for Learning Technology Journal Vol. 10, Pt. 1
2. GAGNE, M. AND SHEPHERD, M. (2002) *A Comparison Between a Distance and a Traditional Graduate Accounting Class,* http://www.thejournal.com/magazine/vault/article
3. PHIPPS, R. AND MERISOTIS, J. (1999) *What's the Difference? A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education,* Washington Institute for Higher Education Policy, http://www.ihep.org/Pubs/PDF/Difference.pdf
4. RUSSELL, T. (2002) *The No Significant Difference Phenomenon,* http://teleeducation.nb.calnosignificantdifference/index.cfm

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COLLABORATIVE LEARNING
A CRITICAL SUCCESS FACTOR IN DISTANCE LEARNING

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Abstract

Both researchers and practitioners have given much attention towards developing prerequisites for effective distance learning in terms of reaching knowledge and ability goals. This article explores one of its fundamental challenges; to provide an understanding of the variables that affect the effectiveness of online delivery. The literature review suggested three variables; (1) Technology, (2) Instructor characteristics, and (3) Student characteristics. This study proposes support for all of these factors. Furthermore, the empirical material, consisting of personal reflections from 250 distance course students, reveals a new variable, collaborative learning. The fourth variable seems to be a feature that adds extra value to the learning experience and makes an imperative difference in student retention and success in distance education.

Introduction

One of the core policies that can be identified within the Swedish society is the provision of personal development and lifelong education of the citizens. Genuine learning for all inhabitants has been promoted and argued for since the 19th century (Abrahamsson, 1993). The basic ideological conviction is that general education of the working class counteracts social problems, and thereby creates an enhanced society. In practice, this political belief is one of the reasons why Sweden traditionally made extensive investments in attempts to improve the knowledge level of the wider community.

The idea of self-education, as a part of this initiative, has been promoted in Sweden for over hundred years. Oscar Olsson was one of the most prominent figures in the beginning of the 20th century, arguing for a reformation of the Swedish educational establishment (Abrahamsson, 1993). He encouraged scientific training of the working class and was a keen advocate of self-education and the utilisation of study circles (Arvidsson, 1991). His ideas have had an enormous impact on the Swedish society and are ingrained in the Swedish way of thinking about recruitment to higher education. Many of Oscar Olssons thoughts were incorporated in the 1977 renewal of the higher education system, for instance the idea to utilize distance education in order to make university studies better obtainable to citizens with varying backgrounds, experiences and geographical locations (Abrahamsson, 1993).

Investment in education within the Swedish educational system of today is characterized by projects such as competence development within the European Social Fund Objective 3 Program, an expansion of the higher education with approximately 100 000 places between the year 1997 and 2003, and the establishment of a more open educational system (SOU 2001/02:15). The open educational system involves pedagogical renewal, an expansion of distance learning via the Internet and coordination of distance learning in the Swedish Internet University. This is done in order to encourage broader participation in higher education by easier access (SOU 2001/02:15). The creation of the net university raises several important questions for modern universities that already struggle with distance education over the Internet.

Distance Education and the Role of Information Technology

Both Swedish and international researchers and practitioners have given much attention towards developing the forms for distance education. Technological advances have become a major focus of attention, and the need to integrate the educational process and suitable technological innovations is nowadays perceived as an important matter in distance education. The ability to use technology has opened new opportunities and a vast number of communication alternatives for distance educators. Furthermore, computer-based technologies have broadened the geographical and temporal range, and thus created new possibilities of interaction. Unfortunately, this progress can also be seen as a disadvantage. The advent of new terminologies, new commercial competitive providers, and new audiences generate a conceptual confusion within the field of distance education (Garrison et. al, 2000). In this altering context, theory is an indispensable tool as it provides an understanding of the field in practice, as well as a guide to the future developments. Thus, a theoretical foundation is of importance as it depicts the progress of the field and upcoming challenges. It is therefore imperative to provide a concise historical framework in order to reflect the assumptions and ideals that currently shape practice.

Historical overview

In order to provide an overview of the theoretical foundation of distance education, a vast number of theories have been reviewed. The contributions examined lead us to conclude that distance education has progressed through three generations that underpin the concept. The first generation of distance education was characterized by the utilization of a single technique for delivering instructions; correspondence study is its typical form. In the second generation, the teaching and the ways learning is structured by instructors was in focus of attention. The present and third generation is characterized by technological advancements that enable synchronous and asynchronous two-way communication between students and their teachers.

Among the theorists in the first generation of distance education, Charles Wedemeyer is very well-known. In the 1960s, Wedemeyer left the then established concept of correspondence study in order to merely focus on the pedagogical assumptions of self-education (Wedemeyer, 1971). He had the separation of teaching and learning in centre of attention and believed that distance education is basically a kind of independent study. His analysis resulted in a framework that describes the characteristics and advantages of independent learning.

The second generation of distance education evolved when researchers and practitioners started to focus on the teaching procedure. One of the most articulate theorists on the relationship of interaction in distance education is Börje Holmberg. The defining characteristic in his theory is the concept of "guided didactic conversations" (1989: 43). This refers to both real and simulated conversations, although he seems to emphasise on the latter. Holmberg (1989) argue for the significance of encouraging conversations fostered by well-developed self-instructional material presented by the instructors.

In the third and present generation, the distinctive feature is increased diversity and freedom of choice. Such progress has been made possible through the utilization of new technological advancements combined with new models for independent or collaborative learning. Garrison (1997) suggest that this indicate that we have entered a new era of distance education where interaction and two-way communication are the key characteristics of the educational experience. In this generation of distance education the prerequisites for utilizing the "learning" as opposed to the "teaching" view has been vastly improved.

Effectiveness of Online Education

The term online delivery is used to depict distance education enabled through the utilization of the Internet and other digital technologies. Thus, online delivery goes beyond traditional distance education as it facilitates the procedure by making two-way communication between student-student as well as student-instructor possible.

When it comes to understanding the effectiveness of online delivery, in term of positive learning effects and reaching knowledge and ability goals, a number of authors such as Leider & Jarvenpaa (1993) and Dillon & Gunawardena (1995) refer to three variables, namely (1) technology, (2) instructor characteristics, and (3) student characteristics. The significance of the first variable has been demonstrated by a vast number of studies that show that both computer application and networks affect the facilitating process. More specific, the reliability, quality, and medium richness[1] seem to be central issues when discussing the technology effectiveness (Sanders et al. 1995). The second variable, instructor characteristics, plays naturally a central role in the effectiveness of online delivery. Some authors even state, *"It is not technology but the instructional implementation of the technology that determines the effects on learning"* (Collis, 1995: 146). The final variable that influences the effectiveness can be identified in the literature as student characteristics or student involvement. This relationship has been identified by authors such as Driver (2002).

Description of the Course and Method of Data Collection

In the following, we will describe and analyse the personal reflections written by approximately 250 students that have participated in an undergraduate distance course via the internet. The course content is about knowledge management and organisational learning. The examination includes written papers and an extended group-project produced in cooperation with a suitable organisation or company. In addition, the students are required to actively take part in continuous web-discussions regarding a number of appropriate topics. Finally, the students are obligated to write a personal reflection regarding their learning experiences.

The study is based on the personal reflections of all students in four course occasions. In all four occasions, the lecturer and the students were geographically remote. The system tool utilized was a web-based groupware product accessed by the lecturer and the students through the Internet. Two different groupware products have been applied, both of which encompassed the same kind of communication characteristics and the same level of user friendliness. The change of system tool was primarily related to economic circumstances, rather than functional or quality issues of the two specific products. In a learning context, the used groupware products had the advantages of combining a variety of tools that promoted lecturer-student as well as student-student interaction. Both of the applied systems contained a large number of discussion forums that were created for different purposes and subjects areas. Some of these forums were open for all kinds of conversations, wherein all of the students had the opportunity to publish messages, ask questions, or respond to each other's writings. Other conversations were specifically intended for group discussions or predetermined topics. Accordingly, the forums represented a virtual room perfectly suited for brainstorming sessions within the area of knowledge management. In addition, the applied groupware products had an integrated e-mail system, which was a convenient and private method for both students and instructors to send messages to either a single person, or a specific group of individuals within the class.

The aim of the personal reflection at the end of the course was to encourage the students to evaluate and describe their learning experience and study situation. In order to explore the subject in depth, we decided to collect the reflection papers from all four occasions before conducting the analysis. Individual utterances and formulations by the students were then categorized with the intention to identify shared themes in the empirical data. The reflections give us clear indications of how we can develop distance learning in order to enhance the pedagogic structure and subsequently education and learning over the Internet.

Analysis of the Data

In order to develop distance education via online delivery, it is important to understand what kinds of variables influence the individuals (that is to say the students) in the centre of attention. The literature review suggested three variables; (1) Technology, (2) Instructor characteristics, and (3) Student characteristics. This study proposes support for all of these factors. Furthermore, our empirical material reveals a new unknown fourth variable, namely collaborative learning.

[1] A rich medium is one that allows for both synchronous and asynchronous communication, as well as the support of a variety of didactical elements (Daft & Lengel, 1986).

Technology

The students verified technology as one of the primary factors that affect the effectiveness of distance education. A vast majority found that the initial trial is to become familiar with the utilized interface design. The problem seems to be to fully understand and control the interaction abilities that the system provides. In line with Hillman et. al, (1994), students with greater experience of computer interaction did not stress this issue as frequent as students who felt primarily unfamiliar with communication technologies. Nonetheless, a large number of the more experienced users also expressed a concern regarding this issue. One of the explanations that were explicitly articulated was *"…the continuous development of the methods and technologies use for computer-assisted interaction."* Another aspect that was articulated put different forms of communicative modes in focus. Both synchronous and asynchronous communication mediums were argued for as vital in the procedure of online delivery. A technological system that provides both kinds of communication modes was perceived as especially helpful in the learning process. The main explanation was that different modes serve different kinds of purposes. Synchronous communication was often used in occasions where the data had to hastily flow between two or more individuals. Such situations occurred when the students had brainstorming sessions or real-time discussions. Asynchronous communication was appreciated when it came to more strict information sharing. As a result, it is possible to declare that online delivery needs to be supported by a variety of communication alternatives. A majority of the students also expressed that the technological system constituted the central link to the instructor, whereby system unreliability was perceived as devastating for the learning process. It was commonly expressed that high degrees of uncertainty lead to frustration, which in turn affected the level of enthusiasm and motivation. As one student pointed out, *"I think it is important that you can rely on the technological system (...) insecurity creates a feeling of dissatisfaction that in the long run affects the forthcoming work."* This statement clearly communicates the significance of a dependably technological platform that makes the students feel safe with online delivery. Apparently, this is an important aspect that may affect the students' engagement in the learning activities.

Instructor Characteristics

The students also identified instructor characteristics as a central factor that affects the effectiveness of distance education. The primary opinion was that the instructor should facilitate the learning process, leaving the traditional way of educating. This would result in a higher degree of freedom in the individual knowledge creating process. In addition, it would enhance the students' control and responsibility for their own learning. One student put it this way, *"As I see it, the teacher has a different function in distance education (...) rather than traditionally teaching the class, he or she should give directions and encourage participation."* This approach to education requires that the instructor start acting as a facilitator, and hence develops a new pedagogical philosophy. It was also suggested that the learning process was highly dependent upon the establishment of a relationship between the instructor and the students. A vast number of students stressed the importance of this connection, especially when comparing distance education with education in traditional classroom settings. The relationship seems to encourage interaction and reduce anxiety over vague instructions. A component of this relationship appears to be timely and continuous feedback. It seems to be essential that the facilitator continuously provides comprehensive feedback. In addition, several students discussed how the instructors utilize and control the interaction abilities that the system provided. It was commonly expressed that the instructor must use the technology efficiently, and promote the system in order to encourage participation. In line with previous studies conducted by Webster & Hackley (1997), it was also articulated that it is important that the instructor believes in the technological solution. Apparently, this gives the students confidence to interact with the tools appropriately. When the students perceived that the instructor did not handle the technological system correctly, it resulted in insecurity that in turn negatively influenced social-emotional variables such as motivation.

Student Characteristics

Most of the students confirmed that a higher degree of involvement is necessary when participating in distance education via online delivery. As one student expressed it, *"compared with regular class-room education, distance learning require that you take a more active and contributing role."* The instructor should indeed promote collaboration and open discussions, however, the students perceived themselves as responsible for actively and frequent participation in the collaborating activities, such as e.g. group work. This opinion was expressed in many of the reflection papers, which also reinforces the idea that the students desire a higher degree of freedom and responsibility. Subsequently, it was generally declared that the willingness to participate to a large degree depends upon the level of motivation. One of the students said it this way, *"If you're feeling motivated, you get involved in the discussions, and the learning process becomes more fun."* Thus, inspiring and appealing tasks that interest the students appears to be essential in order to increase both the level of individual responsibility and the degree of student involvement. Conversely, lack of motivation seems to be devastating in the learning process. This issue was often articulated as the primary reason for poor results and reluctance to participate. Many of the students further declared that concrete real-life projects in existing organisation increased their level of motivation. This relationship, which indeed has been proven in the traditional educational setting, seems to be even more important when it comes to distance education. The issue became especially evident when the students reflected upon their final assignment, a group-project produced in a real-life context. It was expressed that the students definitely noticed a difference in level of engagement among their classmates when participating in the final project. According to the majority, this assignment was perceived as the most interesting and motivating one, which in turn noticeably affected the degree of involvement in a positive way. The correlation between real-life projects and a higher level of involvement have indeed been proven in traditional education; however, its encouraging effect seems to be even more imperative when it comes to online delivery.

Collaborative Learning

The new variable that was revealed in the material was collaborative learning. The importance of this variable is highlighted in the following quotation, *"I have to point out that working and learning close together with my classmate gave me the strength needed to pass the course."* Apparently, student-student interaction has developed as a fundamental factor that affects the effectiveness of distance education. Collaborative learning seems to compensate the loss of face-to-face interaction with the instructor. Most students expressed this opinion and declared that student-student interaction is a significant issue that influence many of the other educational factors in modern distance education. The student's interaction and its influence on performance were especially noticeable in those situations where the students interacted in real-life. Thus, it appears that the dialogue and the discussions that take place between students is a critical variable that help to bridge the gap that physically exists between the instructor and the students. One student expressed it as follows, *"I believe that my discussions with the other classmates was crucial to my personal learning process."* Consequently, collaborative learning is a significant variable that need to be taken into consideration when offering courses work via online delivery.

Interestingly, the value of collaborative learning seems to come into existence in a number of different situations. Several of the students argued that collaborative learning was especially significant when writing the examination papers as it gave them the opportunity to distribute documents and subsequently give feedback on each others works. Others stressed the importance of interaction in order to deal with feelings of frustration regarding diverse course-related issues. Although these two aspects were articulated as importance advantages, the most satisfying outcome with continuous student-student interaction appeared to be the sharing of viewpoints when discussing theories that were included in the predefined literature. As one student said, "*We studied and summarized the course material individually, and then we distributed the documents to the other group members. This gave us the opportunity to identify, discuss and clarify problematical issues in the theories."* This was a widely held belief that could be recognized in the majority of the reflection papers. Furthermore, the analysis of the data indicated that the students, who were most satisfied with the overall quality of the given course, utilized collaborative learning. This suggests that student-student interaction is a vital factor that affects the level of satisfaction with distance education. It was also possible to detect a tendency that the students who did not frequently participate in the collaborative activities perceived the educational procedure as uninteresting or dull. Thus, there appears to be a correlation between a high level of student-student interaction and a high level of satisfaction among the students.

Consequently, collaborative learning seems to be an additional important variable that need to be taken into consideration when developing and delivering online education and learning.

Concluding Discussion and Final Remarks

There are many ways in which we can capture and analyze the concept of effective distance education. This paper suggests a framework based upon the view of students that have participated in higher education through online delivery. As seen in the presentation of the empirical data, the students promote four interconnected domains related to the effectiveness of the learning procedure. The main insight that the material reveal is that the formerly unknown fourth variable, collaborative learning, contributes extensively to increase motivation, enthusiasm, and level of satisfaction with distance education. Collaborative learning seem to be the generic feature that adds the extra value in the learning experience that make an imperative difference in student retention and success in distance education. It gives the students the opportunity to raise questions, discuss ideas, and respond to each other with respect and courtesy. Furthermore, collaborative learning enhances the level of student involvement and interaction between students and the instructors, which in turn leads to higher achievement than individualistic learning. The empirical data also show that the use of collaborative learning creates a positive relationship among the students that increase social-emotional variables such as motivation and encouraging attitudes towards each other. These characteristics clearly speak in favour of utilizing collaborative learning in distance education.

Although collaborative learning in traditional education has a number of well-known advantages (e.g. Webb et. al, 1998), few studies have shown the value of student-student interaction in distance learning situations. Currently, this is an issue that is conspicuously missing in the existing research on distance education. This calls for a shift in the exploration of distance education towards a broader body where issues related to student-student interaction are incorporated. To conclude, this study indicates that one of the challenges faced by academics is the integration of collaborative learning in the deliverance of distance education through Internet technology.

References

1. ABRAHAMSSON, K. (1993) Från arbetarhögskola till forskningscirkel: en skrift till stöd för diskussionen om en facklig högskola, ISBN 91-574-4044-1
2. ANDERSON, M. D. (1998) *Critical elements of an Internet based asynchronous distance education courses*, Journal of Educational Technology Systems, Vol. 26 No. 4 pp.383-388
3. ARVIDSSON, L. (1991) Folkbildning och självuppfostran: en analys av Oscar Olssons idéutveckling och bildningssyn, Stockholm: Tidens förlag
4. COLLIS, B. (1995) *Anticipating the impact of multimedia in education: lessons from the literature,* Computers in Adult Education and Training, Vol. 2 No. 2 pp.136-149
5. DAFT, R. L., LENGEL, R. H. (1986) *A proposed integration among organizational information requirements, media richness, and structural design,* Management Science, No. 32, pp. 554-571
6. DILLON, C. L., GUNAWARDENA, C. N. (1995) *A framework for the evaluation of telecommunications-based distance education,* in Stewart, D. (Ed.) Selected Papers from the 17th Congress of the International Council for Distance Education, Vol. 2, Open University, Milton Keynes, pp. 348-351
7. DRIVER, M. (2002) *Exploring students perceptions of group interaction and class satisfaction in the web-enhanced classroom,* The Internet and Higher Education, Vol.5 pp. 35-45
8. GARRISON, D. R. (1997) *Computer conferencing: The post-industrial age of distance education,* Open Learning Vol. 12 No. 2 pp. 3-11
9. GARRISON, D. R., ANDERSON, T., ARCHER, W. (2000) *Critical inquiry in a text-based environment: Computer conferencing in higher education,* The Internet and Higher Education, Vol. 2 No. 2 pp.1-19

10. HILLMAN, C. A., WILLIS, D. J., GUNAWARDENA, C. N (1994) *Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners,* The American Journal of Distance Education, Vol. 8 No. 2 pp. 30-42

11. HOLMBERG, B. (1989) Theory and practice of distance education, London: Routledge

12. LEIDER, D. E., JARVENPAA S. L. (1993) *The information age confronts education: case studies on electronic classroom*, Information System Research, No. 4, pp. 24-53

13. SANDERS LOPEZ, E., NAGELHOUT, E. (1995) *Building a model for distance collaboration in the computer assisted business communication classroom,* Business Communication Quarterly, Vol. 58, No.2 pp.15-22

14. SOU 2001/02:15 Reforms in higher education – a more open system, Ministry of Education and Science in Sweden

15. WEBB, N., NEMER, K., CHIZHIC, A., SUGRUE, B. (1998) *Equity issues in collaborative group assessment: Group Composition and Performance,* American Educational Research Journal Vol. 38 No. 4

16. WEDEMEYER, C. A. (1971) *Independent study,* In R. Deighton (Ed.), Encyclopaedia of Education IV (pp- 548-557) New York: McMillan

THE BALANCED SCORECARD FOR METHODOLOGY: A TOOL FOR IMPROVEMENT IN HIGHER EDUCATION

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1. Introduction

Quality in university teaching and education has, over recent years, become one of the key aspects in assessing the activities carried out in these institutions.

Different definitions of quality in the e-learning field have appeared in the last years. There might be differences among them, depending on the perspective taken into consideration (students', teachers' or stakeholders' perspective), the quality assurance system adopted, and after all, the approach given to the concept (global, technological, economic or educational).

Rey, R. and Santa María, J. (2000:15) bring forward a specific approach based on Deming's perspective in terms of searching of excellence, *"something certainly achievable in the way of continuous improvement. From this perspective, quality is an integral or global concept which links all the production process: planning, used mechanisms, organization and resulting outcomes"*.

Most of the current quality measuring systems might focus in management and processes (EFQM), in a methodology based in the benchmarking approach (BENVIC), or in evaluation (Balanced Scorecard for Methodology, BSM). In our case, the design of the quality measuring system is based in the evaluation of different methodological aspects, which have been previously identified and defined.

Improvement of the methodological elements in the teaching and learning process can become one of the most effective strategies to achieve better results, in terms of academic performance, and, likewise, in terms of students' perception of their own satisfaction with respect to what they achieve and how they face the set of objectives.

The instrument we wish to present, the Balanced Scorecard for Methodology (BSM), provides specific up-to-date information on the academic results obtained by students, the level of progression seen in the employed study programmes and the level of satisfaction shown in terms of the activities and relations with the university, whilst allowing for the analysis of the possible causes behind those lower-rated indicators.

2. Objectives

Within the new framework of convergence in Higher Education in Europe, there has had a renewal of the commitment from university institutions to levels of excellence and quality in teaching and learning processes.

In this way, systems are being developed are more or less global in their attempts to measure and assess the quality of the activities carried out at universities, both by the various public bodies with responsibilities in the area (quality agencies) and the universities themselves.

Beyond the organisational aspects linked to management or, even, technology, there is an obvious need to measure the achievement of institutional objectives in terms of methodological factors as well.

The UOC, with certain very explicit specificities in both as a virtual university and as a model for distance teaching and learning through the intensive use of ICT, has begun to work on this. Finding out what the results are of academic activity in terms of learning and detecting the perception that the key subject in our educational activities, i.e. the student, has of this same activity, is, from now on, one of the university's priorities.

So as to be able to guarantee success in achieving this objective, it is necessary to involve a range of agents and have them work together on the design of the educational activities and their teaching. It is also necessary, thus, to involve the teaching staff in the continuous improvement processes, providing them with suitable tools for methodological analysis and the subsequent decision-making derived from this analysis.

In this way, the main objective for the UOC's Balanced Scorecard for Methodology (BSM) is to be a tool able to provide the necessary clear and up-to-date information on the main methodological elements which are the core part of the teaching and learning process at our University.

3. Description

One of the first steps to be taken towards this objective was to identify the key elements in the methodological model which need to be assessed in terms of quality, taking into account both the institutional perspective and that the professor's area of activity is, ultimately, the subject or educational activity for which they are responsible.

An analysis of the aforementioned methodological elements was carried out during the last semester of the 2002 academic year from the Educational Innovation and Methodology Department, so as to be able to compile the relevant diagnostic information and plan improvements in the methodology for the short, medium and long term. This analysis was developed using a benchmarking process in the following phases:

- Determining a sample of sufficient university and higher education institutions;
- Studying the documentation relating to the areas of activity at these institutions in terms of quality in its widest sense: measurement, assessment, improvement and certification;
- Detecting the methodological elements assessed in each case;
- Initial conceptualisation and preliminary identification of the indicators to measure methodological quality at the UOC.

The documentation worked on included reports from the National Education Association (NEA), the Consortium of Institutions and Organizations Committed to Online Education (Sloan Consortium) and a wide range of information of other Spanish, European and American universities.

The university aims to ensure a quality education for its students and, despite being difficult to define and come to agreement on what a quality education is, within the framework of the BSM and as a result of this prior reflection, we believe this to be as follows:

- offers good academic results;
- ensures a high level of progression in studies;
- And promotes a high level of satisfaction amongst the students.

Therefore, taking these premises into account, the areas for quality to be measured in by the BSM are as follows:

- Students' academic performance;
- Continuity of students at the university;
- Personal satisfaction.

4. Design

The tool we have designed allows us, on the one hand, to identify the level of perception of quality in the teaching and learning process for UOC students and, on the other, to allow – in those areas in which a level of quality lower than that expected is found – to know a preliminary level of analysis of the possible causes of this failing, so as to be able to design those specific actions that are best suited to ensuring improvement in this area.

We have identified two levels of information: one, which is global and refers to the institution and its study programs. And a second one, much more specific, that relates to the methodological aspects of each one of the subjects or courses. This structure allows using of the BSM tool by people of different roles and aims in the university.

Policy makers, who make strategic decisions on the evolution of the pedagogical model of the university, use the BSM from a global perspective. They require updated and comparable information – per semesters and among the different initiatives within the institution –, about academic results, the level of continuity of the students in the study programmes and the level of students' satisfaction in general terms.

Furthermore, one of the needs of the teaching staff and academics is to analyze the situation and evolution of the study programs they are responsible for, in relation to the rest of degrees offered by the university. In that respect, program directors might assess the situation of the different subjects with regard to the study program in global, together with the situation of the program in relation to the rest of the university programs.

Finally, those professors responsible for several subjects use a more specific level of information. They aim at assessing the quality of theses courses, mainly in relation to the study program. Taking this into consideration, faculty should be able to suggest improvement plans letting them to increase the course quality and its achievements.

In this context, the BSM will have to evolve so that the university itself may adapt and progress thanks to the introduction of the aforementioned actions for improvement. This dynamic nature of the BSM makes it a tool that is capable of periodically taking on new indicators or, even, new areas to measure with the ultimate aim of being able to adapt to a changing reality.

5. Instruments of data gathering

On one hand, an institutional questionnaire has been developed for each programme, which measures aspects such as the feeling of belonging to the UOC community or the compensation and benefits gained from studying at the UOC. Likewise, a questionnaire for each subject has been developed to measure all those aspects directly related to the support offered during studies and the content of each of the subjects on the student's course: the teaching, the learning resources, the virtual learning environment and the assessment system on one hand and the adequate and sufficient nature and application of the contents on the other.

Despite these questionnaires allowing for the obtaining of qualitative information, plans have been made to increase the types of instrument used to collect the data and specific information, as well as having other groups involved taking part. We are referring specifically to the carrying out of interviews, individually or in groups, using guidelines for the application of methods of observation (of communication areas in virtual classes) and to the need to look more closely at the use of other sources for finding out the opinions of students and professors.

6. Indicators

Faculty may access the BSM site. Located in a restricted area in the Virtual Campus for faculty and management staff of the university, it is user friendly, easy to navigate, and understandable according to the information that it contains.

The site is organized in three basic spaces, one for each set of indicators: academic achievements, progression and satisfaction. At the same time, user may choose among different levels of information (institutional or subject area). Indicators, measured using a range of different instruments, have been identified for each of these methodological areas.

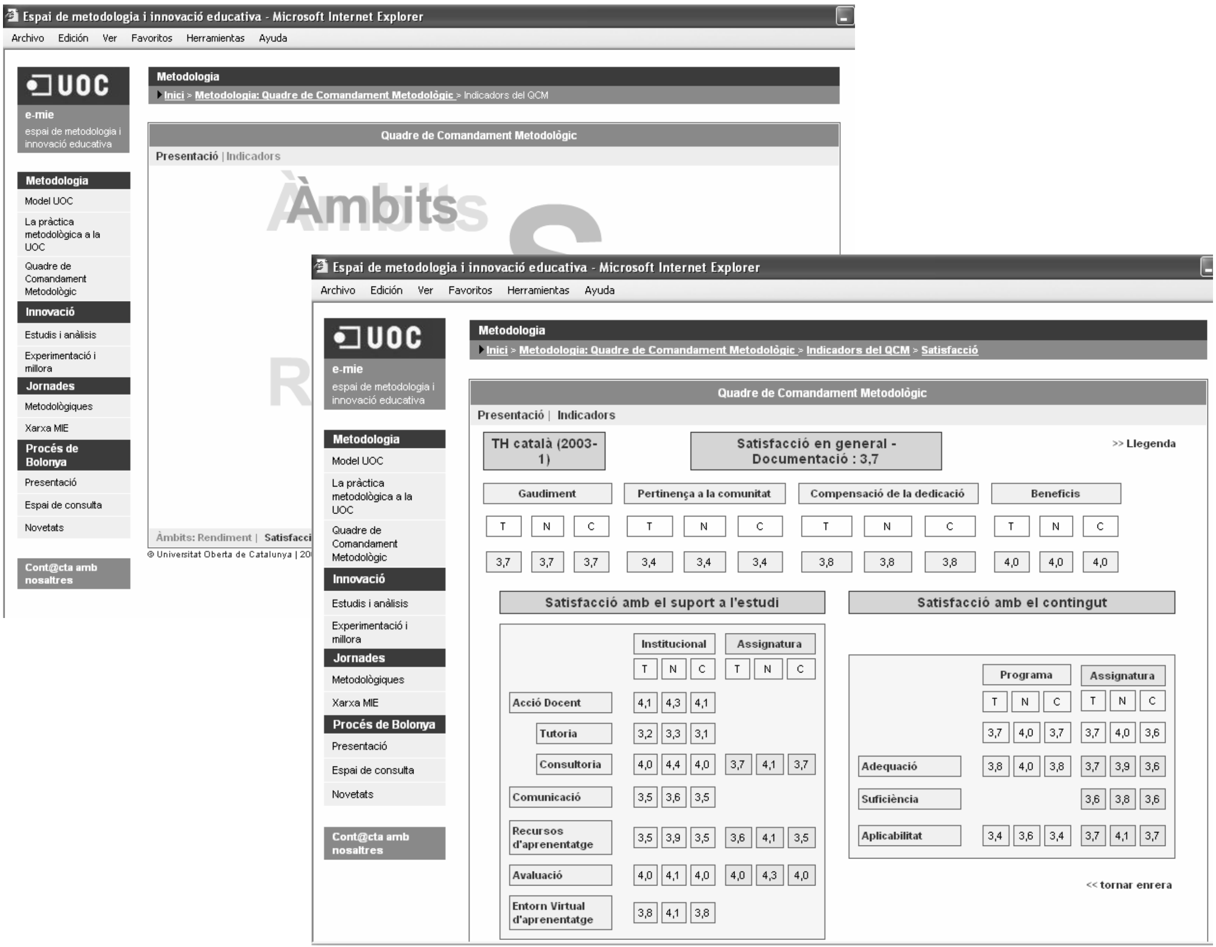
In terms of **students' performance**, indicators, such as the percentage of students passing with respect to the numbers matriculated and/or assessed, are measured with the aid of management tools including databases or inquiry and calculation applications for this data, developed expressly for this end. Students who failed or students passing having followed continuous assessment activities have also been considered academic achievements indicators.

In the same way, these databases and inquiries allow for access to information relating to the **levels of staying on and not dropping out** for the students in terms of the different studies, semesters and qualifications transversally for all the activities carried out at the UOC. Some of the indicators of progression defined are the average of semesters spent, percentage of cancelled enrolments or students having followed continuous assessment but not finished the course.

In the case of measuring personal **satisfaction**, a range of instruments have been developed to help find out the level of student satisfaction in terms of their studies and activities at the university.

As can be checked in the screenshot below, indicators have been defined and divided into three categories:

- General satisfaction: enjoyment, feeling of belonging to the university community, and relation benefits/personal investment of time and efforts.
- Satisfaction in relation to study support: teaching (help provided, motivation, accomplishment of the expected support, easiness to access, level of expertise in the subject matter field), communication (perception of the quality of the relations and interactions provided by the virtual community thought several means and resources), learning resources (update of content, internal organization of the learning materials, opinion on the level of planning and facilitation of learning presented), virtual learning environment (user friendly, facilitation of communication), and evaluation (adequacy and coherence of the evaluation system).
- Satisfaction in relation to content: appropriateness (expected relationship between objectives and type of content and activities suggested), adequacy (fitness between stated learning objectives and real workload generated), and applicability (perception in terms of usefulness in the professional environment).



Each space contents indicators, thematically organized. The above screenshot simulates the presentation of the students' satisfaction results for the Informational Management and Documentation Studies.

Conclusions

Evaluation, continuous improvement and quality can be seen to be different sides to the same three-sided figure, where this coin has a shape, weight and embossing that represents the educational methodology. The whys and wherefores for evaluation, improvement or measurement have to be based fundamentally on the following:

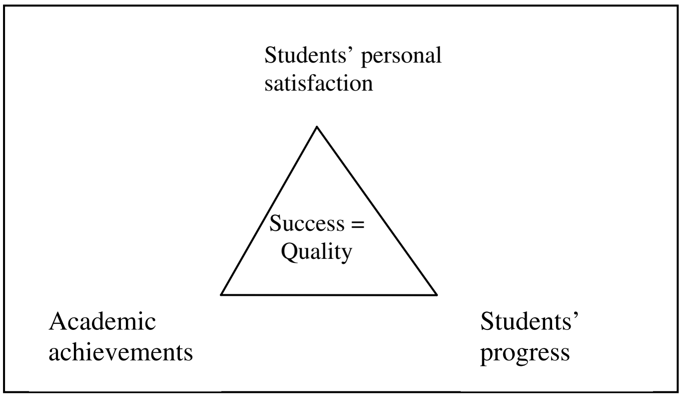
- A coherent concept of the educational model;
- The consistent adoption of this model by the parties involved, both at institutional and individual levels;
- A clear desire by those parties involved to advance towards excellence.

Based on these premises, diverse groups and individuals in our institution are working to obtain specific information that will allow us to assess the different methodological areas and compare them during different academic periods, with the aim of being able to make decisions designed to improve results, stressing the methodological elements that may aid this goal.

In short, the information tool that has been developed has allowed us to:

- Acquire a better knowledge of the methodological issues to improve and disseminate it internally, by the following of several levels of involvement;
- Make decisions on the corrective measures to apply to those areas detected as to be enhanced, by developing and putting into practice innovations of different kinds;

- Work towards a more specific concreteness of each indicator, so as to get to know the reasons and whys several things related to methodology take place.



Personal satisfaction results will be crossed and compared among the above mentioned students' academic performance indicators and those of progress at the university, so that the BSM will be a complete informational tool for faculty – and the institution – semester by semester.

References

1. BOURNE, JOHN, MOORE, JANET C. (2002) Elements of Quality in Online Education. Vol. 3. The Sloan Consortium. http://sloanconsortium.org
2. DEMING, E. W. (1989) Calidad, productividad y competitividad (La salida de la crisis). Díaz de Santos, Madrid
3. EHLERS ULF-DANIEL (2004) *Quality in E-Learning from a Learner's Perspective*, Proceedings on the 3rd EDEN Research Workshop. Oldenburg, Germany. Page. 130
4. NATIONAL EDUCATION ASSOCIATION (2000) *Quality on the line: Benchmarks for success in internet-based distances education.* Washington: Institute for Higher Education policy. http://www.ihep.com/quality.pdf
5. REY, ROBERTO, SANTA MARÍA, JUANA M. (2000) Transformar la educación en un contrato de calidad. CISSPRAXIS, S. A.

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IN CYBERSPACE NO ONE CAN HEAR YOU SCREAM: SUPPORTING ONLINE LEARNERS

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Introduction

In this paper we outline the theory of Transactional Distance (Moore & Kearsley, 1996) and a more recent development of this theory, Transactional Presence (Shin, 2003) which are proposed as key indicators of success or failure in distance education. We also examine the contribution of Simonson's Equivalency Theory in Distance Education (Simonson, 1995). These theories are applied as explanatory frameworks in an evaluation of an online foundation degree module delivered to students learning in remote rural areas of the South West of England. Technical, Academic and Social support methods are defined and discussed. We argue that Transactional Distance can be reduced through the careful application of sensitive tutor support skills and that Transactional Presence can be achieved when these skills are applied using the appropriate technologies. The paper concludes with recommendations for future delivery of similar courses to remote, rural based students.

Transactional Distance and Transactional Presence

Transactional distance was a theory first proposed by Michael Moore (1973) as a means of describing the potential gap of misunderstanding that can occur when teacher and student are separated by geographical or temporal distance. Transactional distance is a pedagogical and psychological distance perceived by students who learn separately from teachers and peer groups and can be expressed in terms of human contact, interaction and relationship. Moore's premise was to consider that a 'distance' exists in all social transactions, and that in distance education, this distance can produce a range of problems for the student including social isolation, frustration, anxiety and possible drop out from the course. Moore proposed that transactional distance might be measured by the relationship between dialogue and course structure. He predicted that in any given learning situation, as dialogue rose, structure would fall, and vice versa. Increased dialogue would reduce the level of distance experienced, but an optimum mix of dialogue and structure were recommended. Moore also suggested that the level of autonomy a student could bring to bear on the learning process would also contribute to the amount of 'distance' experienced. A more comprehensive documentation of the theory and related research can be found in Wheeler (2003).

Shin's development of Moore's theory proposed a new set of variables to predict the success or failure of students in distance education. She proposed that remote students needed to experience the 'social presence' of their tutors in order to reduce misunderstandings and increase the quality of learning outcomes (Shin, 2003). Transactional Presence is the extent to which students feel closeness and immediacy to others when communicating at a distance through instructional media. These theories were brought to bear on the development of online learning at the University of Plymouth.

Distance Learning at the University of Plymouth

At the University of Plymouth in South West England, students are distributed across a vast rural area, and meet irregularly in small clusters in their local classrooms. It is not possible for tutors to meet regularly due to work commitments, distances of travel and economic factors. In the past, the university has been a pioneer in combining convergent technologies (telematics) such as satellite television, videoconferencing and online technologies to provide equivalent learning experiences for remote learners (Simonson, 1995). Students are connected using a variety of instructional media including videoconferencing and web based discussion lists. Experience in delivering on online module to more than 150 students over the past year has informed this study.

Developing Online Learning

One cohort of students currently studying at Foundation Degree level, and training to be classroom assistants, numbers approximately 900 learners. These are predominantly mature, female students who are engaged in part-time study. They are all employed at primary or secondary schools within the region and most have difficulties finding the time to study. This is usually done at the evenings and at weekends, requiring a great deal of commitment. However, local education authorities do provide some funding for day time study, and on these rare occasions, students gather in small clusters of 12-20 at local study centres. It had been recognised for some time that mature students returning to study after protracted absence tend to experience difficulties in readjusting. This is not merely a problem with academic study. The acquisition of new practical learning skills, particularly those related to the use of online materials, word processing, internet search, e-mail communication and presentational software, are also important for contemporary learners to acquire.

In recognition of this need, a new study skills module was created in online problem based learning format, and launched in the autumn term of 2002. The pilot study involved two tutors and 15 students located in three geographical areas. Students worked through the 9 units of the module, submitting their assignments as e-mail attachments to the tutors in a flexible schedule of completion. Tutors endeavoured to return marks and comments within a 48 hour period to encourage and support the learners. At the end of the online module, students were required to complete a web based evaluation form and e-mail it to the tutors. This provided a useful mix of qualitative and quantitative data from which the team were able to ascertain strengths and weaknesses of the online course provision (Townsend & Wheeler, 2004 in press).

Evaluation of the Online Module

The online tutorial team was interested in measuring the quality of provision in a number of areas, three of which will feature in this paper. The first, and perhaps most important, was the provision of tutor support, at academic, practical and social level (Carnwell, 2000) with the proviso of a timely response. The second was the quality of the online materials, including the relevancy of the activities, navigation of materials and level of content. The third area of interest was the accessibility of the online materials, given that the team wished for the module to be flexibly accessed, at any time or place.

Tutorial Support

Tutorial support is a vital component of online study. Students who cannot access support when it is required often flounder and give up. The tutorial team was aware that students who send e-mailed queries or requests for help are pinning their hopes on a timely and practical response in many cases. Lack of a timely response could result in students 'grinding to a halt' and being unable to progress further until their issue is addressed. One student commented:

> *"…the feedback being received quickly was a definite advantage and gave me the encouragement to start the next unit."*

Social and emotional support is often as vitally important as academic and practice support, and often students simply need a 'listening ear' to alleviate the social isolation of learning at a distance. This approach facilitates a form of social presence, where students feel that they are 'not alone' – the idea that '*in cyberspace, no one can hear you scream'* might thus be overturned. When offered sensitively, tutorial support can reduce elements of transactional distance by providing a richness of dialogue that would otherwise be missing from the distance learning experience (Wheeler, 2002). Peer support was also a consideration and as one student commented:

> *"It was suggested at the outset that we should 'buddy up' with another student. This proved invaluable. The fact that someone was out there to support (me) was important. At times, online learning can be very solitary. It made a difference that they were at the end of a telephone line".*

Online Materials

Online learning materials can be used to support the learning process, to deliver content and provide structure to the online module. As the materials were generally studied by students in isolation, the team made efforts to ensure that they were as unambiguous, self-explanatory and easy to navigate through as possible. The use of FAQs – Frequently Asked Questions – was also used to good effect, circumventing the need for tutors to continually respond to the same questions, and from the student perspective, answers were more speedily accessed. Simonson's equivalency theory of distance education states that if distance learning experiences are equivalent to conventional learning, then learning outcomes will also be equivalent (Simonson, 1995). In effect, the FAQs replaced the guidance offered by tutors in face to face teaching, providing equivalence for the remote students.

The use of problem based learning offered students a cognitively engaging set of activities. They were able to apply factual and conceptual knowledge to simulated (or real) contexts and were able to take risks within a psychologically safe environment where no serious consequences resulted if errors were made.

A preference effect for delivery medium was also noticed. Many of the students in the group have commented that using printed versions of the online materials was preferable:

> *"Our lecture notes and units arrived weekly without fail. So that I could read these at my own leisure, I found it useful to print off in hard copy."*

Students reported that the materials were often easier to read and definitely easier to annotate, highlight and file if they were paper based. However, some students complained that the university was transferring the cost of printouts onto them. This trade-off between providing flexible, 'any time any place' learning materials via the Internet against more acceptable paper based versions of the materials is an important one to consider. Students may be more comfortable with paper based materials, but online provision is vital as a means of rapidly updating materials, improving communication and creating more flexible access to learning opportunities for the mature, working student. Online delivery provides an optimum mix of structure and dialogue, espoused by Moore & Kearsley (1996) as a means of reducing transactional distance. Paper based delivery in correspondence mode would be more cumbersome and provide less opportunity for dialogue.

Accessibility

Accessibility should be of concern to all online educators. Limitations in bandwidth are a common problem in rural areas, and network providers are reluctant to offer provision outside of high population areas unless high demand is evident. Therefore, remote students are often unable to easily access online materials, or if they are, these materials are slow to download, and are the source of much frustration. The tutorial team designed the web site and online materials so that a limited amount of imagery and icons were presented. Students reported that in most cases download time was acceptable, but some still experienced difficulties in gaining access due to other reasons. Some students tried to access materials during quiet periods in their schools, only to discover that filters and other protection software installed by the schools prevented them from accessing the website. Others discovered that when studying at home, they had to wait until their families (children doing homework, or husbands doing work) had finished using the computer before they could use it. This led to more frustration and late hours of working for some students. Frustration can often lead to students dropping out from online courses, so accessibility is a key issue to resolve.

Recommendations

In conclusion, we would like to offer some recommendations for future delivery of online learning to remote students based in rural areas. We consider that the need to reduce perceived distance and facilitative transactional presence are paramount in the success of any online course. We therefore suggest the following points for consideration:

- Accessibility – bandwidth in rural areas is often problematic. The design and delivery of graphic rich environments should therefore be avoided or reduced to ease student frustration and anxiety.
- Navigation – Students generally study alone so the clearer the hyperlinks and signposts within the web materials, the better. Clear signposting and easy to understand instructions can alleviate student anxiety.
- Tutor Support – Tutors should agree with students a maximum time within which they will respond to queries, request for help and other support. Tutors should also endeavour to complete and return marking within a short period of time to reduce student anxiety and provide timely feedback on work. Timely dialogue can improve student perceptions of transactional presence.
- Peer Support – This should be encouraged through the use of e-mail groups, bulletin boards and asynchronous discussion groups. Students may feel threatened with synchronous chat, and mature students may find greater difficulty orientating themselves into the use of this medium. Appropriate media should be employed to improve dialogue and thereby reduce transactional distance.
- Activities – Students enjoy working through problems as they gain conceptual knowledge. The use of problem based learning scenarios provides a powerful medium through which operational knowledge can be acquired. Cognitive engagement adds to the sense of purpose and focuses students on the business of learning.

References

1. CARNWELL, R. (2000) *Approaches to Study and the Impact on the Need for Support and Guidance in Distance Learning*. Open Learning. 15 (2), 123-140
2. MOORE, M. G. (1973) *Towards a Theory of Independent Learning and Teaching.* Journal of Higher Education. 44 (12), 661-679
3. MOORE, M. G. & KEARSLEY G. (1996) *Distance Education: A Systems View*. Wadsworth: Belmont
4. SHIN, N. (2003) *Transactional Presence as a Critical Predictor of Success in Distance Learning.* Distance Education. 24 (1) 69-86
5. SIMONSON, M. (1995) *Does anyone really want to learn at a distance?* Tech Trends. 40 (5), 12
6. TOWNSAND M. & WHEELER, S. (2004 in press) *Is There Anybody Out There? Teaching Assistants' Experiences of Online Learning.* Quarterly Review of Distance Education
7. WHEELER, S. (2002) *Student Perceptions of Learning Support in Distance Education.* Quarterly Review of Distance Education. 3 (4), 419-429
8. WHEELER, S. (2003) *Web Based Learning and Transactional Distance Theory.* In N. Nistor, S. English, S. Wheeler & M. Jalobeanu (Eds.) Toward the Virtual University: International Online Perspectives. Greenwich, CT: Information Age

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WEB ASSIGNMENTS CHECKER IN SCIENCE TEACHING

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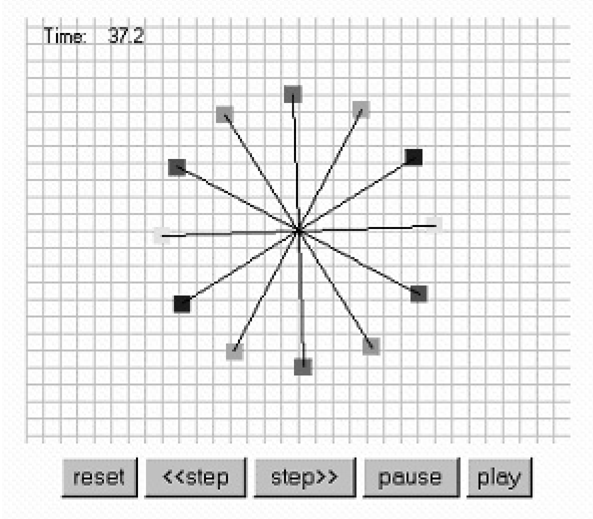
Abstract

What is the effect on studies when integrating a Web Assignments Checker (WAC) in science teaching? This paper examines the change in students' attitudes to this question from the beginning of the course to its end, as compared with the attitudes of the teaching staff. The examiner's questionnaires, with six aspects relating to students' attitudes, were administered in five courses at the start of the semester and at its end. An analysis of the findings identified several members of the teaching staff who had succeeded in reducing the disparity between their attitudes and those of their students by the end of the course. An analysis of the means of operating WAC by these members of the teaching staff points to successful pedagogy that may be implemented in other courses.

Introduction

In recent years, the world has experienced a development in exercise methods and evaluations that rely on Internet databases. Including: questions, tasks, discussion groups, study classes and revision reports of the students' achievements (Pundak & Rozner 2001). The Ort Braude Engineering College decided to examine the integration of WAC into academic studies. An automatic system was selected for checking assignments within an integrated environment called WebAssign. This system allows members of the teaching staff to easily construct tasks during the course. Each assignment is composed of a series of questions dealing with subjects studied during the previous lesson, or questions in preparation for the next lesson (Novak et al. 2000). The system allows a student to contend with assignments given every week of the semester via the Internet. After submitting assignments through the system, the student receives immediate feedback to his responses, and in many instances is given additional opportunities to correct erroneous answers. In this way, students are able to identify their own strengths and weaknesses in their studies from the very first meeting of the course (Mazur 1997).

An example of a question on the subject of circular motion appears in Figure 1. The system allows the teacher to follow the students' responses and their marks in each of the assignment questions. In addition through statistical tools, the teacher can check the level of success of each one of them, and obtain a general view of class performance. This information allows a teacher to prepare the next lesson taking into account the students' difficulties in executing homework, and thus adjust the tuition to the feedback received from the students. This system coordinates the pedagogic approach of "Just in Time Teaching" that emphasizes the importance of consecutively relating to the students' difficulties during the lesson, and in this way the lesson can be adapted to the group being taught.



Start the animation

You are riding the Ferris wheel shown in the animation. (Your position is in meters and time in seconds). Remember, you can find the x and y position of any point in the animation by clicking in that location.

How long does it take you to make one revolution? [10] s

What is your speed? [10.1] m/s

What is your acceleration? [6.32] m/s

Figure 1: Example of a question from an assignment dealing with circular motion. The question demonstrates movement with an animation the student can control. Through the animation, one can measure the time and position of bodies and make calculations. Each student receives different data that is randomly selected.

Redish (1998) identified a disparity between the attitudes of students studying science and the attitudes of the teaching staff. The students' objective is to pass the final exams successfully, while the teaching staff are trying to qualify them as scientists and engineers. Our assumption was that the integration of systematical exercises using WAC would assist in closing the gap between the attitudes of the students and the attitudes of the teaching staff.

In connection with this assumption, we decided to focus on the following two questions regarding WAC integrated courses:

1. How does the gap, which exists between student attitudes and those of the teaching staff change from the beginning of the course to its end?
2. What are the most successful teaching methods in closing the disparity between the attitudes of the students compared with the attitudes of the teaching staff, in the most efficient way possible?

Research tools

We commenced developing the questionnaire during the Spring semester of 2001 at the ORT Braude College. The first version included 35 phrases associated with six aspects of operating WAC (Table 1) collected from interviews with students and teaching staff members, and after consulting experts in teaching the sciences and a survey of the literature (Redish, Steinberg & Saul 1998, Van Heuvelen, H. 2001).

A 5-point scale using the Likart method was attached to the phrases, starting from 'complete agreement' (5) and ending with 'complete disagreement' (1). The validity of these phrases was tested through conversations with science teaching experts and their feedback. Thereafter, the questionnaire was given to 14 staff members. Any phrase for which the staff members' agreement was less than 80% was rejected. At the end of the first stage, we were left with a 26 phrases questionnaire that allowed the identification of the agreement of members of the teaching staff regarding the teaching process incorporating WAC. The attitudes of most of the staff were defined as "preferred attitudes". We divided the students' responses to the 26 phrases into three categories: (a) Those who agree with the attitudes of the staff – "the preferred attitudes". (b) Those who disagree with the attitudes of the staff – "the non-preferred attitudes". (c) No attitude, or those with neutral attitudes. Table 1 shows "the preferred attitudes" and the "non-preferred attitudes" according to 6 aspects that will be explained below.

Table 1: Students' attitudes – "preferred" and "non-preferred" – concerning integrating WAC into the study process.

Aspect	Preferred attitudes	Non-preferred attitudes
Involvement and interest	WAC contributes to team work with the teacher and the students during the course and promotes a personal interest in the study material.	To succeed in the course, the student does not need to show involvement or interest, therefore integrating WAC is superfluous.
Understanding the material studied	Understanding the material studied is conducted actively through repeatedly checking the study material through WAC.	Understanding the material studied is conducted and checked through mid- and end-term tests and not during the studies themselves.
Quality of tuition	The lecturer must activate the students during the course and WAC helps lecturers respond to students' difficulties.	The lecturer must focus on a clear presentation of the study material and not in activating the students and considering their difficulties.
Course importance	Success in studying the course has importance for my success as an engineer.	Success in the course has little or no effect on my success as an engineer.
Traditional exercises versus network exercises	The network exercises enrich the knowledge I am developing during the course in addition to the traditional exercises.	The network exercises neither add anything nor do not contribute as compared with traditional exercises.
Study load	Working with WAC adds to the load placed on me during the course, but improves my ability to succeed in the course.	Working with WAC adds to the load placed on me and thus makes it more difficult for me to succeed in my studies in general and in this course in particular.

In constructing the research tool, we decided to focus on 6 aspects with which we could categorize the attitudes of the students towards incorporating WAC in the courses. Each aspect had 4-5 phrases in the questionnaire.

Research population

187 students who are studying in five courses participated in the research. The students are differentiated from each other by: their academic year (first, second or third) and their background in computers: limited (limited command of MS-Office applications); medium (a medium command of MS-Office applications only); broad (extensive control of MS-Office applications and familiarity with the structure of the computer and communications networks).

Table 2: Data on the 5 groups of students examined.

Group	No. of students	Course	Department	Academic year	Background in computers
1	33	Biochemistry	Biotechnology	A	Limited
2	14	Materials strength	Machinery	A	Limited
3	24	Kinematics	Machinery	B	Medium
4	32	Communications networks	Software	C	Extensive
5	84	Cryptology	Software	C	Extensive

The questionnaire was administered to the students twice in the semester during the courses: during the fourth week of the semester after the students had become familiar with working with WAC, and towards the end of the semester. Each questionnaire took 20 minutes to administer.

Results

For purposes of analyzing the questionnaire, it was decided to attach the responses of those students who had agreed or had completely agreed with the teaching staff (ranking 4 or 5), as well as responses expressing objection or complete objection (ranking 1 or 2). Neutral attitudes (ranking 3) or questions that were not answered were removed from the analysis of the results.

From the results, one may be concluded that:

1. The average disparity between the attitudes of the teaching staff and the students reduced significantly. At the beginning of the semester, the students' average attitude was 3.11, while at the end of the semester it had risen to 3.35.
2. One may observe that there are two distinct research populations. One population is represented by the courses in Biochemistry and in Computer Networks where the disparity between their attitudes and those of the staff did not reduce significantly according to the t-test. The second population is represented by the courses in Kinematics, Cryptology and Materials Strength, where the difference between them and the attitudes of the staff has been significantly narrowed ($p<0.05$).
3. A significant difference was noted between the attitudes of the students during their first or second years, but not during their third year, which is contrary to the research assumptions.
4. The greatest changes in the students' attitudes were measured in the aspects of understanding, involvement and interest.

Discussion and conclusions

The research results identified three courses in which the disparity between the attitudes of the students and those of the staff reduced significantly between the beginning and the end of the course. One may explain this by the fact that the lecturers in these courses effectively adopted a pedagogy that integrated the element of exercises using WAC. For the purpose of identifying the principles of this pedagogy, we held interviews with the lecturers in the five courses. From an analysis of the interviews, we identified four subjects that characterized the lecturers who had reduced the gap significantly.

- **Structure of the assignments** – Three of the lecturers made a point of giving assignments at least once a week on small scopes of material. This was contrary to the tendency with those lecturers who used the traditional exercise methods, in which few assignments were given, but in each assignment many questions appeared.
- **Friendliness towards the student** – The three lecturers directed the students to those chapters in the course book to which the assignment relates. Some of them even "inserted hints" in questions where the students had erred after the first attempt. In this way, the students were able to identify their incorrect approach.

- **Considering the feedback from the WAC during the lesson** – Prior to the lesson, the lecturers went over the students' responses and marked for themselves the outstanding errors, or alternatively the successful answers. The start of the lesson was dedicated to a discussion of the difficulties that had been revealed in the homework, or to encourage the students who had succeeded in giving interesting replies (Salomon & Perkins 1998).
- **Using WAC for evaluation purposes** – When granting the final mark for the course, the lecturers took into account the effort invested by students in performing the assignments. The average weighting the feedback assignments received in these courses was about 10% of the final mark. This encouraged the students to submit the assignments both actively and systematically, and helped their understanding of the study material and their ability to apply it.

Following the research results, we are recommending the integration of exercises using WAC in academic courses. This integration should lay active study (Hake 1998), the students' involvement (Redish 1998).

Bibliography

1. HAKE, R. (1998) *Interactive engagement vs. traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses.* American Journal of Physics, 66(1), 64-74
2. MAZUR, E. (1997) Peer instruction. Upper Saddle River, NJ: Prentice-Hall
3. NOVAK, G. M., PATTERSON, E .T., GAVRIN, A. D. (2000) Just in time teaching: blending active learning with web technology. Upper Saddle River, NJ: Prentice-Hall
4. PUNDAK, D., ROZNER, S. (2001) *Teaching in Real Time - Just in Time Teaching.* Studies in Technology and Science, 34, 17-20
5. REDISH, E. F., STEINBERG R. N. AND SAUL. J. M. (1998) *Student expectations in introductory physics.* American Journal of Physics. 66, 212-224
6. SALOMON, G. & PERKINS, D. N. (1998) *Individual and social aspects in learning.* Review of Research in Education, 23, 1-24, (Special issues editors: P.D. Pearson & A. Iran-Nejad)
7. VAN HEUVELEN, H. (2001) *The workplace, student minds, and physics learning systems.* American Journal of Physics, 69(11), 1139-1146

LANGUAGE IN E-LEARNING: LANGUAGE MANAGEMENT

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Introduction

The issue of language is still heavily underestimated in most kinds of international cooperation programmes and even more specifically in the area of e-learning. In the light of the upcoming enlargement of the European Union, the language issue will become even more important and new solutions might have to be envisaged. In order to deal with the proliferation of languages in European collaboration now and in the future, an efficient *language management* will be indispensable. Furthermore, language management should be integrated in the general management as such from the very beginning of any international cooperation, instead of discovering its central role afterwards only. Let us call it a proactive approach to the language issue.

In important sections of our research on the question of languages in international programmes at universities, as developed within the cEVU project, we have discovered that hardly any university provides any explicit statements or theoretical programmes dealing with the issue of language in the contemporary organisation of academic life- and this despite the ever-increasing flow of foreign students. An analysis of the websites of 50 European universities revealed that most universities still have a monolingual approach, if other languages are used this is often done in a very fragmentary and inconsistent way. Similar conclusions could be drawn from a questionnaire that was developed to evaluate the language use in the day-to-day life of international students at the university (24 hours of a student).

On the basis of our experiences within a number of years of research, it seems appropriate to distinguish in all internationals programmes between the traditional approach to cooperation and the approach linked with e learning or ICT based resources. The reason for making this distinction is not that the situation is so essentially different between traditional learning and e learning; the reason is that we believe that this distinction should be made for reasons of pragmatics and efficiency.

Learning and language

The idea of learning is of course not necessarily specific to a given language, nor to a given society. In new international environments, particularly those using ICT resources, the possibility of communication with partners who are at an enormous distance in space and in time has increased remarkably. Consequently, the chances that they also belong to very different traditions, cultural but also linguistic ones are also increasing. This is one of the first reasons why language matters cannot be put between brackets, as just additional and peripheral "difficulties" that will be solved sooner or – rather – later. It may be expected that international cooperation will be reduced on the basis of implicit linguistic criteria: those who accept to speak my language will then also be my best partners… Back to the past?

There may in fact even be excellent reasons for selecting one's partners outside of one's own linguistic traditions because then the chances to learn something that one is not familiar with are higher. So, forcing the barriers between languages and cultural traditions is part of learning, certainly an essential part of e learning, and even more so in terms of universities (*universe-cities*): differences are an asset, not a handicap. The higher the level of learning, the greater the probability that specialists in one's field do not live next doors.

Language, just a problem?

Why exactly does the variety of languages in international cooperation pose a problem and how could we suggest new solutions to this problem? We shall explain why we deal with language and what exactly we try to achieve. First of all, the claim that language is "a problem" is contested when people say: "What's the problem? What's your point?" But why not reverse the question: why would language *not* be part of the problem and why would this problem not be taken into account from the beginning? Is language part or not of our (new) enterprises, and is it part from the beginning of e-learning projects?

As specialists in language and communication know very well, language is a problem even within so-called monolingual situations, let alone in situations, such as the e-learning environment, where the differentiation in language and cultural background is very high. In a recent symposium organised in Brussels by the "Fondation universitaire" there was a debate organised, allegedly, by the entire academic community of Belgium. Under the impulse of some francophone universities, the academic society organised a symposium on the question of language at universities, reducing the question from the beginning to the question of English. Reducing the language problem in our contemporary universities to the discussion "in favour of" or "against" the use of English is an extremely narrow definition of the language problem. The question of language is not: "shall we use English", the question is not even "what language shall we select", because this implies already that we are convinced to know what kind of possible options are available and that these options are limited. Before excluding any options, we need to better study the problem.

A new problem?

Why is the language problem in international communication so new and how comes it has not been solved so far by research, by trainers, by the entire world of education?

First of all, it seems that in culture, the question of language is continuously redefined. Secondly, the approach and the concepts of researchers, trainers, the people who want to solve the language problem, are based on rather traditional concepts of societies and even on rather traditional approaches to the question of language and culture.

One would expect that for instance contemporary linguistics had found solutions for these problems. Without excluding the fact that we can learn a lot from linguistics, we should explain why exactly linguists and linguistics and even universities in general tend to ignore this particular language issue. Notwithstanding their name (universe-cities), most universities worldwide are firmly in the hands of nations and national budgets. By definition, their enrollment is more or less reduced to a given area and very often – for many reasons – to a given linguistic community. In most universities linguists are still very much focussing on (national) standard languages or on language as a system: language as "verbal communication" or as a possible combination of (and conflict between) languages is not part of their agenda (Lambert 1997). One of the areas that is more or less abandoned by linguistics in general is the internationalisation and the international circulation of communication from one language to the other. Translation studies, a new discipline, are a relatively neglected area within linguistics (see journals such as *Target*, published by John Benjamins). In the organisation of our universities, the question of translation is not really taken into consideration because of the fact that the general map of languages and societies and cultural competencies is still, to a large extent, nation based. Given the new resources and the development of technology, the principle of territory and hence also the principle of specific monolingual societies is more and more outdated, especially in learning.

International societies have tried to solve such problems in various ways. The two extreme options have always been – on the one hand – the use of a "lingua franca", which was the case since the earliest ancient empires. On the other hand, there is the so-called ethno-linguistic democratic model, that the European Union has chosen (Fishman 1993). This model entails that the equal rights and use of languages imply the use of translation.

The very concept of language

The aforementioned traditional models can be heavily criticised because of the rather narrow and old-fashioned concept of language that is being used, i.e. the normative idea of language as a national correct standard, which is in fact basically linked with the tradition of writing and even printing and which is more and more in conflict with the idea of media communication.

It is this traditional concept of language that is adopted by institutions such as the European Union or the United Nations and by every government. Even universities and scholars forget that this is just an idealisation, a normative model. It is sufficient to study the dynamics of language and communication on a continent such as Africa in order to see that language means something very different in societies where the nation-state layer is less firmly established than in Europe.

The concept of "language" has many different meanings, which is the reason why in contemporary linguistics the idea of discourse has been so successful because it singles out one meaning.

Given the mobility of people and the opportunities facilitating long distance communication that are the consequences of recent technological developments, it is safe to say that in certain areas of contemporary life, the very use of a single language, the so-called monolingual model is more and more exceptional. One could even say that those universities who suppose that learning (even before the era of e-learning) could be monolingual are old-fashioned and outdated. Any high level of learning and probably any high level of communication is multilingual.

Language policy

So far, neither universities nor linguists, nor experts in communication have worked out a sound basis for the interaction between different linguistic partners. Universities tend to adopt the same model as governments and diplomats, which is based on the official rules of a given society. It is called *language policy*.

In fact language policy has a strong political value at least in the Western traditions. According to prestigious scholars such as Anderson, Hobsbawm and so many others, the fact that governments have tended to establish a link between community, language and state is one of the specific features of Western civilisation. This also implies that things might be different in the future.

According to Hobsbawm, this approach to language is the result of a typical West European tradition, which is a rather young tradition in the history of mankind. Of course this model for language policy has spread – as a colonial model – to other continents as one of the most powerful components of the nation state vision and it is still widely in use.

It is clear that this nation state idea will fail sooner or later, and does not allow for an efficient communication and exchange of experiences and ideas. This monolingual model is a much too narrow view that does not account for the actual use of languages and discourses. In fact this is true for (almost) any society. In any situation in which one has to do with partners who do not have to play by the rules of policy or diplomacy but where commercial or didactic interest are at stake, we may need other rules for efficient communication. The necessity of new basic rules in international meetings has become obvious since the expansion of international trade. Of course multinationals tend on the one hand to stick to cultural and also linguistic traditions that are linked with their own country of origin. Most multinationals, whatever they may say, still have firm roots in a particular culture. But on the other hand, they also play with the idea of a new kind of flexibility and tell their people to be "good citizens", stimulating them to adapt to the local policy on culture. This new type of corporative language policy will inevitably conflict with the traditional language policy.

The idea of language policy indicates that politicians lay down the rules for the use of language. In a recent book, the Belgian linguist Jean-Marie Klinkenberg questions the assumption that language is the matter of politicians and that governments have the right to control the citizen's language and to regulate it (Klinkenberg 2001). Apparently, it is only on the basis of loyalty that citizens can be convinced of the need to speak as their government and their schoolmaster tell them to. Another kind of view on language has been developed recently that has been extremely influential and successful: the idea of language planning (see the journal Language Planning, published by John Benjamins).

Language management

In recent years quite some research has been done in social psychology and in organisation theory on the problem of language. Nations are just one of the possible kinds of societies. Many societies, such as religions, have developed throughout the ages and have been organized on a worldwide scale, without being reduced to one given nation. One could even argue that the catholic church was the first multinational.

New forms of community, as organisation theory assumes, may also have their own view of language and the use of languages (see discussions in *Target* sine 1999 between Even-Zohar, Pym and Lambert). Given the existence of very new kinds of communities, one of the most basic rules in terms of efficiency should be: how does a given community, in particular a new community, organize its communication?

After all, language policy, as developed by nations is simply one outcome of a pragmatic decision. All nations have had their origin. In the beginning they did not have a language, nations have *constructed* their national language. In other words, national languages, as demonstrated by Ann-Marie Thiesse, have all been created. The development of national languages is a clear demonstration of the deeper principle of the management of communication and language in view of certain goals to be achieved. Language management is a basic principle.

What is new in the current situation, as has been demonstrated in relation with business societies, is the insight that one should not wait and see what kind of linguistic and cultural models will be cooperating; instead of waiting until conflicts will become clear little by little, it may be wiser to try and anticipate the situation and to see what kind of linguistic principles may constitute good options in the given circumstances.

By integrating the idea of language into the overall management of any kind of enterprise from the beginning, a lot of time and money could be saved. Also in terms of values the argument is simple: language is not necessarily an incident or an accidental component in international communication.

Among business people, academics and politicians, many refuse to acknowledge the fact that there is a language problem, because they are afraid this view would be looked upon as old-fashioned. Of course, this could already mean that the language problem constitutes a taboo and is probably an origin of potential conflicts. One of the first principles of language management is to envisage language as a problem, as a possible conflict from the beginning and not when it’s too late.

On the field

So far, we have only given a theoretical explanation for the need of a new basis in our approach to language, but what are the concrete approaches, what kind of methodology could be used? There is another, equally essential question: to what extent do we have specific options for language management in the area of e-learning?

First of all, given the idea that organisation and management are linked with the exact goals of a given society, there is no general rule. It is all a matter of priorities. Precisely one of the basic assumptions here is that – in contradiction with the idea of language policy – it is the community that tries to agree beforehand on the most efficient possible use of linguistic resources, which is exactly the idea of management.

People may have excellent reasons for being flexible in the use of languages and there are many different options in the development of flexibilities. The use of national languages is one of the possible options, but it is no longer a necessity. The use of visual and other kinds of communication could also be taken into account. Translation is another option, but this should also be managed, in the sense that it might not be necessary to translate everything. One of the illustrations of the difference between language management and for instance the language policy of the European Union is that quite a high number of pages, if not thousands and thousands of pages of text translated by the EU are not really needed by the user. Now, in pragmatic terms the question would be: Is it necessary to translate? Where? When? How?

Another idea within language management is that it is not just the political or cultural prestige of a given language that should be decisive; other partners do not necessarily have to adopt the rules of the dominant group. This would obviously be a bad pragmatic starting point because the majority of the partners might simply be unwilling to take part in any cooperation of that kind. Before starting up international cooperation linguistic screening is part of management: are people willing to use another language and how efficient would their use of that particular language be? The distinction should be made between the active and the passive use of language, between written and oral language skills. Many additional principles of this kind can be envisaged from the beginning and can be tested beforehand.

For certain – maybe not all – components of an envisaged cooperation project, the use of a lingua franca might be practical. It might be wise to offer the possibility for some among the partners to opt for a given language just for once and not all the time. All such rules are part of a more pragmatic approach to the question of language.

It should be examined what kind of (new) options can be linked with the various technological possibilities, but also with the various traditions, habits and capacities of our partners in a given ICT based environments. The use of ICT environments could generate new solutions that have not been envisaged so far.

An example: courses on "Literature and cinema"

In the "Literature and Cinema" course, a pilot course within the cEVU project, students coming from Spain and from Belgium have used 4 different languages. The course was simultaneously taught at the university of Granada and at K.U.Leuven; students from both universities used the discussion forums to collaborate in a networked way, which means that they did their assignments in collaboration with the students of the other university. The course also included some videoconferences. The students were screened in advance for their language competencies. A distinction was made between the active and the passive knowledge of languages and between the oral and written language skills. In the virtual learning environment Galatea, the course documents were made available in Spanish, French and English; in most cases parts of the original texts were translated (or summaries were made) into the other languages. In the discussion forums, used for intensive group work, students could choose the language in which they wanted to contribute (Dutch was used as well) and during the videoconferences students spoke in the language in which they felt most comfortable, taking into account, of course, some basic communication rules. Students were strongly encouraged to use other languages besides English. The course entailed a teaching exchange. The Belgian teacher went for a week to Granada and gave several lectures in Spanish, (a gesture that was appreciated by the students). In the future this exchange will become a two way exchange.

When asked for their opinion about the course, the large majority of the students said that especially the multilingual aspect of the course was very enriching and challenging. Nearly all of them stated that they would certainly repeat the experience.

References

1. FISHMAN J. (ED.) (1999) Language and ethnic identity
2. FISHMAN J. (ED.) (1999) Handbook of Language and Ethnic Identity, Oxford UP
3. FISHMAN J. (1972) Language and Nationalism; 2 integrative essays
4. ANDERSON B (1991) Imagined Communities: Reflections on the Origin and Spread of Nationalism, Revised edition ed. London & NY
5. HOBSBAWM ERIC J. (1990) *Nations and Nationalism since 1780,* Cambridge University Press, Cambridge
6. KLINKENBERG J. M. (2001) La langue et le citoyen, Paris, P.U.F.
7. THIESSE ANNE-MARIE (1999) La création des identités nationales, Editions du Seuil
8. LAMBERT J. (1996) *Language and Translation as Managament Problems: A new task for education,* In Cay Dollerup & Vibeke Appel, Eds. Teaching Translation ant Interpreting Amsterdam & Philadelphia, John Benjamins, 271-293

MILCA
DISTANCE EDUCATION IN COMPUTATIONAL LINGUISTICS

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1. Introduction

This paper discusses experiences from supplementing the Computational Linguistics (CL) curriculum at five German universities with distance education in the form of a network of online courses. The courses were developed and taught within the Germany-wide joint project *MiLCA* (*Medienintensive Lehrmodule in der Computerlinguistik-Ausbildung*, media-intensive teaching-modules for education in CL, [2]) that was funded by the German federal ministry of research and education between 2001 and 2003.

We present the contributions of the CL group at Saarbrücken university within this project. To provide the necessary context, we first sketch the goals of the project in relation to the general situation of CL education in Germany.

2. MiLCA – Joint Project

Distance education for Computational Linguistics

CL is an interdisciplinary subject examining the production and processing of human language. Research is conducted with the aim of implementing software systems that model these capacities. Applications range from intelligent spellcheckers to flexible natural language dialogue systems. Several aspects of the subject make it an ideal candidate for the introduction of distance teaching methods, and in particular for e-learning. As a subject at universities, CL is relatively young. While there is still only a small number of programs and departments dedicated solely to computational linguistics, the subject is often offered as a minor at various departments ranging from computer science over cognitive science to linguistics. This fact on the one hand reflects a diversity of topics in the field that makes it attractive for many students and researchers. But on the other hand it presents a major problem for establishing competitive standards of education at a larger number of locations: expertise is spread, institutes often have excellent experts teaching in some of the relevant areas but do not have the capacity to offer comprehensive curricula. In this situation, distance education is a promising way to co-ordinate resources.

Moreover, attitudes towards the use of new media are generally positive amongst students and teaching staff of CL, given the nature of the subject. Computer interaction and computer-based system demos play a great role in many fields of teaching. Techniques such as online co-operation and online information search are of everyday importance to a computational linguist as tools and objects of study alike. Barriers for the introduction of media-based teaching modules are therefore probably lower than in many other areas. Finally, media competence is an important goal of training in its own right, and the educational use of new media helps to reach this goal through practical experience.

The use of distance education and new media does not only offer one way for universities to benefit from each other's expertise and specialisation within existing degree programs. Within the Bologna process, Germany's major CL locations are now introducing Master and Bachelor-degrees and are re-designing their curricula accordingly. This reform generally aims at more transparency and comparability between curricula. It comes along with an increased orientation towards an international audience. Distance education can contribute here by providing a network of virtual courses that define a globally available reference for core fields of the subject. Online course material may also give students with different backgrounds the opportunity to catch up before joining a Masters program.

This may take the form of self studies or even organised preparatory online lectures. Students can attend such courses from wherever they come from without having to move weeks before the actual Masters program starts.

Research and Education in CL are characterised by a large degree of internationality. Major European locations are joined in networks and co-operate intensively in research projects as well as teaching. The international post-graduate college "Language Technology and Cognitive Systems", a co-operation between the universities of Saarbrücken and Edinburgh, as well as the newly introduced international Masters programs are examples of institutionalised forms of international orientation in academic CL education. Distance education can foster such co-operations in various ways. First, online courses make it possible for students to still attend courses at their home university while they are visiting a partner site, or simply help them keep in touch with students and teachers at home. Second, distance education can contribute to the intensification of co-operations even when financial resources limit travel possibilities. This way, co-operations can possibly also be extended to sites that otherwise could not participate at all. Perspectives in this direction were explored on a workshop organised by the *MiLCA* project in November 2003 that focused on the use of e-learning for CL in eastern European countries.

Project Goals

The *MiLCA* project was funded by the German ministry of education and research in the period between 2001 and 2003 as part of the larger framework "*Neue Medien in der Bildung*" (new media in education), comprising nearly 600 academic projects aiming at the production of high-quality learning material with multimedia enhancements.

MiLCA tried to answer the needs and seize the chances sketched above by joining forces between five major German academic centres and further international associated partners. The participants in the project developed nine online course modules. Particular consideration in the development of these modules was given to standards (pedagogical and technical) as well as to the issue of sustainability. While the network of course modules developed in the project covers most of the areas relevant for the subject, it is kept open to integrate contributions by new partners from CL and neighbouring disciplines.

By bundling expertise in web-, language-, and text-technology, as well as previous experiences with online teaching, the *MiLCA* consortium was able to develop most of the particular solutions relevant for its purposes in accordance with evolving standards within the project itself. Moreover international contacts of the participating institutes allowed to integrate further experts as associated partners for technical as well as content development.

Project Members

The MiLCA consortium consists of the universities of Bonn, Gießen, Osnabrück, Saarbrücken, and Tübingen. Further contributions were made (amongst others) by researchers from LORIA, Nancy (France), Carnegie Mellon University, Pittsburgh and Ohio State University, Columbus (USA), the University of Edinburgh (UK) and the University of Toronto (Canada).

Pedagogical standards were imposed through didactical consulting and formative as well as summative didactic evaluation, conducted by project members from the psychological institute of Tübingen university. They provided support ranging from general guidelines, e.g. on the selection of didactic scenarios for the preparation of courses, to specific practical advice, such as regarding the selection of suitable media-types for the effective communication of contents of various characteristics. Evaluation was based on the assessment of changes in subject-specific skills, general media-competence and attitude towards the use of new media by way of questionnaires. Further sources that were considered included protocol data and performance of the students. Evaluation results were encouraging throughout as regards the effectiveness of online teaching for the contents considered, as well as the dynamics in the students' attitude towards new media.

Framework

The WWW was chosen as the main medium for the distribution of course material developed in the MiLCA-project. Consequently, the development of multimedia enhancements was generally oriented towards deployment over the web, and the amount of non-standard software needed in addition to web-browsers and freely available plug-ins was to be kept low. The restrictions imposed on the authors by this decision were outweighed by the benefits of easy availability and high compatibility of the resulting course material. The formal nature of some areas of computational linguistics posed a particular challenge in this respect: techniques for the encoding and presentation of mathematical content over the web were still very much under development at the beginning of the project. Partners in the project agreed to adopt the emerging XML standard MathML [4]. Meanwhile, MathML-encoded content can be directly displayed by the latest generations of most common web browsers.

The project aimed at bundling presentation, communication and content development in one environment. While this aim could only partially be achieved during the project itself, the decisions that were made already lay the ground for future steps into this direction as soon as possible: The consortium decided to use the teaching platform ILIAS (http://www.ilias.uni-koeln.de/ios/index-e.html). ILIAS is a widely accepted, rapidly developing open source solution. From the outset, ILIAS allowed the presentation of HTML-based course material in a standardised environment, connected with an e-mail- and newsgroups-system. Additionally it provided navigation-facilities and various supportive tools for the learne, and user and content management possibilities for teaching and administration. Its major weakness lay in its inadequate support for authoring. Course material in MiLCA was therefore created using external tools and was encoded in a generic XML format from which HTML was generated for the presentation in ILIAS. New versions of ILIAS will allow direct import of MiLCA course material.

Particular consideration was given to the question of sustainability of the project results. Efforts were made on three levels.

- All course modules were coded in XML, relative to a document type description (DTD) developed for this purpose within the sub-project at Gießen University [3]. The defined format is based on the concept of Learning Objects, each standing for a content unit at some level. Learning objects may be nested like chapters and sections in a book, but they may also be related to each other in various other forms. This gives the encoding scheme enough flexibility to reflect the specifics of hypertext and multi-media content. Additionally, the MiLCA-DTD incorporates extensive didactic as well as technical meta-data according to the international LOM standard. Content can be selected, re-grouped and adapted on the grounds of this additional information. The XML-format developed in MiLCA will become part of the ILIAS-platform as an input specification.
- Course modules developed in the project were taught and open for students at all participating sites during the project. Experiences from these ‘test-runs’ will serve as guidelines for establishing them as regular supplements within the curricula at the respective universities and as preparatory courses for Masters programs. Moreover steps were taken to disseminate the project results outside the MiLCA-consortium through publications, presentations on conferences and fairs, summer schools, contacts to other online learning initiatives and a dedicated workshop with a focus on online learning in the acceding countries of central and eastern Europe.
- Future maintenance, distribution and adaptation of course material, as well as upcoming administrative issues will be taken care of by a collecting society funded by three members of the project consortium. The society has agreed upon an open content distribution model for the course material itself. Additional services (e.g. teaching and tutoring) will be offered on a case-by-case contract basis. Up to now, the users of the MiLCA material have been university students, but the training of employees in language technology sections of companies is envisioned as well. Interested parties are welcome to contact the collecting society.

3. MiLCA – Saarbrücken

The Saarbrücken CL group is the largest one in Germany, with large resources in teaching as well as research. The use of new media has long become an integral part of the teaching activities at the Saarbrücken CL group. Online course material was therefore not so much developed to filling gaps in the course schedule or to introduce completely new methods in teaching. Rather the focus was on the exploration of subject specific chances of and requirements on media usage for effective content presentation.

Media Usage

The interdisciplinary character of CL places special demands on the structural conception of teaching material. Most topics have a dual character: On the one hand, there are linguistic phenomena with different theoretical explanations. On the other hand, there are machine-executable algorithms that implement the treatment of the respective phenomena following these explanations. The didactic demands in each of the two cases often differ as much as the applicable methodology.

The use of media in our course material differs accordingly between the two discussed types of content. The more theoretically oriented parts (apart from mathematical content) use standard hypertext and multi-media elements such as images, flash animations, linked glossaries, references, etc. The XML markup, in particular the metadata allows the specification of a fine-grained document structure which delimits material of different difficulty levels. For example this makes it possible to mark sections which leave the basic track of argumentation. Here, hypertext allows for the integration of more in-depth discussion of particular issues for those it may concern.

The second type of content is found in the practical sections, where computational implementations (i.e. fragments of program code) are presented. A coding scheme for this purpose had to fullfill the following three desiderata:

- Quotation of code from program files via symbolic references (instead of manual insertion of code snippets) had to be possible. This technique e.g. keeps downloadable code and code that appears in the text consistent throughout a course.
- Program code had to be in XML markup. Apart from securing consistency with the project wide standards, this makes it possible to use e.g. XSLT transformations to generate plain code for downloading, or HTML-formatted code for displaying.
- Code snippets integrated into the text had to be executable, e.g. in the form of hyperlinks. This method generally allows the reader to inspect the behaviour of a program right where it is discussed. In particular, it can be used to give a direct impression of issues such as run-time or complexity of output.

No ready-made solution was available that could meet all of these requirements. A proposed XML-format was adapted and combined with standard techniques such as CGI-scripting to achieve the described behaviour.

Technical Solutions

The Saarbrücken MiLCA project has added three courses to the MiLCA pool:

- Computational Semantics
- Algorithms for CL
- Natural Language Dialogue Systems.

Details on the courses can be found at http://www.coli.uni-sb.de/cl/projects/milca/. It is not possible to present the contents of the course modules within the range of this paper. Instead, an example from the course on Computational Semantics will be used to illustrate the interconnection between subject specific didactic requirements and media usage.

One of the topics in Computational Semantics is the development of computer based methods for natural language interpretation. Such computer programs analyse sentences in a first step by representing them as logical formulas. These formulas so-to-speak contain the sentence meanings in a computer readable format. As noted earlier, mathematical content (such as logical formulas) in MiLCA is coded in the MathML standard. The latest generation of the most common web browsers can display MathML with convincing results. Yet editing MathML directly remains cumbersome. In the Saarbrücken subproject, a chain of freely available tools was used to convert Latex, the widespread standard format for scientific publications, into MiLCA-XML. While the conversion could be done only semi-automatically for the general case, the generation of MathML from Latex was fully automated, so that mathematical content could be authored using Latex throughout. Documents were edited in an intermediate format where the mathematical formulae still were in Latex within special tags. Below you see an example formula which (in a common approach) describes the meaning of the word every:

$$\lambda P.\lambda Q.\forall x.(P@x \to Q@x)$$

This GIF was automatically generated out of this intermediate (latex-based) format:

```
<math>\lambda P.\lambda Q.\forall x.(P@x\to Q@x)</math>
```

More important, the following MathML has also been automatically generated out of this format:

```
<mml:math xmlns:mml="http://www.w3.org/1998/Math/MathML">
       <mml:mi>&#x3BB;</mml:mi>
       <mml:mi>P</mml:mi>
       <mml:mo>.</mml:mo>
       <mml:mi>&#x3BB;</mml:mi>
       <mml:mi>Q</mml:mi>
       [...]
</mml:math>
```

In cases where a browser cannot display MathML and for print versions, the GIF of the formula presented above can serve for display.

The markup of programme code was realized in close cooperation with an industrial partner who assimilated the proposed CodeML standard to our needs. This made it possible to build a tool chain supporting the insertion of programme code into the textual material. In a first step, a code fragment like the following so-called *clause* of the programming language Prolog (which formulates the translation of the word *every* into the formula presented above):

```
det(lambda(P,lambda(Q,forall(X,(P@X)>(Q@X)))))--> [every].

is automatically transformed to the following flat CodeML markup:

<cpg class="predicate" id="firstLambda:det">
       <cpg class="clause" id="firstLambda:det:1">
       [...]
det(lambda(P,lambda(Q,forall(X,(P@X)&gt;(Q@X)))))--&gt; [every].
       [...]
</cpg>
```

This code fragment can then be mentioned within the text by way of symbolic reference. The following reference cites this clause with the help of a self-explanatory unique name which is made up of the respective file name, the name of the so-called *predicate*, and the clause number:

```
<coderef to="firstLambda:det:1"></coderef>
```

The automatic insertion and formating of the respective code fragments for display is achieved by an XSLT script. This technique makes it possible to insert all used files of the programming language as XML elements within the main document and to refer to parts of the files as explained above. With the same technique, links can be inserted in the text that extract downloadable plain code files again.

4. Conclusion

In this paper we have outlined the *MiLCA* project, a Germany-wide joint project on distance learning in the field of Computational Linguistics funded by the German ministry for education and research. The immediate result of the project is the pool of course material itself. The courses cover all main areas of CL, theoretical as well as applied, and a number of special topics. All material is available in a uniform XML markup including metadata which can be imported into the open-source learning platform ILIAS. A collecting society has been founded to take care of the future administration and distribution of the course material. As a second result of the project, a number of XML standards which existed only as proposals at the beginning of the project have been further developed, tested, and documented by project partners and within a number of co-operations with external experts.

The experiences we made in the Saarbrücken subproject were encouraging. The motivation and the results of the students were generally high. Apart from our positive experience with *eLearning for CL*, the empirical know-how we acquired during the authoring process has revealed a number of promising future research topics in the field of *CL for eLearning*: It has shown that even relatively unsophisticated methods of CL can support the process of authoring course material enormously. For example the rules of thumb we used in the generation of candidate abstracts for metadata markup have proven extremely helpful. An interesting topic to be pursued further is how CL can further facilitate such kinds of authoring, editing and displaying processes. Techniques that will become relevant here are automatic linking of documents and machine-aided summarization. Elaborate multilingual support and dynamic user adaptation are other possible further directions.

References

1. MICHAEL KOHLHASE (2004) *CodeML: An Open Markup Format the Content and Presentatation of Program Code*, 08 March, http://www.mathweb.org/omdoc/projects/codeml.ps
2. LOTHAR LEMNITZER AND BERNHARD SCHRÖDER (EDS.) (2003) Computerlinguistik – Neue Wege in der Lehre. Themenheft von Sprache und Datenverarbeitung., IKP, Bonn
3. HENNING LOBIN AND MAIK STÜHRENBERG (2003) *XML-strukturierte Learning Objects,* Lea Cyrus et al. (ed.), Sprache: Zwischen Theorie und Technologie
4. W3C MATH WORKING GROUP (2003) *Mathematical Markup Language (MathML) 2.0*, 21 October 2003, http://www.w3.org/TR/MathML2/

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EDUCATIONAL SOFTWARE & MULTIMEDIA: TOWARDS A EUROPEAN DIMENSION

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Introduction

Pressed as we are to keep pace with accelerating innovation in educational technology, there is rarely a chance to pause and take stock, but the imminent entry of ten new members to the EU from central and eastern Europe provides a perfect opportunity to reflect about prevailing trends and the state of the art across the continent. Accordingly, we present here a reflection on multimedia materials and educational software and in particular on the wealth of significant resources available within member states, which in our view can and ought to become part of a common European heritage.

The importance of multimedia and educational software in European education has been recognised for some time [7]. As 'far' back as 1996, the Educational Multimedia Taskforce (EMTF)[1] highlighted the "great potential" which multimedia offers in primary and secondary education and made numerous recommendations on how that potential might best be realised [3]. Much has been done in this direction both at national and European levels. However, further efforts are required before educational multimedia can begin to play the key role that the EMTF attributed to it. We believe that the time is now ripe for those further efforts to be made, thanks in part to the convergence of several favourable factors:

- increased (and enlarged) pan-European integration in the cultural, social and economic spheres aided by the introduction of the euro;
- the emergence of a corps of pioneer teachers with solid experience in implementing multimedia in their teaching and in collaborating with colleagues at European level;
- maturity in national education services providing training and support in multimedia, educational software and overall use of information and communication technologies (ICT) in schools;
- the increased scope and importance of the collaborative dimension within multimedia applications themselves.

Our reflection is based on the experience we have gained in the field since 1985 [5] when we established Italy's Educational Software Library (BSD), which has since evolved into Essediquadro (Servizio Documentazione Software Didattico)[2], an online service providing information and support regarding multimedia and educational software from Italy and abroad.

The Italian experience in educational software

Italy's educational software library, Biblioteca del Software Didattico (BSD), was established in 1985 in Genoa by the Institute for Educational Technology of the Italian Research Council (ITD-CNR) in conjunction with the Ministry of Education. The aim was to provide the education, research and publishing worlds with a window on the field of educational multimedia and in particular to help teachers make informed choices when selecting software [6]. Over the years the BSD grew to contain a catalogued collection of over 3,100 educational software titles available in Italy and abroad. These cover all the main subject areas and all school levels: pre-school, primary and secondary school, university and special education.

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[1] European Commission Directorates-General III Industry; XII Science, Research & Development; XIII Telecommunications, Information Market & Exploitation of Research; XXII Education, Training & Youth

[2] http://sd2.itd.ge.cnr.it/

The hurried introduction of ICT in Italy's schools during the 1990s, together with the advent of the world wide web, made apparent the need for remote access to the BSD's considerable wealth of resources and expertise. Thus in 1999 the BSD became Essediquadro, an online service that provides information, support and orientation in educational software and multimedia to over 30,000 users throughout Italy and the world.

Essediquadro produces and makes available objective data as well as informative/descriptive documentation designed to meet the varied needs of teachers seeking to implement digital resources in their teaching. At the core of Essediquadro is a constantly updated database of educational software and multimedia whose entries feature complete product descriptions produced by in-house staff, together with all relevant educational and technical information, images, links to related web sites, etc. Items catalogued include offline and online software, web-based resources, as well as open source software suitable for educational purposes, with download capabilities. Standard and advanced search options allow flexible, personalised consultation of the database.

As well as this descriptive data, Essediquadro provides expert analysis and support in a number of areas to assist in the selection and adoption of educational software at various school levels and in different disciplines. This includes:

- in-depth studies of resources available in particular subject areas or for specific purposes;
- detailed teaching modules based on the use of educational software;
- teacher's reports in using and/or developing software in school;
- guides to web sites and online resources available for various subjects and themes;
- reflections about the positive features of software;
- online consultation services via forums, email, FAQs, etc.;
- teacher training initiatives drawing on on-site, blended and online approaches.

Just how far off is European software?

First of all we ought to ask ourselves what characteristics software needs to have in order to be considered European. The first thing that springs to mind is that these products must be usable in a range of different linguistic settings.

Looking at the full range of software presently at Essediquadro's disposal, surprisingly few of the titles have been conceived exclusively to meet the education needs of Italian speakers. The range is dominated by titles that, for one reason or another, are not totally bound to the specific local context. These include:

- software programs produced elsewhere and subsequently localised to increase usability and suitability for Italian conditions;
- language-independent software;
- multilingual software, including open source products.

Let's examine these categories in more detail and take a look at some examples.

1. Localised software

Many products in Essediquadro are of foreign origin – European and extra-European – and have been adapted, or localised, to some degree so as to make them suitable for use in Italy, or indeed in other European settings. This localisation may be limited to translation of the software's text and audio files, and perhaps translation or production of any support material deemed necessary. However some cases call for a more comprehensive adaptation in which cultural references are modified through changes in graphics and even the program code (Figures 1 and 2). Italian teachers may not be so conscious of the fact that the software they are using has been designed to suit a setting other than their own. What's more (important), they might not realise that colleagues elsewhere in the continent are using the very same software, exploiting similar advantages and facing similar constraints as they are.

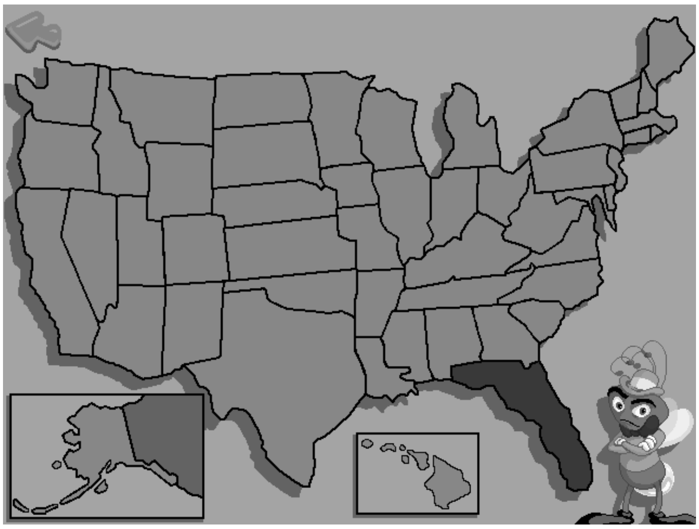

Figure 1: Screenshot of "Jumpstart 2nd Grade" (Knowledge Adventure) showing activity based on North American geography

Figure 2: Screenshot of "So di Più Seconda Elementare" (Knowledge Adventure/Leader), localised version of "Jumpstart 2nd Grade" (Figure 1). The same activity has been adapted to the European context

2. Language independent software

One type of software that is to a large extent free of constraints imposed by the cultural/linguistic setting of use, at least in the European context, is what might be called language-independent software. Typical examples are programmes designed to develop children's basic skills in areas such as logic and mathematics, as well as some technical and personal production tools for older students (see Figures 3). There is a caveat however: we need to ascertain whether the software in question is language-independent for the end user, namely the student, and also for the teacher. Chances are there will be a greater language comprehension burden placed on the latter, in terms of instructions, support material and so on.

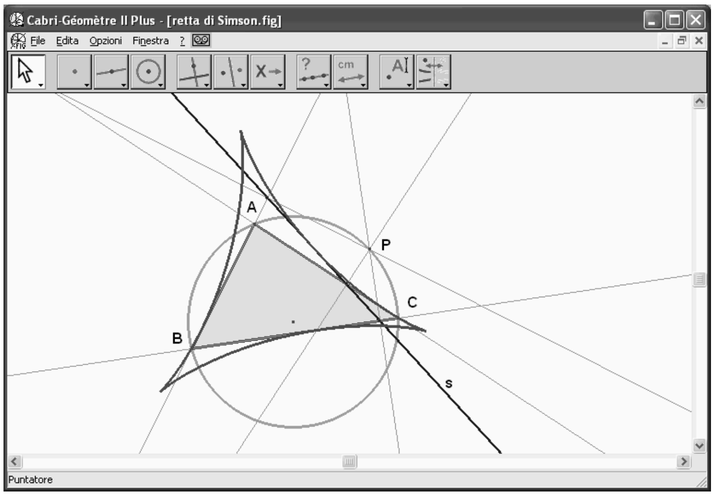

Figure 3: Cabri-géomètre (Cabrilog/Loescher). The language element is limited to a few menu titles

3. Multilingual software

Another significant category that can reach across regional and national boundaries is multilingual software, namely products have been designed specifically to be usable in different linguistic/cultural settings (see Figure 4). These usually allow the student to select the preferred language of use, either on installation of the program or, as is usually the case, at the outset of a work session: sometimes the user may also be able to switch languages mid-stream, as it were. Many of the titles in this category are dedicated to, or at least are useful for, the learning of foreign languages [2]. When considering multilingual programs, special attention needs to be paid to open source software, which can be programmed so as to run in the user's language of choice, thanks to its inherent open-ended design [1]. Indeed, many open source titles include ready-to-use language libraries so that the user can simply select the language s/he desires the program to be in and implement that feature with relative ease[3].

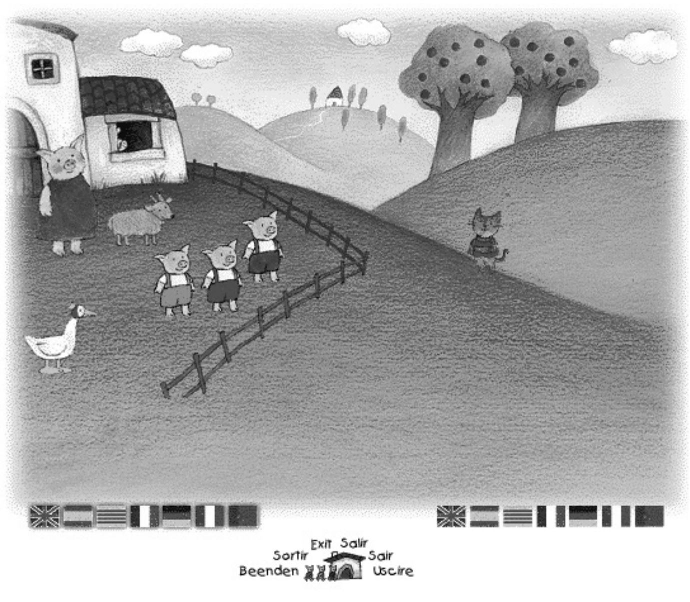

Figure 4: "European Folk Tales" (Institut de Ciencies de l'educacio' – Universitat de Barcelona). Interactive storybook in seven different European languages with bilingual comparison capabilities

Returning to our question at the beginning of this section, we have seen above that much of the software currently being used in Italy (and, it is reasonable to presume, in other European contexts) is not strictly tied to this particular linguistic setting.

[3] For an example see http://kvoctrain.sourceforge.net

Language, however is only one, if the most immediately apparent, of the characteristics that make software more or less usable within different educational settings in Europe. We also need to take into account cultural differences, both in terms of the general cultural/social context and more particularly, perhaps more critically, in terms of the specific educational objectives/contents related to the setting in which software is to be used.

Conclusions

Seen from our viewpoint educational software is, of its own accord, acquiring an increasingly European dimension, especially when we consider purely linguistic aspects. On the socio-cultural front, greater effort is required before we can talk about software that is usable in a range of different European settings. At this point we need to ask ourselves as Europeans what constructive steps might be taken to bring this situation about.

To us the most pressing need is a truly effective pan-European documentation and support service that is easy to access, easy to use, and that really meets the needs of the education community by focusing not only on the nature of resources but also on their use. So, on the one hand, such a service would disseminate descriptive data about European software and multimedia, and on the other make available practical experiences through the active participation of a community of European teachers who share know-how and ideas. To bring this about, we need to coordinate and integrate the wealth of experience already gained at national level and create a constructive dialogue with existing European initiatives.

But just what do we expect to gain from such an effort? First and foremost from the educational point of view a wider and richer range of multimedia resources for everyone to choose from and a larger community of users, both teachers and students, who create a greater body of knowledge in the use of those resources [4]. We can add to this the economic benefits that can be derived from reaching critical mass in the European educational software market: more products, lower costs, increased quality and so on. Who knows? We might even see signs emerge of those grand socio-cultural objectives that the Educational Multimedia Taskforce foresaw back in the mid 1990s, namely that of "determining the outlook of European citizens, affirming this European identity and diffusing European culture throughout the world" [3].

References

1. CANDIANI V., CARUSO G., FERLINO L., OTT M., TAVELLA M. (2003) *Linux a scuola: proviamo...,* IS – Informatica & Scuola, Anno XII numero 4 Novembre, pp. 44-45
2. EARP J., FERLINO L. (2001) *A proposito di risorse multimediali per l'insegnamento/apprendimento dell'inglese come lingua straniera,* Vetrina BSD, TD – Tecnologie Didattiche, numero 22, pp. 61-63
3. EDUCATIONAL MULTIMEDIA TASK FORCE (1996) *Working Document of the Commission Services July 1996*, http://www.ecotec.com/MES/tools.html
4. KNEZEK G., CHRISTENSEN R. (2002) *Impact of New Information Technologies on Teachers and Students,* Education and Information Technologies, 7:4, pp. 369-376. Norwell, MA. Kluwer Academic Publishers
5. OTT M., PERSICO D. (1988) *A Practical Approach to Courseware Analysis and Evaluation,* in H. Mathias, N. Rushby, R. Budgett (eds) Designing New Systems and Technologies for Learning Aspects of Educational Technology XXI, Kogan Page, London /Nichols Publishing Company, New York, pp 189-196
6. OTT M., TRENTIN G. (1990) *Italy facing new educational technologies: an overview from an 'institutional' vantage point*, EC Newsletter, 2, 2, 37-47
7. RICHIER A., HERMANT, C. *I prodotti multimediali nel contesto europeo,* TD Tecnologie Didattiche, 11, 1996

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THE BOLOGNA CHALLENGE: CATERING FOR DIVERSITY THROUGH ACADEMIC WRITING ONLINE

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The Bologna Treaty in a Flemish context

On 13 June 1999, the Flemish Minister of Education signed the Bologna Treaty, the implementation of which involves a thorough reform of higher education in Flanders, the educationally autonomous northern part of Belgium. From the Treaty's reading ensued a lively (and healthy) critical debate about the quality of education which resulted in a Flemish law on Higher Education. The Flemish Structural Decree on Higher Education of 2 April 2003 contains the basic principles of the Bologna Treaty for implementation in the Flemish context, i.e. the Bachelor and Master structure, as well as the regulations concerning the language(s) of instruction.

Flemish undergraduate students in the future will be confronted with an effective study duration of 3 years or a study load of 180 credits as opposed to 4 years and 240 credits at the moment. For a master programme they will have to take 60 credits and for an advanced master another 60 credits. Moreover, the quite rigid partitions between study programmes will disappear and students will be able to more freely combine subjects, which until now was impossible. Since Flemish higher education does not have any admission restrictions (except for an entrance exam for engineering and medicine), it is to be expected that certain 'fashionable' areas of study will attract a high number of students, who may not always be equally motivated or qualified. And this heterogeneous group has to be catered for in the set time-frame.

As far as the linguistic consequences of the Bologna implementation are concerned, article 91 in the Decree, in line with the Belgian language laws, states that the educational language or language of instruction at tertiary level will be Dutch. A threefold exception is made for courses which have the language in question as a subject and are medium-taught, for courses taught by visiting lecturers or visiting professors or in the case courses are attended at another school of higher education where they are taught in another language (e.g. in the case of foreign exchanges). However, in the Bachelor years only 10% of classes can be taught in another language than Dutch, on the condition that the Council of the institution in question can guarantee an added value for the students, i.e. that the language proves to be functional with regard to the field of study and that the lecturer in question has a proper command of the language of instruction.

At first sight this linguistic requirement seems to contradict anything and everything the Bologna Process stands for, and more in particular its striving for an increased internationalisation. Since internationalisation calls for multilingualism and multiculturalism, the decision has been called parochial, a ban on all the efforts towards internationalisation and the ideal way to exclude Flanders from the international market. Foreign exchange students present a 'problem' in what seems a tendency towards monolingualism, since on arrival they have no or only a limited command of the Dutch language, whereas the majority of them have some degree of competence in English. The Decree offers a solution in that the Council of an institution is allowed to offer Bachelor and Master disciplines completely in another language than Dutch, if it concerns specific disciplines for foreign students and if an equivalent discipline in Dutch exists. Questions arising are: should different mediums of academic communication be further developed, and if so, how should multilingualism or partial skills development, i.e. plurilingualism, be approached for as diverse a target audience as can be.

BaMa and internationalisation: the linguistic consequences

The Bologna Process is not a process in isolation, it is part of globalisation and globalisation is internationalisation, which can take the form of an experience as an exchange or a dimension as embedded in the curriculum, and communication plays a vital part in it. In communication two linguistic principles prevail, which are often said to be contradictory, i.e. the value of multilingualism or linguistic diversity and the value of a common language or a lingua franca (Crystal 2001). The first principle fosters historical identity and promotes a climate of mutual linguistic respect, the second principle fosters cultural opportunity and promotes a climate of international intelligibility. Crystal claims that these two principles are complementary. Thus, it is important to find a sensible and sensitive balance between these two principles so they can live side by side.

The literature is clear about it; the future of Europe and of the whole world is that of a multilingual society. A multilingual society means that there will not be a supremacy of one language. Although English plays an important role in establishing relationships between nations and people, globally, Asia and South America are also playing an important role. So, Mandarin Chinese and Spanish are also interesting languages to be learnt. The recent Eurobarometer surveys (2001) prove that the Europeans are not giving up their own national languages in favour of English. They do, however, realise the importance of foreign languages and the possibilities they bring. Although at the moment English is still the first European foreign language, with the enlargement of the EU the linguistic future is open. As a reply to this multitude of possibilities, the University of Antwerp has opted for plurilingualism and is offering students the opportunity to remedy specific skills and competencies in different languages and study areas in the framework of the Educational Development Plan (OOP 2003).

Challenges to be met

The Antwerp situation is a complex one, since on October 1st 2003 three confederal university institutions have merged into one. The Faculty of Humanities, for instance, responsible for the main language tuition, which until then had been divided across two institutions providing undergraduate teaching for students consecutively going from one institution to another, now had to reshape its teaching fundamentals. The staff have closely worked together in redesigning the prerequisites, objectives, outcomes, work forms, evaluation, in short in redesigning the curriculum in the light of the merger. But there are more challenges to be met. One year after the merger the Bologna Process will be implemented in all of Flanders and this has some curricular consequences which have to be dealt with.

The curriculum reform has given rise to specific predictions about the student population-to-come:

- More students will take English;
- The period of study will be shorter (three years or 180 credits);
- The language groups will be large and at intake they will be heterogeneous;
- Antwerp has a large guest student population from all over the world with mainly English as a Language of Wider Communication (not necessarily their area of study);
- Students mainly from Asia take a preparatory year in which to adapt to the academic culture of the guest institution;
- Since the merger of the three Antwerp Universities into one on October 1st 2003, a new allocation model has been put into place, resulting for the language faculty in a reduction of staff.

So, in short, we can expect that more students with a diverse background will have to be taught more intensively and in a shorter span of time with fewer staff how to communicate in an academic context. The main concern in this case then is skills-oriented and ensuring that some comparable level of language proficiency can be obtained while simultaneously working on content.

Academic literacy

Academic staff complain about the deteriorating writing skills of today's students and the fact that they do not seem to learn to write. Leaving aside the issue of whether it all 'used to be a whole lot better', the writing skills of students are said to leave much to be desired and worse is to be feared with the increasing influx when the Bologna Treaty will be implemented. Whether we are talking about incoming undergraduate or post-graduate students, most academics assume that they are able to write in an academic context and deliver more or less acceptable academic papers. Moreover, students are generally expected to increasingly become academically literate while wandering through the hallways of academia. Explicit teaching of writing, as a theoretical paradigm or a skill, whether for academic purposes or not, is almost non-existent in current curricula in Flanders. Very often, an osmotic stance is taken in which the university is believed to be able to reproduce "the learning environment of a literate home" (Howes 1999:209), thus fostering 'good' writing. However, if osmosis is all there is to it, what would there still be to complain about? Apparently, there remains a discrepancy between the judgement of academic staff and students as to what constitutes a well-written academic text. Both parties seem to operate at different streams of thought, i.e. academics seem to hold expectations regarding academic writing which differ from what students interpret these expectations to be and in whatever way they communicate them misunderstandings occur (cf. Lea and Street 1998; Street 1999).

Since too little time is available to ensure the best individually tailored tutoring for language skills, especially the more 'creative' skill of writing in an academic context, at Antwerp University in 2002 and 2003 an academic literacy project extending the boundaries of e-learning was carried out by the *Centre for Language and Speech*, partially funded by the University's Fund for Teaching Innovation, partially by the *Centre* itself. The project – specifically targeting academic writing in Dutch, English and German for language students – is in line with the University's policy document on Teaching Development as a response to the challenges of the Bologna Treaty. The product resulting from it, called *Scribende*, is provided online in an autonomous learning environment and complemented with e-tutoring support by peers as well as academic staff which can optionally be complemented with contact tutoring. It is specifically designed for students studying languages (both linguistics and literature) and forms an integrated part of their curriculum.

Scribende consists of three components. On the basis of the results of (1) a diagnostic entry test students are provided with an individualised learning path focusing on (2) awareness raising (general, applied and language-specific) and (3) skills training for either English, German or Dutch for academic writing purposes.

The entry test is obligatory and mostly contains closed test items, but also essay writing which is marked by a trained tutor. The test is programmed in QuestionMark Perception (2003). The second component, i.e. awareness raising, is a theoretical supporting module consisting of seven chapters, reflective in nature and specifically aiming at language students. Because the test determines the individual's learning path, some students will have to go through all chapters, whereas others will only have to do a few. This reflective module is written in html. The third module is a language-specific practice module with a) closed exercises with online feedback and solutions (in Perception), and b) open exercises, i.e. creative text writing and collaborative writing tasks that are dealt with on a digital learning platform with online tutoring (by peer and academic staff). The discussion line, authored by the tutor, and the fora, authored by the learners, are directly available under Blackboard (release 6.1) as is the case for *Scribende* as a whole.

Even though Flemish students are *Scribende's* primary target group and the materials have been designed on the basis of an error analysis of this population, the programme will also be used for exchange students with another L1, since also for them being able to effectively communicate is an added value and in its pretesting phase the programme has shown to be highly attractive. The programme is currently being extended to cater for specific L1-problems, i.e. for Spanish, Polish, German, etc. Secondly, due to its flexible nature, Flemish students going abroad can take *Scribende* when being abroad. *Scribende* is accessible from a distance also with regard to the collaborative writing tasks.

The challenges for developing an online writing programme are manifold. Let us name a few. It is not always easy to find 'good' materials, which are appealing, to the point, exemplifying, transparent, etc. The tasks should preferably be restricted to one screen, since scrolling has proven to have a detrimental effect on reading. It is not always easy to use the web as a medium for academic reasoning. Students do not often use the web for institutionalised learning and academic style does not match well with banners, flashy colours, funny noises, etc. The medium has its limitations, so *Scribende* approaches learning to write through reading because of the restricted number and length as well as frequency of the direct mail tasks, thus opting for an indirect approach.

Conclusion: the Antwerp rationale

Academic staff have expressed that the learning and teaching situation for academic communication is not ideal at all, and they are anxious that the student intake and the diversification of study programmes after the introduction of the bachelor-structure will cause even more heterogeneous writing needs which with a reduction in staff will be very difficult to adequately respond to.

Scribende tries to bridge the discrepancy between the different expectancy patterns of staff at undergraduate and graduate level by filling in the void that exists regarding academic writing 'training'.

Through the Scribende e-approach integrated in Blackboard students will not only be provided with an individual writing profile, they will autonomously remedy the weaker points in their academic writing. In close and non-face-threatening co-operation with peers they will be able to raise their awareness and practise their skills. The tutor manages some of the critical reflection in that s/he provides individual feedback with which s/he can feed the discussion line and s/he provides the social environment which keeps motivation afloat and thus has a stimulating effect on the outcome of the writing process. The flexibility of Backboard as a pedagogical environment and *Scribende* as learning content enables tutors to make multilingual working groups which in turn provide topicalised templates for future generations of students.

Scribende as an e-learning package contributes to the Bologna Process in that it promotes internationalisation in more than one way. It enhances respect for different languages, i.e. it takes every language serious as a medium of academic communication including the mother tongue, at the same time creating optimal opportunities for the development of a second language in a professional academic environment. It is tailor-made for learners at the home institution, students going on exchange and students coming on an exchange to Antwerp. It is the ideal online distance learning package: flexible but because it also provides human support facilities both from peers and tutors. The package is not restricted to what online packages normally are good at, i.e. closed exercise types, but it uses online tools which offer the benefit of open writing tasks. *Scribende* facilitates the changes in the curriculum and the reduction of staff at the University of Antwerp. Finally, it helps institutional development, since it has been designed as a template and in the near future it will be extended to contain contents for different languages (French) and different topics (biology and environmental studies).

References

1. Blackboard Learning System^{TM} (Release 6) – Blackboard Learning and Community Portal System^{TM}. (Release 6) – 6.1.0 Build 1. Blackboard Inc.
2. CRYSTAL, DAVID (2001) English as a global language. Cambridge: Cambridge University Press 2001
3. EUROPEAN COMMISSION (2001) Europeans and languages. Executive Summary. Eurobarometer report 54. Europe: European Commission
4. HOWES, D. (1999) *A response to "Academic literacy: a case study"*. In Jones, C., J. Turner and B. Street (eds.) Student writing in the university: Cultural and epistemological issues. 207-210
5. LEA, M. R. and B. STREET (1998) *Student writing in higher education: an academic literacies approach.* Studies in higher education 23.2: 157-172
6. OOP (2003) http://www.ua.ac.be
7. Questionmark Perception, Assessment Manager Version 3.4.0.3 Feb 2003. Question Mark Computing Ltd.
8. STREET, B. (1999) *Academic literacies*. In Jones, C., J. Turner and B. Street (eds.) Student writing in the university: Cultural and epistemological issues. Amsterdam: John Benjamins. 193-199

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AN ADVANCED E-LEARNING CONCEPT: MINDMAP

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Introduction

An e-MINDMAP being used in an e-learning course module and presenting the learning content in a graphical way, consists of a number of blocks representing the learning content elements. The learning process has been defined as a sequence of a number of steps, corresponding to the blocks, and is telling the story in a visual way.

A learning object (LO) is an independent content component that can function as a learning content module. In our MINDMAP concept, we'll define our learning objects on MINDMAP level and on sublevel of the units including some blocks linked together in one small story of learning content. The MINDMAPS and the units can be structured as independent learning objects. The blocks are structured as independent content components composed of a set of atomic learning content elements.

The learning objects of all levels and the atomic learning components will be stored and managed in a LO-warehouse, part of a LOMS (learning object management system).

1. Definition and characteristics of learning objects

A learning object (LO) can be defined as any digital content resource that supports learning, that can be re-used and that can be delivered across the network on demand, be it large or small. Examples of smaller reusable digital resources include short text documents, figures, digital images or photos, live data feeds, live or prerecorded video or audio snippets, animations, and smaller web-delivered applications. Examples of larger reusable digital resources include entire web pages that combine text, images and other media or applications to deliver course modules.

Some characteristics

- Learning Objects are a new way of thinking in the learning content environment and are based on a clear learning model, or instructional strategy.
- Traditionally, content comes in a module lasting several hours. Learning Objects are much smaller units of learning, typically ranging from 2 minutes to 15 minutes. Learning objects are small, independent components of knowledge or interactions stored in a warehouse.
- Learning objects are defined as independent objects and can be used as course modules or as information documents.
- Each learning object corresponds to an interactive sub-process of learning. Learners view, listen, respond or interact with the content in some way.
- Learning objects may be re-used in multiple contexts/courses and for different learning concepts.
- Learning objects can be grouped into larger components of content, as part of the e-blended learning process.
- Each learning object has descriptive information, metadata, allowing it to be easily found by a search.

2. Learning objects in the traditional "web-pages e-learning" concept

Until now most of the e-learning courses are html documents, being the result of a translation of a course syllabus into interactive web pages. The learner can read the e-learning course text in a sequential way, comparable with the activity of reading a book.

Small parts of learning content elements are defined as learning objects, and are stored independently in our warehouse of learning materials. For all LOs metadata has been defined and stored in a data table.

The instructor can model a learning content module by packaging some selected learning objects into an e-learning course module. By defining those learning objects as independent components and by managing them in a warehouse, the re-usability of the learning objects is guaranteed. In case the international standards are followed, the interoperability is guaranteed, and so is the opportunity of potential implementation in different learning management systems (LMS).

In our e-blended learning model several kinds of activities, and several kinds of supporting learning content documents have being used:

1. E-learning course modules or learning objects (LO) about the content topics.
2. Additional supporting information documents to back up the basics of the learning content with extensions, explanations, case/ examples (…). All types of file formats can be applied.
3. Tutoring and/or instructional documents:
   In some cases tutorials or tutoring documents, already developed or available as freeware, do exist. If the course is organized as a virtual classroom course and in case of tutoring of the individual learners, some support/instructions/explanations have been given via instructional documents.
4. Student documents: students/student teams are preparing documents on a specific topic and are sharing this knowledge among other students from the learner's team.

Our Learning Object management system (LOMS)

LOMS is managing the input, the storage and the access to the learning content. The learning content itself is stored in the permanent or in the temporary warehouse.

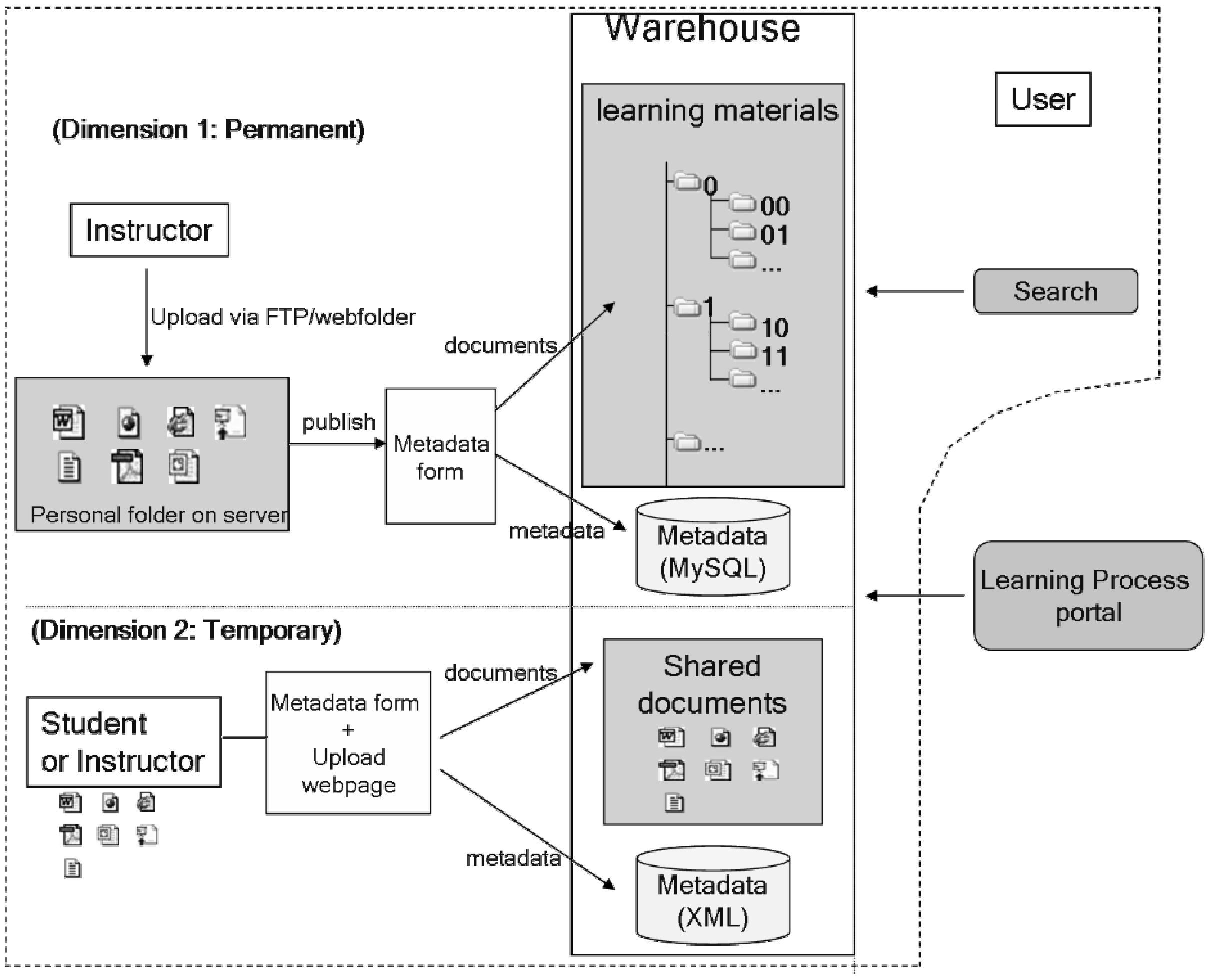
The e-learning course modules or learning objects are stored in the permanent warehouse.

The metadata are stored in a data table (all ODBC-database systems can be used).

All other information documents, as we have the additional supporting information documents, the tutoring or instructional documents and the student documents, are stored in the temporary warehouse.

Uploading of all types of documents results in XML data definition. If documents have to be shared by students, the uploading results in automatic generation of student portal overview documents.

Those documents having been "published" can be found by using the search facility.



3. e-Mindmap

An e-MINDMAP being used in an e-learning course module and presenting the learning content in a graphical way, consists of a number of blocks representing the learning content elements. The learning process has been defined as a sequence of a number of steps, corresponding to the blocks and is telling the story in a visual way.

The first level content, corresponding to a first fast reading, can be a short text on the screen or an audio fragment, directly linked with the blocks. The learning path or the story flow has been organized as a sequence of steps, each step corresponding to a block.

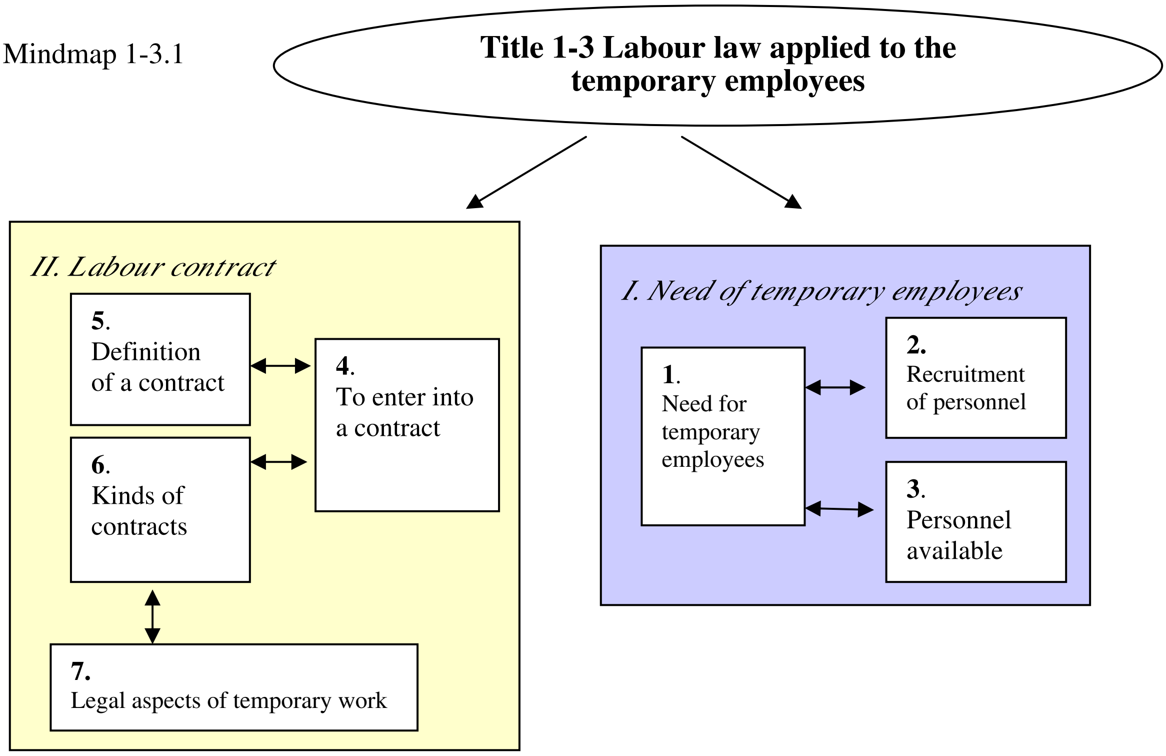
The blocks are composed of some atomic learning-elements, being the short text or audio document, the full text, some additional text or graphical presentations, or pictures, some questions and answers, some tests, some mouse-over animations.

As a consequence the learner can complete the learning activity on a first level by reading only the short text components or can evolve to a deeper study of the topic by reading the full text components in the pre-defined sequence or learning path. In another way the learner can select his preferred learning topics and selects the corresponding blocks in the MINDMAP.

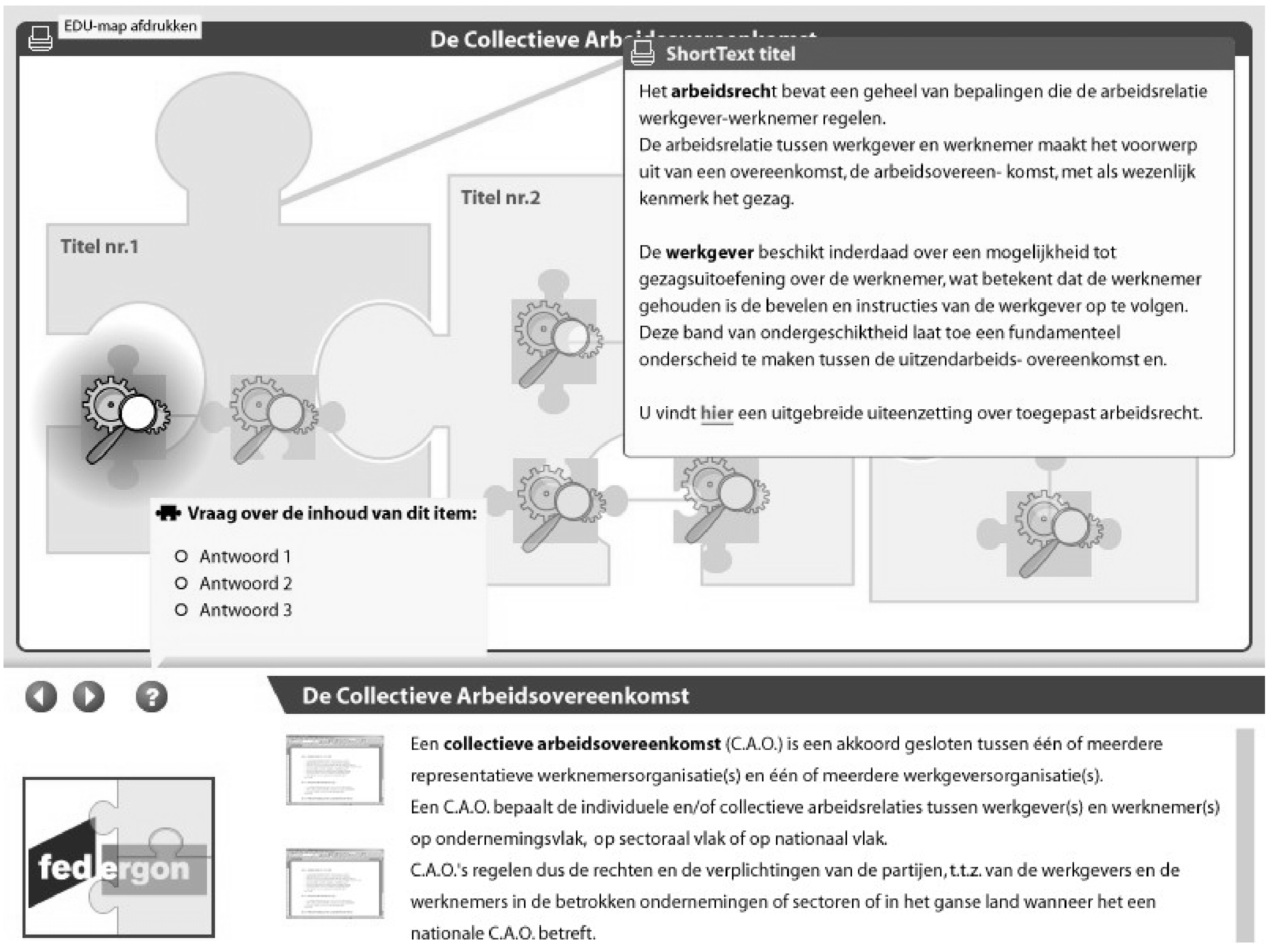
In the example the e-MINDMAP has been split into two units. The first unit is composed of three blocks and the second one in four. The 1-arrow means the composition of the learning module into (two) units of learning content. The 2-arrow means a relation. It can have the following meaning: “can be explained by”, “more specific”, “in more detail”, “it is composed of”.

The block numbers define the sequential steps of the learning process.

Mindmap 1-3.1



A screen of the MINDMAP system:



4. Independent learning objects used in the e-MINDMAP concept

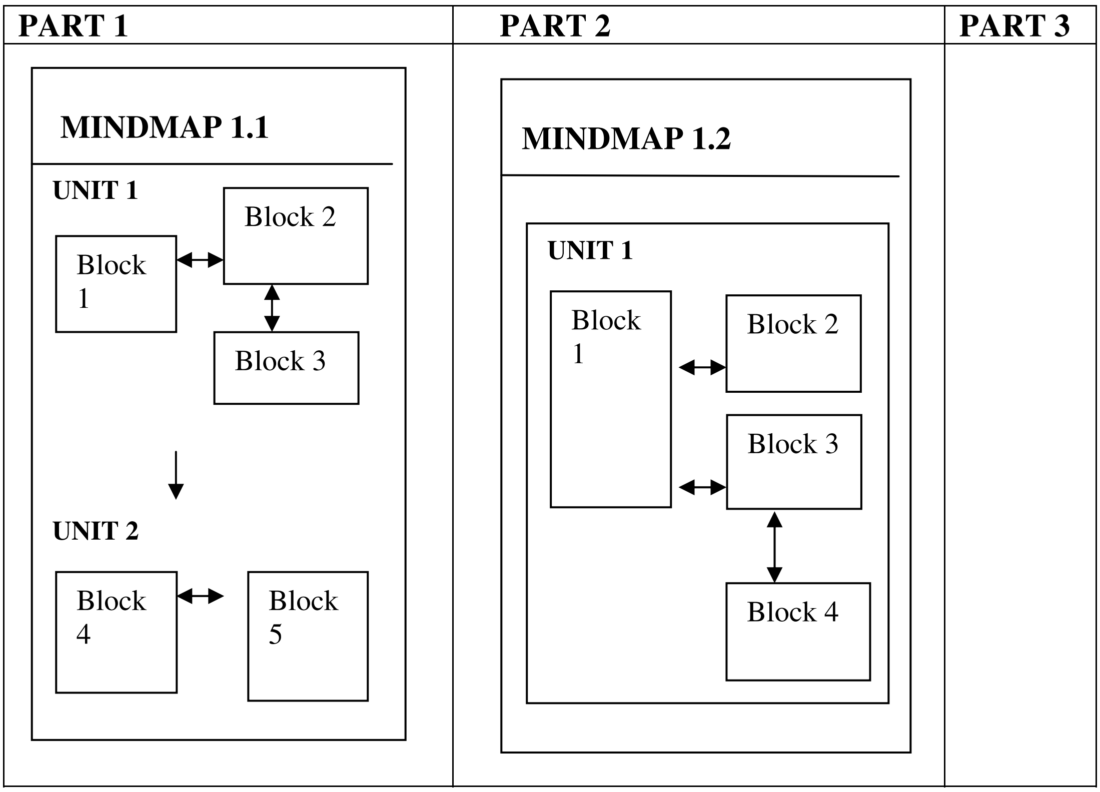
A learning object is an independent content component that can function as an independent learning content module. Talking about objects, we consider the content and all characteristics of the content, including the learning objectives of the learning content module. The reason for using learning objects, is the re-usability of the learning content for implementation in different course texts. Those learning objects can also function as independent content information components that can be used in other information based applications. In our MINDMAP concept the learning objects are defined on MINDMAP level and on sublevel of the units. A unit includes some blocks linked together in one story of learning content.

A generic structure for the learning objects is being developed. To guarantee a flexible composition of a course module keeping in mind the different educational models and fulfilling the needs corresponding to different learning styles, the required characteristics of the objects have been defined.

By following the international defined standards on learning content, the inter operability of the objects in different learning systems is being guaranteed.

A course can be compared with a book, and the content module can be compared with a chapter of a book. A chapter can be split into some content parts. For each content part we define a MINDMAP.

A MINDMAP has been split into some content units, still having the characteristics of learning objects. The units are composed of a set of blocks, corresponding the steps of the learning process.



The MINDMAPS and the units can be structured as independent learning objects.

The blocks are structured as independent information components composed of a set of atomic learning content elements, being the short text, an audio fragment, a full text document, an additional text/figure/.

5. The definition of independent atomic learning components, as building blocks of a course module

We already have explained, that a block in the MINDMAP concept is composed of several atomic learning components, being short text, full text, additional information documents.

To become re-usable in different e-learning concepts, the learning content has to be split into very small components. Those components have to be managed as independent components in a warehouse. A generic modelling tool has to be developed to model the learning modules as defined in different e-learning concepts.

Those atomic learning components can be the basic elements for the traditional "web-pages e-learning" concept as well as for the new MINDMAP concept.

6. The extension of LOMS and modelling of course modules

Our LOMS has to be extended to include the management of these new learning objects and atomic learning components. The development is ongoing.

The learning objects themselves, being a MINDMAP or being a "web-pages e-learning" document, have to be modeled using those atomic learning components. Those have to be structured as objects including their characteristics. The development of those modeling tools is ongoing.

Conclusion

Our LOMS is a complete learning support system. All functions concerning the management of the learning materials, the modeling of the e-learning modules and that of the e-learning process, (…) are available in the system. As far as we opted for a traditional "web-pages e-learning" concept, the LOMS was a good solution to manage all learning objects.

As we'll evolve to a new and advanced e-learning concept MINDMAP, we need to define some smaller content components, being the atomic learning components. We must structure them in such a way, that those atomic components can be used to model the learning modules fitting different e-learning concepts.

We have done several experiments in using MINDMAPS in our traditional courses. The students were very enthusiast about it. The transformation of them to e-MINDMAPs is very straightforward and also very promising.

The first courses have been implemented now. The evaluation will be done afterwards.

References

1. J. SCHREURS, R. MOREAU, I. PICART (2003) *"The value chain of the learning organisation. The L(E)RP system integrating all its subfunctions: an architecture",* Euromedia 2003 conference Plymouth 14-16 April 2003
2. J. SCHREURS, R. MOREAU, I. PICART (2003) *"Building an e-blended learning course using learning objects"* IADIS 3-6 June 2003, Lissabon
3. J. SCHREURS, R. MOREAU, I. PICART (2003) *The use of learner objects for building a flexible e-learning course*, EDEN, 15-18 June Rhodos
4. J. SCHREURS, R. MOREAU, I. PICART (2003) *"E-blended learning course building based on learner objects or learning process objects",* EISTA 2003 Florida 31 July-2 August 2003

5. J. SCHREURS, I. PICART, R. MOREAU (2004) *"Learning Object Management System (LOMS) and Learning Management System (LMS)",* will be published in the Proceedings of the Conference Knowledge Acquisition and management. KAM 2004. Kule Poland May 13-15
6. S. DOWNES (2000) *Learning objects: resources for distance education worldwide*. International review of research in open and distance education worldwide. International review of research in open and distance learning
7. H. W. HODGINS *The future of learning objects*. The Instructional use of learning objects (http://reusability.org.read)
8. ROBSON 1999 Object Oriented instructional design and web-based Authoring. http://robby.orst.edu/papers/objectoriented.html

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A PROPOSAL OF A METHODOLOGY FOR EVALUATING LEARNING OBJECTS

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Abstract

This article proposes a methodology to handle two problems of e-learning: validation of Learning using this method and the return on investment. The first part of this article defines a framework for e-learning, LOs and refers deeper into the problems concerning this recent technology. The European project BENVIC is analyzed, and an adaptation was made to the main tools to contemplate the LOs properties, uses and stakeholders. The methods and tools for a Benchmarking system for LOs (bLO) are described: a LO description based on the Learning Object Metadata standard; a System of Indicators related to LOs; a weighing system that links the indicators proposed with effectiveness and efficiency.

Since there isn't a universal model or a quality standard for LOs, the benchmarking system provides a way to compare LOs with other LOs, regarding different features and uses. This system must also include self-evaluation procedures so that a Continuous Improvement System is implemented. In this way, the system will get closer to meet the needs of the real users and will adapt to the LOs changes. The Continuous Improvement System guarantees that the method will not became obsolete. It will evolve with time and use and will follow the changes of technology, pedagogy and will meet users' needs.

The methodology here proposed does not intend to be a definite or closed system. It defines a working baseline for evaluating LOs, the first step for creating a more complex and more reliable evaluation system.

Introduction

The use of Information and Communication Technologies (ICT) in Education has been increasing in the last few years. It is also constantly evolving and facing new developments. However, when we are talking about developing electronic learning materials, the process is very slow and very expensive [1]. Up to now, e-learning has not been a very efficient solution, in terms of return on investment (ROI). So it is urgent to create mechanisms to evaluate e-learning and make it more competitive so it can grow. This framework led to the development of a new Learning Technology, the Learning Objects (LO). LOs are modular learning materials that can be combined with other LOs to form more complex learning materials or can be taken apart and recombined to create new LOs.

One other reason that makes urgent to evaluate e-learning is related to its effectiveness. It is necessary to validate e-learning as an effective learning method. However, the evaluation of learning is always a very complex process [2]. This is even more evident when we are evaluating LO, a very recent concept, immature, with no history of utilization or evaluation. The process of defining evaluation criteria becomes very hard. Also, the need to evaluate the reutilization potential of LOs brings more complexity to the process.

This work aims to create a useful, dynamic and flexible method to evaluate the efficiency and effectiveness of LOs, in a framework of great instability and constant change. It also aims to promote a collaborative approach that can answer to the concrete needs of the present day but that rapidly adapts to the changes, in a process of continuous improvement.

So, after analysing the present framework for e-learning, the LO concept, features, models and the problems related to evaluation in Education, we chose to develop an evaluation method for LOs based on the BENVIC methodology [3] for the evaluation of Virtual Campus (VC). BENVIC is a European project that developed a benchmarking system to evaluate VC in a context similar to the one we are facing with the LOs. Even though LOs and VC are positioned in different stages of the same sector, e-learning, this model seems a good choice. Both entities share the same general aims and similar problems related to evaluation: the lack of maturity, the quick evolution of technologies and applications, and the consequent difficulty in establishing evaluation criteria.

Proposed method – The Learning Object benchmarking system (bLO)

Any evaluation process implies the comparison with a standard [4]. However, when we refer to the evaluation of LOs there is not a standard, so comparison is not possible. This was the reason that motivated the development of this proposal: to evaluate LOs comparing them with other LOS, using a benchmarking process. This method intends to be flexible enough to adapt to the various types of LOs and also to the constant evolution of this sector. It also intends to be a useful and easy to use tool for teachers or other stakeholders to compare the performance of LOs with others, concentrating on the features they want to evaluate.

The method here proposed is based on the benchmarking methodology developed by the European Project BENVIC since their approach seems to be an adequate solution to the problems referred before.

From BENVIC to bLO

The adaptation of the BENVIC methodology to the method of benchmarking LOs (bLO) had as main principle a reduction of scale. The first refers to VC, an entity that relates to e-learning at the institution level (MACRO), and the second relates essentially at a MICRO level of educational materials. So, the adaptation process consisted in the transfer of principles and tools to the reality of LOs [5].

Principles of the system

Flexibility: This system should be flexible and easily adapted. A benchmarking system is flexible and can be easily adapted to the different stages of evolution of the learning objects and to quick changes. This flexibility is also very important because the LOs can be very different. Even though the LO definition adopted for this work is not as wide as the one adopted by the LOM, a LO can be as simple as an image or as complex as an entire course. Also, teachers, e-learning developers or even institutions can use this system and the system has to include all their needs.

Multidisciplinary approach: When we are evaluating a LO we have to consider not only the LO but also the circumstances in which is being used, the technology involved, the pedagogical strategy, and all the other factors that can influence the performance of the LO. The evaluation should also include other approaches as economical, institutional and cultural factors.

Promotion of a collaborative approach: The whole concept of LO is by itself an incentive to collaboration since it promotes the reuse of learning materials. One LO can and should be used by different teachers in different learning environments. This evaluation system intends to create the means to facilitate the collaboration within the academic community by making available an easy way to find existing LOs and the results of evaluation.

Formative and summative approach: This method has as a final aim the improvement of results and processes through a comparative analysis of practices and procedures.

Social and cultural differences: As it was previously referred to the evaluation of learning strongly depends on the framework. Social and cultural specialities can have a great influence in the performance of a LO. Also, the interpretation of the results of an evaluation process must consider these cultural and social differences.

Adopt an evolutionary approach: The system should be flexible and open to adapt to the rapid changes that are usual in this sector. This evolutionary approach is possible through the updating of the tools by the contributions of all the stakeholders

Consider the sensitivity of stakeholders: Different stakeholders have different needs and perspectives in relation to the performance of a LO. So, the bLO must include a weighing system that relates the features of a LO to the specific needs of a stakeholder.

The tools of the bLO system

The bLO includes the following tools, essential to the benchmarking process:

Profiling tool for LOs based on the standard Learning Object Metadata

This tool helps to structure the information for the rest of the evaluation process. It has also an important output: the creation of a standard repository of LOs.

It is very important that the description of the LO is universal. By using a standard description we make comparison among LOs possible. We chose to use the standard Learning Object Metadata [6] to describe the LOs. However, the LOM standard uses a very long description of LO that would take a long time to apply, making the tool less agile. So, at this point we are using a subset of the standard, adapted from a document created by the European project "Electronically Enhanced Education in Engineering: E3".

Also, we chose to use the LO definition proposed by Wiley [7]: "any digital resource that can be reused to support learning". This definition is also a subset of the one included in the LOM document. Mainly, we intended that this profiling tool should comply with the standards but also it should be very easy and straightforward to apply. The wide use of this tool is critical for the success of a collaborative evaluation system as bLO. This profiling tool includes filling instructions and a mapping of the data o the LOM standard.

A system of indicators

It establishes values for the performance of LOs, covering all aspects and features of LOs and its application. This tool also gives a relative position of a LO compared to all the others that have been evaluated and will make transparent which part of the LO should be improved.

The indicators are the critical point of the system since all comparisons between LOs will be based on this tool. So, for the development of this tool some principles had to be considered:

- The indicators should predict the use for any kind of LO included in the definition adopted
- It should meet the needs of every stakeholder of the process and follow the evolution of those needs
- It should contemplate the circumstances of application

However, at the time that this tool was created there were no quality criteria established for LO. So, we have chosen to develop an initial system of indicators based on the analysis of the LO concept as it is proposed by several models and entities [7] [8]. It is important to understand that, at this point, this tool intends to be nothing more than a starting point, a working baseline. The system has to be calibrated and validated. To accomplish that, the system has to be applied to several LOs, in different contexts. The use of the bLO will help to understand how the LOs relate to the indicators, which ones should be applied in each situation and other crucial information. Also, the bLO should include a meta-evaluation system to make it a Continuous Improvement System. This will probably mean that in the first phase of application the system will need major changes to meet the users' needs. But, in a later phase each input will make small adjustments to the system that will make the system accurate and up to date.

One other important aspect of this system is that with a general use, a LO quality standard is being simultaneously created and this standard will also evolve with the system. The standard is built on every LO that is included in the system.

The first phase of development consisted in research about the LO and its features. Several models [7] [8] and definitions [6] were analysed in detail. Next, a concept map was built based on the information gathered before. Several important concepts related to the evaluation of LOs became evident. After that, four categories of attributes of LOs were established by grouping the information of the profiling tool: Educational, Technical, Structural and Logistical.

Finally, after the four categories were found and considering the result of the previous analysis, an embryo of an indictors system was established. As in BENVIC [5], three types of indicators were considered: Structural, Practice and Performance. To make easier the application of the system, we adopted the following marks for the indicators: (0) Not applicable; (1) Partially applicable; (2) Totally applicable. The performance indicators have different marks. For each category, several indicators were selected.

After the indicators were found we concluded that would be essential to relate this indicators with the reuse potential of the LO and its Learning efficiency. So, a weighing system was created that relates each indicator with these two fundamental characteristics of the LOs. This weighing system has to be calibrated and validated along with the rest of the system.

A map of competences and procedures

Helps identifying which are the competences and procedures that are necessary to improve the LOs on the areas identified on the previous steps. An improvement plan is built as a result of this tool.

After the system of indicators is fully developed, tested, and validated, it is necessary to relate the indicators to the competences and procedures necessary to improve those indicators. Only then, an improvement plan can be established. However, this last tool should be based on empirical data retrieved from the real use of LOs in various contexts. As all the other tools of this system, this one should also include an evolutionary approach, should meet the needs of every stakeholder and should contemplate the framework of application.

Conclusions

The system bLO here described is still in an early stage of development. Three fundamental tools have been developed: a profiling tool, an indicators system and a weighing system. It is now necessary to start the implementation phase, applying the tools to several case studies. With the data gathered, the system can be calibrated and validated. Only then, the map of competences should be built.

Also, as future works, it would be interesting to develop weighing systems that relate the indicators with specific needs of stakeholders, with cultural and social specificities and with different kinds of LOs. One other interesting tool to be developed would be a system that would gather the results of the metaevaluation of the system and that would automatically feed the results back in to the bLO.

References

1. MORTIMER, L. (2001) *The Devil is in the Details: Converting Classroom Courses to E-Learning,* Learning Circuits, www.learningcircuits.com
2. CARVALHO, C. V. (2003) *Defining an evaluationMethodology for blended learning in Higher Education,* Evaluating e-learning – Galecia Project
3. BENVIC (2000) BENVIC benchmarking system. Methodological Report
4. WILLIAMS, D. D. Evaluation of Learning Objects and Instruction using Learning Objects
5. BENVIC (2002) Evaluation Methodology Report – Benchmarking for Virtual Campuses
6. IEEE/LTSC (2002) Draft Standard for Learning Object Metadata, Institute for Electrical and Electronics Engineers
7. WILEY, D. A. Connecting Learning Objects to instructional design theory: a definition, a metaphor and a taxonomy
8. MASIE, E (2002) *Making Sense of Learnig Specifications & Standards: A Decision Maker's Guide to their Adoption*, The Masie Center, evaluation

CONTEXT MEDIATION FOR LEARNING OBJECTS EXCHANGE

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Abstract

The wide proliferation of e-Learning technologies makes their users capable to access a large amount of learning objects created in various parts of the world and across many cultures. Moreover, the globalization of society causes integration and exchange of curricula built in different countries and educational organization. Due to the semantic heterogeneity of learning objects built within different cultural contexts, the delivery of these objects to learners is not effective. The presented paper is related to the development of a delivery technology based on the approach of context mediation, which improves the effective integration of semantically heterogeneous learning objects, adapts their contents to specific cultural contexts of learners and facilitates their delivery to such culturally diverse learners.

Introduction

The context mediation is an approach for achieving semantic interoperability among sources and consumers of large-scale semantically heterogeneous databases [1, 2], such as databases of learning objects. Within this approach (Figure 1) the Learning Objects, such as course outlines, course notes, textbooks, pictures, and visual presentations, are the semantically heterogeneous data sources loaded from the local digital library or Web.

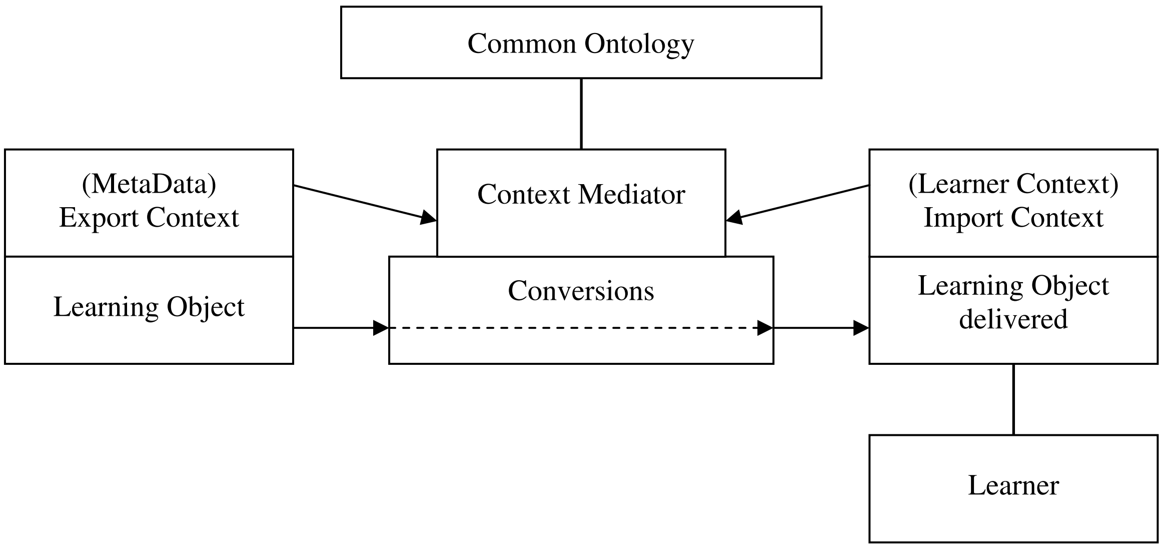

Figure 1. Context mediation for learning objects exchange

The learning object's MetaData contains the semantic description of the learning object that constitutes Export Context of the learning object. The Learner is the data consumer. The Learner Context is the description of mental and cultural characteristics of the learner that constitutes Import Context of the learner. The MetaData and Learner Context can be captured and then coded by the same language or formal system. These contextual descriptions usually contain characteristics, such as language, measuring system, conventional data types, cultural features, etc. An approach described in this paper assumes that the learner is not independent user of e-Learning tools. Usually the learner exists within an educational system, which has built its own learning objects. Thus, capturing the learner context can be carried out through capturing the MetaData of the learning objects built within learner's educational system. The Context Mediator compares the Export and Import contexts (the MetaData and Learner Context) and eliminates semantic conflicts that are detected through the comparison process. As a result of the elimination of these conflicts, the Context Mediator generates a sequence of context conversions that are necessary to represent the learning object in a context (or a view), which is understandable for the learner. The converted learning object is delivered to the learner.

This comparison of the contexts is based on the Common Ontology [1], as specification of the Context Mediator's knowledge about learning objects and knowledge domains, which these learning objects belong to. This description should be conventional (or standard) for any database of Learning Objects and independent on contexts of learning objects and learners. This paper is focused in building and integrating domain ontologies of the learning objects involved in delivery to learners with the goal of building a domain of Common Ontology.

The definitions, basic principles and criteria for design of ontologies [3] as well as some existing methodologies for building ontologies are reviewed [4], and the *Skeletal Methodology* by Uschold and King, which provides general guidelines for developing ontologies, is selected as basic approach for the task of building Common Ontology in the context mediation for achieving interoperability among learning objects and learners. According to this methodology the process of building the Common Ontology assumes three steps [5]: ontology capture, coding ontology using a formal language, and integrating existing ontologies. This work is concentrated on the process of building ontologies of learning objects following the Skeletal Methodology and implementing them in the context mediation.

The framework of building ontology for the context mediation and its use for forming learning objects to be delivered to learner's context

Let us introduce some definitions useful for the topic. The basic knowledge representation model for ontology representation in this work is *ontological graph* (*ontograph*) formally described in [6]. The ontological graph is *multilevel*, because during the acquisition and forming ontological knowledge the installation of steady associations is happening. A *steady association* is a set of ontological concepts and relationships among them unambiguously describing some knowledge. The steady association is considered as a new concept on a higher level of the ontograph. Because the ontograph is multilevel it is necessarily to link its levels. A *transition matrix* is used for formalizing the transitions between levels. In terms of the context mediation, *ontology* – is a set of objects and relationships between them, which are mapped into conceptual model of a data source. *Context* describes relationships between particular data and its semantics in the particular databases. The following context and ontological definitions are used for the context mediation approach:

- *basic ontology* – is a basic ontological graph formed for any source or consumer;
- *integrated ontology* – is a result of integration of basic ontologies;
- *steady associated ontology* – is a resulting ontology with steady associations – this is the higher-level ontology;
- *contextualized ontology* – is an ontology with an attached conceptual context of any source of consumer involved in data exchange;
- *conceptual context* – a set of concepts for a domain of learning objects and learners participating in e-Learning case.

Following the Skeletal Methodology the process of building Common (or integrated) Ontology consists of: conceptualization of the systems (learning objects and learners) involved in data exchange and forming basic ontologies, attaching the conceptual contexts to the basic ontologies, and resolving ontological conflicts, caused by semantic heterogeneity of the basic ontologies, for finding interoperability among ontologies participating in the integration.

In terms of the task of context mediation the process of forming ontologies of learning objects to be delivered to learners can be figured out as the following:

1. *Pre-processing* – forming a set of objects participating in the integration process, definition of data sources (learning objects) and consumers (learners) depending of goals of the integration process.
2. *Conceptualization* – forming basic ontological graphs of learning objects involved in delivery without consideration of heterogeneous structure of them, and finding potential interoperability between these learning objects and learner. The basic ontological graph is formed trough decomposition of learning objects, coding ontology, forming possible steady associations, and forming object dictionary.
3. *Contextualization* – determining contexts of interoperability and eliminating data conflicts caused by structural and semantic heterogeneity. The contexts of interoperability are formed trough attachment of conceptual contexts of learning objects and learners to the ontological objects obtained in the conceptualization stage.
4. *Integrating ontologies and finding interoperability* among the integrated ontological objects is happening trough elimination of semantic homonyms and finding semantic synonyms in the contextualized ontologies. As a result of integration of ontologies the Common Ontology is obtained. The Common Ontology can be used for the further conversion of learning objects to learner's context.

The process of integrating ontologies for the context mediation assumes existing several integrated basic ontologies of systems involved in data exchange and resulting ontology. Domains of integrated and resulting ontologies may be different but usually they are loosely coupled. Guarino formulates the problem of *integrating* ontologies as a lack of overlapping different intended models, which are approximated by two different ontologies, even if these ontologies overlap [7]. It means that a bottom-up approach to integration may not work for the tasks, where ontologies are focused on the relations relevant to a specific context. The use of a single *top-level ontology* rather then *intersection* of different ontologies is proposed for resolving this problem. Within the approach in this work it means that domain of the resulting (common) ontology includes either knowledge about domains of all integrated ontologies or knowledge about links among domains of integrated ontologies. These links are formed trough search of identical and/or synonymic concepts in the integrated ontologies.

The context-ontological relations in the context mediation approach are represented in figure 2. The process of finding interoperability between learning objects and learners can be carried out trough the following four ways:

1. Direct linking basic ontologies (or intersection of ontologies) of learning objects. This way is possible only for semantically and structurally identical learning objects.
2. Linking basic ontologies through the built top-level ontology. This way is also possible only for semantically identical learning objects, but the basic ontologies can be structurally different. Also this way allows reusing these links.
3. Comparison of contexts and linking semantically equivalent concepts. This way considers contexts of data, and allows integrating semantically heterogeneous learning objects, but this comparison is necessarily for each session of delivery of learning object to learner.
4. Building the top-level ontology considering contexts of learner

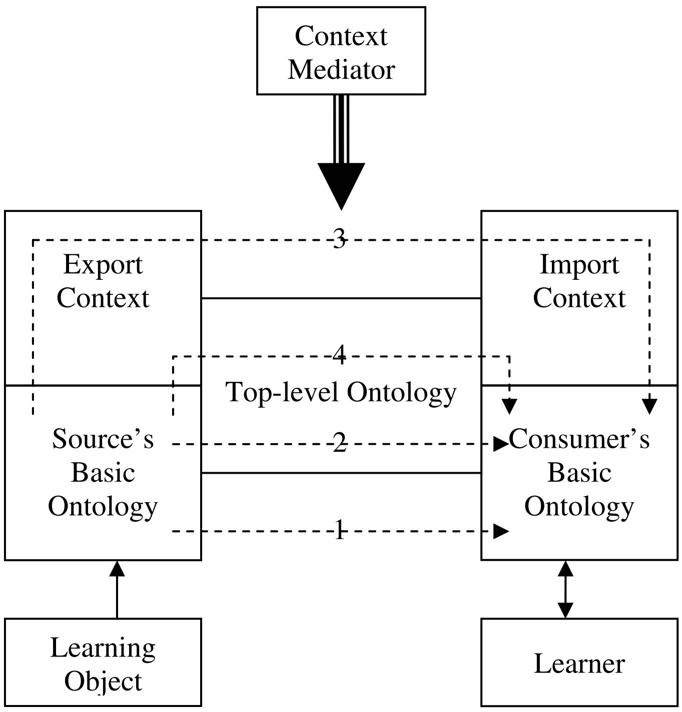

Figure 2. Context-ontological relations

object and learner. This way allows integrating semantically heterogeneous learning objects and storing the links of interoperability for the further reuse.

The way 4 is used in this work for building ontology to assist delivery learning objects to learner's context. Theoretical approaches for building and integrating ontologies for interoperability among learning objects are described in [8]. An example of conceptualization, contextualization and achieving interoperability among learning objects is represented below.

An example of building and integrating ontologies of fragments of course descriptions

The example in figure 3 describes integration of two simple fragments of learning objects – course descriptions. The goal of this integration is to find compatibility of curriculums in Canadian and Ukrainian universities, where Ukrainian learners are consumers of both Canadian and Ukrainian curriculums. Although the conceptualization maps data from these two fragments of descriptions to the same ontological objects "Course" and "Credit", they cannot match without modification, because they are represented in different contexts. To find interoperability between these data structures, their domain ontologies should be integrated with the goal to build a domain of Common Ontology.

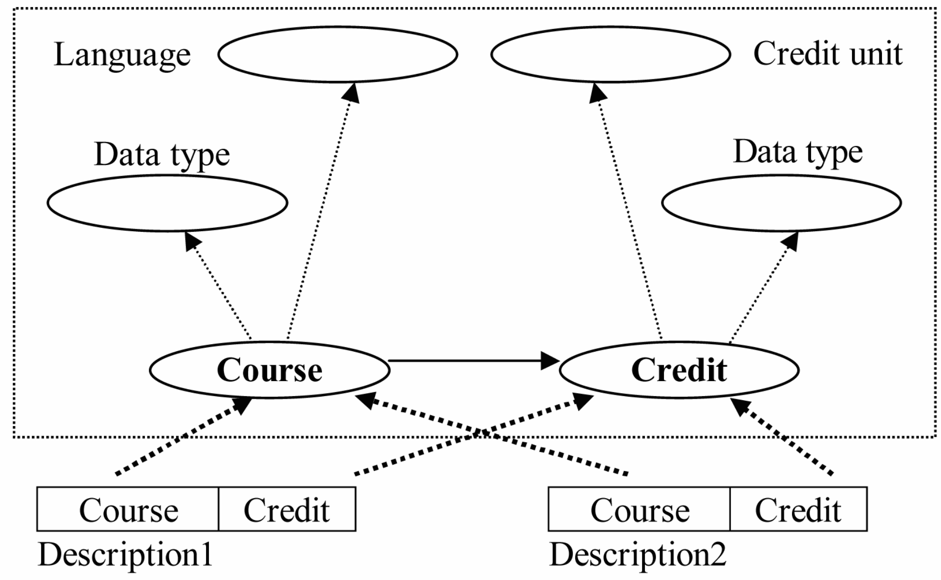

Figure 3. Mapping data to ontology and attaching its contexts

During the process of contextualization of these ontological fragments the following conceptual contexts are attached to ontological objects: for the object "Course" CC_1={name, type, language}, for the object "Credit" CC_2={name, type, credit unit}. The particular values of these concepts are represented in figure 3. A lack of overlapping between these contextualized ontologies is a problem of integration of these ontologies; that is why integration must involve not only ontologies, but also sets of conversion operations to find identical and/or synonymous concepts. The resulting ontology includes either knowledge about all integrated ontologies or knowledge about links among these ontologies through conversion operations.

The ontological graph of resulting ontology (figure 4) consists of:

- previously contextualized *ontological fragments* O1 and O2 (solid line arcs represent relationships between ontological objects; dotted line arcs represent attachments of conceptual contexts to ontological objects, which are considered as transitions to the steady associated ontology in the resulting ontology);
- *conversion operations* (C1 – Ukrainian-English translator, C2 – converter of credit hours to academic hours, C3 – converter of data types);

- *meaningful links* among integrated ontologies and conversion methods, or steady associations (doubled line arcs – these arcs represent links between identical concepts of the conceptual contexts and conversion methods).

Thus, the resulting ontology is built. Interpretation of meaningful ontological chains between objects produces sequences of applying conversions for achieving interoperability between represented learning objects. According to the resulting ontological graph in this example: for achieving interoperability between attributes "Course" it is necessarily to translate data from English to Ukrainian (Ukrainian learners are consumers); for attributes "Credit" – conversion of data types and conversion of credit hours to academic hours. This resulting ontological fragment can be then reused for integration of curricula of other Canadian (English-lingual) and Ukrainian Universities. The same way of building common ontology can be applied to other types of learning objects built in various contexts.

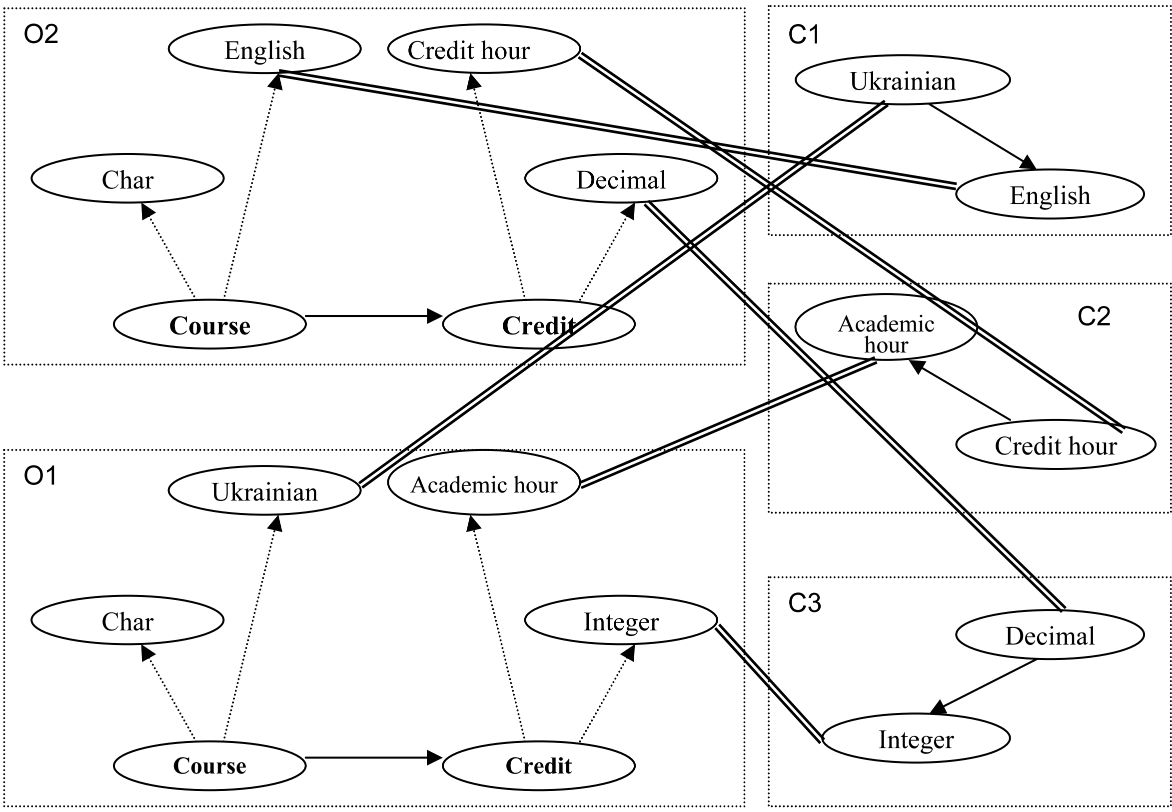

Figure 4. Integration of contextualized ontologies through use of conversion operations

Conclusion

The presented paper describes an approach and example of building ontology for context mediation to assist delivery of learning objects to learner's context. The approach is based on finding links of interoperability between learning objects to be delivered to a learner and learning objects already existing in the learner's context (in the presented example there are fragments of course descriptions). The built ontology allows finding correct sequences of conversion operations to transform learning objects to a form that is understandable by a learner. The delivery of transformed learning objects is important to support distance education for learners from various countries and cultures around the world. Although the represented example shows connectivity between Canadian and Ukrainian learning objects (because there are author's countries) it can be used for connectivity among other cultures that is particularly important for culturally diverse European Union.

References

1. GOH, C. H., MADNICK, S. E. AND SIEGEL, M. D. (1994) *Context interchange: overcoming the challenges of large scale interoperable database systems in a dynamic environment*, in Proceedings of the Third International Conference on Information and Knowledge Management, Gaithersburg, MD, 337-346
2. FIRAT, A., MADNICK, S., GROSOF, B. (2002) *Financial Information Integration in the Presence of Equational Ontological Conflicts*, MIT Sloan Working Paper No. 4408-02; CISL Working Paper No. 2002-16
3. GRUBER, T. (1995) *Towards Principles for the Design of Ontologies Used for Knowledge Sharing*, International Journal of Human-Computer studies, 43 (5/6): 907-928
4. FERNANDEZ LOPEZ, M. (1999) *Overview of Methodologies for Building Ontologies*, Workshop on Ontologies and Problem-Solving Methods: Lessons Learned and Future Trends, IJCAI-99, Stockholm, Sweden
5. USCHOLD, M. AND GRUNINGER, M. (1996) *Ontologies: principles, methods and applications*. The Knowledge Engineering Review*, 11(2): 93-136*
6. BILETSKIY, Y., DUDAR, Z., VOROCHEK, O. (2003) *Integration of Ontologies for the Meta-Context Mediation*, IASTED International Conference on Artificial Intelligence and Soft Computing, Banff, Canada
7. GUARINO, N. (1998) *Formal Ontology and Information Systems,* Formal Ontology in Information Systems. IOS Press.
8. BILETSKIY, Y., VOROCHEK, O., MEDOVOY, A. (2004) *Building Ontologies for Interoperability Among Learning Objects and Learners*, The 17th International Conference on Industrial and Engineering Applications of Artificial Intelligence and Expert Systems (IEA/AIE), Ottawa, Canada (to appear)

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E-LEARNING AND THE FILTERING OF KNOWLEDGE

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1. Introduction

The amount of information in the online learning environment is enormous. The e-learner therefore needs to filter out what is of relevance for his/her purpose. Finding, selecting and judging information are increasingly important skills in an ever changing and complex world. New problems occur and new solutions are needed. The faster one can solve new problems based on reliable information, the more competitive the individual is. Information filters can be desirable, necessary, efficient and valuable. On the other hand, information filters may have unwanted, negative and biased effects.

The FILTER project wants to enhance affordable access to high quality electronic knowledge[1] and information to learners at all educational levels in Europe. Economic and cultural filtering may reduce the unbiased and independent forming of opinions of the learner, with young generations growing up with diminished social and cultural consciousness. This is counterproductive to the common ideal of a 'Europe of knowledge' where favourable conditions should be created for a fair and high quality European educational content. FILTER will address these issues related to affordable, cost effective, fair and generally accessible knowledge on the web as well as their implications for policy regulation in the public and open domain. In this paper the FILTER objectives and project details will be presented (par. II). In paragraph III the different filtering levels will be discussed. In paragraph IV some filtering cases are shown. Finally, the results achieved and expected are presented (par. V).

2. Objectives and project details

FILTER objectives. The right of European learners to have free or at least affordable access to useful and high quality knowledge is largely undisputed. On account of the emergence and rapidly increasing importance of digital distribution channels however, access to knowledge becomes more and more limited to those Europeans privileged to be able to afford it. Additionally, electronic knowledge itself may be filtered on economic criteria set by content providers and bounded by intellectual property rights issues. And electronic knowledge might be bounded in an ideological or cultural tradition. The term *electronic knowledge* within the framework of FILTER refers to all information resources and services in electronic learning environments. The above considerations lead to the following main FILTER objectives and subsequent five work packages:

1. To identify and formulate an operational concept of the hidden mechanisms that hinder generally accessible, fair and affordable knowledge, based upon a review of various resources. In this Work package 1 a conceptual framework is formulated.
2. To demonstrate the specific economic filtering criteria and ownership mechanisms that lead to reduced educational access in the different countries. Work package 2 will lead to a comparative analysis of the filtering issues.
3. To provide the policy making communities throughout Europe with the crucial FILTER factors and to discuss a successful knowledge foundation for the concept of a Europe of knowledge. Work package 3 will include interactive conferences and increased web presence.
4. To assess a viable and cost effective strategy to solve the FILTER problems, after consultation of country-experts. During Work package 4 expert interviews and strategy development are envisaged.
5. To disseminate the FILTER results on a large scale throughout Europe, in Work package 5.

The project team. The FILTER group is composed of a core group and a resonance group and represents colleagues from academia, government, industry, education, and training. The co-ordinating organisation is the Economisch and Sociaal Instituut of the Vrije Universiteit (ESI) in Amsterdam (NL). The Partner organisations in the FILTER team are:

Core group: Ministry of Education (BE), World Bank (PO), AristeiaOnline (IT), Open University (UK), Stockholm University (SE), BOLDIC (DK), CEDEFOP (GR)

Resonance group: Compu'Train (NL), Budapest Business School (HU), SANTEC (Botswana), SOFF (NO), Bolger (IR), Technical University of Athens (GR), Seventer, van (NL)

Main focus areas. FILTER will study on quality-issues of the internet information in relation to educational use. Two main focus areas are (1) economic filtering, and (2) ideological and cultural filtering. With respect to these two focus areas FILTER envisages to identify economic and ideological/cultural filtering processes of information on the Internet that decreases its usefulness in educational contexts. FILTER will try to explain and understand the driving forces, processes and actors behind the two focus areas. FILTER will identify existing practices and recommend new policies. Policies that assure valid and reliable internet information for educational purposes. Finally policies limiting economic, ideological/cultural filtering and respecting the variety of cultures and languages worldwide.

Further details. FILTER envisages the European learner, from infant to adult into his seniority, in search of relevant knowledge, able to have free or at least affordable access to public sources without social, cultural or economic exclusion of certain groups or data. The historical and multicultural approach of FILTER is symbolised by the words of Confucius (551-479 BC) "*To know that we know what we know and that we do not know what we do not know, that is real knowledge*". FILTER originated from a paper presented at the EDEN conference last year (van de Bunt-Kokhuis, 2003), has a duration of 24 months and will complete its work by the end of 2005. The project is supported by the European Commission, the so called *eLearning Initiative*, see http://europa.eu.int/comm/elearning.

3. Different filtering levels

During the first stage of the study, FILTER worked on the development of a conceptual framework to structure the fieldwork. In this paragraph an impression is given of a major element of the conceptual framework, namely the identification of some filtering levels. Filtering is not a new phenomenon in society. In the internet age it may get an unprecedented size. And the scope of filtering may accelerate compared to former days. The table below summarizes some of the filters that are of interest in this study. The aim is to give a holistic picture of the different types of filters on the gliding scale from information to knowledge. Individual filtering on level A is of importance for the marketing of messages – catching attention, directing attention and getting the message across. Filtering at level C, the pre-internet level, signifies all information and resources not available on the Internet, sometimes used to validate internet information. The FILTER-project primary focuses on the filters built in purposefully or not on the Internet and its information, levels D, E and F. A second focus is the filter at level B, individual knowledge and value filtering – that is, to what extent people are aware of existing filters? How they cope with filters? What strategies and interpretations they developed about internet filters? At the levels outlined so far there are many subcategories of filters to be further elaborated in the coming phases of this project.

Level A

Perception filters. At the individual levels there are two basic categories of information filters. First our senses automatically filter the flow of information already before it reaches the conscious brain. This filtering mainly takes place at brainstem level. Without this information filter sorting out "noise" we would be overwhelmed by stimuli. Sensory impairments can distort the input and act as an undesired filter. The internet information is less communicated if colours, fonts, layout etc. are not adapted to human perception. Some web sites enable optional appearances in order to make information accessible to people with disabilities: Talking web pages and larger fonts for the visually impaired and so on. In order to attract attention, direct attention and convince the knowledge about how human perception works is also used by commercial and political actors. The moving objects on web pages attracts our attention naturally – our senses are sharp and alert to detect event changes in the environment, probably an advantage to survival. To use movements and sudden sounds to attract our attention are now possible and is increasingly used in the new media, it was not possible in the printed papers. One can easily see the great difference between a printed version and a web page version of the same newspaper. The perception filter is filter at level A.

Level B

Knowledge and value filters. Another individual information filter is our knowledge, our judgments, critical thinking, values, comparison with pervious knowledge etc. This knowledge filter – filter at level B – is personal and individually constructed in contrast to the innate filter at level A – all humans' senses functions in the same way, but experiences and knowledge is acquired uniquely for each individual. Our pre-knowledge, ability to code and store information acts as filters – active processes in selecting and deselecting of information. Therefore the same information will be interpreted different by a different individual. When reading the underlying meaning in a text circa 50% is made up by our own pre-knowledge – it is not there explicitly.

The 18th century philosopher, Denis Diderot said something like "*Who is the most creative, the author or the reader?*" Research findings indicate that it is in fact the reader. Meaning is created when an individual absorbs information and merge it with previous knowledge and insights. As an individual: to acquire a "*brain filter*", meaning the skills and ability to critically judge information is probably the best vaccination against fake and unreliable information. In order to develop this brain filter, the individual needs to know the nature of the information environment and potential biases.

Not only knowledge differs between individuals, but also values and norms. In a global world with the Internet as one of the prime driving forces it is clear that not the least values and norms differ between societies, groups and individuals. It was evident that filter B was of prime importance among the interviewees – since they were very experienced in using internet information. Their knowledge filters about information to be trusted and their critical thinking are probably much more developed than among the general public. To develop strategies and knowledge improving filter B is one of the aims of this project and also to find out ways of protecting subjects using Internet with a weak or less developed filter B, like children and naïve users – including old users. The interviews uncovered some useful filter B strategies, see below. When it comes to information it is also filtered consciously by the producers and providers.

Level C

Pre-internet filter. One filter is that not all information is available via the Internet for different reasons, filter level C. When it comes to deep knowledge the printed book still holds a strong position. The screening of information before acceptance to publish as a printed book is more rigorous since it involves economic risk taking compared to simply publish the information on the Internet. The pre-internet filter is the screening of information that never ends up at the Internet at all. What are the reasons? It could be that the information is too trivial and therefore was never published on the Internet. Or the opposite; the information is very valuable and therefore never published on the Internet. It is difficult to get paid for information on the Internet – newspapers, book publishers, authors, etc. have experienced that. Therefore if an author has something to say and people find it important enough to pay for it, the publishing of that information would most probably be in the form of a book. This is even true for research and books on topics about how to use Internet efficiently, distance education using IT, etc. We therefore have a filter before Internet that screens out important information and distributes it via other channels.

Level D

Search and sorting-out filters. The filtering of information on the Internet involves first of all filters used to find information among millions of web pages, both dealing and sorting out the large quantities (to cover all/or most information in the topic) and to sort out the high quality content. The internet filters used to search information on the Internet we term filter at level D. Notably here we find the search engines and how they operate, but also browsers and their adjustable filters, specially tailored programs blocking unwanted information or screening out wanted information. A large subcategory is the security filters such as anti-spy programs, anti-spam filters, fire walls, virus protections, anti-cookie programs etc.

At this level the quantity (volume) and quality (valid) aspects of information are at stake. Concerning the quality of information, studies have shown that there is a ranking order from best quality (e.g. books) to lesser quality (e.g. CDs) to lowest quality (Internet). Internet contains both very low quality and very high quality in great volume. To compare: low quality books will probably not get printed at all. The qualitative filtering is probably less strict on the Internet. The quantitative filtering is enhanced by search engines, trying to structure the internet volume of information more or less successfully. No search engine can handle all internet information, only parts of it. What does this imply for the e-learning environment? Students may predominantly use internet information. The may rely on the offered selection of (market driven) search engines or a standard menu of their PC or online course. If students do not read books anymore there is a risk that they only get the surface information. Students are filtered out from the deeper book information which takes longer time to get hold to, is too expensive or is not available at all. Schools are reporting that they are better off because the students can use the Internet as a vast "library" for free and with easy access compared to their own poor, not updated physical libraries. At the same time teachers are complaining about the low quality of student work because they only use surface internet information. Students (and teachers!) may filter themselves out by not using the deeper book information as was the case in the past. Or by not exploring the deeper web but go for the easy search machine option. An anti-intellectual attitude may become more common. A last issue related to the quality of information is the integrity of sources. Access to pluralistic sources is not always possible. What are the driving forces behind cultural and ideological filtering? Is the content offered in a multicultural context or are examples drawn from one culture, is the learning style culture-bound, etc.?

Level E

Legal and language filters. Once the information is found we want to use it, but may be prohibited because of various reasons such as copyright, it is protected by passwords, we don't master the language etc we term this as level E-filters. For obvious reasons, authors and publishers want to get paid for their work. To get real quality information on the Internet, more often the user has to pay for passwords to enter electronic journals and encyclopaedias. This filtering process increasingly excludes students and marginalizes various less privileged groups from the online learning environment. Another filter is the confusing and distracting moving banners, etc. that draw attention to the marketing of products. Not only do they make it more difficult to find and select relevant information, but these applications also slow the computer down and make information seeking more time consuming. That is probably the price to pay for having information for free.

Level F

Surveillance filters. Finally in this preliminary conceptual framework there is a category of filters, sorting out of who you are, what you do, what information you seek etc in order to market things to you, identify you or control you. These types of surveillances, often unnoticed by the individual and not monitored by the subject, are termed F- filters. They are fought, if noticed, by a whole brand of filters at level D, see above and by altering behaviour and procedures when using Internet. Filters at level D and Filters at level F are in a constant arms race. The privacy of the e-learner is an underestimated issue in the societal and European discourse. Very little is known by the public about electronic traces and filters to monitor the communication flows in the e-learning environment. New software and hardware to be launched in the near future will even enforce a further monitoring and filtering of users. Different filtering and monitoring purposes such as marketing and safety issues are subject of study here.

Table: A summary of the filter levels

1. Individual:
= our senses – (Filter level A) – "Perception filters".
= our thinking – (Filter level B) –"Knowledge and value filters".

2. Information:
= Not available on the Internet (Filter level C) – "Pre-internet filters".

3. Internet information. (Filter level D) – "Search and sorting-out filters":
i) Volume: quantity
ii) Valid: quality

To use information:
iii) Copyright, language (Filter level E) – "Legal and language filters".
iv) Privacy: covertly controlled (Filter level F) – "Surveillance filters".

4. Some filtering cases

Search engines. On the Internet there is an increased offer of electronic search engines. Search engines are an example of filtering on *Level D*, where quality and quantity aspects of information are at stake. Information representing a certain market value might be given preference over other information. Over the last decade search engines have become more entrepreneurial, rather than being neutral electronic encyclopaedia. Commercial search engines offer, for understandable reasons, additional services to companies. Henshaw (2001) shows the ethical problems with electronic search engines. First, search engines offer paid placement, by selling increased brand visibility in the directories of the search machine. Second, paid inclusion does interfere with search hits. Results from commercial sites are interspersed with true editorial results. Waters (2003) argues that paid listings have put a question mark over the legitimacy of results. For users it is not always transparant which search results have been commercially sponsored and which have not. According to Waters, it is '*rather like mixing a public library's card index with the Yellow Pages*'. Some search engines use human editors, to select a list of top websites. The algorithm they use reads all of the results without knowing which are paid and which are unpaid. The human editors advise advertisers how to present the information from their websites so that it has the best chance of catching the eye of the algorithm and winning a higher ranking. Through this process, search engines indirectly play a crucial role in the privatisation of information on the web. Exclusive knowledge is becoming more and more scarce, and likely to be expensive in the future. Through the use of intelligent agents, advertisers can more easily target consumers through their search criteria. In close collaboration with search engines, the advertisements might be build in as hidden messages or wrapped e-mails.

Intellectual property rights. Intellectual property rights (IPR) illustrate the filtering on *Level E*. For economic reasons some high quality information is not free available via the web. IPR is not a new phenomenon in the world of business, research and education. Over the last few decades international companies provide funding for some areas of research. In turn these companies want to have the first benefits of the research results. There are various examples of in-built bias in the university research system, e.g. in pharmacy the influence of international industry is manifest. In this respect Quinn Trank and Rynes (2003) are concerned about the responsiveness of business school curricula to the latest market trends. Business schools offer commodified knowledge, a capital good "owned" by corporations and for sale on the marketplace. Bok (2003, pp.79-80) argues that irreplaceable value might get lost if online courses are introduced on a commercial basis in higher education. He gives the example of Columbia Business School (CBS) that contracted the company U.Next to develop online copyrighted courses. CBS allowed their professors to offer online courses in exchange for royalties from fees collected from subscribing students. The contract gave the company U.Next instant credibility and made it easier to enlist other leading universities with the kind of '*brand names*' that could attract large enrollments of students here and abroad. CBS was interested and the company offer matched with the CBS ideal '*to reach a global audience and corporate marketplace*'. Despite the fact that the impact for faculty and students was enormous, the contract was negotiated behind closed doors without consultation of the future users.

Privacy of the e-learner. Privacy is an example of filtering on *Level F*. The computer industry foresees a big market in producing filtering software to protect computers from hackers and viruses. Probably, not only new software, also new hardware is needed to protect the new computer from viruses. In the near future hard- and software will be connected to a personalised signature. This signature requires privacy details of the e-learner and thus creates *conditioned access* to the e-learning environment. This implies new and complex privacy problems. Producers of software will have increased control over how e-learners search, apply or modify their educational information. Some critics even question why students, while monitored for marketing reasons, not get paid for this in stead of paying for attending the course. In theory the future software of a certain brand can block the access to documents and valuable knowledge made with software of competitive brands, and subsequently limit the free flow of knowledge. What are the lessons to be learned from online marketing? Youth marketers developed various online monitoring methods to surveillance youth trends in peer-to-peer settings (Quart, 2003, p.57). The company Youth Intelligence invites children to participate in chat panels to gather data on their taste and collect opinions of these young minds. Big Fat Inc. encourages children to promote new movies in their online peergroup. The Big Fat website instructs its workers on how to "*Get your target talking about your brand without even knowing they're talking about it […] now that's real buzz*".

5. Outlook: results achieved and expected

The results achieved after the first two months of FILTER are (1) the commitment of various project partners able to contribute to FILTER's objectives, (2) development of an initial framework to guide FILTER's project partners in their analysis, (3) sponsorship meetings with interested organisations to contribute financially or provide access to relevant practice areas, (4) kick-off meeting in February 2004 in Amsterdam focussed on the enhancement of the conceptual framework and official start of Work Package 1, (5) position papers and discussion statements on intellectual property rights, multimedia and search engines, (6) some international articles published or forthcoming, (7) launching of the dedicated website www.filternetwork.org.

In the longer term the main deliverable of FILTER consists of an advanced package of essential information on filtering of knowledge. Through publications, web presence, conferences and CDs the study results and insights will be disseminated. Not only awareness will be raised among European citizens concerning the (hidden) mechanisms that hinder an open access to knowledge on the web. Practical guidelines will provide improved conditions for open-source and public domain content in a democratic Europe. The outcomes address a large audience. The FILTER package will be disseminated in various media in a two-step approach. The main target group is the policy-making community. Indirect target groups will be reached through the policy-making community, amongst others e-learners within higher education, small and medium sized enterprises, e-learners in marginalized (socio-economic) positions or locations such as Africa or Eastern Europe, and e-learners with specific mental or physical needs. The project addresses the fundamental question how Europeans think about the relationship between education as a public good, Internet and the world economy. It is a common concern to educate younger generations to become creative citizens with ideals and who care. In the other extreme case education would produce passive young consumers of prefab online content. There are many positive initiatives in education to explore further. The rich history of various knowledge traditions in the enlarged European community is worth working on this ideal!

References

1. BOK, DEREK (2003) Universities and the Marketplace, The Commercialization of higher education, Princeton University Press
2. VAN DE BUNT-KOKHUIS (2003) *E-Learning and the Quality of Knowledge in a Globalised World,* In: The Quality Dialoque, Integrating Quality Cultures in Flexible, Distance and eLearning, Conference Proceedings, EDEN Conference Rhodos, pp. 6-11
3. HENSHAW, R. (2001) *What next for Internet Journals? Implications of the Trend Towards Paid Placement in Search Engines,* In: First Monday, Issue 6, No.9
4. QUART, ALISSA (2003) Branded. The buying and selling of teenagers, Arrow
5. QUINN TRANK, C. AND S. RYNES (2003) *Who Moved Our Cheese? Reclaiming Professionalism in Business Education,* In: Academy of Management Learning and Education, Vol.2, no.2, pp.189-205
6. WATERS, R. (2003) *Do search engines tell us the truth?,* In: Financial Times, August 12, p.6

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[1] The concept of '*knowledge*' is discussed here in its international and cultural context. The large amount of available information in various societies and on the Internet provides building bricks for knowledge. Whether information is considered knowledge or not depends on the context where knowledge receives its significance. Knowledge can be legitimised from within the context of a certain organisation, e.g. research undertaken in a university. Research can create meaningful knowledge within and outside the context of the university. On the level of the individual person, knowledge is a composition of experience, information and skills. More often, knowledge is not explicitly perceptible, and information is. Implicit norms and values influence the personal perception of what valuable knowledge is about. On the one hand, knowledge is considered organised knowledge, e.g. in the setting of training and research. On the other hand, implicit or tacit knowledge supports the way knowledge is perceived. In the FILTER study, the concepts of knowledge and information, and the intertwined concepts of culture, quality etc. will be explicitly defined in the conceptual framework. The index of all these concepts is currently under construction and will be used as a guideline for the in-depth analysis.

DELIVERING MATHEMATICS IN DISTANCE EDUCATION

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Abstract

It is impossible to imagine that the medium of e-learning can be successful without the capacity to deliver mathematical content. The language of mathematics is central to the way we understand our world and we must, both as educators and students be able to communicate mathematics through electronic media. This paper reviews the current state of the art, proposing a way in which e-learning implementers can select appropriate solutions to this problem. Finally, we discuss the solutions we selected for the development of a web-based multilingual thesaurus of mathematical concepts.

Writing Mathematics

The need to write and share electronic documents, which include mathematical content, is common to the experience of school children and professors of cosmology alike. A range of tools has already emerged which fulfil these diverse needs to some extent. However there are still many writers – and this is true at all levels of mathematical ability – who are unable to transfer their mathematical ideas from paper to screen without enlisting technical help. Even where good solutions exist, they may not be known to the authors who need them.

One of the first distinctions the author must understand is that between writing mathematics using the ambiguous presentational notation that we learn in school, and writing language where the notation encodes the meaning more precisely. This is a distinction between presentational mark-up and content mark-up.

Content mark-up

If formulae or equations are to be manipulated by programs such as computer algebra systems or spreadsheets, then they must be written using terminology that can be understood by that program. In the past this has meant that the program we choose dictates the mathematical language we must use. Expressive capabilities have been limited to the needs of the software. We have grown used to the idea that moving a formula from a spreadsheet to an academic paper will require us to recast it for print. The W3C MathML version 2 recommendation includes a standard for content mark-up, known unsurprisingly, as Content MathML [6]. We can expect that, in future, many mathematics entry systems will adopt this standard. This will lead to immediate benefits for authors who will then find they can cut and paste active formulae between web browsers, word processors, spreadsheets and specialist mathematics packages without loss of function and without the need to recode.

Some editing systems capable of capturing the meaning of mathematical formulae do already exist. Examples are Mathematica and Maple. These commercial high-end systems are typically not available in schools, but are capable of manipulating, storing, and sharing mathematics through the common mark-up language of Content MathML.

At this point we should also mention the OpenMath project (http://www.openmath.org), which has taken on the much more difficult task of formalising a language capable of encoding any mathematical object; not just formulae or equations. This language is used by researchers developing electronic repositories (known as content dictionaries) of formal mathematical objects and results. Tools exist to extract content MathML from the OpenMath language.

Presentational mark-up

For most authors, the benefits of content mark-up are still in the future. Also, many authors are only concerned with communicating to human users where it is sufficient that the text *looks* correct.

Let us review some of the options that are available for presentational mark-up:

- Word processing packages augmented with visual equation editors. An example of this approach would be Microsoft Word with its equation editor. This solution is the one most commonly available in schools.
- TeX [1] and LaTeX [3]. TeX was developed in the 1980s by Donald Knuth and is a very well established and reliable system for typesetting mathematics. LaTeX augments TeX with a set of commands that help in the creation of structured documents. It, too, is well established.
- Visual editors that can export TeX and LaTeX. One example is MS Word together with MathType. Another commercial product is Scientific Word. Among freely available multi-platfom programs, LyX should be mentioned (http://www.lyx.org/)

TeX and LaTeX

The sheer volume of mathematics that has been published in TeX or LaTeX means that this is the technology that dominates mathematical publishing today.

TeX does suffer from some important limitations that will ultimately require us to change. The most important limitation is that it is a presentational markup language. For example, the TeX sequence **`\overbar{x}`** generates $\overline{x}$, but this does not explain its meaning unambiguously. In statistics it could be 'the mean of x'; in algebra, 'the vector x'; and in logic 'the negation of x'.

TeX is not a visual language. Authors writing directly in TeX have to master a textual typesetting macro language which is as full of subtlety as it is powerful. Authors who overcome this hurdle find that this keyboard driven way of entering mathematics is far faster than visual point-and-click systems. Visual editors such as MathType can be used in situations where learning a computer language would be an unwanted barrier.

Until the next generation of semantic mark-up systems find more general favour, TeX remains the lingua franca of mathematics texts. The problem of publishing mathematics on the web is greatly simplified if we reduce it to the problem of rendering TeX on the web. That is the problem we shall primarily address in this paper.

HyperTEX and HyperLATeX

TeX and LaTeX have been extended with the HyperTEX [4] and HyperLATEX packages. They allow inclusion of HTML mark-up into TEX or LATEX documents. The source code (text with mark-up) can be processed in two ways: to produce printed output (in this case HTML-related markup is ignored) and to produce HTML document (in this case many commands related to formatting printed output are ignored).

Rendering Mathematics

By *rendering*, we mean the presentation of mathematics on paper or screen. The process of rendering is deeply dependent on the medium. Paper has fixed physical dimensions whereas the dimensions of readers' windows are usually unknown to the author. There are also problems of device resolution or pixels per inch. Graphic images that appear to be perfect at 72 pixels per inch on a screen appear too small on paper if printed at 600 pixels per inch. If such a graphic is scaled up so the size is correct, then quality suffers. If we use graphics to render mathematics then we can expect to see this kind of problem.

Online paper or printable display?

In designing systems which can deliver mathematical content, it is useful to decide first whether the primary medium is paper or the screen.

If the primary medium is paper, then it may be sufficient to use file formats such as Adobe's PDF. Many freely available tools exist to render these on screen, and properly formatted documents will print well and predictably. If your authors are concerned with issues such as margin size and page breaks, then you know that your primary medium is paper.

If the primary medium is screen, then better solutions exist that are able to adapt to different screen or window sizes, and most importantly, to the reader's preferences. A reader who prefers large font sizes on screen should not be forced to use a horizontal scroll bar to access both sides of a line of text. Here the implementation choices we make are very important. Bad choices will create documents that may behave well for one reader, but poorly for another reader.

Publishing on-line textbooks and study materials where the primary medium is paper

The use of HyperTEX [4] and HyperLATEX is very attractive for technical writers, who usually already have many TEX /LATEX documents, which can be given a second life using this method.

HyperDVI, HyperPostscript and PDF

There are also other hypermedia formats, which have their origin in TEX/LATEX. The first one is HyperDVI. This is a result of TEX-processing of the marked-up text. HyperDVI is device independent format, which can therefore be viewed on any platform. The second one is HyperPostcript, which is a hypermedia extension of the Postscript language [5] (developed by Adobe company). It is also device independent. It allows obtaining of high-quality printed output as well as an interactive viewing using some browser, in some cases equipped with an appropriate plug-in.

The last one is so-called Portable Document Format (PDF), developed also by Adobe. PDF is similar to HyperPostscript, but PDF files are much smaller. PDF uses True Type (Type 1) scalable fonts, and document in PDF are displayed quickly and can be printed exactly as they appear on the screen. Programs for interactive viewing of PDF files are now freely available for almost all platforms.

PDF files can be produced in several ways. From the viewpoint of mathematical hypertext, it is interesting that fully interactive PDF files can be obtained from HyperPostscript files with the help of Adobe Acrobat Distiller, which is available on the commercial basis. Alternatively, such full-featured PDF documents can be produced by using pdfTeX. PDF documents without interactivity can be produced by many other programs, some of which are available free of charge, including OpenOffice.org.

Publishing mathematical web sites where the primary medium is screen display

If the primary medium is the web, then it becomes important to provide mathematics that sits easily within the context of a web site. Web sites contain collections of interlinked pages – often containing content supplied dynamically from a database – and often backed up by some kind of content management system so authors and editors can maintain the site using online tools. The site may link to complete mathematical documents, but a growing number of applications require the insertion of mathematics within the webs' natural rendering language of (X)HTML.

One very important problem that is yet to be solved is how to provide discussion forums or weblogs that are capable of carrying mathematics well. How can pupils contribute to such discussions without first learning a suitable mark-up language such as TeX?

For these kinds of application, the W3C MathML recommendations are now becoming very relevant. The standards have existed for some time, but only now are the leading Internet browsers able to render MathML well and reliably. We now have native support for MathML in Netscape and Mozilla. Internet Explorer can access MathML using a plugin – which will be incorporated into the standard Internet Explorer distribution in the next version. Other browsers, such as Opera and Safari, are also able to access MathML with plugin support.

The benefits of using MathML to render mathematics are many. Here is a quick summary:

1. The user is able to change the font size, and the mathematics will rescale itself to correspond to the font size of the surrounding text. This is always a big problem when simple GIF images are used to insert mathematics.
2. It is an international standard, so many new programs are able to use this format. Users will begin to see sensible results when they cut mathematics out of a web page and paste it into a word processing document.
3. It looks good.
4. It can adapt to the new small-screen mobile devices, as well as to the new breed of displays becoming commonplace with screen sizes as wide as 1600px.
5. There are many good programs that can convert from TeX/LaTeX or from visual editing forms to MathML, and more are on the way. International standards are good, but the tools must be available.

Building mathematical systems: some advice for implementers

By the time you read this paper any specific advice on programs is likely to be out of date. However the following general guidelines should still be useful:

- Determine whether your source texts are to be prepared using content markup or presentational markup. Find (or create) appropriate editing systems to support this markup.
- Determine whether you are publishing paper documents online, or publishing primarily for the screen. That will determine the appropriate rendering technology.
- If you are publishing multilingual mathematics texts, you also need to factor in Unicode support. Read our case study.
- Research available tools on the internet. You will find the most up to date information there.
- Download and test the tools, keeping in mind the needs of your application. Testing is vital as this way you will begin to understand the many different approaches that are available to you, and will be able to select the right tools for the job.

Case Study: a multilingual Mathematics thesaurus on the web

We recently completed a web application designed to deliver a multilingual mathematics thesaurus. This was a 2 year EU Socrates Minerva project that completed in March 2004 [8].

We can categorise this application as:

- Using presentational mark-up (TeX/LaTeX)
- Primarily screen based – so we render using MathML.
- Containing multilingual source texts.
- Rendering multilingual texts on the same web page.

The multilingual requirement means that we must use the Unicode character set, both in preparing sources and in rendering them on web pages. Unicode aims to include almost any alphabet known to man, past and present. Unicode was an absolute necessity for this project, but unfortunately our requirements here were a little in advance of available tools. For a long time we could find no good solution that could cope with both mathematics and Unicode.

Fortunately, in 2003, we found some good solutions for offline, and eventually for online editing of mathematics and its display in mathML. If you wish to follow our footsteps, these are the tools you need to use:

- For offline TeX/LaTeX preparation, you need a good Unicode-aware and TeX-aware text editor. We used UniReD [7] – a Russian text editor freely available from: http://www.esperanto.mv.ru/UniReD
- Use the ucs Unicode style sheet within LaTeX to adapt it to allow Unicode sources. Find this on any CTAN site.
- Use the TtM [2] TeX to XHTML/mathML conversion utility by Ian Hutchinson available from http://hutchinson.belmont.ma.us/tth/mml. This is the only utility suitable for installation in a content management system which we found able to handle this conversion when the TeX source code contains Unicode.
- For word processing, we used Microsoft Word with MathType. This solution can cope with mathematics and Unicode, but usually generates documents that require further processing before they are suitable for web publication.

Conclusion

Delivering mathematics over the web remains a tricky problem for implementers, which in more advanced applications such as our thesaurus is likely to involve considerable programming effort. However, it no longer needs to be a problem for users. Nevertheless, users with older systems who have not, or are not yet able, to update to the latest internet browsers may still, in the short term, be disadvantaged. The future holds more promise as there are now good international standards for online mathematics which are increasingly being supported by software vendors and open source projects.

References

1. KNUTH D. E. (1984) *The TeXbook, Computers and Typesetting*, Vol. A. Reading MA: Addison-Wesley
2. HUTCHINSON, I. (1984) TtM, a TeX to MathML translator (http://hutchinson.belmont.ma.us/tth/mml)
3. LAMPORT, L. LaTeX, (1994) a Document preparation System. 2nd edition, Addison-Wesley
4. SCHWARZKOPF, O. The HyperLATEX package (http://www.postech.ac.kr/ otfried/html/hyperlatex.html)
5. ADOBE SYSTEMS, INC. PostScript Language Program Design, Addison-Wesley Publ. Co., Inc., 1988
6. W3C MathML (http://www.w3.org/Math)
7. FINKEL, Y. UniReD – a Unicode plain text editor for Windows http://www.esperanto.mv.ru/UniReD
8. OLAH, V. Multilingual Knowledge Base in the enlarged European Union in Mathematics (Case study of a Socrates Minerva project)

VIRTUAL CAMPUSES – FROM GLOBAL ARCHITECTURE TO LOCAL SOLUTIONS

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Functionality of Virtual Campuses

In the last 5 years the authors worked as partners in a number of international projects in the field of e-learning, applying directly the Virtual campus paradigm. A thorough consideration of the specific training needs of the potential customers, their background and available infrastructure was seen as a precondition for success of the developed local context-oriented training solutions. The work on these projects demonstrated that further improvement of the Virtual campus functionality may be achieved essentially by specialising the generic functionality towards the needs of more specific learner groups and learning modes.

Virtual campus is a paradigm for Web-based networked collaborative online learning environment, customised for post-secondary and/or workplace education. It provides a framework for designing, delivering and managing individual courses or whole programs. This paradigm is mostly applied for the needs of learning institutions, but there is a number of examples of Virtual campuses for vocational and/or life-long learning, addressing non-formal and even informal learning. The virtual campus is like a real university campus in its mission and educational process – the principal difference is in the student access. Students in the virtual university can gain access to the courses from anywhere, at any time, convenient to them and appropriate to the course.

Innovative learning environments require flexible pedagogic approaches and activities, such as "learning by doing", and collaborative and group learning through different types of interaction. In order to achieve their maximum potential, it is essential that the content and the context of learning platforms can be structured and standardised. That results in requirements to developing the building blocks for the underlying support services in order to assemble distributed learning systems in such a way that learning objects (courses, modules etc.) can be flexibly archived, described and retrieved for re-use. Resulting platforms and tools support content packaging, the production of meta-data, learner information profiling, and interfacing with enterprise systems. Nowadays R&D work focuses on the development and validation of re-usable components, and is closely linked to component software engineering. In technological terms, the main development areas include: learning object manipulation (metadata generators and retrieval systems); learning object authoring systems; security and trust infrastructures (APIs, smartcards); knowledge repositories.

Architectures for Virtual Campuses

The Virtual campuses are organised around learning management systems and contain the following main subsystems:

- **Virtual training centre.** This is the core of the Virtual campus, ensuring the systematic learning/teaching process and servicing the common long-term learning activities in a training institution. It also acts as a virtual structure to organise qualification courses and skill acquisition outside the curricula structures (short term courses, focus on hands-on experience, courses on demand). The virtual training centres are normally organised as virtual learning environment – integrated Intranet and/or Internet-based software systems, implementing course delivery to learners, course assessments, course-learners management etc.

- **Learning content management system (LCMS)** with author's studia, producing all kind of multimedia learning materials. The modern content management systems apply international standards (SCORM, IMS) and organise the courseware as re-usable shareable content objects.
- **Communication system,** allowing synchronous/asynchronous communication between learners and instructors and between learners themselves during the training process. Some developers work with Virtual class technology, permitting live class experience to be conducted over the web and including functions as shared whiteboards, application screen sharing and live feedback, videoconferencing, voice over IP, archiving of classes as Learning Objects, inter connectivity with the Learning Content Management System.
- **Virtual library/repository** (dataware house for reusable multimedia learning materials), storing various types of courseware or documents required by the actors to fulfil their functions. Normally it is implemented as a distributed multimedia database with metadata presentation of the learning objects (e.g. LOM standard).
- **'Public relations' department** with personal learners guides, which act as information mediators for the users (admission advisers, carrier advisers, employing consultant etc.). This module also presents the available courses for the web site guests and may organise a virtual tour of the campus for potential new users.

A learning management system also takes charge of the administrative activities, document management etc. of the training institution. The result of this integration is that having access with a single sign-on into administrative, e-learning, and communications systems speeds access to services and information for all users. Faculty, staff, administrators, and students do not need to make multiple entries, bookmark pages, or memorize URLs. The main actors in a Virtual campus are:

- Learner – transfers the information into knowledge. S/he uses the courseware from the distributed repository acting as learning scripts navigator, repository resources explorer, self-evaluator of personal assessments, participant in collaborative forms of learning.
- Trainer/advisor – assists the learners in the educational process, acting as producer of diagnoses, mentor, assignment evaluator, coach.
- Manager – manages the actors and events in the educational process, acting as planner, decision maker, supervisor, team or group organiser.
- Author of learning materials, using the facilities of authors studio and the repository of courseware materials.
- Counsellor (mediator / information broker) – facilitates the navigation of the other participants, acting as information communicator, user profiles producer etc. Normally this user role is implemented by intelligent agents technology.

Nowadays one may find in Internet hundreds of sites for virtual campuses of universities and colleges all over the world. There are also portals, giving access to associations of (regional) Virtual campuses Most of the Virtual campuses are developed by using commercially available Learning Management Systems (LMS) and Authoring Systems. WebCT (www.webct.com) – and BlackBoard (www.blackboard.com) are two of the most used LMSs in the higher-education sector, but many other products/solutions are available on the market. There is not just one *best* product, but all of them offer many similar services and some specific ones.

The academic lecturers, actively working on development and especially on maintenance of Virtual campuses stress on the fact that modern technology play an important role in supporting the Virtual campus – but it is only a supportive role. The Virtual campus has to be founded on an understanding of: how adults learn, the different mechanisms needed to support people while they are studying, the roles, responsibilities and processes that support the delivery of any educational programme, the needs and requirements of learners studying at a distance.

Analyses of the RTD work in the field of Virtual campuses, which tries to address more generic questions, non limited to a single implementation for a given training institution, demonstrate that the most important success factor for the projects was the *ability to customise the products* and ensure that user needs are properly addressed. This is particularly relevant for products aimed at users with no specialist knowledge or skills. Flexibility means being capable of meeting the needs of multiple users and customers; it is crucial in order to maximise the potential of a particular application.

Development of Learning Management Systems – Local Solutions

Archimed Knowledge Village (AKV), a generic open learning environment, organised around the metaphor of "virtual campus", was developed under the international project *ARCHIMED "Advanced Multimedia-System Architectures and Applications for Educational Telematics"* (1998-2000) [3]. The environment ensures sufficient functionality and is relevant to the modern pedagogical approaches and tendencies for teacher-assisted and learner-centred education in local and global computer networks with some collaborative learning possibilities. The pilot implementation of AKV multimedia environment organise distant training centres which integrate a set of necessary methods, services and tools assuring a self-paced and/or remotely monitored learning in a given knowledge field with the help of available courseware materials and the pedagogical interactivity between a teacher/instructor and a student/learner. The AKV environment contains two types of distant training centres:

- Intranet-based distant training centre, build upon a local computer network of an institution in Client-Server mode and accessed also through remote terminals. This organisation takes into account the state-of-the-art of the public communications on a part of the ARCHIMED partner countries, where on-line access to multimedia courseware is not always feasible.
- Internet-based distant training centre: this version of the system has as its objective to serve the needs of working people who have no capability to move and remain for extended time periods at the premises of the teaching organisation. The technologies used include: a/ Relational database management system (SQL server) for the backbone of the system and for supporting the model (data model plus operation's model – transactions) of the learning environment; b/ Access to the functionality of the learning model and tools from distance using the standard Internet protocols (HTTP, web browser, web server).

The experiments with the pilot application with different user groups demonstrated the AKV potential and shortcomings and led to some decisions about the further development and improvement of the environment. They revealed that further improvement of the functionality of the Virtual campus may be attacked essentially by specialising the generic AKV functionality towards the needs of more specific learners groups and learning modes.

ADONIS Virtual Campus is developed under LdV project *PP-136029 ADONIS "Advanced on-the-job e-Training solutions in e-Business for SME's"* (2002-2004) (www.adonisproject.hu) for e-training of vocational trainees of tourism SME's. The functional characteristics of the ADONIS learning environment, built up as adaptation and enhancement of the ARCHIMED platform, consider the specifics of: 1/ the form of learning processes – on-the-job training /OJT/; 2/ the target group of learners – personnel of tourist-oriented SME's; 3/ the learning content – IT and other knowledge and skills, allowing and stimulating successful e-business activities. The analysis of these specific topics led to formulation of three main requirements for the ADONIS environment: A/ Operation in Internet mode by distance learning delivery of OJT courses/modules; B/ Support of learning-by-doing practice; C/ Operation in working conditions (with real software systems).

Besides the traditional functionality, necessary for web-based education, the implementations of distant training centres in ADONIS virtual campus focus on the following specific characteristics supporting on-the-job e-training:

- Support for the teachers/trainers acting in their specific roles and activities in on-the-job training mode (as 'master', 'supervisor', 'coach') [4].
- Allowing the learner to work and practise inside the learning environment with the real software products s/he learns. This frees the learner from the need to purchase the software system and to organise its use for his exercises and projects.

- Use of a standard browser from the learner's part, avoiding the need to download programs/ files on the learner's computer. This imposes lesser requirements to the learner's computer resources and also increases learner's trust in the security of his company confident information.
- Controlled access to learning resources to support structured on-the-job-training with possibilities for self-directed learning and testing, i.e. mixed initiative in activating the learning tasks. The navigation through the learning units is system-guided, but may also be learner-determined.
- Automatic fixation of the current status on exiting the learning environment in order to allow fast restoring and continuation of the e-training with the last learned unit without passing through multiple windows at next log-in. This allows more flexible schedule for learning on the work place, necessarily intermixed with work tasks.
- Asynchronous connection with the teacher/tutor in order to work with standard/not excessive computer resources and moderate data exchange rate.
- Sufficiently intuitive interface for the end-user, removing the need of special training how to use the environment and focusing learner's attention on the current task.

These characteristics are considered in lesser extent or not at all in the traditional Virtual campuses, used in colleges and universities. They were implemented at each distant training centre of the ADONIS Virtual campus at different level and details due to the local specifics of the partners. The Bulgarian local training centre [4] was developed on relational database management system (SQL server), supporting the data model and operation's model of the virtual training centre. It uses WEB server for the middle tier logic and standard browser for presenting the user interface functions (Figure 1). The specific requirement for project-oriented learning with real software systems without installing any additional software on the learner's computer was achieved by using remote server technology. The learned products and the trainees workspaces for intermediate and final results of their exercises and projects are located on a server in the training centre and are accessible through web interface. This solution facilitates and makes more flexible the OJT e-learning. In the same time it requires additional interface functions to support the work of the courseware authors – for preparation of exercises and projects and of the system administrator – to organise the trainees workspaces. The wish to help the learner, who has only an asynchronous connection with the teacher, lead to inclusion of some additional facilities – e.g. explanation of terms and possibility to use annotations in learning presentation mode (Figure 1) or displaying hints and recommendations how to do the exercise when working with the real software product on the remote server (Figure 2).

Exchange and re-use of the developed courseware materials is possible due to their shaping as shareable learning objects in SCORM standard – a set of specifications for developing, packaging and delivering high quality education and training materials. SZTAKI SCORM LCMS [5], developed for the Hungarian local training centre, is an XML/SQL database platform with web based editor and administration modules, workgroup supporting tools, export/import modules and a learning material library which can be accessible through the web. Its core is the virtual repository with SCORM support – appropriate database structures for SCORM package specification and LOM metadata. The system is based on Linux/Java platform with MySQL and Xindice database management system. Developers can upload and replace the content elements (assets, SCOs) according to their rights, and can modify the structure of the learning material. The export-import modules are able to generate SCORM 1.2 compatible packages from the database and import such packages. The LCMS accepts also some non-standard learning material formats popular on the local market. The system supports eLibrary module – a SCORM compatible "store" of training packages users can view and download according to their rights. The LCMS system does not support interaction, but it is a cheap entry point to the deployment of SCROM compatible learning materials.

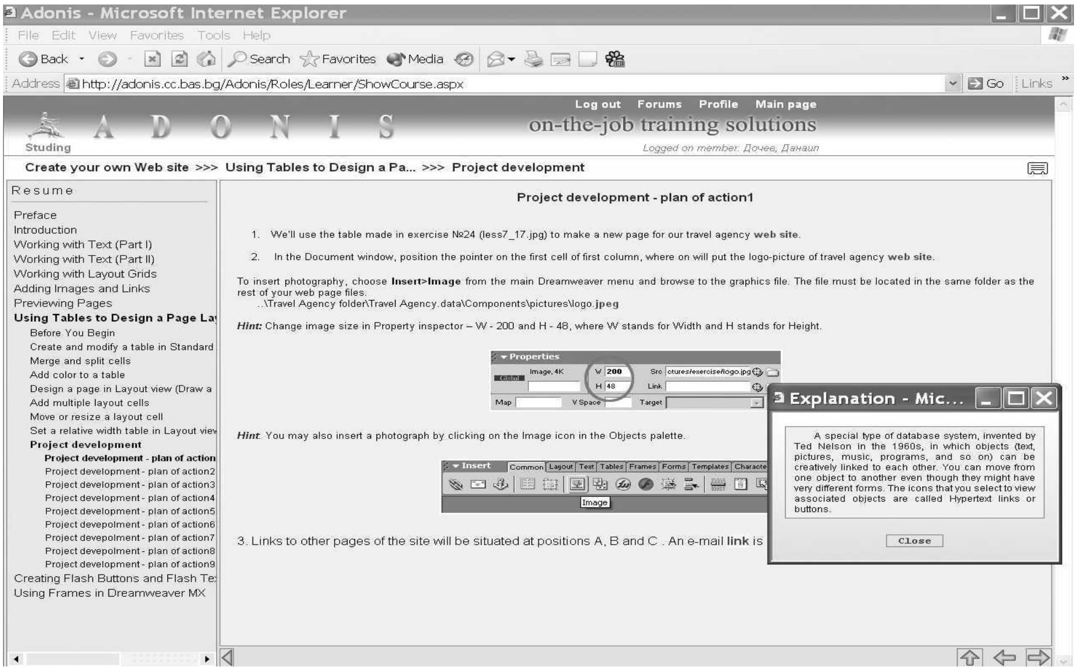

Figure 1. Presentation of learning material in ADONIS Distant Training Centre

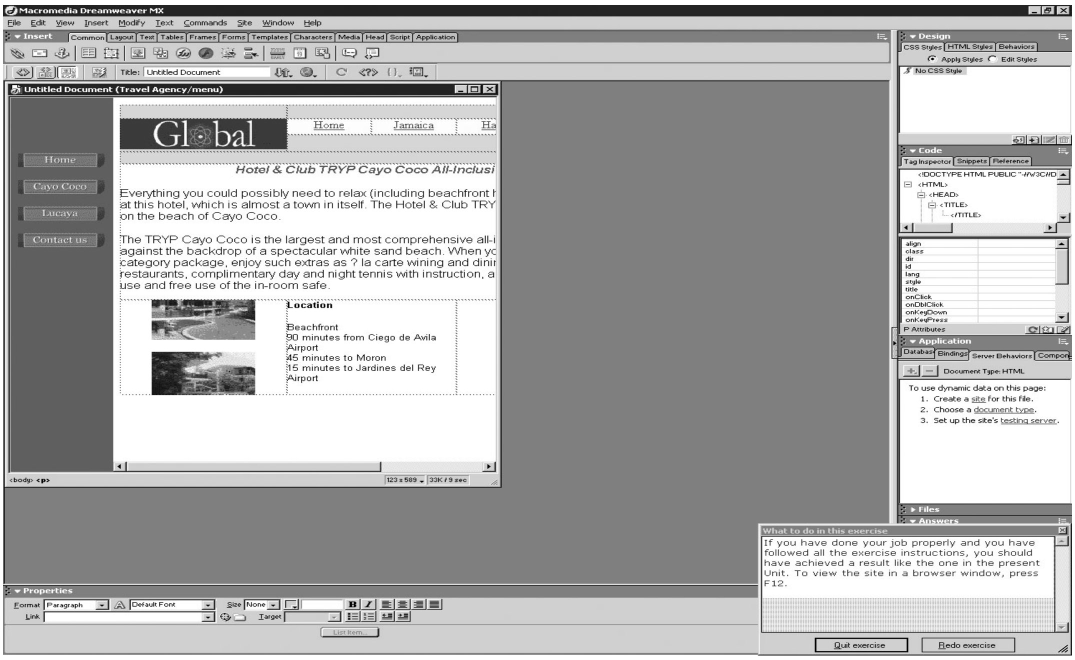

Figure 2. Doing exercises in ADONIS Distant Training Centre

New Media Knowledge Village is another Virtual campus under development in LdV project *PP-114025 KNOSOS "New Media Knowledge Village for Innovative E-Learning Solutions"* (2003-2005). The aim of the project is to create a network of virtual training and resource centres of expertise for development of competence in integrated web and digital TV Anytime-Anywhere technologies. This virtual campus covers web-based means for training without dealing with more specific training modes as on-the-job-training and facilities like executing exercises on remote computer. Attention is paid on the development of more detailed and standardised learning content concerning interactive TV standards and educational applications of digital TV. The Virtual campus "New Media Knowledge Village" is oriented to address the vocational training needs of ICT and new media professionals, working for educational content providers through digital TV devices, as well as for electronic mass media, advertising agencies etc. The local training centres of the distributed environment have to use more enhanced equipment, considering the learning content and target groups. The centres will exchange and reuse not only the educational content as shareable learning objects, but also information about this content (metadata) and about the learner profiles.

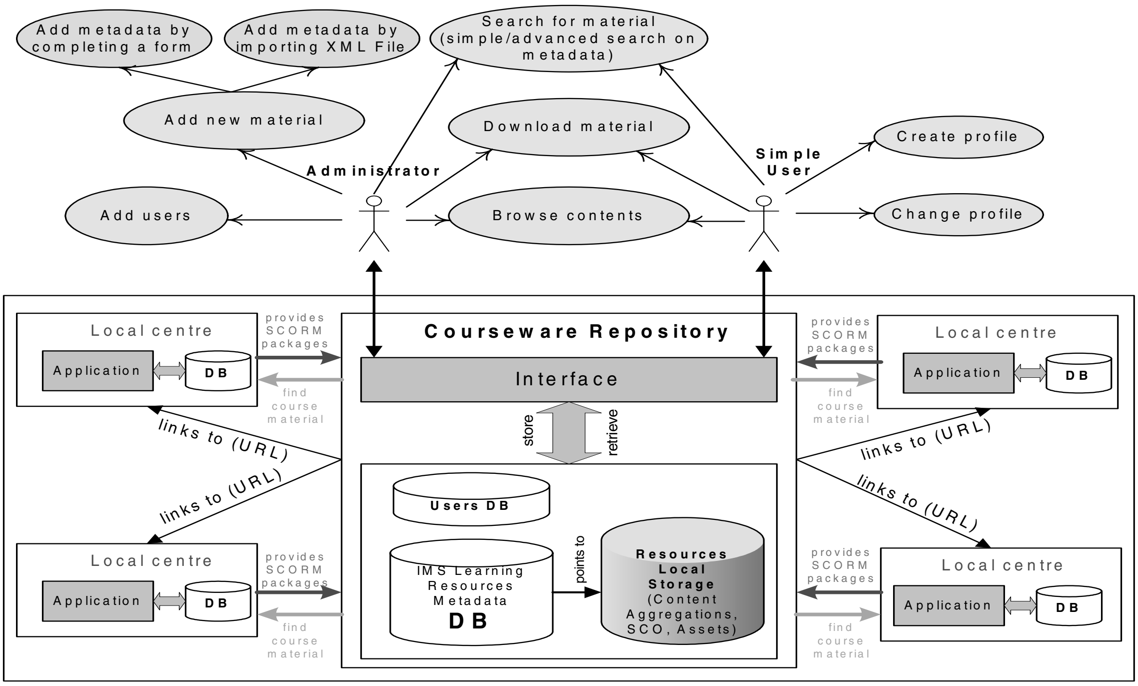

Figure 3. General architecture of the New Media Knowledge Village

Conclusions

The Virtual campus proved to be a useful paradigm for grouping and organising e-Learning activities. The work on ARCHIMED, ADONIS and KNOSOS environments confirmed the assumptions that improvement of an environment functionality may be achieved by specialising the generic functionality towards the needs of specific learner groups and learning modes. Further enhancement of the environments effectiveness (e.g. improving authors' interface, management of the learners' workspaces, communication facilities) will be based on users' feedback.

References

1. EUROPEAN UNION-SUPPORTED EDUCATIONAL RESEARCH 1995-2003 (2003) *Briefing papers for policy makers,* EUR 20791, p. 209
2. HARASSIM L. (2001) *The Virtual University: A state of the Art.* In: Advances in Computers, Vol. 55, 2001, "Academic Press", pp. 2-47
3. DOCHEV D., R. PAVLOV, R. YOSHINOV (2000) *An Open Distributed Computer Environment for Educational Telematics*. Proc. of the EDEN Fourth Open Classroom Conference, Barcelona, 20-21 November 2000, pp. 247-252
4. DOCHEV D., R. PAVLOV, M. MONOVA-ZHELEVA (2003) *Principles, Quality Requirements and Solutions for On-the-Job e-Training in SME.* Proceedings of the EDEN Annual Conference, Rhodes, 15-18 June 2003, pp. 518-523
5. HUTTER O., T. SÁRVÁRY, I. SIMONICS, B. WAGNER (2004) *eLearning: Frameworks, Contents and Standards,* Third EDEN Research Workshop, Oldenburg, March 2004
6. ARAPI P., N. MOMOUTSIS, S. CHRISTODOULAKIS (2003) *Supporting Interoperability in an Existing e-Learning Platform Using SCORM*. ICALT 2003: pp. 388-389

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LEARNING CONTENT MANAGEMENT SYSTEMS: ADVANCED TECHNOLOGY FOR ONLINE COURSE DEVELOPMENT, MANAGEMENT AND DELIVERY

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Current technology for online courses in higher education

Current technology in use for the delivery of instruction in higher education is limited in its capacity to allow for: (a) cost-effective management of content, (b) localization of content for specific markets (this could mean different languages or different variations of a course), (c) adaptation of content to individual needs, and (d) distributed development of courses. Limitations (a) – (c) have been apparent to practitioners for some time, whereas (d) is becoming an important constraint given an emerging focus, in North America (NA), on team-based development of courses and curricula in higher education.

In higher education, online courses are generally designed according to some variation on a familiar theme. The basic model comprises lecture notes and assignments, perhaps some lecture style video (possibly shot in a face-to-face class), reference material (including *urls*), and teacher-student or student-to-student contact via email and threaded discussions. While this model can be effective, it does not scale that well. This is largely because of the requirement for a good deal of computer-mediated communication (CMC) and the need to moderate or facilitate that communication quite closely, if it is to be productive. While the focus on communication is often portrayed as a strategy to engage learners in higher-order thinking, in fact not that many empirical studies have succeeded in demonstrating significant success with this objective. Arguably, the heavy use of CMC is sometimes invoked as a strategy to compensate for the challenge of developing content rich, adaptive courses on-line.

Current course management and delivery systems, and web-media authoring tools, in widespread use in higher education – systems such as Blackboard, WebCT, Dreamweaver, and one-off site-generator tools – also afford limited capability for authoring and managing content. To enable sophisticated interactions with content requires the additional use of media development tools like Flash. Developing material with a tool like Flash requires significant, expensive technical expertise and time. Once a course is built, it is not easy to revise content, and any revisions require, once again, the intervention of a qualified developer.

An alternative technology: Learning Content Management Systems

There exist powerful tools, learning content management systems (LCMS), that address the limitations mentioned above. Although their use for training delivery in the private sector is increasingly widespread, LCMS are not widely used in education, except in the context of learning object repositories, which are a recent innovation, and not widely utilized themselves. One reason for this is cost. Institutions of higher education, especially publicly-funded ones, are not known for their willingness to make investments, or to analyze ROI – even though the “business case” for LCMS would not be hard to make in most situations. They operate more typically on the basis of cost and cost-containment. History and lack of awareness are a second factor. Technology integration is a field of study itself in higher education. There are not many examples of planned, successful integration. The best examples in NA, the “laptop” universities, have only just begun to be studied, and we have limited access to reliable data concerning their successes and failures, in the realms of either learning outcomes or institutional planning. With this lack of systematic planning, knowledge and awareness, LCMS are never considered as an option in most cases. Third, there is the circumstance that until very recently, LCMS have been cumbersome to use, their authoring tools were limited, and their implementation of earlier versions of standards like SCORM ruled out much innovation in instructional design and mitigated in favour of lowest-common-denominator, page-turning creations. This picture has now changed fairly dramatically. Finally, there is possibly a fear of complexity operating. Enterprise content management systems are expensive, have no instructional authoring component, and are complex to implement and manage. LCMS are a different breed – smaller, simpler, cheaper, and optimized for instructional development and delivery. But the words "content management system" in LCMS may carry the connotations of their larger cousins for those who have only heard of CMS.

There is a good case to be made for LCMS as a platform for higher education online courses. In the next section, we will describe the generic capabilities of the best-in-breed of the current generation of LCMS, with some particular mention of a system developed in North America and Europe, ForceTen from Eedo (www.eedo.com). Eedo is currently carrying out an aggressive research and development program in conjunction with industry partners and universities. The program is aimed at several objectives including: increasing the modalities for interaction with content, providing advanced tools for categorization and retrieval of content, supporting distributed content models, and new capabilities for mobile computing. Given available space, we will outline features and functionality, then devote some space to one topic: advanced categorization and retrieval strategies, and their role in the context of content development and delivery in higher education.

LCMS functionality

Simplified content management:

LCMS are systems that store content as objects in a database or repository. These objects can be as small or fine-grained as one would like, and may also reflect different levels of aggregation. In combination with tools that make this content searchable and retrievable – taxonomies and metadata – this paradigm supports two key capabilities. First, content can be re-used (with or without some degree of adaptation, depending on circumstances). This reduces the time and cost to create courses. It also allows for the adaptation of courses to different audiences. For instance, a basic statistics course for the social sciences could have content appropriate for all disciplines, and a smaller component tailored to specific disciplines or fields. The latter might include, for example, discipline-appropriate examples, and different statements concerning preferred analyses and norms. With a content management system, the common content would exist only once in the database, but would appear in multiple course structures or content containers. Hence, any corrections or revisions to this content would be made only once, then reflected across all courses in which it is featured. The separation of content and structure simplifies management of content, reduces development costs by encouraging re-use, and allows for the creation of various versions of a course customized to suit somewhat different audiences.

Localization

The same features mentioned above support other forms of localization. For example, courses could be adapted to delivery in different regions. One of the emerging challenges of online learning in higher education is how to respond to cultural differences in the context of an increasingly globalized context for delivery. Localization might include different content, but also different languages and perhaps even different interfaces. LCMS offer very cost effective solutions for delivery in multiple languages, again owing to the separation of content and structure. Through the use of templates, courses can easily be masked with different look-and-feel interfaces. Translation costs are reduced through translation facilities. Basically, the text objects are exported from a first-language version of a course, then translation is carried out in a spreadsheet-like environment, and the translated objects are re-imported into the production environment to populate a new course. The cost of multiple language development becomes primarily the cost of translation, rather than additional production.

Single-source publishing

LCMS do not offer the same capability to format and publish material from their repositories for different modes of delivery (e.g., print, computer, hand-held device, etc.) as do XML-based enterprise content management systems. However, best-of-breed systems allow for some flexibility through interfacing with other applications, such as electronic or desk-top publishing systems. They may also offer conversion modules for standard print and electronic presentation formats such as Word® documents or PowerPoint® presentations. This means reduced costs for institutions that run courses both online and face-to-face, as some content sharing is enabled across modalities.

Support for distributed publishing

Course creation often involves experts from different fields and specializations. This might mean a variety of subject matter experts, graphic designers, pedagogical experts, project managers, and (if you are using a participative design methodology) end-users. In the academic context, from a curricular standpoint there is an increase in the practice of team-based course development, involving the cooperation of multiple instructors [1, 2]. Conventional authoring and course management tools do not have any built-in support for such practices. In contrast, an LCMS may include full support for a distributed publishing process: version control tools, check-in/check-out, workflow and task assignment and management tools, project tracking and reporting tools, annotation capability for reviews, built-in storyboard facilities. With such tools, even a geographically dispersed team can work productively in a collaborative fashion. ForceTen is an example of a browser-based system. The availability of content within the browser further facilitates and simplifies the entire process. Overall, the complete cycle of development, review, revision and approval can be streamlined, while simultaneously allowing for more input from different sources (generating better content), and improved quality assurance.

Eedo has recently implemented the functionality required to support a distributed content model. In this model, different organizations maintain their own content locally, but may have access to content produced and maintained by other organizations which they can then integrate and sequence with their own. The scheme is accomplished via parent-child relationships. Though designed to address a particular need in the aviation industry, this capability could extend the usefulness of learning object repositories and enable further content re-use across institutions in the context of higher education. An LCMS could also be set up to handle copyright management within this scenario. Support for standards (such as SCORM, IEEE LOM, AICC) across the industry enables any number of re-use or integration strategies.

One additional problem posed by large-scale production is maintaining standards, and related quality assurance procedures, when there are multiple developers or development teams. LCMS can assist in this regard also, through the use of templates.

Simplified authoring of congenial, interactive content

The authoring tools within a LCMS allow subject-matter experts (instructors, in the present context) to create content rapidly either free-form or with templates, without requiring any high level of technical proficiency. Earlier generations of LCMS were no great shakes when it came to the quality and interactive aspects of content that could be developed. The current incarnations have addressed this deficiency. ForceTen, for example, includes a wide variety of different task types and different assessment item types and a variety of specific learning object types designed to contextualize and situate learning. Two examples of specialized learning objects include a scenario object and a survey or real-time audience-response object. The scenario object allows for the creation of interactive scenarios depicting different situations that, typically, call for some kind of problem-solving, analysis, or decision-making. The object allows learners to branch to review relevant content, then return to the scenario and the related task. The survey object presents a question, accepts a response from the learner and then provides feedback indicating how all learners have responded up to that point in real time. This replicates the function of the audience-response technology that is being adapted to classroom use in many institutions.

LCMS platforms can be used to deliver rich media (like video and Flash components) with plug-ins and, if required, streaming technology. However, they can also be used to develop and deliver highly interactive content (including e.g., a wide variety of assessment items, tasks, simulation or scenario objects, path animation), without plug-ins.

Support for different delivery strategies

An LCMS can be used to develop, maintain and deploy traditional "courses". However, given that content is built and maintained at a more fine-grained level, and is searchable at a more detailed level (say "topics" or "learning objectives" or "learning objects"), other strategies are possible. For example, learners can search for content in the repository under a taxonomy, or via an index, through a portal. They can also ask for a diagnostic test to be generated, randomly, from a pool of items indexed to the content they are searching.

Knowledge can also be harvested. FAQ databases can be built within the LCMS. Lessons learned or best practices developed or encountered by students during project work can be incorporated into the repository, also, using templates. In ForceTen, students can easily contribute additional resources related to course components (book titles, journal references, conference information, urls, etc.). These are routed to a pre-designated expert (instructor or instructor's assistant or other subject matter expert), approved, and then published to the repository, where they become searchable under the taxonomy as a knowledge-sharing component.

Advanced categorization and retrieval of content

A key component in these alternative strategies is advanced search and retrieval capabilities. While many have argued for the Web as a tremendous learning resource, the commercialization and growth of the internet, and the limitations of conventional web search technology [3, 4] has lead to significant problems accessing information. According to Pedersen [3], as of October 2000, there were approximately 2.5 billion "visible" or static pages and 550 billion "invisible" or dynamically generated pages available on the Web. Similar problems are encountered in dealing with large digital online libraries, and the growing number of learning object repositories, such as Merlot [4].

Currently, Concordia University researchers are working with industry partners in the LCMS (Eedo) and content management worlds (Kontentsu) to develop Topic Map technology as a response to the need for sophisticated, scalable user-centred views of content, with support from Industry Canada's Canarie fund. This technology will support search and retrieval within digital libraries, including learning object repositories, LCMS repositories and selected Web resources.

Topic maps provide a form of indexing that captures and displays the semantic relationships among topics and anchors resources to topics [5]. The power of topic maps lie in their unparalleled ability to separate the relationships between topics from the actual resources that describe the topics themselves. This distinct separation of resources from the topics allows for *flexibility* – in terms of allowing user-controlled topic and relation creations without having to recompile a database of resources, as well as *scalability* – in terms of merging topic maps and creating interconnected representations of complex and ill-structured, knowledge-intensive domains. Different topic maps can be created to provide user-centred or discipline-centred views of the same resources. Topic maps can be both compared – offering insight into alternative conceptualizations of the resources, and conjoined – to provide a wider or more comprehensive view. There are several important and exciting implications of this technology for education in general, and enhancement and enrichment of online courses, in particular. Consider the following points:

- A topic map, once completed by experts, provides learners with an observable, inspectable map or model of the domain. The map itself is a significant learning resource, supporting the learner's acquisition of ideas about the organization of the domain, the relationships among concepts, the uses of information with the domain and terminology. Given the right interfaces, one can also imagine the task of creating a topic map as a legitimate and high-value learning exercise for students.
- A topic map allows users to browse content, following the resources associated with concepts that have certain semantic relationships. Unlike conventional searches (e.g., boolean search of key words or descriptors), a user can traverse a web of relationships, much as one might

browse the shelves of a physical library where books with related content are stored under different, but proximal, classifications. Thus, a user can encounter relevant information they would not find using full text search or key-word search strategies.

- Topic maps can be created to provide different user-centred views of large digital libraries or repositories, allowing them to be accessed readily by different disciplines. This increases the value and utility of repositories or digital collections, and has obvious implications for inter-disciplinary work. Topic maps can be compared, and they can also be conjoined to create wider or more comprehensive views of content. Topic maps also allow different users to work with their preferred language, rather than necessarily constraining everyone to work with the same restricted vocabulary. In fact, inspection of topic maps built in accordance with different user views and preferences would provide a basis for comparing these views.
- Topic maps are extensible. Traditional approaches require that new insights into how content should be classified require that new meta-data fields be defined and populated, or new key words be agreed upon, and applied. This is typically not feasible or extremely expensive, from a database recompilation standpoint. Topic maps can be built at a higher-level of abstraction, leveraging, elaborating and reorganizing existing metadata.
- Finally, it is possible to use topic maps to make content searchable based on instructional tasks related to the content of the repository. For example, we have developed a topic map for a graduate course on e-learning, which provides learners an unprecedented degree of flexibility in viewing a repository of articles and white papers on learning content management systems and learning management systems. Given an instructional task, such as writing an opinion piece on the merits and demerits of current purchase processes employed by organizations, learners are able to navigate the articles and papers in the repository using an instructional ontology grounded in the cognitive operations summoned by learners in writing their opinion pieces.

Conclusion

The current generation of LCMS has much to offer in terms of content development, content management and content deployment for online education. Features of LCMS allow for re-use and sharing of content, better tailoring of courses to specific audiences, reduced development costs, simpler maintenance, better quality control and more input from subject matter experts. At the same time, LCMS are not restricted to simple course delivery strategies. Sophisticated forms of knowledge sharing, "pull" technology (searching for content and assessments in a portal implementation), and harvesting of knowledge from students, is also possible. With email facilities and threaded discussion within an LCMS, or provided a third-party bulletin board, listserv or conferencing application, a best-of-breed LCMS provides all the tools and functionality needed to establish and support a basic community of practice. At the same time, with the globalization of education an inevitable outcome of instructional uses of the web, an LCMS also provides the means to localize content and strategies to suit different regional requirements and culture. The time is ripe for the higher educational community to examine LCMS more widely as a platform for online learning.

References

1. DREW, L. & VAUGHAN, S. (2002) *The course team as the focus for contextualized professional learning,* Innovations in Education and Teaching International, 39(3), 183-195
2. TOOHEY, S. (1999) *Designing courses for higher education.* UK: SRHE and Open University Press
3. PEDERSEN, A. (2001) *Semi-automated web resource discovery and analysis: An approach based on interactive machine learning principles,* Unpublished dissertation, Agder University College, Norway
4. BAEZA-YATES, R. (in press) *Information retrieval in the Web: Beyond current search engines,* International Journal of Approximate Reasoning
5. PEPPER, S. (2000) *The TAO of Topic Maps.* Available online at [www.ontopia.net/topicmaps/materials/tao.html]

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E-LEARNING FORMATS FOR WEB-BASED LEARNING: BRIDGING THE GAP BETWEEN INFORMATION PORTALS AND LEARNING PLATFORMS

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The challenge of creating learning content and learner support for information portals

Most e-learning scenarios are anchored in some form of institutional context such as school, job-related training, or different forms of adult or community learning, for example. Numerous e-learning methods have been developed to meet the needs of different learners, learning scenarios and learning purposes. While traditional, often costly CBL (computer-based learning) solutions are still successfully employed in business settings, there has been a general trend towards more modular and cost-effective web-based e-learning solutions. To this end, learning platforms are increasingly used to meet the complex requirements of organizations, instructors, and learners for delivering content and managing the learning experience.

Besides serving as a vehicle for e-learning solutions, the internet has become a powerful source of information for professional and private needs alike. In Germany, the number of people who are "onliners", i.e. people with regular online access possibilities, as defined by a large scale study by the EMNID Institute continues to increase rapidly (from 37% in 2001 to 50% in 2003) with the highest rate of increase among older people and women[1]. As an increasing number of people search the Internet for information, *search engines* are most commonly used as a starting point (with "Google" being a clear favorite among most users) (Brenstein, Kos, Holtsch, & Lehmann, in print). However, *information portals* have also established themselves firmly as a "home base" from which to start internet exploration. The many different kinds of portals (global portals, vertical portals, enterprise information portals or educational portals) have in common that they bundle information and services of interest to a particular group of users. Educational portals sometimes combine the functionality of an information portal with that of a learning management system.

From a pedagogical point of view, there is a difference between the kind of explicit learning which occurs in a more formalized e-learning context and the implicit learning which occurs when people are looking for information on the web (Wache, 2003). Information portals usually provide little explicit guidance for the learner other than presenting information in a clear and logically structured way with a consistent look & feel and a consistent navigational structure. Thus they provide a valuable service in helping learners to orient themselves and to navigate through the information. Moreover, the fact that the content has been editorially selected and possibly quality-rated, facilitates selection processes.

However, the problem remains, that learners are faced with a multitude of information which is structured according to a *content logic* which is usually not ideally suited for learning purposes. This is especially an issue for novice learners who usually lack a mental model of the subject matter. Experts, on the other hand, can learn new information more easily by connecting it with an existing knowledge base.

One solution to this problem is to create modularly designed learning units in which content and activities can be structured according to a *learning design logic* which meets the specific needs, interests and goals of different learners. To that end, the informational content base (Greenberg, 2001; Wiley, 2001) has to be supplemented by a didactical content base in the form of didactical building blocks (Brenstein 2003) which can be combined with the content in different ways to create a meaningful *explicit* learning experience.

[1] http://www.nonliner-atlas.de/dyntemp/NONLINER-Atlas2003_TNS%20Emnid_InitiativeD21.pdf

Case in point: Teaching the general public about health care reforms in Germany

One highly frequented entry point for continuing education is the portal of the Federal Agency for Civic Education (Bundeszentrale für politische Bildung/bpb[2]). For over 50 years, the bpb has been providing a broad range of educational activities and materials to provide insights into how political, cultural, social and economic processes fit together in history and society. Its goal its to motivate and enable people to give critical thought to political and social issues and play an active part in political life[3].

Recently, online learning materials have been developed for a broad general audience interested in learning more about ongoing and future reform efforts within the German Health System[4]. The purpose of these materials is to convey basic as well as in-depth information about institutions, systems and players involved in or affected by the reform process. At the same time it is meant to raise political awareness of controversial issues for all concerned and empower citizens to make informed decisions.

Due to the scope and complexity of the subject matter, it is important to present the information such that it appeals to a broad range of readers with varying interests and learning agendas (Caumann & Hollfelder, 2001). Therefore an attempt has been made to supplement the information-base with a variety of learner support elements in order to motivate and enable students to engage in a more in-depth individual discourse with the content. The question is to what extent such "didactic enrichment" is utilized and considered useful in this general civic education context.

In this paper, we will first outline the learning design concept underlying this development, present an overview over the developed e-learning formats and finally report first results of an evaluation to assess the acceptance and effectiveness of such formats by different target groups.

Learning design

Since the content is geared towards an ill-defined heterogeneous target audience (ranging from general citicens, pupils and students to journalists and experts) in a variety of learning scenarios, it was important to provide a clear and intuitive *navigational structure* to facilitate information access for learners with different needs and interests and provide a *content structure* which allows to easily recognize individual components and their respective purposes. Due to the lack of an institutional context or clear learning requirements serving as extrinsic motivators, it was furthermore important to enrich the materials with a variety of learner support elements such as case examples, interactive graphs, excercises etc. to support the maintenance of an intrisic learning motivation, especially for learners with little prior knowledge. The task of developing a learning design for this content proved challenging on several accounts:

1. content factors:

- a multi-faceted and complex subject matter
- absence of subject-matter specific guidelines for structuring and teaching this content
- the requirement to present information from a "neutral" value-free perspective (in the main texts)
- the need for presenting materials which take multiple perspectives into account (web links)

2. learner characteristics:

- the voluntary nature of the learning scenario
- very different motivations and learning goals among learners
- little systematic learning interest
- low self-regulated learning skills, low self-discipline

[2] www.bpb.de

[3] http://www.bpb.de/die_bpb/PE8IKY,0,0,The_Federal_Agency_for_Civic_Education.html

[4] Partners: Federal Agency for Civic Education, Bonn; Institute for Health and Social Research (Institut für Gesundheits- und Sozialforschung GmbH), Berlin; Fraunhofer Institute for Software and Systems Engineering, Berlin; Helliwood Media, Berlin

- varying degrees of prior knowledge

3. methodological considerations:
   - need to provide intuitive content navigation within and across the three modes of access
   - lack of interactive feedback mechanisms for learner support (instructor, tutor or co-learners)

Navigational structure

Based on different kinds of *learning interests* (personal, professional, and school/training-related), different kinds of *learning goals* and corresponding *access modes* can be identified:

- Learners looking for a *specific piece of information* can use the search mode or the topic map access to find the appropriate learning object
- Learners wanting to gain a *quick overview over relevant issues*, can orient themselves with the topic map or look at the elements of the learning tours
- Learners who have *questions of common interest* can look up corresponding topics in the topic map and identify a relevant cluster of learning objects which will answer their questions
- Finally, learners who want to *understand the background*, particular mechanisms and current developments of the reform agenda in all its complexity, can acquire basic and in-depth knowledge via the learning tours and consolidate this knowledge through exercises and tests.

Content structure

Learning objects have a consistent basic structure consisting of an introduction, followed by an overview list of all topics covered in subsequent text units and conclude with a summary. Learning objects can contain a variety of building blocks such as

- Text components (text units, advanced organizer)
- Aesthetic filler components (photo strips, simple illustrations)
- Components for further understanding (case examples, complex graphical illustrations)
- Interactive assessment components (e-votes, drag & drop, multiple choice, fill-in the blancs)
- Reference elements (citation sources, weblinks).

Each learning object can be annotated with didactic metadata in order to allow for specific multiple-criteria searches by content, method or media-related criteria. The modular approach makes it possible to “reuse” or “repurpose” learning materials in a variety of ways. Thus learning objects can also be made available for other teaching/learning contexts. They can be used as supplementary in-class teaching materials or as worksheets for students, for example.

Topic Map Access

The topic map navigator (Figure 1) is meant as a graphical tool for orientation and navigation. It represents topics, learning objects and keywords in a knowledge network. Users can access individual learning objects, mini-clusters of learning objects related to specific topics, as well as learning objects which are part of a sequentially structured learning tour.

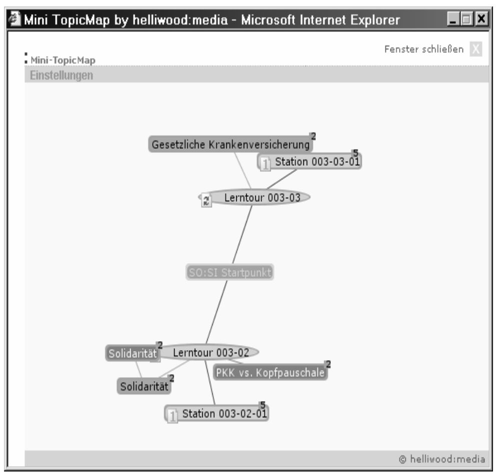

Figure 1: Topic Map Navigator

Learning Tour Access

Figure 2: Overview Learning Tour

In addition to providing random access to the content, learning objects can also be combined to form a coherent didactic sequence as part of a learning tour. Learning objects within a tour can be accessed in any order, depending on prior knowledge, interest, or time constraints. Thus learners can choose the scope and the sequence of what they want to learn. At the beginning of each tour, an overview is provided to assist learners in making informed choices as to which contents or methods to access in which order (Figure 2).

Since learning objects can be considered "virtual" stations on such a tour, the learning tours have been conceptualized based on the learning design approach of *learning stations.* This method is used in classroom settings, where students are provided with a range of materials and activities set up around individual stations. Student visit the stations and complete various learning tasks at each station. The advantage of this modular organization of the learning experience is that students can choose and work on tasks individually.

A key aspect of learning stations is that learners are given specific materials and tasks related to these materials. Students usually enjoy working on stations since they are required to get actively involved, either alone or in groups. It is therefore important that the materials and activities provided represent a variety of teaching/learning approaches so as to provide differential learning access (for example, via different sensory channels). A record of all activities is kept by the student on a "progress sheet." This supports an iterative approach to learning in that stations can be revisited to attend to different aspects of a topic. Students can return to something they had only glanced at at first and can "see something with different eyes" after having learned more about it at other stations.

We have applied the learning station approach to our virtual learning scenario regarding the German Health System. Learners first get an overview of the materials and the activities available at different stations (learning objects) of the tour and then decide where to go. They record their progress in terms of each topic read or activity completed on a "progress sheet" so as to keep track of where they have gone and what has been done. This can be done electronically or on paper. In either case, it allows students to backtrack their steps in case they get "lost in hyperspace". Secondly, it enables learners to continue where the have left off last time. Thus learners are supported in taking responsibility for their learning[5].

Didactical E-learning formats

To implement the learning design principles outlined above, the content layer of the material base (first column in Figure 3) has been supplemented by a layer of learner support elements meant to encourage explicit learning activities (second column in Figure 3). At the moment, these elements have been designed to appeal to a broad adult target audience. However, it is planed to provide personalized access in the future so that users can be presented with additional materials and activities suited to their specific learning requirements (third column of Figure 3).

[5] While progress-tracking is a standard feature of most learning management systems, it is seldom found in the context of information portals

Evaluation

Since these materials have been developed for a broad target audience, it is important to assess to which extent users utilize the provided didactic aids and whether they are indeed effective in improving the learning outcome. To this end an evaluation study is currently being completed in which 3 user groups (average citizens, teachers and Gymnasium students[6]) have worked with the learning environment under different task requirements reflecting the different access scenarios outlined above. Subjects were given a) a search task, b) a vocabulary learning task and c) a comprehension task. In order to assess learning effectiveness, subject-specific pre and post-knowledge was assessed (with pre-knowledge as a covariate). The learning outcome data was also related to the scores of a newly developed scale for "Self-efficacy in web-based learning" (Domes & Brenstein, 2003). Finally, all users were asked to evaluate the various components of the learning environment along a series of usability criteria.

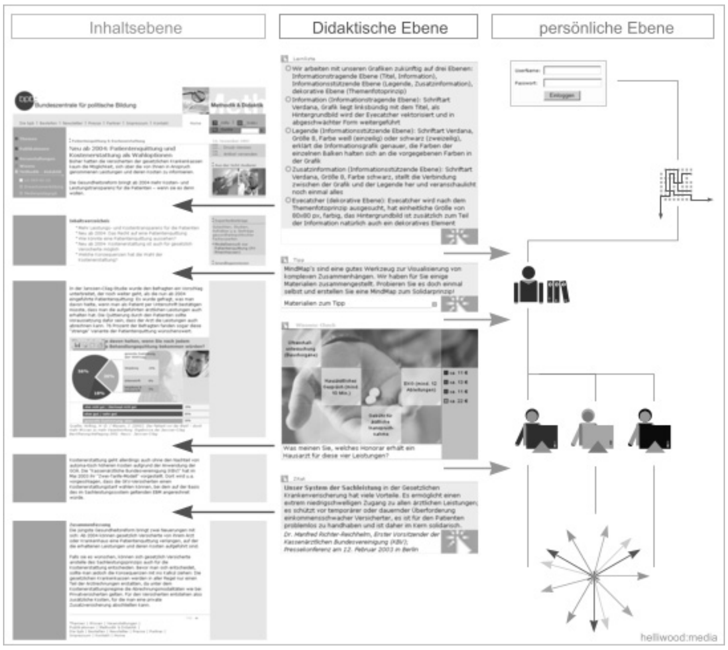

Figure 3: Three levels of learning design: Content, learner support and personalization

First results of the evaluation show that users rate the overall design as very appealing and find the texts very interesting and personally relevant (although they are deemed most suited for an audience with a good educational background and good language skills).

Figure 4: Fill-in-the-blank knowledge check

The utilization of learning support features varies considerably depending on motivation and personal preferences. For example, some students welcome the opportunities for discussing their ideas with others as suggested in some of the learning tipps while others make no use of this, prefering to work on their own. Most learners enjoy the interactive learning formats such as drag & drop tests or fill in the blank exercise (Figure 4). For all three groups, high self-efficacy in web-based learning was significantly positively correlated with learning outcome for the comprehension task. Full evaluations results will be presented at the conference.

[6] N > 65

References

1. BRENSTEIN, E. (2003) Didactic Modeling of Learning Fragments. Milestone Report for the Teachware on Demand Project, Humboldt University, Berlin
2. BRENSTEIN, E., KOS, O., LEHMANN, R., HOLTSCH, D. (in print) Grundlegende Aspekte der Qualitätsentwicklung und Qualitätssicherung von Bildungsportalen unter besonderer Berücksichtigung des Deutschen Bildungsservers. Project Report. Peter Lang
3. CAUMANNS, J., HOLLFELDER, S. (2001) *Lernen à la Carte – Neue Medien machen individuelles Lernen möglich.* In: Deiters W, Lienemann C.: Report Informationslogistik – Informationen just-in-time, Düsseldorf, Symposion Publishing, pp. 97-100
4. DOMES & BRENSTEIN, 2003 Online Fragebogen Selbstwirksamkeit beim Lernen im Netz. Humboldt Universität, Berlin
5. GREENBERG, J. Ed. (2001) Metadata and organizing educational resources on the Internet. New York, Haworth Information Press
6. WACHE, M. (2003) *E-learning: Bildung im digitalen Zeitalter*. http://www.bpb.de/methodik/B466VO,,0,ELearning_Bildung_im_digitalen_Zeitalter.html
7. WILEY, D. A. (2001) *Connecting learning objects to instructional design theory: A definition, a metaphor, and a taxonomy*. In D. A. Wiley (Ed.) The instructional use of learning objects. http://reusability.org/read/chapters/wiley.doc

MULTIMEDIA AUTHORING FOR E-LEARNING APPLICATIONS

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Introduction

Electronic educational applications are now becoming a reality in our everyday lives. For many years educators and employers have been talking about the enormous potentials of e-learning but change has been gradual. One reason for this is possibly technological innovations in educational institutions and offices have been geared mainly for automating the old learning processes rather than discovering and designing new ones. Although technology based education is impressive, knowing how to use it effectively is still something few people understand clearly or possess the necessary skills for.

Another reason that might have contributed to the slow adaptation of e-learning practices is that of technological limitations of our present systems. In order for e-learning to be established as a global norm, learning packages should attempt to go beyond the textual representation of information and harness the capabilities and utilities of non-textual or multimedia elements. Everybody has heard the expression “A picture is worth a thousand words”. Going along that line, a video must be worth a million words. Multimedia based content is created by incorporating various media components like text, image, graphics, audio, video and animation, using multimedia authoring software, for stand-alone applications to be run from a CD-ROM, or Web programming languages and tools, for network and Internet based applications. Other than the advantage of presenting the information in various different perspectives, multimedia presentations also incorporate components for interactivity between the learner and the application, which induce greater involvement with the subject matter and is perceived as crucial for learning modules. This is because it leads to a greater retentivity factor, as people remember only 20% of what they read but almost 70% of what they do. However current authoring tools and languages have not been geared towards e-learning applications with the result that they do not handle their requirements very well. This paper focuses on the technical requirements of an e-learning application and investigates how they are handled by currently available software tools, specifically for incorporating multimedia based content. The paper also proposes a solution architecture for those areas which cannot be fulfilled by current methods.

Requirement Analysis

On-line education is the most recent form of what is generally termed as distance education. The concept attempts to move educational opportunities out from a traditional classroom paradigm to anywhere the student feels convenient to access from. The electronic form of packaging content provides one of the fastest and cheapest ways of disseminating it. The term “on-line” emphasises that the access to such information is to be made using Internet and Web enabled technologies rather than packaging it in CD-ROMs, although the latter may also form part of the process. In fact in developing countries the Internet bandwidths are far from satisfactory especially for transporting multimedia content, which makes CD-ROM packaging a viable alternative.

Including multimedia based content for e-learning packages presents a host of requirements which needs to be addressed during the multimedia authoring process, for creating an effective and efficient machinery for information distribution. Some of these requirements can be identified as below:

- The content material should be capable of being accessed simultaneously by multiple users from geographically dispersed locations.
- The content should contain a generous mix of various media elements to present different perspectives of a topic.
- The byte size of the content should be small so as to be capable of being transported efficiently over bandwidth sensitive networks and channels.

- The content should be capable of being updated frequently without too much effort and time involvement.
- The content should contain sufficient amount of interactivity components to induce learners to participate actively instead of being passive absorbers of information.
- The users of the package should have a mechanism of searching for the content of their interests within the package.

As already mentioned, multimedia content can be created either by multimedia authoring software for CD-ROM based applications, or by Web programming languages for distributed network based applications. For "on-line" applications the latter method is of more interest however in general "distance learning" may involve both these mechanisms. In the following section, the paper investigates how the above requirements might be fulfilled using currently available authoring procedures.

Multimedia Authoring Issues

Web programming tools include the popular scripting languages used to create Web content: HyperText Markup Language (HTML), Cascading Style Sheets (CSS), JavaScript and Java (applets). Multimedia authoring software include popular GUI packages like Macromedia Director, Macromedia Authorware, Macromedia Flash, Asymmetrix ToolBook etc. which are used worldwide.

Content created using Web programming languages could be hosted on a Web server and would be available to multiple users worldwide having access to the Internet. The users could also simultaneously access the same document from different locations via the Web Browser client software, which makes this scheme quite suitable for distributing information to a large group of people at the same time. The constraint on the number of users would only depend on the physical bandwidth capable of being supported by the server and associated network infrastructures. Such access to information via the Browser would essentially be of a "read-only" nature ensuring protection of the content from being manipulated and changed. Content prepared by using multimedia authoring software, on the other hand, are usually distributed on CD-ROM discs to the various users, where they are accessed in stand-alone environments on personal computers. With the fall in prices of CD-ROMs and their capabilities of storing a relatively large amount of data, this has become a viable distribution mechanism for distance education. The drawback here is of course the time delay in physically distributing the CD-ROM discs and the cost involvement in doing that, however the advantage is that better quality content (implying bigger files) can be more easily accessed from CD-ROMs and the cost factor is a one-time affair instead of incurring connection charges every time on-line material is accessed. So in general a mix of the above methods may be adopted in a practical scenario: the main content including larger files like audio/video content may be distributed via CD-ROMs periodically (say, once in a few months), while updates, exercises, projects, quizes, examinations etc. which might be primarily textual or graphical in nature, could be disseminated over on-line channels on a daily or weekly basis.

Both the Web programming languages including the Web browser and the multimedia authoring software are capable of incorporating various multimedia components in standard file formats within a presentation. These include text, displayable in a number of fonts, colors and sizes; images and graphics ranging from 8-bit to 24-bit color depths in BMP (uncompressed), GIF (lossless compression), JPG (lossy compression) formats; audio including speech and music in WAV (uncompressed), MP3 (lossy compression), MIDI (textual files containing instructions for playing music) formats; video and animation in AVI (uncompressed), QuickTime (lossy compression), MPEG (lossy compression) formats. In some cases the Web browser might need additional downloadable plug-ins to play specific media types e.g. Flash movies. The authoring software usually generate their output as executable (EXE) files which contain their own run-time engines to play all the file types they support, without needing any external utilities.

Web programming languages use source files composed of ASCII text characters. The instructions in the source files are interpreted by the Web browser which display the contents to the user as the developers have designed them. The Web browser, e.g. Microsoft Internet Explorer, Netscape Navigator, is a standard free downloadable software and is expected to reside in all client-end systems, thus precluding their needs to be included within the e-learning application package. Thus transporting an application would involve simply transmitting compact text files which would not consume appreciable network resources. However, these text files actually remain linked to media files which may be arbitrarily large in size, especially audio/video content. For displaying multimedia content to the end user the media elements also need to flow from the Web server to the client machines, and this is seen as a bottleneck for smooth functionality. Depending on the network bandwidth, network load, media file size and Web server capabilities, delays in displaying media content can range from few seconds to hours. These delays might be tackled in two ways: one, by using small content in more efficient ways in order to reduce bandwidth requirements e.g. using animated GIF files instead of video clips, looping a small clip multiple times instead of larger clips etc. The second ploy is to use improved mechanisms to transport the media so that delay at the user end is minimised. The Hypertext Transport Protocol (HTTP), the default transport protocol for Web applications, is not able to handle network delays satisfactorily forcing experts to design more improved protocols for the purpose. One example is Real Time Protocol (RTP) which uses feedback mechanisms between the server and client to transport content in real time. Another avenue of research is to design Streaming technologies which enable components to start playing without being fully downloaded onto the client system. The initial few frames of a media clip start playing in the user interface while the remaining portions download in the background. Authoring software tools usually embed the media components along with the presentation into a single executable file, due to which the file sizes become extremely large often spanning over hundreds of megabytes. These files are therefore not suitable for distributing over the Web and are instead physically distributed in CD-ROM discs.

An important requirement of an e-learning system would be an efficient method to change content quickly mostly to accommodate new content, new groups of users or newer perspectives in explaining the content. A multimedia presentation created using the Web programming languages is suitable for such changes, since the source text files may be changed simply by using a text editor and then uploading the new file onto the Web server at off-peak hours. The users would be able to get the new updated content the next time they connect to the server for accessing the material. Multimedia authoring software however generate executable files as output whose single monolythic structure precludes any possibility of making changes without an entire process of recompilation which may be both time consuming and costly in terms of effort. Therefore this form of distribution would not be suitable for content which needs to be frequently updated.

For Web content interactivity elements are created using languages like JavaScript and Java applets. These include buttons, menus, popup boxes and windows, input fields, alert boxes, pull-down lists etc. These interactivity elements however seem of a very basic level geared more towards efficient navigational pathways than for enabling a better understanding of the content material. In an e-learning package interactivity should be of a much more subtle nature designed for aiding in the semantic comprehension of the learner. Of course implementing such methods would call for an in-depth understanding of the principles of pedagogy, since the teaching process does not involve technology alone. However it should be noted that the basic concept of an Intelligent Tutoring System (ITS) is to gauge the knowledge depth of the learner and to dynamically adjust the content as per his/her comprehension levels, and the point that is being made here is that current methodologies as yet do not seem to provide features to incorporate such functionality efficiently. Even for multimedia authoring software, incorporating such functionality is still a far cry, although in general they are seen to provide more sophisticated and innovate interactive elements than Web programming languages. For example adjusting the volume of the background music or creating path animations are done more easily using these software than the Web programming languages.

Another crucial requirement of e-learning packages would be to allow the learners to search for content of their interest. This would typically involve allowing them to type a keyword or text string and asking for the application to retrieve the desired content. For example the users of a geological learning package may type “granite” or “sandstone” and the application is supposed to retrieve a list of pages containing one or more occurrences of the keywords. Such functionality could be easily incorporated by using a modern browser which can search for text strings in the currently open page or by writing JavaScript programs to list all pages containing specific terms. For multimedia authoring packages, the embedded programming languages e.g. Lingo in Macromedia Director, ActionScript in

Macromedia Flash, might be required to incorporate these features. However, it should be remembered that e-learning packages contain multimedia components too and searching for such content may introduce newer dimensions altogether. An image or audio or video cannot be searched directly by typing a keyword unless it has been labelled from beforehand by the developer. This topic needs further detailing and is discussed in a separate section below.

Multimedia Content Searching

A picture of a car can only be retrieved when it has previously been associated with the text term "car". This may lead to ambiguities as different persons may search for the same item using different keywords e.g. "car", "vehicle" and "automobile" refers to the same object. Here is another example. One person might ask for information on rock samples from a specific geological era, while another might want rock samples at a specific geographical region, while a third person might want rock samples containing a particular ore of iron. It can be easily appreciated that the number of choices would be potentially too large and extremely difficult for the developers to envisage from beforehand all the various terms that could be used in describing an object. The ambiguities do not end here. How would the application decide which pages to display to somebody who asks for images containing "rose red" or "sky blue" since no standard definitions for these exist. "Rock" in the context of geology may be completely different from "rock" in music. Such varied queries can be made for retrieving other media components too: people may search for audio clips containing "call of a cuckoo bird", "firing of a gun", "breaking glass" or musical pieces like "song of Beatles" or "folksong of India". Video queries may range from "movies directed by Spielberg" or "science fiction movie" to "movies that won an Oscar in 2000". Moreover, it is entirely possible that all the above three queries may actually point to the same movie. Additionally, it has to be considered that labelling of each media object manually by multiple descriptions may be highly time consuming and practically infeasible for large collection of media objects.

A more serious problem emerges when queries may not be totally textual in nature. For example a learner of a geological package may not know the consistencies of the image of a rock but wants to view images of rocks similar to the one that he/she has. How would such queries be expressed? How would one retrieve a musical clip similar in composition to an existing musical clip or perhaps by the same composer? Currently available methods in Web programming or multimedia authoring software do not allow the developers in incorporating such functionality. However, they are crucial and important when considered in context of interactive learning systems. The next section outlines a solution architecture whereby such functionality may be possible at least in part to be incorporated.

A Solution Architecture

In order to handle problems stated above, this paper proposes creating a multimedia database at the back-end of on-line e-learning applications. A multimedia database can be defined as a collection of various media components kept in such a way that they can be retrieved based on queries. This implies that the database would not simply be a storage place of media files but that it should have an organised structured for efficient retrieval. When a query is issued to a multimedia database media objects are retrieved based on similarity matching between the query and the stored objects. However, unlike a text database where the objects (alphanumeric data) themselves are compared with each other to determine a match, for a multimedia database, the media objects themselves are not compared directly but rather some characteristics of objects are compared to determine a match e.g. dimensions or color of an image. Thus a multimedia database consists of two levels of abstractions – the physical level consisting of the media objects themselves and the logical level consisting of the features characterising the media objects. In effect a multimedia database consists of two separate databases – a "Media-DB" and a "Feature-DB" with a link between them for associating the physical objects to their descriptions.

While the Media-DB may simply be a folder populated by media files, a Feature-DB is to be designed based on the type of information it contains. If the features can be expressed as alphanumeric strings then a conventional relational database would suffice. Such information can be specified in two different ways. The first is by manually attaching the information with the media files. It has already been seen that this would be an ambiguous way of characterising media however there are certain information that could be specified only in this way which includes semantic descriptions of objects e.g. name and date of birth of a person in a photograph. The second way of attaching textual information is by using software to read file attributes directly from file headers. These include image dimensions (e.g. 640 pixels × 480 pixels), color depth (e.g. 24-bit), resolution (e.g. 75 dpi), audio sampling rate (e.g. 44.1 KHz), video frame rate (e.g. 15 fps) etc. Other feature information cannot be expressed simply as textual strings but needs to be expressed as mathematical vectors. Specialised algorithms are required to analyze the media content structure and extract the feature set as multidimensional vectors. For example the color content of an entire image may be expressed as a summation of a series of histograms calculated over all the pixels; the loudness of an audio clip may be indicated by the average energy levels calculated over all the audio samples; displacements of objects within a video clip may be described by motion vectors etc. Storage of these values might not be possible using relational databases as in most cases these represent multi-dimensional vector quantities while relational tables only support atomic attributes. Hence object-oriented (O-O) databases are being preferred for storing multimedia content because O-O terminology supports properties or attributes of objects which are themselves complex objects e.g. audio track of a video clip. Another reason for which O-O concepts are preferred relates to the dynamic time-varying properties of multimedia objects which may be conveniently represented by object methods, which is not possible in a relational framework.

A query in an O-O multimedia database usually consists of a multimedia object as a query object e.g. given an image an individual might want to retrieve all similar images from the database. In this scenario a similarity measure also needs to be specified i.e. how similar the retrieved images should be in order to be considered a match. Algorithms would be first required to analyze the query object and represent its features as a combination of textual description, file attributes and multi-dimensional vectors. Assuming that the features of all objects in the database have been previously analyzed and represented as features, the features of the stored objects and the query object are mapped into an n-dimensional feature space. The query is then processed by using the "near neighbour searching" algorithm which can be formulated as follows: If P_1, P_2, …, P_k be a series of k points in an n-dimensional feature space, given a multimedia query whose feature point is Q and similarity measure r, the answer of this query is $\{P_i \mid d(P_i,Q) \leq r,\ P_i \in (P_1, P_2, \ldots, P_k)\}$ where $d(P_i,Q)$ is the distance between P_i and Q in the n-dimensional feature space. In most cases this distance is taken as the smallest Euclidean distance between two points $a = (a_1, a_2, \ldots, a_n)$ and $b = (b_1, b_2, \ldots, b_n)$:

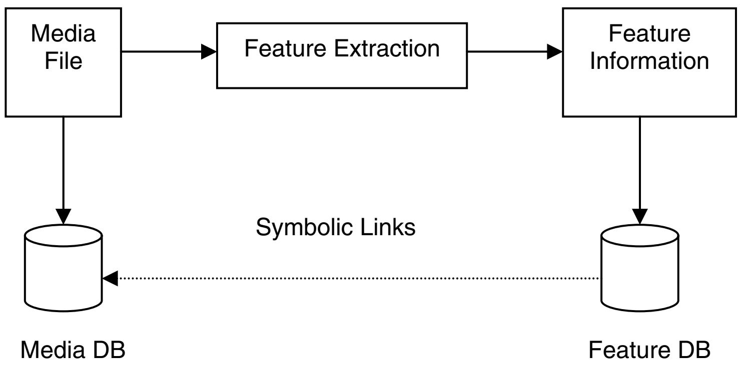

Figure 1

$$d(a,b) = \sqrt{\sum_{i=1}^{n} (b_i - a_i)^2}$$

The output of the query processing is usually a list of similar objects from which the user can manually select or preview a specific item by clicking. The block diagram of such an architecture is illustrated in Figure 1.

Conclusion and Future Scope

This paper discussed the main technical requirements of implementing e-learning applications especially those incorporating multimedia components, and investigated how these might be fulfilled using current technologies. In doing so two methods were considered: creating content using Web programming languages and multimedia authoring software along with their merits and demerits. For incorporating a multimedia search engine within an e-learning application, the paper proposes incorporating a multimedia database and provides an outline how it may function as well as its architecture. This is expected to provide a model based on which on-line e-learning packages incorporating multimedia components and including searching facilities of multimedia information through textual and non-textual queries could be constructed. This might lead to a new paradigm of interactive systems where users would have the full flexibility of finding any content of their choice instead of being bounded by structures laid down by content developers. This model could be enhanced by incorporating distributed media where the media components do not remain within a local repository but stay distributed over an accessible network. The model may further be standardized by incorporating data models like MPEG-7 which provides standardized descriptions of multimedia components.

References

1. M. FLICKNER et al. (1995) *Query by Image and Video Content*: The QBIC System, IEEE Computer, pp. 23-32
2. W. KIM, D. WOELK, W. LUTHER (1986) *An Object-Oriented Approach to Multimedia Databases,* Proc. of ACM-SIGMOD, pp. 311-325
3. J. K. WU, A. D. NARASIMHALU, B. M. MEHTRE, C. P. LAM, Y. J. GAO (1995) CORE: *A Content Based Retrieval Engine for Multimedia Information Systems,* Multimedia Systems, 3(1), pp. 25-41
4. C. C. LIU, J. L. HSU, A. L. CHEN (2001) *Efficient Near Neighbour Searching using Multi-Indexes for Content Based Multimedia Data Retrieval*, Multimedia Tools and Applications, 13, pp. 235-254, Kluwer Academic Publishers
5. W. KIM (1989) *A Model of Queries for Object Oriented Databases*, Proc. of 15th VLDB Conference, pp. 423-432
6. R. KOENEN, F. PEREIRA (2000) MPEG-7: *A Standardized Description of Audio Visual Content,* Signal Processing: Image Communications (16), pp. 5-13
7. A GUPTA, T. WEYMOUTH, R. JAIN (1991) *Semantic Queries with Pictures: the VIMSYS Model*, Proc. of the 17th VLDB Conference, pp. 69-79
8. R. GONZALEZ, G. CRANITCH, J JO (2000) *Academic Directions for Multimedia Education*, Comm. of the ACM, 43(1), pp. 89-95
9. W. KIM (1990) *Research Directions in Object Oriented Database Systems*, Comm. of the ACM
10. R. KALAKOTA, A. B. WHINSTON (1999) Frontiers of Electronic Commerce, Addison-Wesley

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THE MODEL OF DIGITAL VIDEO PRODUCTION – CASE STUDY: COURSE PRODUCTION AT THE UNIVERSITY OF OULU, DEPARTMENT OF INFORMATION PROCESSING SCIENCE

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Introduction

The rapid development of educational technology and information networks has enhanced the interest in the production of online courses and possibilities to use learning materials. In the activities of universities, the added value of the use of online courses can be seen in improved prerequisites for regional activities as well as in possibilities to offer flexible study opportunities to students who cannot participate in normal teaching due to causes such as work issues or geographic distances. The use of learning technology in universities is reaching a degree of maturity in which the main attention is not any longer targeted at the solution of technical problems. More and more attention is being given to what is done with the technology and what contents are conveyed with it. The universities have not, however, had any clear common production concept for wide-scope production and delivery of learning materials.

The number of content creation units and companies is growing as a result of increased demand, and it therefore becomes more and more requisite to promote good practices and examples of efficient content creation projects. Similarly to many other fast-growing areas, the production methods have developed along with the activities, and they have usually not been systematically developed, let alone modelled or researched.

The Digital Media Creation Unit (DiVision) of the Department of Information Processing Science at the University of Oulu developed a production model for fast streaming video in the years 2002-2003. In this model, experiences from Agile type software development models were applied to the multimedia creation process. One of the main requirements of the model has been transferability to separate production environments and cost-efficiency. The model was developed for the needs of producing learning materials, but it can also be applied to other productions implemented with streaming media.

Background

In the current situation, with digital content creation for online learning environments only taking its first steps in many universities, the need arises for practical functional examples. With the help of examples from practical experiences, the attitudes of those working in the field of education can be changed to be more positive towards online education and they can be offered practical models for the arrangement of online courses (Collan 1998).

Media recordings are currently produced and will also be produced in the future with highly different methods and resources. Some of the production consists of mass recording of normal lectures, while the other extreme comprises finished and resource-hungry multimedia production reminiscent of TV productions. Considering the unit size of Finnish universities, all of them cannot afford to search by trial and error for the method of production that best suits their own contents. Common production model recommendations help to improve compatibility in a field that is otherwise very fragmented and to aim the limited resources at the right target. The production models comprise:

- Phases and critical points of the production process in different types of media stream production

- Recommendations on production hardware and software that has been found to be good to make the purchase decision easier
- Examples and instructions for different phases of production (Sariola 2003, 70.)

The development is taking us towards professionally run production units, because the regional activities of universities and improved network connections in students' apartments lead to an increase in the general interest in media stream techniques and to their increased utilization in teaching. This is also influenced by the change in the role of the universities. Their strategies, structures and fields of action are changing. The regional campus-like universities are developing towards virtual universities that make use of the applications of information and communications technologies and are nationally and internationally networked communities of lifelong learning. In addition to teaching and research, they also have social functions to an increasing extent. This development helps to add to the demand and quality requirements for applications and services related to the use of ICT in instruction.

We are using the term "professionally run production group" here, but it does not really refer to professionalism in the economic sense, but as a way to do work. Professional work is systematic, cost-efficient and produces materials with a uniform quality. This requires thorough familiarisation with the working processes, development of one's own working model and strict adherence to it.

DiVision – production unit for digital media

DiVision is the production unit for digital materials in the Department of Information Processing Science at the University of Oulu. At the time of the study the DiVision production team consisted of eight members and a team leader. The team has grown in two years into the current form as its activities have expanded so fast. The team was initiated in May 2001 when the Department of Information Processing Science launched the Master's programme in Digital Media. The activities expanded along with the Masters' Programme in Software Production the following year, and during the period covered by the study the team produced distance learning materials for 235 students in seven localities (Haapavesi, Kajaani, Kemi, Kuusamo, Oulu, Raahe and Ylivieska). These Master's programmes were produced 58 credits worth of courses in the winter 2002-2003, and some 350 hours of videotaped materials were produced in this connection. The activities expanded further when the new Master's Programme in Mobile Services was launched in December 2003. The team consists of experts in different fields with varying educational backgrounds. This is a characteristic in common to all multimedia production teams, as the manufacture of the end product requires multidisciplinary know-how (e.g. England & Finney 1999, 8).

Production model

In this paper the model is first outlined as a task-level description which is initially divided into smaller wholes to make the model easier to perceive. Finally, the entire model is presented as well as its connection to the course production model on a more general level of abstraction.

Shooting, editing and sound processing

The description of the process starts with the shooting. We are not concerned with what the shooting conditions are or what is being shot. Shooting is done with a DV video camera, and the materials shot are recorded either with the camera on DV tape or directly onto the hard disk of a computer, thereby avoiding the transfer of materials from tape to the hard disk. In video editing, a switch has been made to fully computer-based editing, so the materials to be edited need to be in digital form on the hard disk of a computer. DiVision uses Adobe's Premiere software for video editing. In quick-tempoed productions the editing is usually limited to the definition of exact cue points and possibly the removal of certain sections. An effort is already made at the shooting stage to avoid unnecessary materials. This will cut down the need for editing and make the process faster. The person who did the shooting usually also edits the materials s/he shot, so time need not be spent on getting familiar with the materials.

Graphic design is a process in support of the video production process that will not be discussed in more detail here. Graphics design produces the graphics that may be needed, such as credit titles or table, and they are connected to the video at the time of editing.

Sound recorded on lectures usually contains a plethora of disturbing noises that the human ear filters out in the actual lecture situation. They include air conditioning, coughing or moving of chairs from one place to another. When the video is viewed, such sounds are emphasised, so they need to be filtered out. It is therefore necessary to detach the soundtrack from the video so that the audio can be processed on its own (cf. Figure 1).

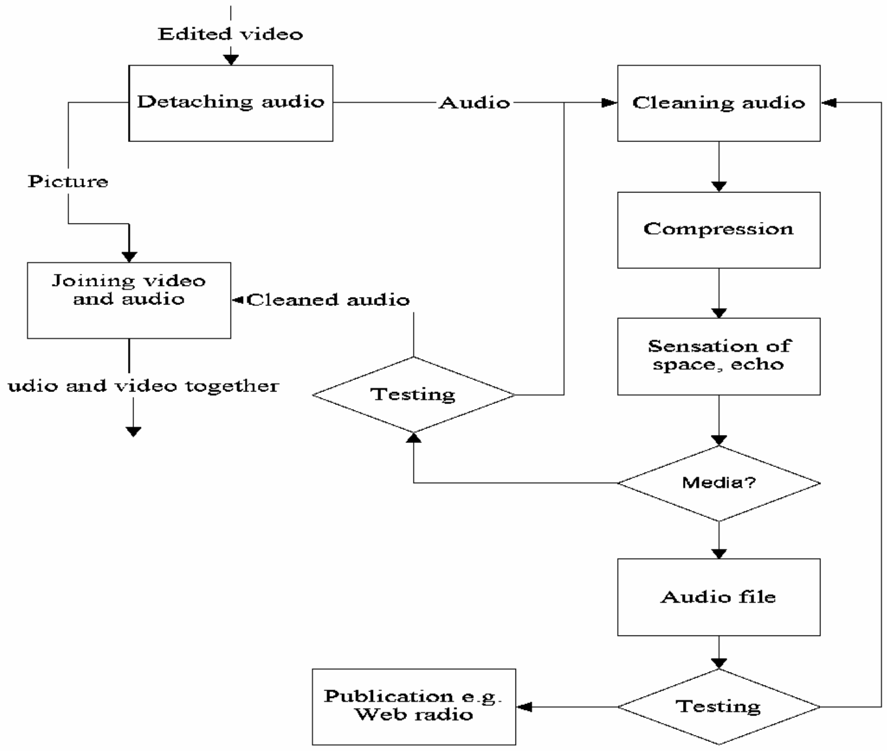

Figure 1. Audio processing

Audio processing software is used to analyse and filter out or decrease the volume of any sounds other than the lecturer's voice. The audio that has been thus cleaned is then compressed. During compression the audio is levelled out by lowering the peak volumes and raising the low volumes. In this way the entire bandwidth can be made better use of and the average audio level can be raised, making it easier to listen to. After cleaning the sound is too clean to the human ear. The audio will sound dry and it is not pleasant to listen to. The human ear is used to hearing the distortions introduced to sound by the room atmosphere, such as echoing, so they are added to the sound thus creating an impression of space.

The standard procedure is to create two different audio files. One of them is used for audio to be connected to the video picture. The other file is compressed into MPEG3 format and can be used, among other things, for online radio broadcasts. The file is saved for user access on a media server. Students have liked to listen to the sound files, as a media stream of 20 kilobits per second can also be listened to over a slow modem connection.

Video compression and transfer into forms required by publication media

After combining image and sound, the video materials can already be viewed. The file size is, however, so large that it is not sensible to distribute it. That is why the video needs to be compressed. Compression is always a compromise between quality and file size, and the amount of compression is therefore dependent on which aspect is valued more highly. Compression cuts down the amount of information by making the image smaller and reducing the number of images per second. After this a compression algorithm is used to remove unnecessary or redundant information in the images (cf. Figure 2). The level of video compression used by DiVision in normal production reduces the size from 3.6 Mb/s to 117 kb/s. Video compressed in this way requires approx. 51 MB/hour.

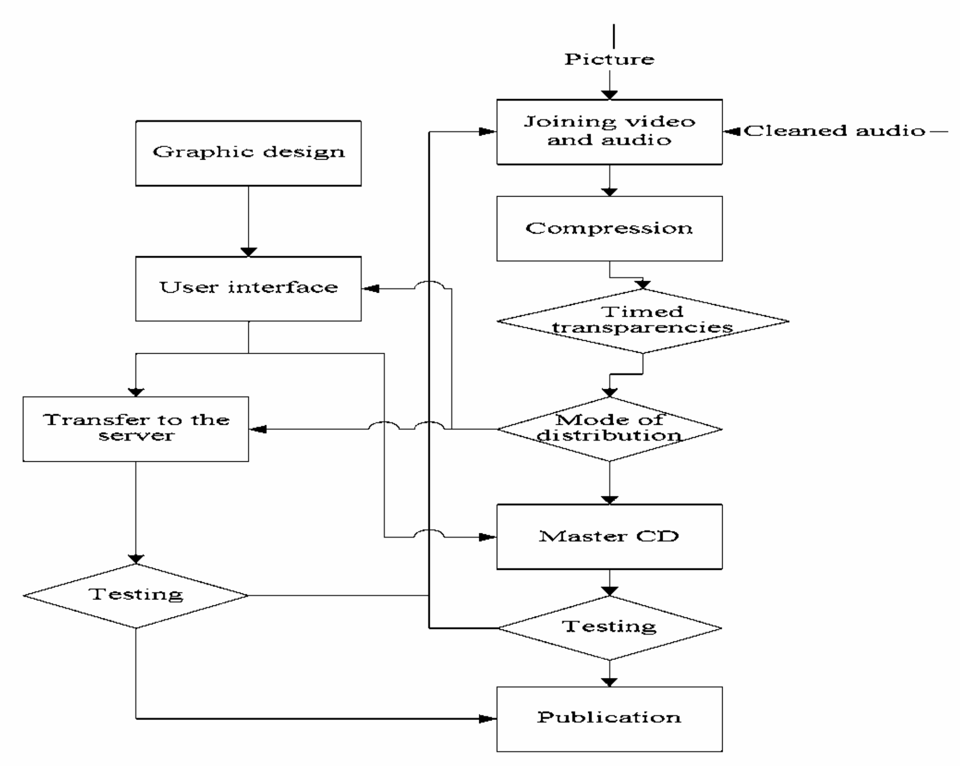

Figure 2. Video compression and transfer into forms required by publication media

After compression, the video material is basically ready for distribution on different media. If it is desirable, however, to time lecture transparencies to go with the video, it needs to be done at this stage. The timing of lecture transparencies is not carried out for all productions because of the time it takes, but timing is on the increase thanks to positive feedback.

The compressed video materials are in the WMV format and as such suitable for various distribution media. The video to be viewed online and the Flash or HTML user interface constructed for a course are stored on the media server. The media server allows publication of video one at a time, so they are available on the day following a lecture. In the case of distribution on CD-ROM, enough lectures are put together to fill the capacity of the disk before a master disk is made. The master disk is a disk prepared for the CD copying robot to make the final copies.

Model of video production

An overall picture of the video production process of the DiVision team is presented in Figure 3. The figure is a task-level presentation of the various tasks in the production processes and as such should be revealing to experts on this field. Because of its high accuracy, however, it can be difficult to perceive the processes that it represents. Therefore, a simplified diagram is presented in Figure 4 describing the production on the process level and its connections with course production.

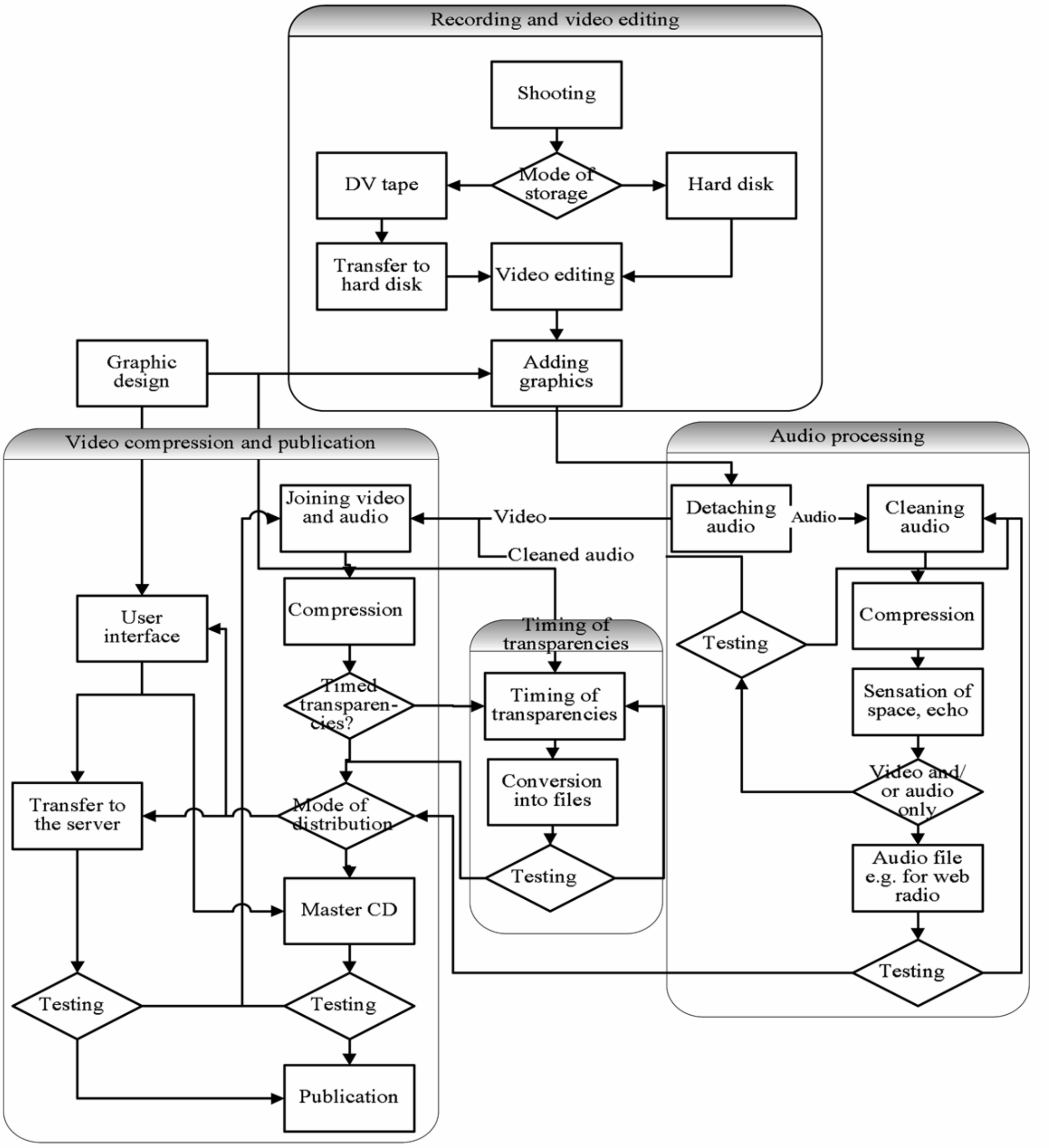

Figure 3. Description of the video production process used by the DiVision team

In the model of video production used by the DiVision team, the number of tasks can be surprisingly large and make it difficult to perceive the model. The picture becomes much clearer when we move from a task-level description to the description of processes and sub processes. An incremental production model can be clearly seen in Figure 4. Incrementality becomes even more obvious when we think of lecture descriptions as parts of the production of an entire course. The recording of a single lecture followed by all the subsequent processing forms a single increment, producing a lecture video as a partial publication. The lecture videos contained in a course together form a course in digital form that can be distributed online or on various storage media (such as CD-ROM or DVD).

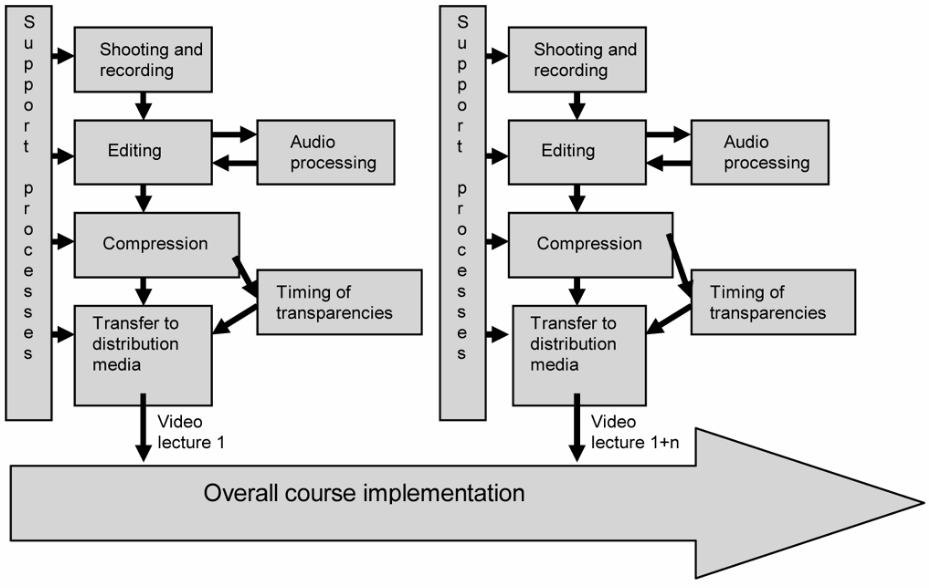

Figure 4. General model of video production by the DiVision team

Conclusions

The starting-points of production determine the process and the end results. In course production the starting-points are constituted by the students' needs and the needs of the institution that is providing the course. In the Master's programmes offered by the Department of Information Processing Science, the students' requirements have been related to production speed and a high quality. The Department's requirement, in addition to those mentioned above, has been the cost-efficiency of production. These starting-points have directed the activities towards an incremental production process. In the waterfall production model, the whole course would be made ready before publishing it to the students. This is not sensible from the students' point of view, as they would have to wait for the course to be finished before starting their own studies. The lectures made available as a partial publication through the incremental production process make it possible to pursue the studies with a delay of a couple of days. The feedback on partial publications has a great significance for risk management and development of production quality. In the model of incremental production, it is possible to change the production techniques in the middle of course production on the basis of feedback and experiences received.

In addition to the models of production, the activities of groups are essentially influenced by the working habits that they adopt. In new production groups the working habits often emerge on an ad hoc basis. As a basis for the development of working habits, it would be necessary to find ways of action already developed and investigated by others. The agile type of working method used in the production model presented above proved to be a highly functional way to work on multimedia production.

References

1. SARIOLA, J. (ED) (2003) *Videoteknologian käyttö yliopistoissa 2003-2006 – Suomen virtuaaliyliopiston palveluhankkeiden määrittelyraportti*. Suomen virtuaaliyliopiston e-julkaisuja

2. ENGLAND, E. & FINNEY, A. (1999) *Managing Multimedia, Project Management for Interactive Multimedia. Second edition,* Essex: Addison-Wesley

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USING EDUCATIONAL TECHNOLOGY IN REGIONAL MASTER'S PROGRAMMES AT THE UNIVERSITY OF OULU

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Introduction

The Department of Information Processing Science is one of the largest departments at the University of Oulu. At the beginning of 2004 there were some 1500 students studying for a first degree and 80 postgraduate students in the department. A total of 335 students are currently studying in Master's programmes implemented outside the campus area. The Department employs 145 people, with 130 of them in Oulu and 15 in Kajaani.

We are using educational technology and digital materials in the Master's programmes in Digital Media, Software Production and Mobile Services to offer students equal opportunities to pursue academic studies in different locations in Oulu Province. The Master's programmes lead to the degree of Master of Science (240 ECTS) in Information Processing Science. The Department of Information Processing Science carries the main responsibility for the implementation of the programmes. The Department will be in charge of the contents of the programmes, the teaching to be provided, the production of the learning materials and learning technology used. The Department is one of the most significant providers of regional academic instruction in Finland. We are also strongly involved in the development of the virtual university.

This paper aims at (1) evaluating the applicability of educational technology to the production of multimedia materials in online learning environments, (2) describing the process of digital materials production used by the department, and (3) reporting on the students' experiences on the use of educational technology to implement Master's programmes.

Background

The Department of Information Processing Science has put a considerable effort to develop distance and flexible education. The activities have been targeted especially to retraining and Master's programmes in northern Finnish localities outside the Oulu campus area. The productions will also be utilised from the beginning of 2004 in the teaching offered by the Kajaani Unit of the Department of Information Processing Science. In the last three years the Department has produced the contents of approx. 30 courses in digital format (online materials, video lectures and exercises). In 2004 the goal is to pilot the applicability of mobile devices and systems for the study of information processing sciences.

Supporting the department's staff, DiVision, the production unit for digital media, is in charge of digital content creation. Its function is to produce multimedia materials on various distribution media for the department's teaching purposes, projects and external co-operation partners. The unit is also responsible for supporting educational technology and learning environments in the department and to some extent in the entire university.

Educational technology is made good use of in teaching in the regional Master's programmes, such as IP/ISDN video conferencing connections supplemented by web radio and tools for application sharing, for instance. Distance education is provided by using digital learning materials (lecture and exercise materials related to the course) produced on the media server or other distribution media (CD/ROM, DVD). In all of our Master's programmes we are using a Web-based learning environment (Discendum OPTIMA) as a distribution place for course materials, project studies, group exercises, virtual conversation and returning place for assignments.

The Master's programmes have course-specific tutors and technical support personnel in the localities outside the campus. They are in charge of the practical implementation of distance teaching and exercises. Some of the teaching outside Oulu is given by local teachers. Certain courses can be taken independently of time and place at home or work by using the digital materials or the virtual learning environment.

On online learning environments

Learning environments are often compared or described in terms of their relation to time and place, and the multimedia applications contained in them are compared in terms of interaction or structured ness. The first advantage offered by the network that is typically presented is the frequently repeated thesis of the independence of time and place that ICT offers. This applies, however, only partially, as when we communicate, we are always tied to a time and place. The advantage is more obvious as concerns place, though. In practice, a learning environment is seldom implemented purely as such, as they usually feature various combinations. The development of Internet-based multimedia environments in particular has obscured the boundaries between learning environments.

According to Agius and Angelides (1997, 679), the division can be made in an environment containing multimedia on the basis of whether the environments are passive or interactive and if they are unstructured or structured environments. In a passive environment there are predetermined cycles of events that the user cannot change. An interactive environment offers the user some degree of possibility to control the events, whereby the learning process becomes more personal, as the system adapts to the user's needs. An unstructured environment does not guide the user as s/he moves forward, whereby learning usually takes place through inquiry or simulation. Meanwhile in a structured environment the instruction proceeds in a clear manner and the student has more or less obvious goals.

From the viewpoint of this paper, the essential thing in the use of online environments is the application of audio and video materials conveyed through the network. This use can be divided into three ways:

- Support material and illustrative tool for contact and distance education;
- Course implementation is mainly based on media recordings distributed on the network;
- Normal contact lectures are stored as revision materials for the students or to replace a contact teaching session.

The last two cases are the most common in the activities of the Department of Information Processing Science. This is also the typical scenario in other university units (cf. Sariola 2003, 21). Replacing contact teaching with video recordings is an increasingly common approach to solving scheduling and distance problems in distance education in particular. The problem of this "Internet environment" model proves to be the passive and unstructured nature of the materials produced, so we have a good cause to ask what the added value of the network is for teaching and learning. If the method of use is purely communicative, the added value of the network can be easily limited to independence of time and place.

Implementing lectures with streaming technology

Streaming technology means in this connection continuous, unidirectional transfer of a media stream A video or audio file compressed as media stream can be transmitted either live or on demand. The file is not usually loaded onto the viewer's computer, as the multimedia material is viewed from the multimedia server at the same time as the material is being transferred from the server. In this way you can start viewing multimedia as soon as you have issued the request to the media server.

Multimedia files can also be compressed and distributed as files (e.g. via ftp) or on various media (CD-ROM, DVD). The most common media stream formats are currently commercial formats such as RealMedia, WindowsMedia and Quicktime. The DiVision production team used the WindowsMedia format in its productions in the spring of 2003. The criteria for this choice included good quality, general availability of the media player, and low cost of the media server software. Distribution was offered mostly through the media server, while CD-ROM was used as a distribution medium for students who had no access to a fast network connection.

The production of lectures into a video format in the Department of Information Processing Science can be divided into the following stages:

- Pedagogical coordinator consults with the teacher;
- Technical support person agrees with teacher on practical implementation and scheduling;
- Shooting and recording;
- Editing;
- Sound processing;
- Compression;
- Timing of transparencies;
- Transfer to distribution media.

These partial processes constituted the hooting of a single lecture. A course comprises several lecture shootings and the lecture videos produced from these shootings constitute one whole course.

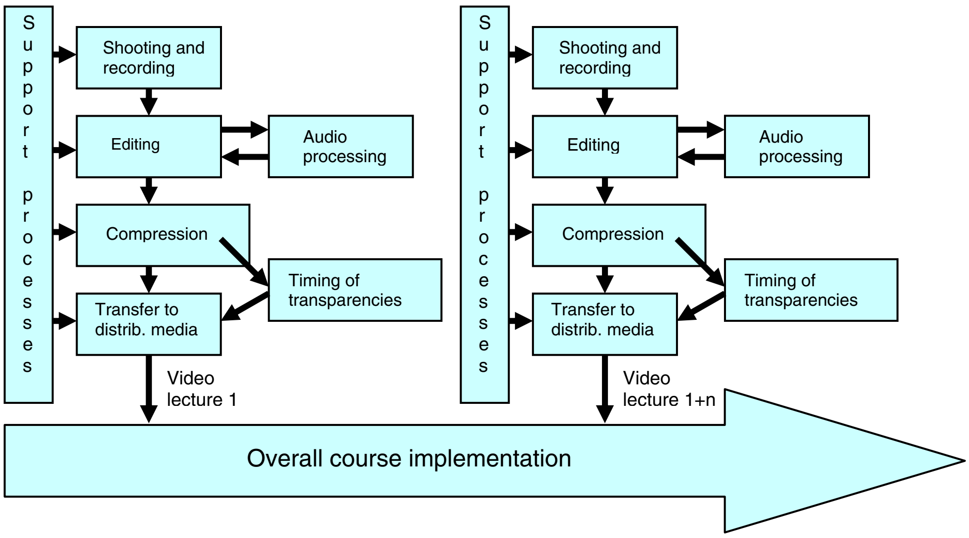

Figure 1. General model of course production

Using video materials in teaching

The Department of Information Processing Science has currently opted to make most of the lectures series available in a format that can be viewed online (cf. Figure 2). For use by students with poor network connections the lecture materials are also produced in a format that is distributed on CD-ROM or DVD. The need for them has rapidly decreased as students have acquired fast network connections. An effort is made to convey the opening and closing lectures of each lecture series through videoconferencing, thus helping real-time information provision on course arrangements and answers to students' questions. The students taking part in a course have access to a learning environment for distribution of materials, doing project work and taking care of online tutoring.

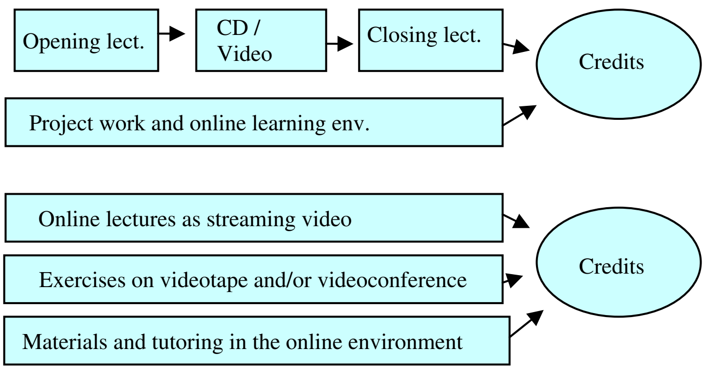

Figure 2. Use of online materials in teaching

An effort is always made to arrange the exercises forming part of a course locally. If it cannot be done because there is no one to take charge of the exercises, videoconferencing and an integrated application sharing programme are used to supervise the work. Application sharing allows the student and tutor to share documents and software related to the exercises.

Results of student experiences in using learning technologies

The Department of Information Processing Science has conducted feedback inquiries among students participating in three regional Master's programmes in 2002-04. The inquiries aimed, among other things, at finding out the experiences and skills of the students in using and utilising various distribution media and formats of digital materials in their studies. These were only one part of our larger survey consisting 16 different topic areas.

There are 105 students in the Master's Programme in Digital Media (DM) and 72 (68.6 %) of them answered to our survey at the beginning of 2002 (Figure 3). The inquiry was made again to the same target group early in 2003 (Figure 4). The number of respondents to the new inquiry was 45 (42.9 %). We also repeated the survey in February 2003 for 127 students in the Master's Programme in Software Production (SP) (Figure 5). The number of respondents to this inquiry was 76 (59.8 %).

Figures 3-5 illustrate the experiences in using different media in two different Master's programmes. Abbreviations in figures are: On-line videoconferencing, CD-ROM materials, Streaming video in lectures, Streaming video in exercises, Streaming voice in lectures.

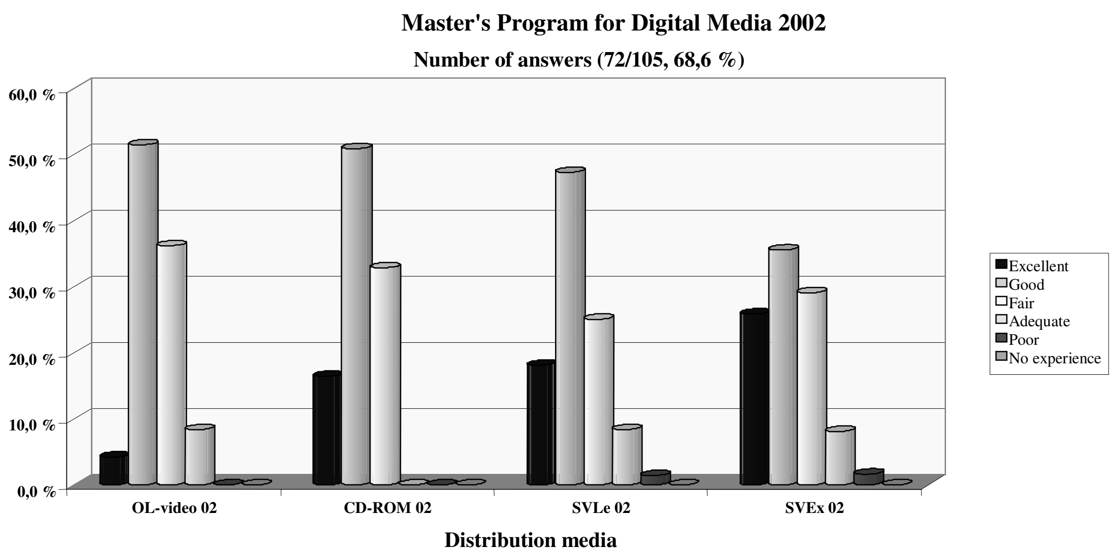

Figure 3: Student experiences using different distribution media: DM survey 2002

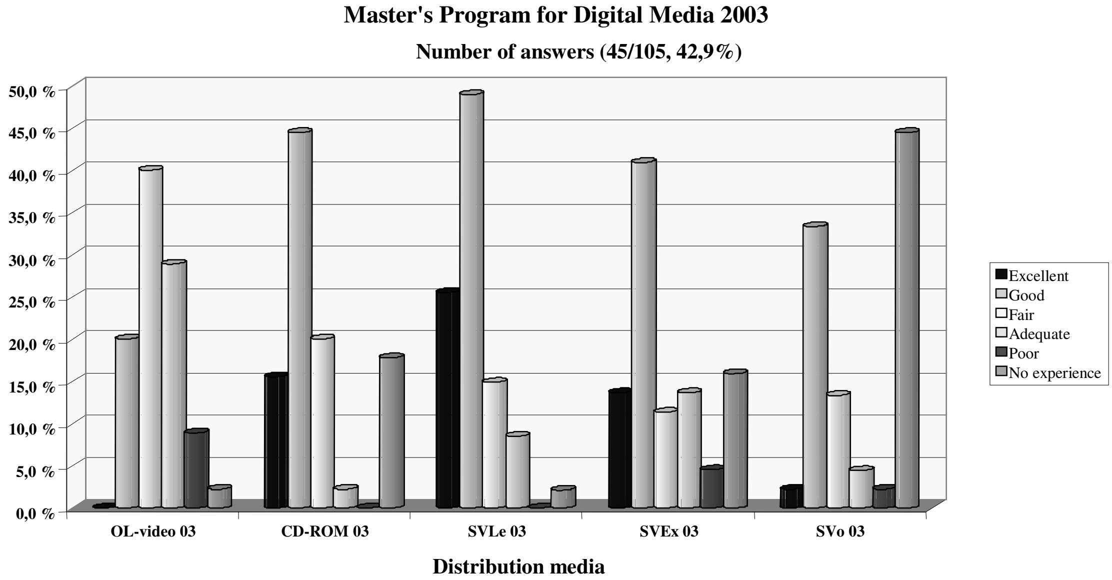

Figure 4: Student experiences using different distribution media: DM survey 2003

There was quite a small difference in students' answers between the media they used. In the Master's programme implementation the use of real-time IP-based multipoint videoconferencing for lectures was less common than was anticipated. In this connection the deteriorated student feedback in the repeat inquiry in the Master's Programme in Digital Media was most likely caused by the technical problems that were encountered at the time. There has been occasional trouble in the IP communication connections at peak loads.

The student feedback followed the same lines in the Master's Programme in Software Production as well. Based on the feedback, comparison of media showed that the experiences were best with the use of streamed video and audio stored on the media server. CD-ROM recordings were also considered very good, and in the comparison of media carried out by the Master's Programme in Software Production they were actually the most popular medium.

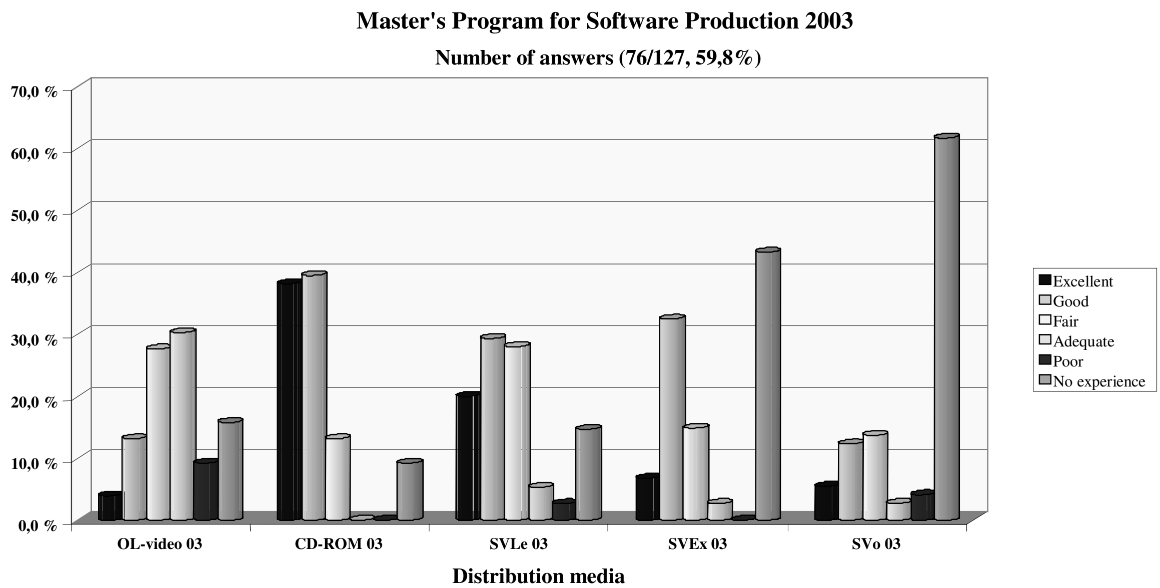

Figure 5: Student experiences using different distribution media: SP survey 2003

Some 70 % of the students had a fixed connection to the Internet. The students carried out study tasks that demanded an Internet connection (downloading of materials, work in the learning environment, searching for information on the Internet) at home (73 %), at work (30 %) or at the university (7 %) The overlap in these figures is due to the fact that some of the students make use several of these working methods.

Here are a few direct quotations from the students' answers. "A course offered locally is a great opportunity. I value highly the videoing of lectures in particular. Lecture materials stored on CD-ROM are great and make scheduling easier. The quality of online lectures varies greatly and some of the lecturers do not take pay any regard to the fact that the speech of those participating in discussion is not heard on the video. The network connections have worked variably, there have also been problems with viewing, and there is a tendency to get jammed. I suggest books in digital form as a solution to the problem of the availability of literature. As I have been working full-time throughout my studies, online lectures and project work instructions in particular have made it easier for me to pursue my studies. Independent study at home suits me well, as it is always hard to arrange times for group work. It would be good to be able to listen to the lectures on the Internet, read the book and go to the exam. Videoconferencing at the start of a course also improves audibility, it is nice to see the course leaders and discuss issues related to the course. I study partly at my workplace and use the Internet connection and so forth at work on my employer's permission, but I always study outside the working hours in the evenings and at weekends."

In addition we are just making a third survey for 100 students in the Master's Programme in Mobile Services. Later in the spring of 2004 we will be comparing the results of the surveys to each other.

Conclusions

Based on our experiences and student feedback, real-time distance education and reproduced digital materials (lectures and supplementary multimedia materials) that are partly compensatory or supplementary to it are well suited for teaching that is offered simultaneously in several locations without causing any significant additional costs. The volume needs to be sufficiently large, however, with a number of groups in the distant localities, sizable groups and a broad course programme. There must be an exceptionally heavy investment of personal resources on tutoring, it is recommended that the students draw up their personal study plans under guidance, care must be taken to reconcile work and studies, and the students need to be activated more than traditional students on the campus.

The success and regional influence of Master's programmes implemented at the University of Oulu as EU Structural Fund projects has been studied on a more general level by Jouni Ponnikas and Pentti Malinen (2004). An evaluation of the Master's programmes in the Department of Information Processing Science based on interviews and inquiries was provided by the writers of this paper.

References

1. SARIOLA, J. ED. (2003) *Videoteknologian käyttö yliopistoissa 2003 – 2006 – Suomen virtuaaliyliopiston palveluhankkeiden määrittelyraportti.* Suomen virtuaaliyliopiston e-julkaisuja
2. AGIUS, H. W. & ANGELIDES, M. C. (1997) *Integrating logical video and audio segments with content-related information in instructional multimedia systems,* Title of Source/Book/Volume, Information and Software Technology 39: 679-694
3. PONNIKAS, J., MALINEN P. (2004) *Tavoitteena pysyvät vaikutukset – Oulun yliopiston rakennerahastohankkeiden väliarviointi,* Oulun yliopiston hallintopalvelujen julkaisu

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THE MOTFAL PROJECT
MOBILE TECHNOLOGIES FOR AD-HOC LEARNING

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Abstract

The **Mobile Technologies For Ad-hoc Learning (MoTFAL)** project is a joint initiative of pedagogical, cognitive science and technological experts, educators, and psychologists to research the possibilities of using mobile platforms – mobile phones and PDA devices – with Internet access for educational purposes at school level. The project designs, develops, tests and evaluates a handheld learning environment based on emerging technology that facilitates in situ learning and maximize the impact of information that is provided when the motivation of the learner is highest. The proposed approach cross-cuts the traditional boundary between the classroom, home, and other alternative educational settings (museums, libraries, archaeological and historical sites, etc.) as distinct learning environments. The goal is to shift away from classroom learning to "daylong" learning and to use the mobile technology to facilitate that shift. This paper presents the basic principles of the **MoTFAL** project, the theoretical background of its development as well as the possibilities for its educational exploitation.

Introduction

The **MoTFAL** learning environment includes full access to digital resources, cognitive tools, knowledge visualizations, software mentors to help with learning to use devices such as digital cameras, organise and recall images and sounds of people and situations, knowledge sharing between students in different environments, contextual personal tools that change their behaviour based on where they are and the activity in progress. Students have the chance to be linked to video clips, PDF articles, and Websites.

The project's background

Over the last two decades, instructional computing introduced algorithmically based procedures and information-processing tools such as word processing and spreadsheets to enhance learning. The Internet added communication, connectivity and collaboration. *Education is no longer bound by a specific location*. Internet applications change the core relationship between teacher, learner and material, making guided and self-directed distance learning fully actualized. It is clear that ICT opens the door to "virtual schooling". The web through conventional PCs is combined with a major disadvantage: It fails in mobility. Students can only access the web at school or at home. Modern educational theories though have proved the significance of informal learning in situ. It is proven that students are more motivated to learn about a historical site or a scientific application when they actually see it, in a museum or in a factory. Presenting information through the web implies that the teacher motivates the students in school or at home, where the motivating stimuli are not present.

It is obvious that for the expansion of the idea of learning and the creation of learning schemes that are based on the effective use of motivation that arises when a student is faced with the stimuli, mobile devices with Internet access can offer significant advantages. The advantages are clear: accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning, and performance-based assessment: m-learning independent of location in time or space.

In situ learning and learning through mobile technology

Classrooms, textbooks, lectures, and training sessions have at least one thing in common. As characteristic of learning opportunities, they take the learners out of the context of their everyday tasks and other activities and situations and put them into specialized learning contexts. Traditionally, this is the way people learned.

But there is another idea, one that promises to complement traditional dedicated learning situations with "contextual learning", in which learning is a dimension of those everyday tasks, activities, and situations. And this alternative approach is becoming all the more attractive in the light of current trends in work and learning, emphasizing ***continuous and just-in-time learning***.

Learning happens in various ways. Students learn in classrooms, but they also learn by exploring streams and parks, trying and failing to perform tasks, talking to friends etc. Adults learn in many of the same ways, by experience, by involvement, by talking with peers and experts, or by delving into a practical problem. All of these can be legitimate learning activities. Virtually *any experience can be a learning opportunity, but often the resources to make it so are lacking*. We are used to thinking of knowledge as something "stored", "held", or contained in a "body of knowledge". That conception lends itself very easily to conceptions of learning as "acquiring knowledge", collecting it from books, lectures, and other media. We are following a different, complementary insight here, that ***knowledge is something active in situations and contextual in its very nature***. Knowledge is something that happens rather than something that is stored and applied when appropriate.

The idea of contextual learning is fully supported in the framework of m-learning application. In the word *m-learning* "m" stands for "mobile", representing the back-stage mobile delivery technology.

Educational point of view

Educational theories

The educational theories that are the basis for the development of the educational material as well as the educational framework of the **MoTFAL** project are the following:

- Constructivism: As a learning theory constructivism describes knowledge as being in flux, where an individual internally constructs knowledge through social and cultural mediation. Constructivist learning theorists contend that social activity and discourse play important roles for understanding to occur.
- Collaborative learning: In collaborative learning students generally work together in groups of two or more. These are usually face-to-face groups but, with the rapid expansion and availability of information and communication technologies such as e-mail, this can also be done effectively at a distance. The mobile application of the MoTFAL system enhances students' collaboration as it gives them the possibility to communicate and cooperate just by using the project's platform.
- Contextual learning: Contextual learning is learning that occurs in close relationship with actual experience. Its main principle is to motivate students to make connections between knowledge and its applications to their lives. In the framework of the MoTFAL project students have the opportunity to study their curricula in real environments, they have for example the possibility to learn about the Parthenon while they are looking at it.
- Autonomous learning: Autonomous and self directed learning views learners as responsible owners and managers of their own learning process. The main principle of the pedagogical theory of autonomous learning is the conscious involvement of the learner in some or all of the learning process. The MoTFAL project supports the autonomy of the learners by providing them with a variety of resources and materials, with an open environment for learning and collaboration and also with opportunities to work alone or with others.

- Learning by doing/ Experiential learning: Experiential learning takes place when a person is involved in an activity, looks back and evaluates it, determines what was useful or important to remember and uses this information to perform another activity. The application of the MoTFAL project supports the pedagogical method of experiential learning as it gives students the opportunity to get personally involved in the learning activity and not just to learn and think about it.

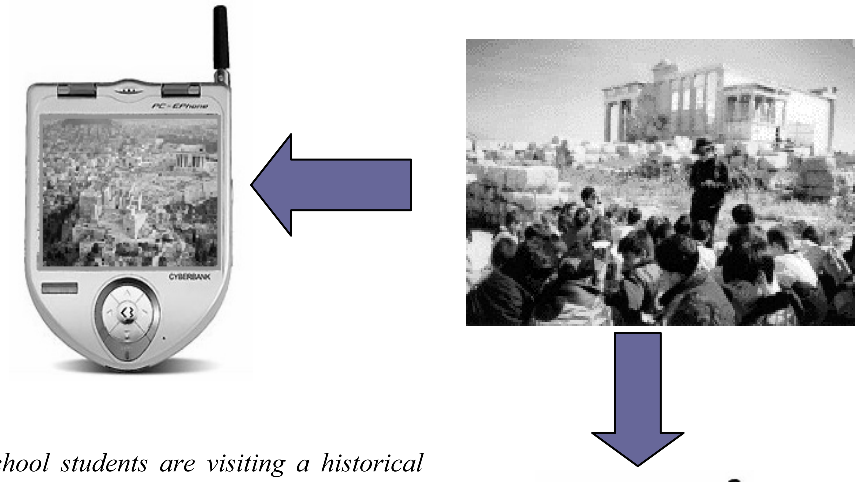
Educational scenarios for learning through mobile devices: History education, an example

Research on the methods of teaching history in the class has proved that: The main difficulties that students face are related to the understanding of historical terms, the placement of historical events in space and time, the proposition of multidimensional causative relationships, the considering of every event as a unique product of a society. They also face difficulties in understanding that historical studies are not political, military or diplomatic events but the every day life of people of an epoch. Contextual learning in history education and the scenario design method offer a different approach and perspective to history teaching and learning.

The educational approach, which is adopted in the framework of the **MoTFAL** project, is to use scenario-based design method as a means of defining suitable educational applications of the mobile technology. Scenario building is one main design techniques to explore new forms of interaction in which the physical environment is able to react to human behaviour, using handheld devices as a mediator. The project includes an extended period of school-centred work. The aim is to help both teachers and students to actively participate in the development of the **MoTFAL** platform by giving their input and contributions. Furthermore the project is sing of a student-centred approach in order to assure the maximal usability of the new tools as well as a realistic evaluation of the pedagogical effects.

In the framework of the **MoTFAL** project a series of scenarios as well as the relevant educational material are being designed and developed in order to be used during the implementation phase of the project. An example of a learning scenario is presented below.

The teacher of a high school class takes the students to a field trip to Parthenon. As they are visiting the monument the students are requested to connect to the specific area of the platform where the teacher has already uploaded the selected material concerning the history of the monument. Students are able to see pictures of the monument during the time, to see drawings of the monument enriched by animations. They can also have access to a video presenting how the monument was and how it was related to the everyday life of the people living at that time. They can even find sound and video recordings of remarkable events of this specific period. Furthermore students are able to capture moments of their visit with the camera of the device and upload them to the server for future reference and also to add their comments and to continue their research by accessing relevant web-sites.



High school students are visiting a historical monument, like Parthenon. In the framework of their visit they are using PDA devices with Internet connection. The PDA devices give students the possibility to have access in further information about the monument and in related sites. They can also capture moments from their visit just by using the camera of the device and also make their own comments. They can even communicate with students that they are visiting a museum and exchange their experiences, views and ideas.

Technological point of view

A true m-learning environment resembles in principle a sophisticated content and data management system, with development, delivery and control of the content and the learning progress. Its main objective is the learning of the material. Based on this definition, m-learning should be described as part of an integrated global learning strategy, encompassing a variety of instructional methods, learning content management and services that supply the learner with electronic information and educational content regardless of space and time.

Technical description

The main technological aim of the **MoTFAL** project is the development of a platform that makes Internet services available anyplace, anytime. The **MoTFAL** system is composed by a handheld device, a GPRS capable mobile phone and an open web platform. The open structure of the platform gives teachers the possibility to develop and upload the teaching material that it is useful for their lesson.

The project develops methods and software for storing, retrieving and dynamically synthesizing educational modules to meet each learner's goals. To achieve this, the content is broken into small, independent multimedia educational modules. These are stored and retrieved using a database management system. Content modules present domain topics in many different formats. Meta-data are used to describe the modules. Aspects to describe using meta-data include the format of module and other technological aspects, its technology requirements, its duration, its role in the learning cycle etc. A set of software modules is also used in order to synthesize and educational course – based on the specific scenarios.

At the time of access the learner informs the service provider of her/his terminal characteristics (display dimensions, computing capacity, graphic processing capacity, etc.), and the provider transmits the required information, adapting representation to the indicated characteristics.

Consequently the same information is presented in different ways, according to whether access is from a desktop computer or from a mobile terminal.

The platform services are delivered via an advanced user-interface, where the user has to log in. The first major component of the user-interface is 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
- Pro-actively suggest content to the student, based on his/her profile
- 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

A Multimedia Messaging Platform (MMP) is being developed that will provide two-way communication. The MMP is the second major component of the user-interface. A web-based application provides the interface for the delivery of the multimedia messages. A web server is 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 is enhanced with such a service that allows for easy and immediate exchange of information (transmission of quality photographs, sound and video is possible enabling instant, high quality collaboration among the users).

Usability issues and the project's technological requirements

Learning through mobile technology has been slow to grow because most wireless devices up today have small screens, low resolution, slow processing, and limited storage capabilities. Likewise, difficulty connecting various types of devices to the same network is a real limitation. Given these limitations, "mobilizing" existing 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 m-learning system's development cycle. 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 **MoTFAL** project plays a fundamental role for the development of such a system: *user-centered design* and *scenario based design* are means for assuring that the final system is appropriate to the user and to the context of use.

The system of the **MoTFAL** project fulfils the following 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.

Conclusions – future work

The MoTFAL 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 devices 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 travelling.

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 MoTFAL system. The consortium aims to investigate the impact that handheld technology has on how final users experience wireless m-learning applications.

References

1. J. R. ANDERSON, L. M. REDER, & H. A. SIMON *Situated learning and education*, Educational Researcher, 25(4), 1996, pp 5-11
2. A. AVIRAM International Review of Education 39(5), 1993, pp 419-433
3. G. RINGLAND Scenario Planning: Managing for the future, Chichester: John Willey and Sons, 1998
4. J. FLEISCHMAN *Going Mobile: New Technologies in Education*, Converge Magazine, May 2001, www.convergemag.com
5. D. A. NORMAN *The invisible computer*, MIT Press, 1999, ISBN 0-262-14065-9

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EVALUATING Lab@Future, A COLLABORATIVE E-LEARNING LABORATORY EXPERIMENTS PLATFORM

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Abstract

This paper presents Lab@Future, an advanced e-learning platform that uses novel Information and Communication Technologies to support and expand laboratory teaching practices. For this purpose, Lab@Future uses real and computer generated objects that are interfaced using mechatronic systems, augmented reality, mobile technologies and 3D multi user environments. The main aim is to develop and demonstrate technological support for practical experiments in the following focused disciplines namely: Fluid Dynamics-Science subject in Germany; Geometry-Mathematics, subject in Austria; History and Environmental Awareness-Arts and Humanities, subjects in Greece and Slovenia. In order to pedagogically enhance the design and functional aspects of this e-learning technology, we are investigating the dialogical operationalisation of learning theories [1] so as to leverage our understanding of teaching and learning practices in the targeted context of deployment. To be able to evaluate the lab@future system in its entire complexity an evaluation methodology including several phases has been developed, performing formative as well as summative evaluations.

1. Introduction

The Lab@Future project (the project full name being – ‘School LABoratory anticipating FUTURE needs of European Youth’) is a research and development project, funded by the European Union (EU) as part of the Information Society Technologies (IST) program.

The project investigates the means by which pedagogical insight and state-of-the-art technologies can be harnessed in the development of e-learning technological tools so as to facilitate and enhance innovative approaches to teaching and learning in European high schools. In order to achieve this remit, pedagogical research in the Lab@Future project is underpinned by learning theories that highlight the significance of social and cultural aspects of teaching and learning practices in context whilst recognizing the dynamic nature of tool use behaviour. Given this consideration, Lab@Future e-learning technological tools strive to support established ways of teaching and learning in focused contexts whilst nurturing emerging and innovative practices in teaching and learning methods. Lab@Future strives to achieve this by facilitating flexibility and exploration in tool use mechanisms when teaching and learning, therefore enabling the user to introduce new teaching methodologies and learning activities under a common communication and collaboration technological environment [2].

The main goal of the Lab@Future project is therefore, to research and develop a prototype system for supporting secondary school laboratory education. The overall rationale is that both the pedagogical and technological effectiveness of the developed system will be evaluated at real educational sites i.e. school laboratories, educational venues e.g. museum and historical sites. In summary, key pedagogical and technological features integrated in the Lab@Future project include the following:

- Pedagogical features such as
  - Real problem solving, collaborative learning, exploratory learning, interdisciplinary learning

- Technological features such as
  - E-learning and m-learning
  - Open learning environments
  - Communication and collaboration platforms for learning
  - Mixed and augmented reality for learning
  - Shared virtual learning environments

2. Theoretical framework and pedagogical context

The three major pedagogical theories that Lab@Future supports are *activity theory*, *the theory of expansive learning*, and *social constructivism*. The Lab@Future platform is focused on supporting novel pedagogical concepts and learning practices based on constructivism, combined with action oriented learning such as real-problem solving, collaborative learning, exploratory learning and interdisciplinary learning. When working with the outlined pedagogical theories, we recognise the fact that there are diversities and variations in emphasis when applied to learning research. Therefore, in order to achieve a workable compromise with regards to the various facets of these three theories, research in the Lab@Future project in capitalising on exploiting the dialogical aspects of these theories so as to facilitate positive debate in the perception of teaching and learning from the viewpoint of these three theories.

Activity theory and *the theory of expansive learning* determining that 'subjects' or participants (e.g. students and teachers) in a learning activity consciously and unconsciously are engaged in dynamic learning goal or object formation. This entails that the outcome from a learning experience or activity cannot always be predicted because it will be influenced by several factors operating within the contextual environment or community in which teaching and learning takes place. This pedagogical stance therefore, emphasizes the fact that knowledge emerges as a result of disturbances or conflicts in learning activity, which results in the construction of novel practical activity systems and artefacts for use in real life contexts. Therefore, participants in a learning activity are essentially involved in constructing new:

- Learning activities
- Methods for teaching and learning
- Tools for exploring and interacting with learning objects (e.g. application sharing tools, content management tools etc.).

3. Evaluation methodology

The project puts a strong emphasis on the evaluation of prototypes. It takes into account the rich empirical results of former projects on European laboratory learning and their recommendations [4, 7], while also undertaking empirical evaluations for every different lab@future experiment prototype developed. The lab@future experimental prototypes (tested at several schools per country from eight different European countries) are built based on specified learning scenarios for laboratory experiments on Fluid Dynamics, Mathematics, Environmental Sciences and Arts & Humanities. The evaluation methodology based on pedagogical and socio-technical theories aims at assessing the usability and usefulness of the lab@future system from a holistic perspective [3].

Since the pedagogical criteria play a central role for the development of the lab@future system (i.e. defining experimental settings, technical requirements and the evaluation methodology), we developed a multi-step procedure involving the consortium in the derivation process in order to elaborate a shared understanding of these criteria and their relevance for the lab@future development. They are derived from the pedagogical framework with the intent of providing a basis for forecasting effects of lab@future technology in more long-term curricular use. In addition to that, a more general evaluation regarding changes in learning cultures and organizational influences and opportunities for new teaching and learning is carried out, with the aim of trying to anticipate effects of the system on the work system and its overall activities.

Our methodological framework is based on CIELT (Concept & Instruments for evaluating learning technologies) [4, 5], supporting heterogeneous teams in defining design goals and evaluating the fulfilment of these goals on the levels of technical requirements, pedagogical and didactic objectives, and changes in the organization of the system into which the new technology and new pedagogical approaches are introduced.

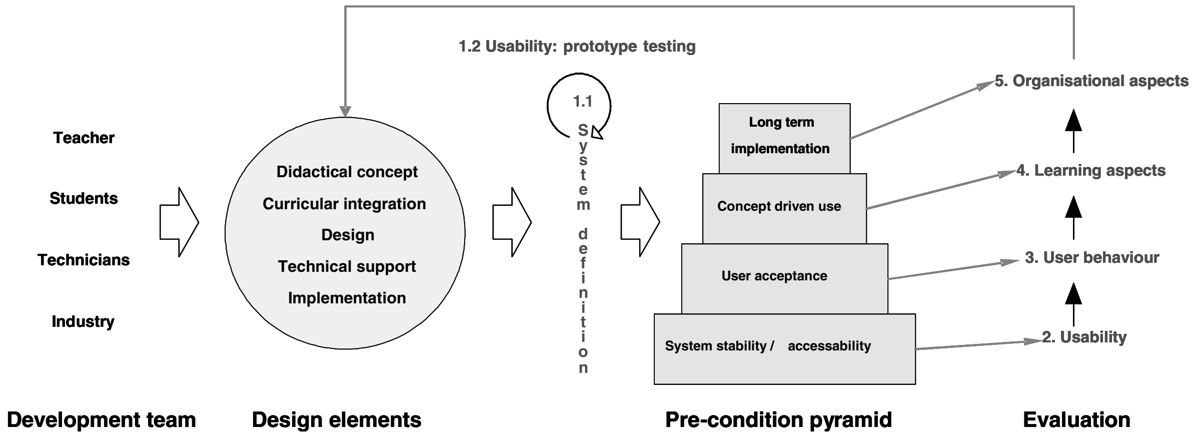


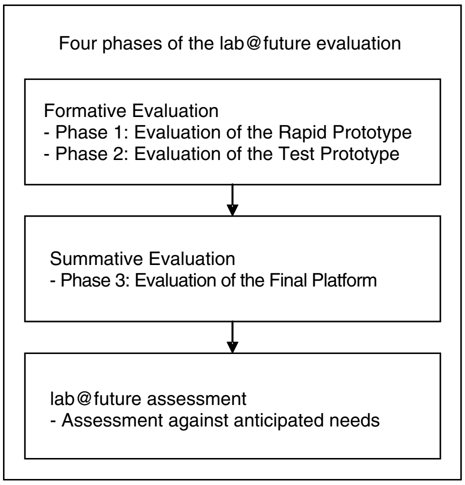
Figure 3: Overview of CIELT

Figure 3 shows an overview of CIELT. On the left hand side of the figure the different persons of the development team involved in a project are listed, displaying the heterogeneity of such teams. Core design elements are described, which have to be integrated in order to define an e-learning system (figure 3-point 1.1). The prototype testing focusing on usability (figure 3-point 1.2) is considered to be the first step in the evaluation process, setting the stage for any real world application and evaluation of the system. For the following steps in an evaluation process, the precondition pyramid needs to be considered. This pyramid proposes different levels of requirements that need to be fulfilled for evaluating specific aspects of an e-learning system. All steps are to be carried out in real world settings involving users of varied backgrounds in order to support user-centered evaluation and system design.

To be able to evaluate the lab@future system in its entire complexity an evaluation methodology including several phases has been developed, performing formative as well as summative evaluations [6]. The formative part consists of two phases (phase 1 and 2) and provides intermediary results with the aim to modify the ongoing development of the lab@future system. The summative evaluation (phase 3) aims to assess the overall quality of the lab@future system. After the final system has been implemented and will be available over a longer period of time assessments against anticipated needs are performed. Different roles are assigned to the schools involved in the evaluation. Moderator Schools participate in a detailed and comprehensive evaluation, which takes place either at the schools or in the laboratories of lab@future project partners. At Remote Sites evaluations also involve the application of mobile technologies in museums or outdoor. Learner Schools are engaged applying the web-end solution of the lab@future system to provide a picture of the different application options at schools as well as providing insights into the varying demands to schools.

Table 1 presents all phases of the lab@future evaluation with respect to the development state of the lab@future system.

Table 1: Phases of the lab@future evaluation design



The phases of the lab@future evaluation design are described as follows:

Formative evaluation of the rapid prototype: To ensure a level of high quality of the design and implementation processes, the evaluation design takes into account three complementary perspectives. The first perspective of the rapid prototype evaluation focuses on technological requirements such as technological accessibility of the system and system performance in terms of communication and collaboration capacity. A real life situation is simulated, using several computers with different system set-ups. The reliability and responsiveness of the system is evaluated across these set-ups. In addition to the performance test, users with expert knowledge in different areas are asked to evaluate the user interface(s) of the lab@future system. Finally, end user evaluation provides fundamental information about how actual users interact with the lab@future system and what their concrete problems are. The main goal is to find out which aspects of the system are good or bad, and how the design can be improved. Targeted test tasks (based on the pedagogical requirements) carried out with the lab@future rapid prototype (small-scale experiments) are investigated. One moderator school with six pupils and two teachers participates in the evaluation.

Formative evaluation of the test prototype: For the second phase of the formative evaluation the lab@future test prototype has integrated the Fluid Dynamics, the Geometry, the History and the Environmental Awareness experiments. In addition to collaboration and communication functionalities the lab@future test prototype evaluation analyzes learning and teaching process. To be able to evaluate these processes the evaluation is performed over a longer period of time. For this reason the participating end users use the lab@future system for six teaching units' up to 50 minutes within 3 weeks. During these sessions a Learner school observes these sessions via an on-line connection. They are able to follow the session via PC to monitor the used system features. Furthermore a survey in the participating schools is conducted, regarding changes in learning cultures, organizational influences and opportunities for new teaching and learning methods. The survey constitutes a base line for the actual technology use in schools.

Summative evaluation of the final platform: During this evaluation, Moderator Schools are involved in an in-depth evaluation aiming at an integration of the lab@future system into their curricula. They use the lab@future system for several weeks, including the experiments in their regular class. Therefore a comprehensive evaluation of pedagogical criteria, organizational aspects, as well as the usability of the technical requirements is provided. To allow the comparison between collaborative learning supported by the lab@future system and the traditional more individualistic learning, project members attend and observe "normal" courses for several days. This information is then compared with observations made during the experimental sessions using the lab@future system.

Assessment against anticipated needs: The last stage of the evaluation process focuses on the actual use of the lab@future system in the real world (outside the research labs). To be able to draw a comprehensive picture, several dimensions of use have been identified.

In Figure 4 a graphical depiction of a proposed set of dimensions that are used to analyze the context of use is presented.

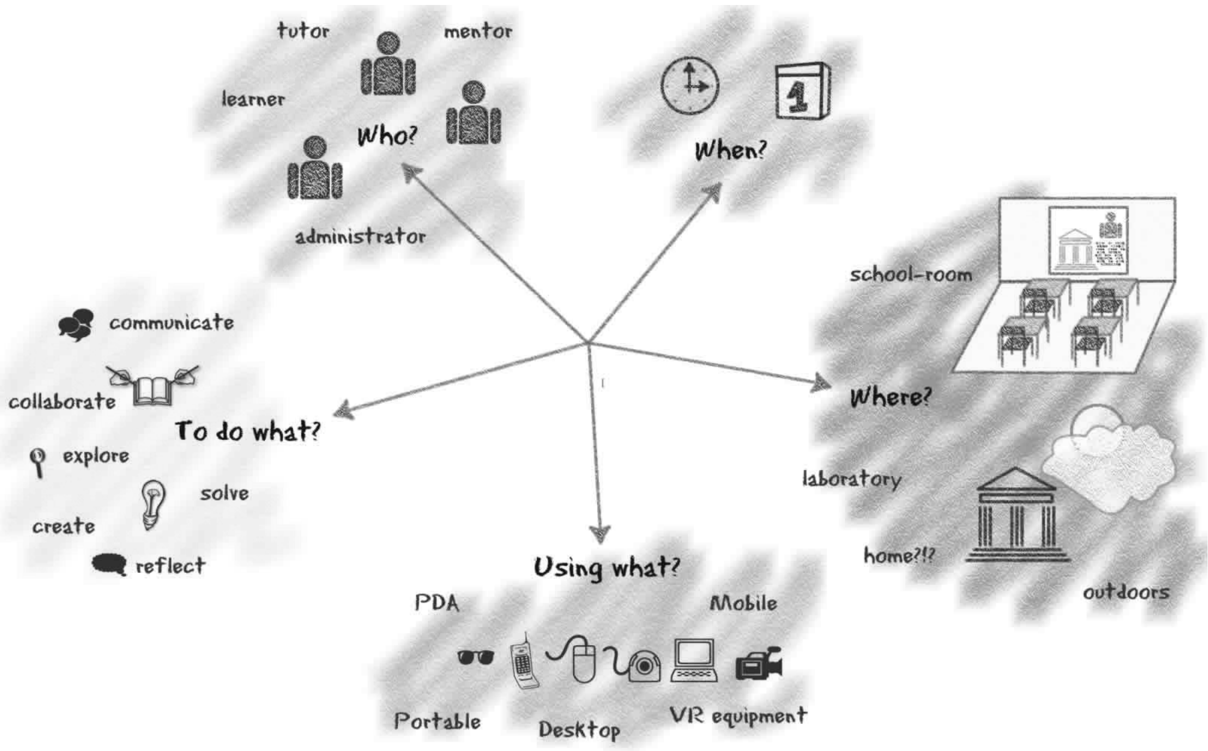


Figure 4: Dimensions of use

The main data basis for this assessment is provided by log files identifying frequency of use, duration, non use etc. (see dimension "when the lab@future system is used", "to do what"). To be able to interpret the monitored usage patterns this information is then correlated with user profiles (e.g. who is using the system) based on questionnaire data as well as organizational analysis data, collected in the previous evaluations.

Conclusions

The Lab@Future project is focused on researching and developing innovative ICT for teaching and learning by pioneering the implementation of a "mixed and augmented reality" into an e-learning platform incorporating: 3D, Virtual reality, mobile and wireless technologies. In the meanwhile, Lab@Future research and design procedures are underpinned by pedagogical concepts drawn from the constructivist theory of learning, in combination and dialogue with activity theory, especially the theory of expansive learning. This approach to developing an e-learning environment introduces innovative features to e-learning that are based on a constructivist and expansive framework so as to provide an enhance and enrich common teaching environment in schools throughout Europe. Towards this end, Lab@Future is adopting a novel approach to evaluating the usability and usefulness of technological tools presented in the e-learning environment, which involves use of real educational site engaged in collaborative 'e-laboratories' learning sessions or what we refer to as 'Lab@Future Experiments'. We applied this methodology to several European schools. This process started in December 2002 and will be completed at the end of the project, May 2005. Currently, the first set of results implies impressions for the system stability, usability and initial user behaviour. The method utilized questionnaires and interviews to evaluate the rapid prototype environment. Each experiment involved two (2) teachers and six (6) students. On system stability the platform components were reported as sufficiently integrated. On usability the user interface level was reported as sufficiently integrated. User behaviour with respect to the audio-conferencing was deemed of extreme importance and use while video-conferencing, stimulation and component help was deemed important to visualize results. User behaviour on virtual task accomplishment was regarded stimulating and satisfying, nevertheless it was more time consuming than expected.

References

1. MWANZA, D., AND ENGESTRÖM, Y. (2003) *Pedagogical Adeptness in the Design of E-learning Environments: Experiences from the Lab@Future Project.* Proceedings of E-Learn 2003 – International conference on E-Learning in Corporate, Government, Healthcare, & Higher Education. Phoenix, USA
2. Lab@Future platform test: http://www.laas.fr/~vero/PLATINE_TEST/
3. TOTTER, A., GRUND, S., GROTE, G. (2004) *A Methodological Approach to the Evaluation of e-Learning Technologies*, to appear in Proceedings of ED-MEDIA, World Conference on Educational Multimedia, Hypermedia & Televommunications, Lugano, Switzerland, June 21-26, 2004
4. GRUND, S., WINDLINGER, L. & GROTE, G. (2002) *Concept for Interdisciplinary Evaluation of Learning Tools (CIELT,)* In F. F., C. Lutz, P. Schulz & L. Cantoni (Hrsg.), 4th International Conference on New Educational Environments (S. 2.4 11-12.14 14). Lugano: Manno
5. GRUND, S., GROTE, G. & WINDLINGER, L. (2003) CIELT: *Concept and Instruments for Evaluation of Learning Tools,* Report. Zürich: Institut für Arbeitspsychologie ETH
6. TOTTER A., LITTLE S., GRUND S., GROTE G. (2003) *Evaluation Methodology, Deliverable 7.1; LAB@FUTURE Document Number: D7.1*
7. GRUND, S. & GROTE, G. (2003) *Can mixed reality system substitute real complex systems in vocational training?* In P. Barker & S. Rebelsky (Hrsg.), ED-Media 2003 (S. 576-583). Hawai: Norfolk, VA: Association for the Advancement of Computing in Education

REALIZATION OF A DISTRIBUTED REMOTE LABORATORY WITH EXPERIMENTS LOCATED IN ROMANIA AND AUSTRIA

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Introduction

Laboratories are important elements in science, engineering and technical education. They allow the application and testing of theoretical knowledge in practical learning situations. Active working with experiments and problem solving does help learners to acquire applicable knowledge that can be used in practical situations. That is why courses in the sciences and engineering incorporate laboratory experimentation as an essential part of educating students. Experimentation and experience-based learning is also performed in many other subject areas, for example in economics where students lead virtual companies and compete on a simulated market.

Up to now there is no common characterization of laboratories from an eLearning point of view. There is still some overlapping in the concepts, but we suggest the following characterization of laboratories as working hypotheses, where we distinguish between local, remote and virtual laboratories (Figure 1).

The laboratories in the right column we call online laboratories. That means that the most important mode of use of these laboratories is the online mode via Internet or Intranet. Online labs are software simulations or hardware based experiments in real time at specialized distributed servers. Obviously there is still need of further investigations to have a full characterization and taxonomy of online labs and the learning with such labs.

		Experimenter	
		local	**remote**
Experiment	**real**	Traditional Lab	Remote Lab
	virtual	Local Simulation	Virtual Lab

Figure 1: Characterization of Labs

Online labs are typically organized in a Client-Server-Architecture (Figure 2). In most cases every experiment needs its own experiment server. If the experiments and its servers of a lab are at different locations, so we call it a distributed lab. This means: use of lab resources at different locations by use of a network or grid. Distributed labs may contain different types of online labs.

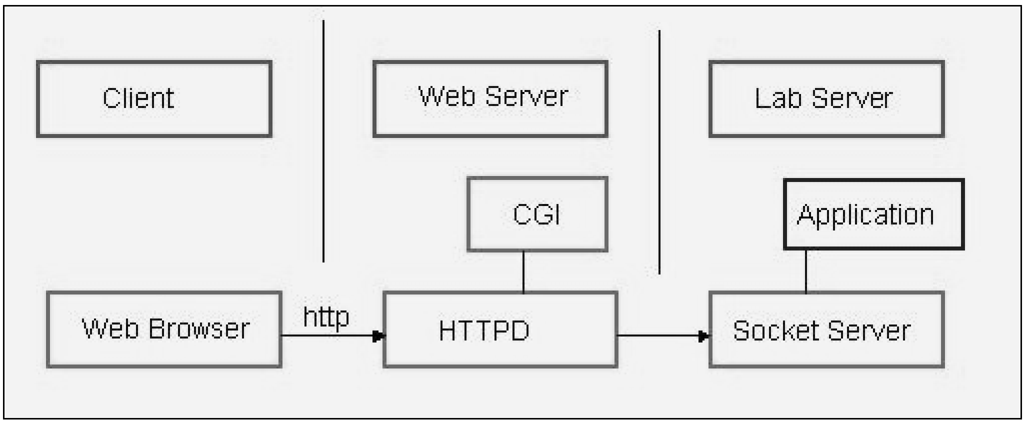

Figure 2: Client-Server-Architecture of Remote Labs

The student works (together with his tutor) in a virtual lab environment. The locations of the individual experiments are tranparent for the user, which means it seems to be only one lab location. Some requirements for this will be discussed later in this paper.

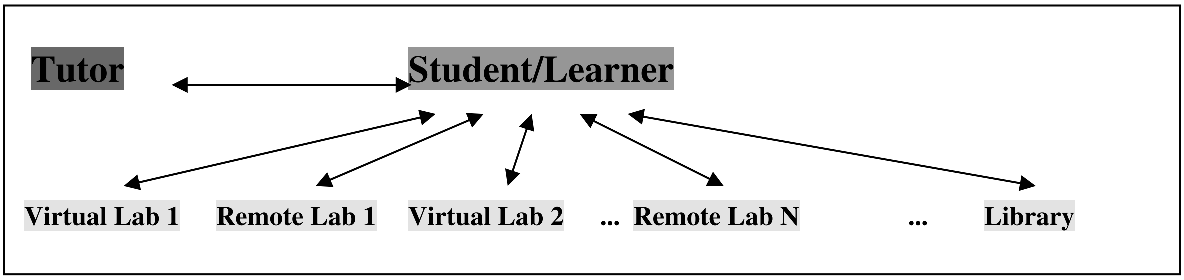

Figure 3: Distributed Lab Structure

Furthermore, there are different levels of the distribution of work between servers and clients as shown in Figure 4.

	Server or Server-Cluster	Client	Comments
Level 1	content	Web-Browser, application	slightly flexible, costly administration
Level 2	content, part of the application, e.g. simulator	Web-Browser, part of the application, e.g. schematic entry	licenses, performance of the computers
Level 3	content, full application	Web-Browser	highly flexible, central administration

Figure 4: Distribution of work between server and client

Factors, which influence these distributions, are e.g. performance of the clients and the servers, bandwidth between servers and clients, license policy, administrative needs, etc.

The REL Environment as a Realization of a Remote Lab

The Remote Electronic Lab (REL) is a system for carrying out electronic experiments via the Internet in the context of distance education. Two instances of such a remote lab were being built up at Carinthia Tech Institute Villach/Austria and at University Transylvania Brasov/Romania.

Both are based on remote control of real laboratory instruments and not on simulation. Minimization of the effort of administration and software needs at the client side is required. Therefore HTML-files with embedded ActiveX-controls in a common Internet browser are used exclusively as user interfaces. For the server-side control of the instruments LabVIEW is used. The communication between LabVIEW as a “server” and ActiveX-Controls as a “client” is carried out via ComponentWork’s DataSocket.

During the preparative phase of the project, some basic requirements arose due to the introduction of a new eLearning system at the Carinthia Tech Institute:

- An integration of the project in the existing as well as other systems should be achieved. This means that a standard Internet browser has to be the interface to the user.
- No additional applications should be required for the user, in order to minimize the administrative needs at the client side.

The REL-server is a PC with a GPIB interface. A power supply, a function generator, a digital multi meter (DMM), and a oscilloscope are connected to it. Figure 5 shows the REL-Server configuration.

The essential software running on this computer is LabVIEW 5.1. The instruments are controlled by means of LabVIEW-GPIB-drivers.

The necessary parameters and the gained measurements have to be exchanged between user and server to enable remote control. The new DataSocket technology is suitable for that demand.

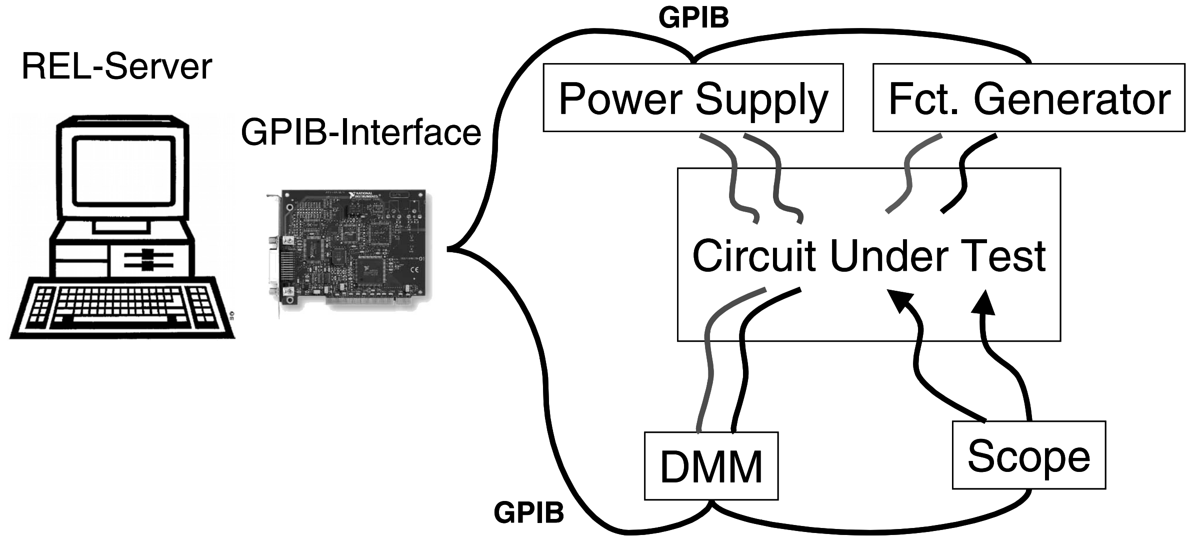

Figure 5: Schematic of Remote Lab

For coordinating the exchange of data, a LabVIEW-VI (Virtual Instrument) has been developed. The instrument-drivers are integrated as sub-VIs.

The interfaces to the user at a remote computer are ActiveX-controls. ComponetWorks offers a number of ActiveX-components having a similar appearance as controls and indicators in LabVIEW-front panels. Finally, these controls are embedded in HTML-files and displayed in MS Internet Explorer 5.

On loading the ActiveX-controls at the client-computer, they connect to the DataSocket-Server, if no other user is currently online. Now the student may set some parameters for the instruments and click "Enter" in order to transmit the information to the DataSocket-Server from where the REL-Server can call it.

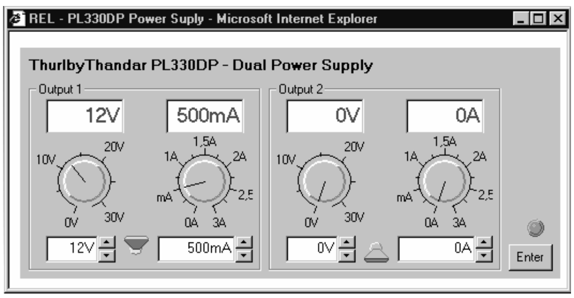

Figure 6: User interface "Power Supply"

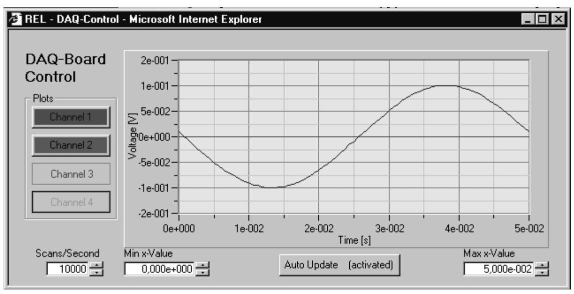

Figure 7: User interface "DAQ-Board"

In Figure 6 you can see the power supply control of the experiments and in Figure 7 the output signal waveform.

These clients of the Remote Electronic Lab are ActiveX-controls. They are embedded in html-files in order to be displayed in a common Web browser.

Remote Electronic Lab already offers a quite interesting substitution for local experiments. Beside from distance education it is obvious that it can be used in any other field of application too.

The REL environment is very flexible and can be tuned to the requirements of the user. For example the remote lab in Brasov has a little bit other, more compact interface design (see Figure 8).

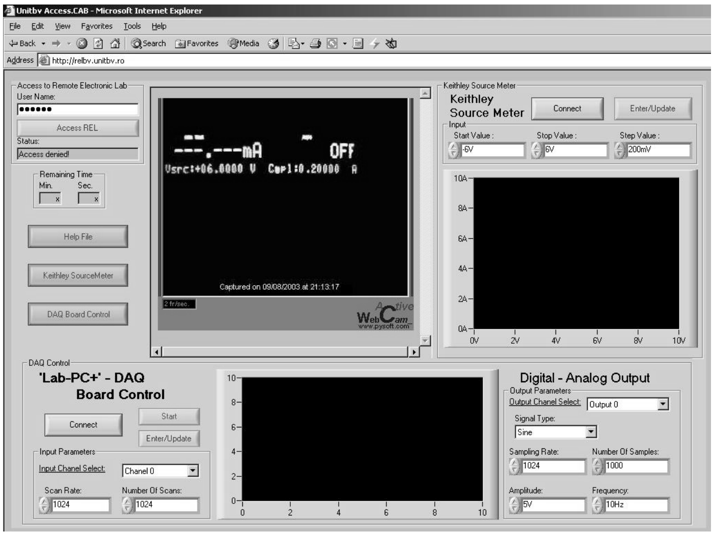

Figure 8: The more compact REL interface in Brasov

Work in Progress

Having in view the structure of the Network in “Transylvania” University Brasov, with more than ten buildings, spread in the whole city, we decided to build up a **“wireless connectivity”**. This wireless connectivity together with a good roaming system will help us to have a good coverage, inside and outside the university. The roaming system makes it possible for all students to use a computer, a notebook or a PDA device to access the network, the Internet and by this eliminate long distance call charges for the same access at these resources.

Using this infrastructure and the expertise of the “Center for Valorization and Transfer of Competence” (CVTC) in the field of ODL we started to develop a network of remote laboratories intended for Long Life Learning and training of industrial workers in the Brasov County.

This remote laboratory – simultaneously – can be used also for extensive applications in the academic disciplines of engineering, physical and applied sciences – inside the university.

In the CVTC center for the development of REL laboratory we acquired the new **NI ELVIS** system from National Instruments. The NI Educational Laboratory Virtual Instrumentation Suite (NI ELVIS) is a LabVIEW-based design and prototype environment for university science and engineering laboratories. NI ELVIS consists of LabVIEW-based virtual instruments, a multifunction data acquisition (DAQ) device, and a custom-designed bench-top workstation and prototype board. This combination provides a ready-to-use suite of instruments found in all educational laboratories. Because it is based on LabVIEW and provides complete data acquisition and prototyping capabilities, the system is ideal for academic coursework that range from lower-division classes to advanced project-based curricula. Its flexibility gives instructors the ability to implement the system in various levels of curricula, from beginning to advanced levels. In addition, the open nature of the system means instructors can give an unprecedented, hands-on experience to students.

Another direction of ongoing work is the future **use of PDA’s** to control the remote labs/experiments. The LabVIEW 7 PDA Module automatically compiles VIs to run on selected PDA targets and downloads the completed application to the PDA. For our developments we acquired some Fujitsu-Siemens LOOX 610 PocketPC handheld computers. Pocket LOOX 610 is based on Microsoft®

Windows Mobile™ 2003 software for Pocket PC and the leading-edge performance and low-power technology of the Intel® XScale™ PXA 255 Processor. The handheld provides wireless connectivity via Bluetooth™ and integrated WLAN (optional we can add GSM/GPRS CompactFlash cards). Students – from any point of the university and/or the city – can now connect to the REL and are able to understand the laboratory needs and even to do small laboratory works.

Experiences

In this section we want to present some experiences gained while performing the project.

- Students like this form of labs, but they wish
  - to mandatory integrate remote lab experiments in the courses and
  - not to remove from the curriculum.
- For an effective use of a distributed lab the user interface design should be the same for the different locations (screen design, functionality). This avoids too much time spent on training the use of the lab. Otherwise students don't have fun to work with the lab.
- From the above follows: it is necessary to work out standards for the user interface of online labs.
- A time slot reservation tool is necessary, because only one person can work in a remote lab (real hardware!). This will be one of the next steps in further developing our distributed lab.
- Furthermore we plan to realize a blended lab approach. This means: if a lab experiment is busy, other users have the possibility to perform nearly the same experiments by simulation.
- Our solution of a distributed lab especially for educational purposes in electronics engineering can widely be used also in other subjects and working areas. Of course it could be helpful also in an industrial environment, especially in SME's. The so called "Remote Engineering" is one of the main directions of the future development in engineering and science.

Next Steps

From the point of view of the two partners it was a very good cooperation and we will deepen it in the following ways:

- Full integration of the remote lab experiments of both institutions in the curricula.
- Student exchange between Carinthia Tech Institute and University Transylvania within the SOCRATES program of the EU.
- Building up additional experiments with partners all over Europe, for example at the Technical University of Barcelona.
- Elaboration of a Joint European Master Degree Program "Remote Engineering" together with partners from Austria, Germany, Ireland, Romania and Slovenia within a SOCRATES/ERASMUS project.

References

1. AUER, M. E., GALLENT, W. (2000) *The "Remote Electronic Lab" as a Part of the Telelearning Concept at the Carinthia Tech Institute,* Proceedings of the ICL2000, Villach/Austria, 28./29.09.2000
2. FALTIN, N., BÖHNE, A., TUTTAS, J., WAGNER, B. (2002) *Distributed Team Learning in an Internet-Assisted Laboratory,* Proceeding of the ICEE 2002, Manchester, UK, August 18-20, 2002
3. TUTTAS, J., WAGNER, B. (2001) *Distributed Online Laboratories,* Proceedings of the International Conference on Engineering Education, Oslo, Norway, August 6-10, 2001
4. GEYKEN, A., MANDL, H., REITER,W. (1998) *Selbstgesteuertes Lernen mit Tele-Tutoring*, in: R. Schwarzer 8ed. MultiMedia und Telelearning, Lernen im Cyberspace, Frankfurt, 1998

5. URSUTIU, D., SAMOILA, C., COTFAS, P., MESAROS, H., AUER, M. (2003) *Distributed Remote Electronic Laboratory (REL)*, Proceedings of the ICL2003, Villach/Austria, 24-26 09.2003

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ONLINE HANDS-ON TRAININGS – REAL WORLDS IN VIRTUAL ENVIRONMENTS

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Abstract

During the last years a number of electronically supported learning and training applications have been developed in the field of automation and mechatronics. The Control-Net network provides 15 hands-on trainings in electrical engineering as well as in communication technology. The concept of these modules is described with a focus on the technical realisation and the benefits for the students or trainees. Furthermore, a cost analysis is presented, which is an important part of the sustainability discussion. Distance learning applications in this field ensure the possibility to improve the usage of resources available at various universities in a network. The Control-Net network (www.wir-lernen-die-zukunft.de) is an example of a small network sharing expertise and available online hardware.

Development of hands-on trainings in automation technology

Introduction and motivation

Nowadays trainings in the automation engineering are largely based on presence trainings. This concerns both university based training as well as development of employees in enterprises. The training is place and time dependent. Due to the time cramped training situation only the basic knowledge can be introduced mostly. The activation of the learned knowledge by the application to a concrete problem is neglected considerably at presence trainings mostly. The real learning process, the situated putting into action of the basic knowledge is demanded in later traineeships, at all. This means that from the point of view of time the application of the bases (traineeships) and the teaching of the bases can be far from each other. The exercises at real machines are reduced to machines being available. The ability for the self permanent production of knowledge is trained at this procedure insufficiently.

The web based training (Electronically-Supported-Learning) offers knowledge and practice to the learner simultaneously. Furthermore this environment will be available to the learner independent of time and location. Hence the learner will be able to define the time and the place of studying for him optimally. The acceptance of this way of performing the necessary hands-on trainings offered to the learner will increase by such basic advantages considerably.

This scenario offers substantial advantages with respect to teaching:

- The update of the knowledge data base is improved significantly.
- The contextual hyperlinks offer the possibility of collecting extensive information from different sources according to the problem under consideration. Through it the competence of the learner for the self permanent production of knowledge will be improved considerably.
- The application of the knowledge into traineeships can be extended by a greater variety of plants. Through this the practical experiences of the learner can be improved substantially. In the context of the networked environment the investments can be used more efficiently. Instead of using three identical processes for a training of 20 participants, only one machine has to be available for 24 hours. The investment capital being available through this can be used for another two plants.
- By the web-based learning environment different kinds of learners will be addressed. This is possible in presence trainings only in low measure.

Simultaneously, demands for the conception of self-directed learning modules arise.

Construction of the base module

In the first step a simple process of automation which is suitable to install and to test all components of a web based learning environment was built up. This base module is of use for the development of the competences for the online traineeships and serves at the same time for the putting into action of new learning modules.

Formulation

The base module "Abschervorrichtung" ("cutting device") originates from the control system engineering which represents a basic technology of the automation engineering. It is the aim of this training to design a control program for the "Abschervorrichtung" and to program the planned process. For it the software S7 GRAPH of Siemens AG is used in the context of the traineeship. The learner shall upload his program via internet on the programmable logic controller SIMATIC S7 and execute it on this remote device. From the observation of the process and a previous test of the program the learner learns whether his program accomplishes the task and is suitable.

Technology supported learning environment

Horst Dichanz and Annette Ernst suggest in [5] to use the idea of the Electronically Supported Learning instead of the concept E-Learning since by this concept an improved portrayal of what is meant with use of electronic media in the area of the education. So, electronic media serve the support of studying.

In the context of the base module within the project Control-Net introduced here electronic media are used for the support of the learner during the processing of the provided task. The following learning objectives shall be reached:

- The learner shall learn what it is to conceptualize and to interpret the control of a given process.
- The learner self permanently shall be able to make, to test and to load into the programmable logic controller (PLC) a control program with the help of S7 graph.
- The learner shall learn how the plant to be steered will be taken into operation over the internet and shall supervise the execution of the control program.
- The learner shall be able to evaluate and to optimize existing automation solutions.
- The learner shall be able to identify possible faults in control programs.

The conceived learning environment provides necessary materials and software tools for the attainment of the learning objectives. Applying a goal-based scenario (GBS) the learner selects the necessary materials in the respective situation. He will receive a feedback on the action carried out immediately [6].

In the further course of the Control-Net project the experiments will contain a pilot plant of the vehicle components point welding and also a plant for the distillation which is part of a pharmaceutical industry production plant.

Another advantage of this learning strategy consists that the learner also can cause errors in the programming of the control which he has to solve either self permanently or by the communication with a group. Through it the successful principle of "learn from errors" will be activated. If a solution of the problem isn't possible, a communication with a tutor will be available.

In the context of the Control-Net project at the FHNON (and with most partners) the realization of these requests is realized on the open source learning environment ILIAS[1] which has been developed at the University of Cologne. ILLIAS provides the required basic mechanisms. Additional requests can be developed in cooperation with other interested organizations or can be provided by in-house development. Due to this decision the project Control-Net can concentrate on the development of the

[1] www.ilias.uni-koeln.de/ios/demo-e.html

online traineeships at the FHNON. The following requests get filled with the selected ILIAS environment:

- Interactive learning environment.
- The time and location independent availability.
- Hybrid learning environment, real plant into combination with virtual tools.
- Support of the learning environment by video and audio.
- Exclusive use of official and released internet tools (e.g. official HTML standard).
- Use of “open source” software, ensure around a high availability of the learning system and guarantee the implementation of additional tools (e.g. tools for the evaluation).

ILIAS provides the following skills in the context of the ES-Learning environment construction, which has been identified as didactic requirements:

- Author tool for the construction of ES-Learning suitable learning materials
- Environment for studying together
- Building up of working groups and interaction with an online tutor.

The following must be realized in addition to these qualities either directly in the ILIAS environment or on the server assigned to the experiment:

- Availability of necessary documents or necessary software as downloads,
- World Wide Web based tests and certification,
- A tool for the resources management.

The possibility of the automatic execution of tests, inclusive a certification of the learners, increases the personal use of the learners. At more complex formulations which go beyond the described basic module the building-up of working groups who communicate and are accompanied by an online tutor via internet seems meaningful.

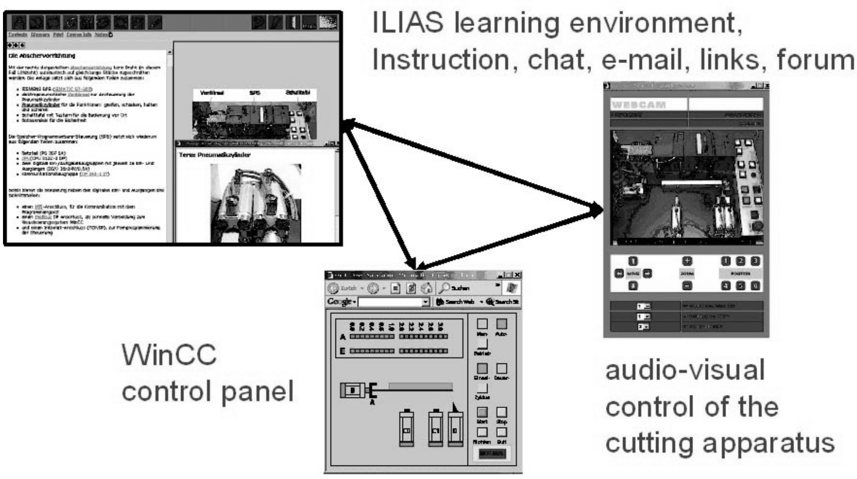


Figure 1: Components of “Abschervorrichtung” hands on training

Description of the base module

As the first module the control of an “Abschervorrichtung” was built up. The design of this traineeship experiment is represented in Figure 1. The task of the learner consists in the construction of a program for the control of this plant which essentially consists of control of the four top-hats movement. The task shall be carried out in the following way:

- The learner watches the sequence of the movement of the top-hats and makes a description of the “Abschervorrichtung” as a word model or a process plan.
- The learner writes a program for the control of the “Abschervorrichtung”. During this phase the learner is supported by manuals and assistants for the working with the software. Furthermore the learner receives information about use of tests.

Following the completion of the control system software the learner sends his program via internet to the programmable logic controller at the FHNON which is installed directly besides the real “Abschervorrichtung”. The programmable logic controller receives the control program and stores this in its CPU.

The learner will execute the control program made by him on the remote stationary “Abschervorrichtung” after that.

The commands are transmitted via TCP/IP to a server on which a process visualisation of the “Abschervorrichtung” is active. This process visualisation is realized by the Siemens program WinCC. Figure 1 shows the WinCC based process visualisation available via the WinCC web navigator on the internet. Furthermore the live picture about which the process of the “Abschervorrichtung” can be supervised is shown by the web camera. The browser window of the process visualisation also receives the final switch signals of the “Abschervorrichtung” so that the process can be checked, too.

The complete course of the analysis, the planning and the execution of an automation and control task is undertaken in the scenario described above. The learner profits of:

- a practical application of a control task,
- the high practice relevance of the available material,
- time and location independent access to a real process.

Work surroundings of the base module “Abschervorrichtung”

The work environment of all hands-on trainings consists of supporting tools, learning material as well as an access to teamwork and a moderation through a tutor. The environment development continues currently and is extended to additional hands-on trainings in further areas supported by evaluation and user feedback.

The individual components accomplish the following tasks for the ES-Learning strategy in the context of:

Component	Task / request
Abschervorrichtung/ experimental setup	The process to be steered is in the centre of the work environment. The following components are arranged around this process displayed as icons or graphic links. The formulation of the task connected to the experimental setup is provided in the following way: "Develop a control program for the *Abschervorrichtung* and program it with the Siemens STEP 7 /S7 GRAPH software for the execution on a SIMATIC S7 300. After doing this realize the program on the remote *Abschervorrichtung*".
ILIAS learning material	The learning material makes several courses available for the construction of the program demanded in the task formulation. The learner also gets helps which support him directly at the programming.
industrial software	The software needed for the realization of the project is provided to the learner. This is industry standard software which is at the learner's disposal on the server of the online traineeship for the duration of its traineeship. In addition to the learning material this software also contains an extensive help.
links to industrial applications	Link collection provided to the learner links to practical applications of automation engineering. This link collection is enlarged by an especially developed search engine.
documentation	The documentation component contains: • an extensive documentation of the traineeship which describes the used components of the plant (e.g. in the case of the *Abschervorrichtung* top-hats of the company FESTO) and the complete equipment with final switches. • additional documentations of the control system components.
simulation	The developed program can be tested by the used software before the execution. Furthermore, a simulation which supports the software development is offered. Further simulations can be offered for the interpretation of the pneumatics. This is not object of the traineeship, however, and could overtax the learner.
working group	It is meaningful to carry out the traineeship in teamwork (working group) at more complex control tasks or with insecure learners. This could be realized both within the work surroundings and within the ILIAS learning environment.
tutor	The availability of a tutor who will answer e-mail questions or will be available within a chat has to be guaranteed around a smooth and contemporary provision of the traineeship necessarily from our point of view.

After design of the control program the learner sends this to the programmable logic controller being remote via TCP/IP and supervises the execution by means of the Siemens WinCC user interface represented in Figure 1. Through it the learner receives an immediate feedback for the control program made by him or her. The learner is motivated to carry out improvements in the program immediately and will receive the consequences at once.

Safety

The safety of the learning environment touches the following aspects till now:

- Safety of the server against external attacks of viruses.
- Safety of the experimental environment.

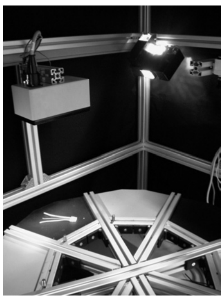
The use of a firewall and the blocking of ports is limited since the access of the user to the online traineeship by at least one open port has to be accomplish. An alternative strategy by opening the access to the online traineeship only to stored and accepted IP addresses would limit the location independence of the online traineeship would be replaced by a location dependence of the user or his access to the internet. An alternative solution on a LINUX based system is not possible regarding the online traineeship since the used software exclusively bases on MS Windows for the control and it is not to expect any change here in future either. The ILIAS learning environment itself is on a LINUX computer and is of these difficulties therefore largely untouchable. Additionally the permanent control of the software and hardware configuration will bind resources permanently.

Although not influencing the safety, in the sense of data safety or system safety, the aspect of a safe user access has to be taken into account. In the context of the project Control-Net a resources management tool was considered, which either can become part of the ILIAS environment or is located over the ILIAS environment hierarchically. With the resources management tool the user gets the possibility to plan his online traineeship and gets a guarantee for the availability of the plant at this time. The resources management tool must make sure that only one appointment can be booked by every user for the online traineeship. Depending on the number of users alternative appointments and priorities also could be realized. This aspect ensures the guarantee for the user to be able to carry out his or her online traineeship at the desired time.

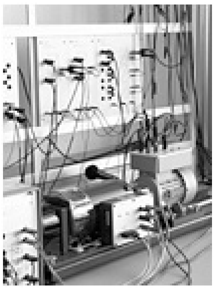
Hands-on trainings at www.wir-lernen-die-zukunft.de

Currently a number of hands-on trainings in various areas of automation technology are available:

Industrial Image Processing

Learning Module Objectives	During the course of this module the learner will experience how an optimal lighting of objects can be established to achieve recognition with sufficient depth of field. Furthermore, the learner will study the reduction of the amount of data by lighting the objects with coloured light. A further hands-on training explains the method of grid projection on a three dimensional surface to visualize the surface curvature.
Learning Module Contents 	The learner will login to the shaded experimental cabin equipped with a rotary table in the centre. Six different objects (crown caps, bottles, coated paper, etc.) are displayed on the rotary table. The various positions of the rotary table will be controlled by the learner via the WinCC web navigator interface interactively. Each hands-on training is lighted by several lamps, which are controlled via the WinCC interface, too. In order to reduce the image amount of data by filtering a specific colour, the learner selects via the WinCC interface a coloured lamp from the list. Following this the learner grabs the image by a black and white digital camera operating in a 8-Bit modus. Further hands-on trainings explain the effects of polarization and of rays of light at different angles to a surface. The projection of a grid on a three dimensional surface is a method to distinguish flat and non-flat surfaces. The learner observes the hands-on trainings (position of the rotary table, lighting situation) by a web cam located in the cabin.

Electrical Drives Engineering

Learning Module Objectives	The learner will investigate the characteristic of an asynchronous electrical drive in this hands-on training. These devices are commonly used in industrial electrical drives engineering e.g. to facilitate transport vehicle movement in warehouses or the operation of cranes. The learner will experience the linking of supply frequency, number of revolutions and torque by interactive experiments with a real asynchronous motor. The basic knowledge will be supplied to the learner.
Learning Module Contents  	The hands-on training contains an industrial standard asynchronous motor, which is operated by the learner via the Internet by the SIEMENS WinCC web navigator software. Additionally the learner controls via the WinCC web navigator an eddy current brake located at the power train. As a result of a higher braking action the section modules of the motor increases, which results in a higher current consumption of the asynchronous motor. During the hands-on training the learner develops the asynchronous motor characteristic curves by measuring number-of-revolution – section-modules pairs at a certain power-supply-frequency and voltage values. The learner observes the measured data from a meter, which is observed using the web cam, or by download of the data set from the hands-on training server. After completion of the test series the learner is able to draw the characteristic curve of the selected power-supply-frequency/voltage combination. The complete asynchronous motor characteristic diagram results from a variation of the power-supply-frequency/voltage combinations. The learner experiences the regions of the so called guy anchor adjusting range and of the electric field adjusting range.

Manufacturing Technology

Learning Module Objectives	Within this module the learner will find out about production engineering according to DIN 8580. The goal is creating a CNC program to operate a milling machine.
Learning Module Contents 	In the beginning, the learner will get an overview about the different manufacturing techniques. Than the different manufacturing methods e.g. milling or turning, as well as the needed tools will be explained. Based on that, the learner will be taught in the basics of CNC programming considering as examples. With respect to the safety requirements, the learner will have access via a powerful simulation including collision considerations 24h a day and access to the real machine at one day a week. Currently this scenario is tested and the user requirements are proofed.

The trainings from www.wir-lernen-die-zukunft.de are a collection of hands-on trainings with real devices or plants available in several areas of engineering sciences. The Virtual Laboratory (www.vvl.de) provides experiments in the field of pneumatics, ICT, PROFIBUS, TCP/IP, microscopy, etc.

Current Situation and Future Planning

Most of these developments have received a high acceptance of students, lecturers and other people with interest in vocational training. The high availability of these hands-on training accompanied by a time management has improved the degree of utilisation by a factor larger than 1000. As a result of this additional costs for maintenance occur to provide the accessibility at 24h a day on 365 days a year. This will lead to approximately 2000 € per year depending on the installation. However the efficiency of the usage and the investment has been improved significantly.

As these hands-on trainings are localized at a university, they are introduced to the local students and will be used by these students mainly. The possibility of distant education is not used in this scenario. A reason for this is the wish of lecturers to have access to their hands-on trainings locally and the overload of many students, which hinders the use of additional offers, which will not be approved by the local university.

Currently a number of distance hands-on trainings are available over Europe, but are used locally only. The www.wir-lernen-die-zukunft.de group has identified the need for the establishment of a critical mass in a network. The idea of the journeyman, which has been the technology transfer motor since the middle age, is behind the initiative of an intercultural network over Europe.

Conclusions

The scheme of a future network of educational organisations in the automation technology has been developed. The core of this network is formed by some Centres of Excellence which have respectively a great expertise on special fields of the automation technology. This network offers the learners especially developed material (courses, laboratories, etc.). The learners consist both of university students and of enterprises employees, who will use this for further or basis education.

The results of the ES-Learning project will influence not only the education area, but also substantially for the development of future requirements on tele-services of plants.

Gratitude

The project Control-Net (www.wir-lernen-die-zukunft.de, www.controlnet24.de) has been funded in the context of the research programme “Investment in Future” (ZIP) of the Federal Government (www.bmbf.de).

Literature

1. SEUFERT, P., BAKE, A., HÄUSLER, M. (2001) E Learrning, smart Books Publishing, Kilchberg, CH,
2. KOCH, C., PARK, P. B., ELLIS, T.J., GEORGIADIS, A.: Illumination technique for optical dynamic rank compression and offset of reduction, British Machine vision Conference Sept.2001
3. KOCH, C., ELLIS, T.J., GEORGIADIS, A. (2001) ShadowFlash: Greylevel estimation for shadowed areas, British Machine vision Conference Sept.
4. KERRES, M. (2001) Multi-media and tele-middle learning environments, 2nd edition, Oldenbourg publishing house, Munich, Vienna
5. SCHEFFER, U., HESSIAN, F. W. (2002) E learning, Klett-Cotta, Stuttgart
6. BAR, R. C. (1997) Virtual Learning, McGraw-Hill, New York

INTERNET-BASED LEARNING – THE ONLINE LABORATORY DISTILLATION COLUMN

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1. Introduction

In the field of process and plant technology teaching, practical experience plays an important role. Currently, many institutions for engineering education are making great efforts to provide a web-based access to real experimental facilities to their students (Carnevali & Buttazzo, 2003; Erbe & Bruns, 2003; Zeilmann et al., 2003; Michaud et al., 2001, Henry & Knight 2003). Since practical training is also a very time-consuming task for both students and teachers, and therefore often neglected, the DBTA[1] and the ZMMS[2] departments of the Berlin Technical University are searching for new ways of giving access to the laboratories and integrating this field in the existing curriculum. Therefore, at the DBTA an online plant was installed which is the basis for a web-based laboratory. Students can operate an online experiment and download experimental data generated by the process.

The process used for this experiment is composed of a distillation column for methanol-water mixture with 20 glass-trays and a set of video cameras for visualisation. The separation of methanol-water is a standard learning-example in Process Dynamics and Operation. The transparent glass distillation tower which is 3.5 m high and has a diameter of 35mm is automated and controlled by the PCS[3] ABB Freelance 2000™. To facilitate interoperability with other applications, Freelance includes an OPC-server which is based on DCOM[TM,4]. The distillation column is specially designed for the online experimentation. For security reasons, a small total hold-up is used and the performance is reduced. These constraints increase the security but don't reduce the flexibility of learning examples.

This paper focuses on the technical realisation and the didactical implementation of an online column within a teaching course for students. The pooling of online experiments as well as the standardisation of access technologies is pointed out as the next step to introduce this technology into common learning scenarios. The technical realisation is topic of the next section, while section three focuses on the didactical implementation of the online experiment into the education in Process and Chemical Engineering.

2. Technology of the Online Column

The laboratory scaled online column is connected to the Internet, so students can use it for experiments from home or in the lecture. Therefore a connection between the Process Control System (PCS) and the web browser was built.

On the client-side, we use a proprietary developed Java™-based experimental PCS called PE/SSE[5], which is able to run the user interface embedded in web browsers (Figure 1). The data-exchange between this GUI and the PCS core is based on an open Internet protocol for process data transport (PDTP). To connect Freelance2000 to the PCS core we implement a bridge between the client side and the server-side process control systems.

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[1] Department of Process Dynamics and Operation
[2] Center of Human Machine Systems
[3] Process Control System
[4] Distributed Component Object Model, http://www.microsoft.com/com/tech/DCOM.asp
[5] Process Operation Education and Training/Small Systems Edition

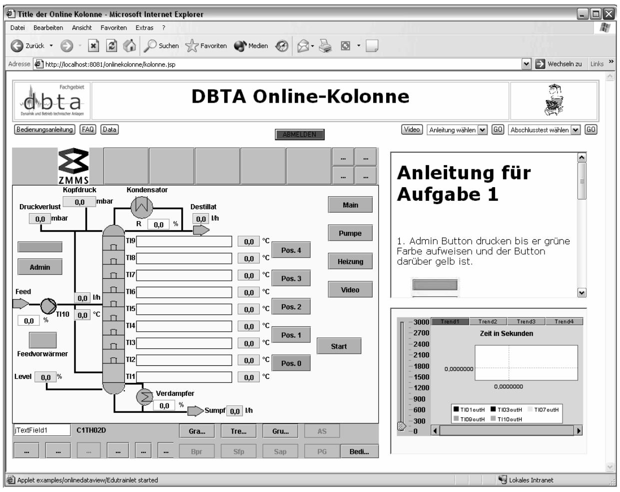


Figure 1: Browser-based PCS

This architecture ensures scalable and reliable access to our laboratory resources.

As shown in Figure 2 below, the bridge between client- and server-side PCS consists of:

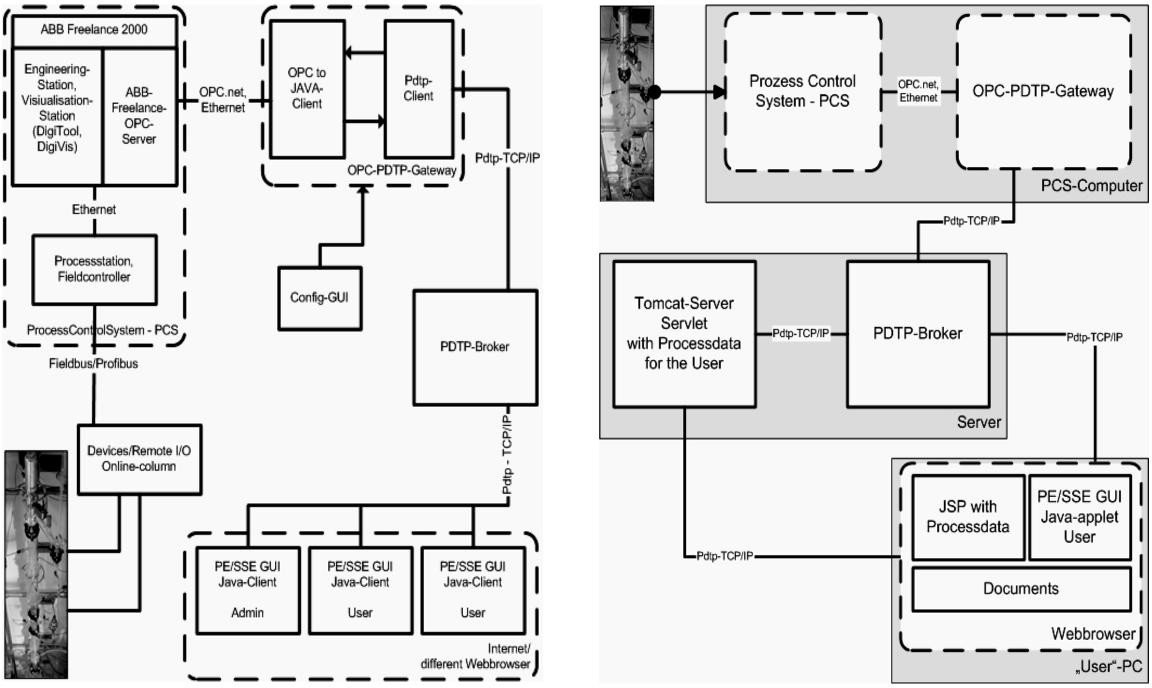
- OPC-server: This server is part of the ABB Freelance2000 PCS.
- OPC-to-JAVA-client [3]: This client provides a Java™ API to access the OPC-server.
- PDTP-client: This newly designed compound translates PDTP-variables used by the PDTP-Broker into OPC-to-JAVA-client function calls.
- PDTP-broker: The purpose of this compound is to manage the communication between the PE/SSE-GUI's of users and other gateways. The OPC-variables which have to be sent to the PDTP-broker are defined in a configuration-GUI. Besides the PCS, we develop an interface between the broker and commercial simulation environments like gProms™,[6]. With these interfaces at last, it doesn't matter if the data originate from a real process or a simulation, if they are PDTP compliant. Furthermore, the broker handles the user connections between PE/SSE and process (real or simulation). It is possible that multiple GUIs get data from one process. The control of the process belongs to one GUI (admin). With this system you can build teacher/student-systems or realize a team control environment, where one person has the control over the process (teacher or group-leader) while the other persons (students or members of the team) can observe his action.

OPC-server, gateway, broker and browser are linked via Ethernet-Network, so they can run on different computers to be more scalable.

The PE/SSE-GUI has the same structure as a process visualisation system with some additional abilities. On the one hand, the GUI can be run either as a standalone program on any operating system or embedded in a web browser as a Java-applet. On the other hand, we have implemented many add-ons for different purposes, e.g. integrated adaptive information and support depending on process data or alarm information. It is also possible to integrate the GUI into a learning management system in order to solve exercises concerning the online column. The GUI must be programmed in Java for every new problem. Therefore, a library of templates is implemented into the PE/SSE-environment.

Besides the process data, which is visualized by PE/SSE, the users can also observe the column using video streams of two cameras. One of them permanently focuses on the boiler, the other movable camera shows either the stages or the condenser. The live streaming video signal is captured with a broadcaster and sent to the user either directly (Multicast-protocol) or with the help of a streaming server (Unicast-protocol). The camera positions are driven by the PCS and are also controlled via OPC-PDTP-broker by the PE/SSE-GUI.

[6] gProms™ by PS-Enterprise modelling and simulations software for process engineering



(A) (B)

Figure 2:
Communication structure PCS – Web browser: (A) OPC-server / Client, (B) real-time Data trends

The third part of the system is the saving of the real-time data of the process and the visualisation of this data. Therefore, servlet-technology is used. The servlet is connected to the broker and gets its data from the process. These data are stored in circular buffer on the server. With help of this tomcat-server the jsp-side which contains the dynamic data is sent to the user, if requested. The main advantage of this way of data transfer is that the data are stored on a server and if the connection to the user is broken, no data are lost. The second advantage is that the user can see a "history" of the process. If he log-in he will see the last two hours of the process.

The experimental PCS that is already used for browsing e-learning materials and running process simulations is in this way extended to connect to real processes. With this integrated approach, we expect to close the gap between theoretical and practical experience in teaching process and plant technology.

3. Integration of online experiments into curricular activities

Online experiments are expensive and hard to maintain. Although online experiments have these disadvantages, they sometimes can be a good addendum to common learning material since they support building broader experience on certain topics. Such online laboratories are expected to have a significant pedagogical benefit, especially compared to virtual laboratories, which are based on simulations (Alhalabi et al., 2000). In particular, remote labs are considered as advantageous for being closer to reality, providing real-time, noisy data and a higher degree of freedom for the learners. This is assumed to increase the involvement of the learners, enabling a "thrilling" learning experience and stimulating higher order thinking skills.

At the DBTA, online experiments are integrated into existing courses, where the lecturer can access the online column from a lecture, as well as into practical exercises, where students can handle the column themselves to see the effect of certain disturbances on the hydrodynamic, energy balance and the product quality. The results of the experiments can be taken over into MS EXCEL and there they can be analysed. With this experiment, practical process knowledge can be transferred to the students inside the university learning environment.

The DBTA offers the column included in two CBT/WBT as an applet and as a downloadable standalone version for self-studies. Furthermore, a context-sensitive help system is integrated to give the students background information about the distillation process. Interested students can check their process knowledge with several multiple-choice tests.

The first evaluation of the tool is made by (Gauss et al., 2004). He used a didactical scenario with a troubleshooting task which was realised with the online column. The students in the role of operators had to identify and to fix two disturbances affecting the proper operation of the column. Therefore, the students had to detect the irregularities in the related trend diagrams and gather the correct malfunction cause. At least, the students should initiate the correct reaction and bring the process back into a steady state. The diagnosis task was supported by a given Malfunctions-Symptoms-Matrix (MSM). This MSM consists of a list of twelve possible malfunctions of the process and their qualitative effect on eight process measurands. The measurands are displayed in the trend diagrams for pressure, temperature and flow of the PCS. Each disturbance is characterised by a certain pattern of symptoms, so that there is exactly one correct cause for the malfunction.

The troubleshooting scenario supports the students to go deeper into the relation of theoretical modelling and the physical behaviour of the real process. As the students operate the process, they get a new perspective on theoretical learning content by closing the gap between their theoretical knowledge and the applicable practical interaction with the process.

The results of the evaluation study indicate that the learning scenario was highly accepted by the students (Gauss et al., 2004). Troubleshooting performance was influenced by intrinsic motivation and information processing velocity of the learners. The effect of troubleshooting on learning outcome was slightly positive.

Conclusion

In this paper we presented the development of a web-based online distillation column to close the gap between laboratory experiments for only a few students and the theoretical multimedia courses without practical aspects. This tool is also an addition to the well established face-to-face lectures and exercise courses and will increase the way of teaching process dynamics and operation.

Regarding Gauss et al. (2004), the learning scenario was highly accepted by the students, producing a reasonable learning outcome. This results points to the effective usage of online experiments in higher education.

To reduce cost and to maximise the usage of existing online experiments, standardisation of the access and usage of online experiments is urgently needed. Therefore, we propose the open structure PROPER EDUCT to configure the user interface and access commercial Process Control Systems used in the Chemical Industry via the common standard OPC. This flexible system could be easily expanded for future requirements and other applications like learning management systems or other web surroundings.

The proprietary developed high-fidelity Process Control System PROPER EDUCT which works in a normal internet browser exclusively basing on the JAVA-Runtime environment can be flexibly adapted to different teaching tasks and seems to be well accepted by the students. Online experiments increase the practical aspects of higher education and help to see the theoretical aspects of process dynamics and operation from a different view.

References

1. URBAS, L. (1999) *Entwicklung und Realisierung einer Trainings- und Ausbildungsumgebung zur Schulung der Prozessdynamik und des Anlagenbetriebs im Internet (Development and realisation of a trainings environment for process dynamics and operation via internet),* VDI-Fortschrittsberichte Reihe 10 Nr. 614
2. WWW.OPCFOUNDATION.ORG

3. JOPCCLIENT ™, OPI ODENSE PRODUCTION INFORMATION, DENMARK

4. KLEIN, A., ZERRY, R., HAUSMANNS, C., URBAS, L. & WOZNY, G. (2003) *Java based Process control of a distillation column via internet using OPC;* ECCE-4, Granada [Spain], 21-25. September 2003

5. GAUSS, B., KLEIN, A., URBAS, L., ZERRY, R. & WOZNY, G. (2004) *Learning by troubleshooting – a suitable didactical scenario for online experiments?,* INCOM 2004 – 11th IFAC Symposium on Information Control Problems in Manufacturing, 5-7 April 2004, Salvador, Brasil

6. CARNEVALI, G. & BUTTAZZO, G. (2003) *A virtual laboratory environment for real-time experiments.* In Proceedings of the 5th IFAC International Symposium on Intelligent Components and Instruments for Control Applications (SICICA 2003), Aveiro, Portugal, July 9-11 (pp. 39-44)

7. ERBE, H.-H. & BRUNS, F. W. (2003) *Didactical aspects of mechatronics education.* In Proceedings of the 5th IFAC International Symposium on Intelligent Components and Instruments for Control Applications (SICICA 2003), Aveiro, Portugal, July 9-11 (pp. 45-50)

8. MICHAUD, F., GENTIL, S. & BARRAULT, M. (2001) *Expected benefits of web-based learning for engineering education: examples in control engineering*. European Journal of Engineering Education, 26 (2), 151-168

9. ZEILMANN, R. P., GOMES DA SILVA JR., J. M., BAZANELLA, A. S. & PEREIRA, C. E. (2003) *A web-based remote laboratory for control education.* In Proceedings of the 5th IFAC International Symposium on Intelligent Components and Instruments for Control Applications (SICICA 2003), Aveiro, Portugal, July 9-11 (pp. 51-56)

10. HENRY, J. & KNIGHT, C. (2003) *Modern Engineering Laboratories at a distance,* Int. J. Engng. Ed. Vol. 19, No. 3, pp. 403-408, 2003

11. ALHALABI, B., MARCOVITZ, D., HAMZA, K. & HSU, S. (2000) *Remote Labs: An Innovative Leap in Engineering Distance Education.* Proceedings of the 5th IFAC Symposium on Advances in Control Education (ACE 2000), Gold Coast, Australia, December 17-19, 2000

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EXPERIENCE IN INITIAL AND FURTHER TEACHER EDUCATION IN AN ELEARNING ENVIRONMENT

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Abstract

Despite the fact that entities in charge of school education have put some effort into improving the technical infrastructure in German schools, the use of ICT in the educational process is still very unsatisfactory, mostly due to the insufficient ICT competencies of teachers.

In order to provide these teachers with ICT competencies, FIM-NewLearning at the Friedrich-Alexander-University, Erlangen-Nürnberg, and the Carl von Ossietzky University, Oldenburg, have developed, tested and evaluated the *first eLearning training* for 'in-service' teachers and student teachers in Germany. The training aims at the integration of new media as a supporting tool for all teaching activities. The participants learn and practise in a virtual environment, they are organised in small groups and each of these groups is headed and supervised by a specific tutor. The training contents are basically offered in an application-based and project-based form and are specific to the different teaching subjects.

In the last three years, over 700 participants have attended the training successfully, providing a wide range of experiences concerning the integration of virtual learning environments in teacher training.

Initial and Further Teacher Education in a eLearning Environment

The project eL3 – eLearning and eTeaching in initial and further teacher education – is a BMBF[1] -funded project.

Since summer 2001, FIM-NewLearning at the Friedrich-Alexander-University, Erlangen-Nürnberg, and the Carl von Ossietzky University, Oldenburg, have been developing and testing a web-based training system for in-service teachers and student teachers.

Background

FIM-New Learning, the institution

FIM-NewLearning, the co-ordinating partner was created in 1976 and has been involved in the development and implementation of network-based learning systems for about 10 years, regarding all components like content, support, technology, organisation, evaluation in a lifelong learning perspective. This involves a broad range of target groups, from young adults to senior citizens. FIM has an interdisciplinary team of about 50 people, including a technology lab which develops, mostly in an open source context, e.g. database applications, learning environments, communication environments, specific user interfaces. FIM has been co-ordinating European projects since more than 15 years.

[1] Bundesministerium für Bildung und Forschung – German Federal Ministry of Education and Research

The situation at German schools

Despite the fact that entities in charge of school education in Germany have put some effort into improving the technical infrastructure in schools, the use of ICT in the learning process is still very unsatisfactory. Approximately 50% of all teachers in Germany (>700,000) do not use a computer for teaching or the preparation of teaching material, only 10% use computers in the classroom and only 5% use the Internet in the classroom (Estimated by Federal educational administrations, 2001).

The low level of ICT use in classrooms is a matter of insufficient competences in the field of ICT on the teacher side. On the one hand, this situation is due to insufficient traditional teacher training and inadequate ICT-training at university level. On the other hand, the public pressure regarding the use of ICT in classrooms is extremely high. Especially older teachers experience a high level of stress in this respect and have an urgent need to overcome the feeling of being outdated and in an inferior to that of their own. The pressure on teachers is very high indeed.

The project "eLearning and eTeaching in initial and further teacher education" – eL3

The project eL3 is an attempt to introduce and improve the use of ICT in schools. The project started in January 2001 and has been funded by the German Federal Ministry of Education and Research with a total budget of 2.39 million EURO.

The training aims at the integration of the computer as a support tool for all teaching activities.

As a minimum, teachers develop basic competences on *ICT in a subject context* involving:

1. Office applications (Microsoft and OpenOffice)
2. Use & evaluation of web-resources and educational software
3. Production of web content
4. Production of multimedia contents
5. Communication and co-operation tools

Learners' profile

Who is the learner in eL3?

He/she is an in-service or student teacher with no or little previous experience on eLearning. In the most cases he/she has very little experience with ICT.

The target group is used to working and learning independently and individually, is well motivated and has very high expectations concerning the use of ICT for teaching.

One important aspect to consicer is the technical equipment on learner side, which is mostly a low-performance computer system with a low-speed connection to the Internet.

Key Aspects

Developing a learning system with a focus on the learner

The eLearning content has to be integrated into an overall learning system with focus on the learner. The target group delivers the information needed to produce a complete learning system that fits the learner's needs exactly. Th four columns of the learning system – organisation, content, support and technology – have to be constructed according to the learner profile.

Organisation well adapted to learner's need

The eLearning system in eL3 offers a high degree of independence. Learners can determine their own learning speed, they can learn whenever and wherever it is suitable for them. The focus on certain content is in accordance with the individual preference of the learner.

The participants are well-motivated adults and due to their profession they have a high degree of self-management skills for learning by themselves.

Learners are organized in small groups. Each learner group comprises between 25 and 100 participants and is subdivided into small groups of about 8 persons. Each of these groups is headed and supervised by a specific tutor. These tutors are teachers with practical experience, who have been trained specifically for this purpose and have done further training, as well as young scientists. The small groups comprise students and in-service teachers.

Content subject and practice-oriented

The didactic concept closely follows the experience made in the most advanced countries and which have already resulted in standard solutions ('state of the art'). It is based on constructionalist learning models, emphasising thus 'open', 'active' and 'self-organizing' learning forms. These types of training supply possibilities that are basically offered in application and project-based form. The examples and tasks are practice-related and emulate everyday teaching tasks. They always set out from concrete exercises which derive, as far as possible, from concrete school situations and whose solutions can be trained in this same practical field. This fact allows for the immediate transfer of learning contents to teaching situations, which leads to a prompt recognition of the added value of the training.

The courses and their contents

The training involves a basic and an advanced course.

The basic course takes about five months and demands about five hours a week for learning and practising. In the fifteen units of the basic course, the participants learn how to prepare their classes, using ICT. This involves the use of office applications (Microsoft Office and OpenOffice) like text processing and presentation tools, the use and evaluation of web resources as information sources, how to design learning materials and how to use communication and co-operation tools. The units are specific to the teaching subject. Right now, the training is available for the subjects German, Biology, Physics, History, Arts, Geography, French, Religion, Politics, Elementary school and Mathematics.

The advanced course takes about three months and also demands five hours a week for training and exercising. In the seven units of the advanced course, the teachers learn how to integrate ICT in the teaching process within the classroom. The course focuses on project work at school integrating new media.

Both courses start with a first unit explaining how to use the learning platform. In this unit, learners learn in a step-by-step modus the characteristics, meanings and advantages of the applications embedded in the learning management system. As one advantageous result, learners develop the self-confidence and motivation that they need to get along with this new kind of learning system, right from the beginning.

All units have the same structure and design, self-evaluation tasks and all end with an compulsory task.

Support – Intensive and prompt support

Self-organised online learning should not signify "learning by oneself". Support is the determining key aspect for successful eLearning.

In eL3 tutors, authors, technical hotline and organisers carry out support.

The tutor plays a central role in the learning process, he/she takes care of motivation and ongoing support in all questions, organises face-to-face meetings and gives feedback on the unit tasks.

The content authors are also involved in the learning system, giving support on all questions concerning the content material.

The course also offers a technical hotline, which gives advice on all technical problems, not only on the issues concerning the learning platform itself.

The course organisers handle all questions concerning the course enrolment and sequence.

All "supporters" are committed to give an answer to learner questions within 24 hours!

The Learning Management System – Technical aspects remain in the background

Since the training takes place online, the learning management system (LMS) fulfils two functions: it is the delivery medium for the contents and part of the learning content itself. Therefore the requirements on the learning management system are very high. The LMS has to be a "slim" and stable web environment system, with an integrated range of tools to support learning and communication between all persons involved in the learning process. According to the learner profile, it has to be as easy to deal with as possible, via a highly intuitive user interface.

As LMS, the platform ILIAS has been used. ILIAS, an open source platform, complies with the described requirements and, in addition, the open source code allows the implementation and adaptation of existing and new applications based on the demands of learners and tutors and permits the use of ILIAS outside the university, having no limitations on the number of users.

Evaluation

In all phases, training was accompanied by an evaluation process in order to become aware of the improvements required during the project, to judge the quality of the training, to analyse the learning process and change of attitude towards ICT on the learner side, and finally to reflect about eLearning for teacher training.

Process embedded improvement

The project was committed to a very tight contact to learners and tutors in order to find out about their experiences and, if possible, to improve the learning system according to their statements, proposals and answers in the questionnaires.

Despite the fact that in-service teachers and student teachers have very little experience with virtual learning environments, they have a very critical understanding of the added value of a web-based system for teacher training. The targeted participants are a precious source for constructive and critical contributions, resulting in continuous improvement. Some of the learner's suggestions could be promptly realised, which caused self-encouraging feedback for further suggestions which then promptly came in.

Quality of the training according to learners' statements

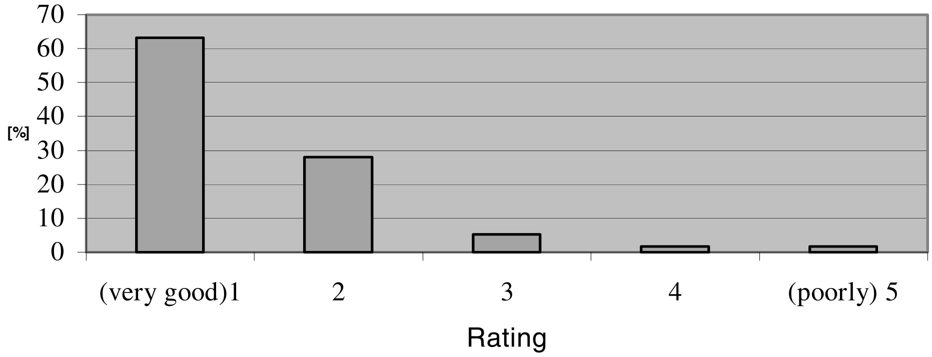
Did our efforts in choosing; implementing and improving the learning system as well as the learning contents match the learners' needs? Have the learners been satisfied with the virtual learning system?

The learners delivered the answers as part of the evaluation during and after the training.

Some of the results can be seen in the following examples (the charts reflect the questionnaires after two training cycles).

1. One of the main objectives of the training was to develop a training method in which the acquired skills can immediately be transferred into everyday life. The learning units always set out from concrete exercises which in most cases reflected concrete teaching situations and could immediately be used at school.

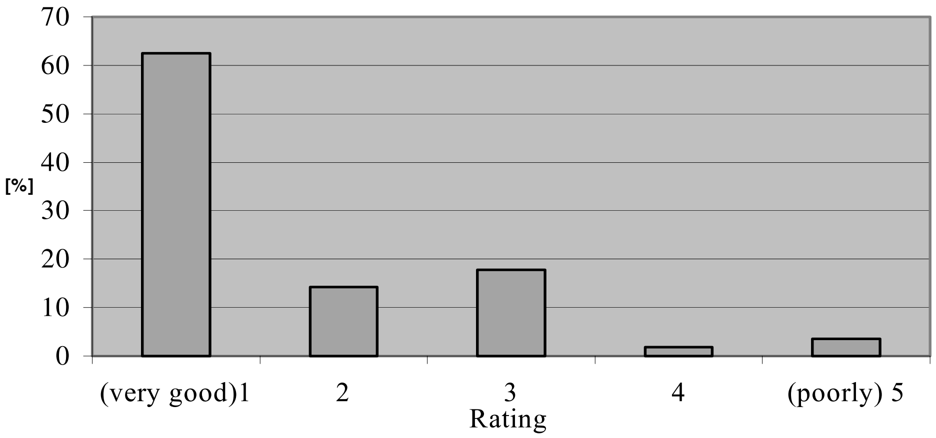
Integration of the learned matters in everyday's life



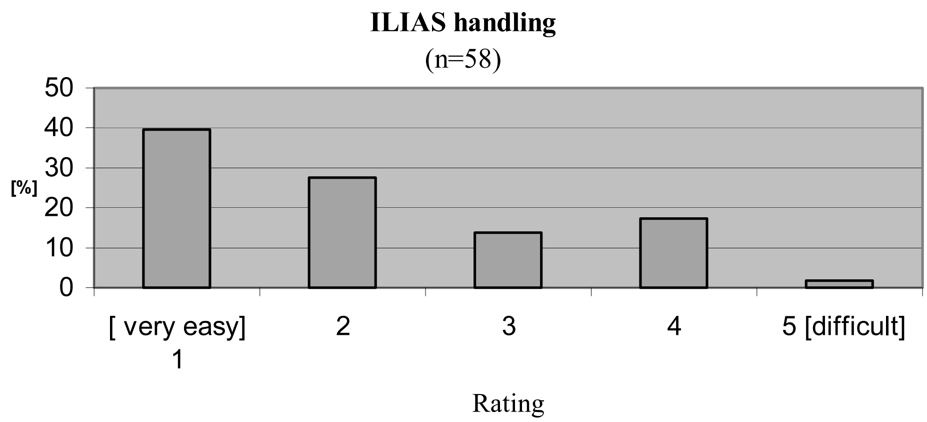
2. The tutor plays the predominant role in the learning system. A good support by the tutors is decisive for a good learning system

Support by the tutor

(n=56)



3. The Learning platform (ILIAS) has to be a stable web environment system, with an integrated range of tools to support learning and communication. According to the learners' profile, it has to be as easy to handle as possible.



Analysing the achievements on the learner's side

The main goal to be achieved was to put 'in-service teachers' and student teachers in a position to be able to effectively and skillfully use ICT for and in their classes.

According to the information provided by the participants in the final questionnaires as well as in the meetings at the end of the courses, the following statements characterise the participant's individual situation at the end of the training:

- In a very short time 'in-service' teachers and student teachers were able to effectively use ICT for and in their classes as good as their experienced colleges. Many of them turned out to be truly experts in the field of ICT and education at their schools.
- Teachers' fears concerning the use of ICT completely disappeared.
- Participants reported that their attitude towards students in terms of ICT use completely changed. Teachers no longer feel unqualified for work with a computer when compared with their students. Teachers regain the "leader and mentor role".
- Participants reported that due to the training, now they easily try out new teaching methods supported by ICT.
- Due to the acquired ICT-skills participants stated that now they can easily deal with new software or hardware devices.

Reflection on eLearning for teacher training

Is there a link between the learning method and the success of the training? Is eLearning for ICT teacher training the most suitable method?

After evaluating the statements of a large number of participants, we concluded that:

1. eLearning is a highly suitable method for the training of 'in-service' teachers and student teachers because of the high independence degree offered by eLearning. To choose when and where to learn, to set the individual focus, to fit the learning speed to the own needs is very well appropriated for teachers since they have very well-developed self-management skills, are very well-motivated and prefer working individually at home.
2. ICT as a learning matter *and* learning medium increases the learning success enormously.

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A PRODUCER BASED SUPPORT MODEL FOR TEACHERS FROM THE UNIVERSITY OF ART AND DESIGN (UIAH)

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The producer based support model for teachers

Flexible teaching is an aim that generally demands the development of teaching and the use of IT from the teacher. Should the teachers be able to cope with this change by themselves or what sort of needs may they have? Teachers are individuals as well as students. Most educators already seem to understand the different needs of the students. However, this is not enough. We should also more take into account the different support needs of the teachers. This presentation is about one support model made for teachers at the University of Art and Design, Helsinki (UIAH).

At UIAH we believe that teachers should have the possibility to renew their teaching by the use of new technology, even if they do not possess this knowledge. At first we tried to offer training courses for teachers, but it was difficult for teachers to make commitments because of their every day work. Also the needs of teachers seemed to vary. In addition we noticed a great gap in the communication between teachers and technical people. It is not easy for a teacher to present wishes about desired technologies or even be aware of what kind of technologies are available. Technical people on the other hand know technology and the supply, whereas they do not necessarily recognise the pedagogical needs in order be able to offer suitable software or tools for the teacher's pedagogical needs.

The virtual university unit (VIRTU) of the University of Art and Design, Helsinki operates as a support service unit for teaching. Its function is to assist teachers in renewing and developing their own teaching to become more flexible. In many cases a portion of this includes the use of IT. However, in every case the question is not simply about IT, but pedagogy.

In Finland every university has a virtual university unit, which primarily works on developing their own teaching and teaching materials. In this Finnish university network (FVU www.virtuaaliyliopisto.fi), the different units co-operate by representing their own universities expertise and by aiming at making dispensable support and teaching materials as well as developing and providing collective courses. Nonetheless, every virtual university unit is individual as support and production methods differ.

The aim at the Virtual University of the University of Art and Design, Helsinki has been to find support for art and design teachers as well as a support model for developing and renewing teaching and teaching materials, which at the same time helps and takes into consideration the personal needs of the teacher. Attention has also been put on the developing of production processes. From this starting point, a producer based support model has taken form.

The developed methods with which the producer based support model has been realized

According to recent research, where the teachers themselves have listed their needs for measure of support, are as follows:

1. Control of change
2. Awareness of expectations of the surrounding world
3. Online presence
4. Time management
5. The role of the educator
6. Information retrieval
7. Having tools and skills to choose suitable media for different purposes

(Koskinen, 2004, 36)

Certainly, some of our teachers are enthusiastic about coding and mastering the ways of both visual communication and digital image processing. The VIRTU supports these teachers according to their wishes by offering deeper teaching of tools or by supporting the planning of the pedagogical process. However, there are still teachers with no time or interest for, for example, constructing web pages. For these teachers the virtual university has a production team that does the practical realization work and takes care of the user friendly quality issues, whereupon the teacher takes the role of being the expert of the course's content and expresses expectations for the realization. In the actual renewing planning of the teaching process, the producer is the teacher's personal mentor in methods and technologies.

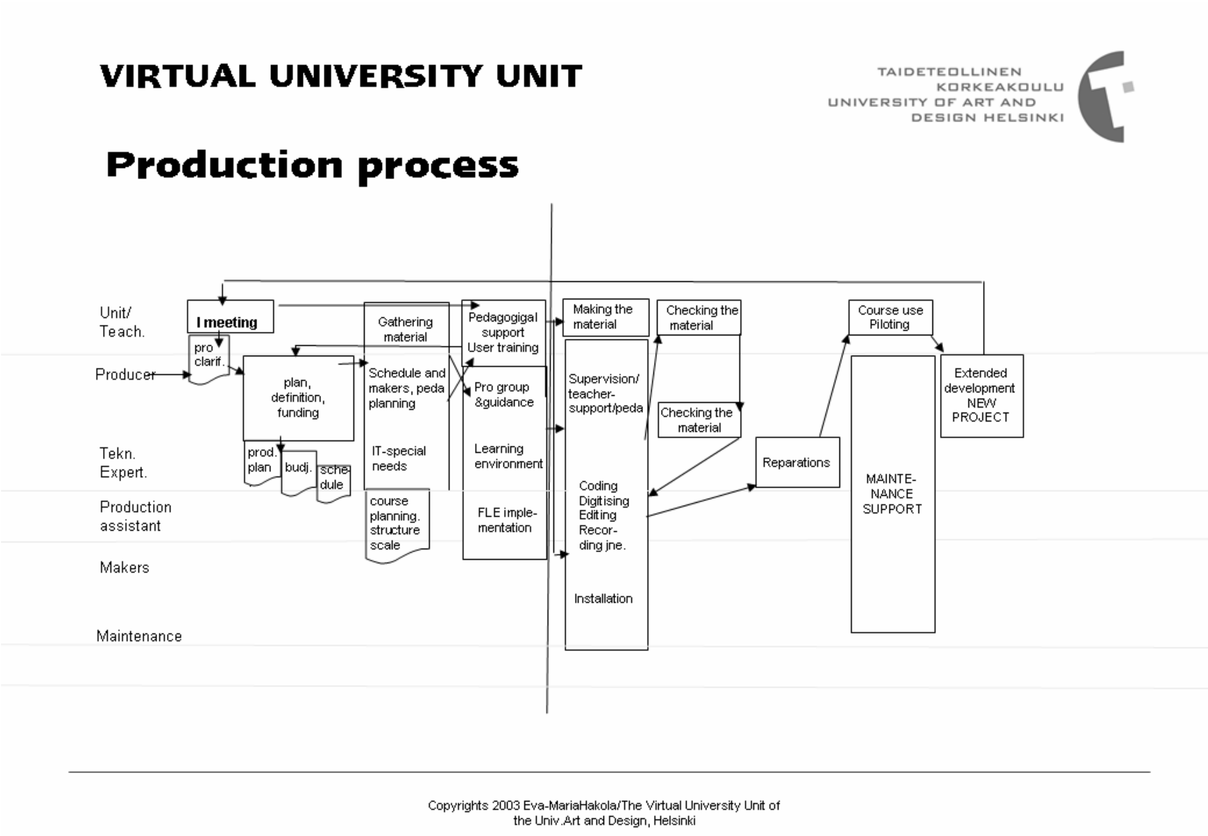

Figure 1. The Model of the basic processes

Accomplishments and results during the past two and a half years

From this basis VIRTU has developed production models and a support process, in which the producer proceeds as a support for the teacher and on the other hand is responsible for producing the material and for choosing the suitable tools. The producer meets with the teacher, conducts a preliminary interview, searches for and proposes suitable working methods and tools. A structural plan of the course is done with the teacher, which works as the basis for the order of realizing matters. Teachers have been pleased to have this service and the feedback has been extremely good.

In 2003 there have been 34 teachers in the domain of the support service. There are 150 professors and lecturers at UIAH. In this two and a half years period, more teachers per year seek the services of this operation.

An indication of the functionality of the methods is that the teachers who have come to this service, have stayed and continued with the co-operation of developing their own teaching and have given very positive feedback. This feedback has also indicated the satisfaction concerning the web material, for its usability and high quality, as most teachers would not posses the required skills in order to achieve this themselves.

The teachers have found the support and working methods of the production team to be extremely helpful when developing their own teaching. It is presumable that these methods have increased and accelerated their use of IT at UIAH compared to if the teachers prepared the teaching and materials themselves. Usually the change of the course mode, technology and methods seems to take place rather slowly. (Collis & van der Wend, 2003, 7)

The Ministry of Education of Finland awarded the producer based support model developed by the VIRTU in the spring of 2003 with a certificate of honour.

Conclusions

The hardest part in the process is the changing of the pedagogical thinking and methods. This can be made less strenuous with well-planned on-line tutor work, training, and support.

Redoing art and design course and materials for a first time it takes approximately 80-160 hours work if teacher is doing a 40 hours course. The completion takes about 2-6 months and VIRTU is involved in all stages. When running a course the next time it becomes less time consuming but often some improvements are needed.

The most important task of supports team is to make sure that the first experiment with IT and that the new course structure and methods are relatively well functioned. This is the way to encourage the teachers to develop their own skills and teaching.

References

1. KOSKINEN, LEENA (2004) *New Technologies and Flexible Teaching, Expectations, roles and support.* In the publication on the move – Sharing experience on the Bologna Process in the Arts. Edited by Ophuysen, Truus and Ebert, Lars. Published by ELIA Executive Office, Amsterdam, The Netherlands, p.36
2. COLLIS, BETTY AND VAN DER WENDE, MARIJK, Report 2002, Models of Technology and change In Higher Education – An international comparative survey the current and future use of ICT in Higher Education, p.7. http://www.utwente.nl/cheps/documenten/ictrapport.pdf

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BLENDED LEARNING IN HIGHER EDUCATION FOR STUDENT GROUPS HAVING DIFFERENT LEARNING STRATEGIES. THE INTEGRATED LEARNING CONTENT MANAGEMENT SYSTEM AT DENNIS GABOR COLLEGE

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Introduction

In the field of using informational and communicational technologies (ICT) in education – overcoming the early problems of web-based virtual education – blended learning became general which is based on integrated application of electronic and paper-based college bulletin. In a functioning institution of higher education, in the course of accomplishing effective blended learning, the real problem emerges from choosing the most appropriate form of education, education service and medium – "The challenge: to find the right blend" (Moreau, Picart, Schreurs, 2002).

Evidently, when a decision has to be made between an online or an ICT supported conventional course, one must start form the students' needs according to the modern pedagogical principles. Therefore, an effective blended learning education system cannot be developed without definition and analysis of the student groups having different learning strategies. Taking into consideration all the above makes it possible to effectively "blend" the different education services.

The present article examines this problem from the point of view of colleges dealing with mass open-system distance education. It states some general conclusions about the needed education management for modern blended learning, and also for Learning Content Management System (LCMS). Also, the article summarises experiences of Dennis Gabor College, Hungary with regard to these questions.

Blended learning as a complex and integrated system of education

In the era of coming the age of the information society, following the quickly changing factual knowledge becomes difficult within the boundaries of the traditional system of education. Nobody argues that the future of education shall be searched in utilizing ICT and especially the possibilities provided by the Internet. At the same time the ambitious development programs for e-learning, the optimistic market prognoses, and the predictions for mass spreading of virtual education when faced the practice have not turned out as imagined. According to critical analysis, there were more expectations towards e-learning than it really could perform (Szűcs, Zarka, 2003).

Criticism coming from the academic sphere, connected with the programs of first generation e-learning or web based education, is focused on the following:

- Virtual online courses are formed through simply "translating" them from the traditional classroom version into the Internet (Singh, 2003);
- Most part of the provided online contents (sections from course books, lecture outlines, etc. or at cases .html versions of these) is textual, their multimedia content is minimal and there are very few interactive components (Schulmeister, 2002);
- Many times virtual education is formed on the basis of an obsolete pedagogical-andragogical model, learning is viewed as a passive information giving process (Greenagel, 2003). The different learning styles, education, skills and motivation of students are not taken into consideration in the teaching processes and the content;
- In many e-learning projects the technocrat "economy" view sets in, which regards the media of education and the environment as the starting point and puts the main stress on "cost-saving" implementation. "The programmer overrules the teacher" (Kárpáti, 2003).

Criticism targeting asynchronic courses in the higher education has been internalised by professionals working in institutional training in the past couple of years. They express growing scepticism towards the effectiveness of Internet based online courses (Kriger, 2003) (Villanti, 2003).

By these days practise has proved that education through online courses can only be widely effective if the student is highly motivated, and capable of cognitive, purpose oriented self-studying. Besides, these student groups obviously can take only online courses, because of their special life circumstances cannot participate in other education (eg. cannot access education institutions from their home).

In order to solve the problems introduced above, some ways of research/development have been outlined, out of which the generally accepted concept was "blended learning", targeting the application of electronic and traditional learning material together. According to the international specialized literature, this can be regarded as the most effective solution widely used by students (Kárpáti, 2003). Added to its success the fact that this form of education can be accepted by institutions using traditional or distance education, following the necessary alterations, since it makes evolutionary development without radical changes.

The basic idea of blended learning is very simple: such form of education and medium (media), have to be selected, which serve the goal of the most effective way of education. Under the concept of blended learning we mean a teaching/learning concept, which aims the connection and coordination of different teaching forms (including traditional classroom and the new ICT based virtual respective online education) based on reasonable and pre-planned didactic (based on Fachlexikon e-learning, 2003).

We can talk about effective blended learning when the "blending" is intentional and among the specific elements of the education system, properly organized, pre-planned contacts are made. The effective blended learning strategy spans over the whole lifecycle of the stages of blended learning education (plan, develop, deliver, manage, evaluate) (Singh, 2003).

Therefore, the complex and integrated approach to blended learning offers not only more choice for the student, but puts down procedures for joint application of ICT, pedagogical ideas, didactic methods, and learning resources (Berge, Fjuk, 2003).

Such a model can be Kahn's octogonal framework which introduces the eight fields of blended learning (institutional, pedagogical, technological, interface design, evaluation, management, resource support, ethical) (Kahn).

In a functioning higher education institution, organizing modern and effective blended learning presumes the elaboration of an overall development program (strategic plan) on the institutional level.

In connection with the pedagogic and ICT conditions of this, some conclusions can be made with generalization in the given field.

Applying different learning strategies and blended learning in open colleges' distance education

Trying to maximally take into consideration the individual needs is a characteristics of the present era. According to the opinion of some professional experts, one of the main tendencies of the 21st century will be to adjust education to individual needs (Piller, Möslein, 2002).

In the case of an open institute of higher education, following distance education for effective implementation of blended learning, the learning strategy chosen by the student is essential, which depends on the learning style, skills and in some cases the special life circumstances (eg. not able to participate in the face-to-face courses on causes of distance or work) of the student.

One possible definition of learning/teaching strategy: a complex system of methods, tools, organizing methods and forms serving individual goals, which are founded on coherent theoretical basis, having particular syntax (definitions and order of the steps to be carried out), and is realised in a particular learning environment (Falus, 1998. p 274).

There are some theoretic results and references in this field. One example is the four learning style defined by Kolb (Kolb, 1983) or the "many sided intelligence" approach (Lazear, Gardner 1991), of which well defined learning strategies can be formed. More elaborate analysis of the topic can be found in DEOS (Distance Education Online Symposium). On the other hand, applying these theoretic results directly in practice makes further analysis necessary. Main difficulties arise from measuring what belongs to the certain categories and the alteration of learning style in time, caused by learning and the changing circumstances of life. As opposed to this, some groups substantially differing in learning habits can be lined out. Such can be for example: a group of young students without experience in higher- and distance education.

In order to effectively organize blended learning for the group described above in an institution of higher education following distance education, the following should be considered: in the first year the students must be prepared for using the education environment and, must learn how to study, basically in the face-to-face courses which is further and further combined with ICT support. These courses can also be used for collecting information in order to group students according to the theoretic learning styles (teacher's experience, surveys, tests). By evaluating these, the students can receive personal methodological offers. Pure online courses shall be offered from the second year on and in special professional fields.

Integrated LCMS supporting blended learning

The effective blended learning as integrated system of education, presumes the operation of Learning (Content) Management System LCMS, which provides the cooperation (framing) of ICT based services.

As a software tool, functionalities of LCMS provide creation, storage, collection and service of reusable learning objects and collective control of administrative, communicational and learning material handling tasks. (With applying LCMS theory, the literature does not follow the same line: in some cases LCMS is regarded a unifying system together with Learning Management System (LMS) and Content Management System (CMS) functions, other authors identify LCMS with the virtual learning environment, etc.)

The integrated LCMS on the institutional level, can be regarded as the infrastructure of blended learning. It provides complex services for the whole of the educating body and students.

Some major characteristics:

- Its services comprehend each and every element and form of blended learning (interactive teaching program on the web, electronic presentation in the classroom, electronic version of a printed book etc.).
- It handles a database of course material meeting the international standards (LOM, SCROM, IMS, SML) together with elements, recyclable, nuclear education objects and metadata describing these.
- Its modularised resource handling makes possible suiting the learning process and contents to each individual.
- It handles the professional integrated thesaurus for vocabulary occurring in the learning material.

Part of the available LCMS software meets the criteria mentioned above (Baumgartner, Häfele, Maier-Häfele, 2002; Schulmeister 2003), their complex introduction in an operating institution following distance education may need significant organizing and financing.

Experiences of Dennis Gabor College in Hungary with regard to blended learning

At the end of the 1980's, at founding Dennis Gabor College (GDF), based on the negative experiences (major part of the enrolled students did not continue his/her studies, did not take the exams) of the first Hungarian training courses following pure distance education (student educating packages), the founders deliberately built in face-to-face elements in the system of distance education. According to Dr. Magda Kovács the director general of GDF then and now: "We were preparing for distance education, but (…) intense occupation with students and weekly examining them in written form according to the required learning material, seemed necessary." (Kovács, 1998). This open system education supplemented by traditional forms of education has been applied by GDF for more than a decade for mass educating information technology professionals on college level. The school has issued more than 5,000 diplomas (March 2004).

It has been proven that effective open-system distance education in masses can be realized only with applying the following:

- open system education adapted to the Hungarian circumstances,
- well-thought and organized methodology, tutor and mentor system,
- learner-friendly learning materials prepared for distance education,
- better utilization of modern teaching technology

in the course of which intense and personal contact with students (consultation, weekly exams) is vital.

Within view of this, since 1992 at GDF education has been pursued in a mixed system, that is in the form of blended learning as opposed to the original idea of Open University. Essential element of the education system is the printed learning material (course book, lecture notes) prepared for distance education and also the personal consultation and practice, which are supplemented and made more vivid with e-learning services using different media (film, CD, Internet).

The course guides provide the program for students, with the help of which they are able to organize and use the learning material contained on the different media. These also define when students shall study each material and proceed on to the next one, also highlight the connections and relations among the learning materials of different technologies (CD, video, print, hypermedia on the web).

In connection with the research titled "Education technology development of program controlled distance education system with the use of the Internet" have been the different student behaviours and strategies analysed by statistical methods (RI-29, 2003).

Major results of the research based on one general computing subject and 2,359 students:

- Taking advantage of the open system education, 46% of the students was not studying continuously or taking exams during the period of the data collection.
- The ratio of students studying continuously is 54% (1,278 persons). A greater part of these students (71%) required face-to-face education, and 52% met the exam requirements.
- 29% of the students prepared for the exams on the basis of printed learning material made for distance education (these did not participate in face-to-face courses). A part of these students has better success in taking the exams than those participating in the face-to-face learning, mainly because of motivation, and preliminary training.

Taken into consideration all mentioned above, offering online courses (in these cases students receive printed learning material in their packages as well) are planned for only certain subjects or the part of a subject at GDF. During the first year students of different majors are going to be prepared for web-based learning by one or two online subjects.

At GDF uniformed and integrated web-based distance education services joined by LCMS, have been made justified by the expanding numbers and growing quality of electronic learning material-services and computerizing the electronic learning material, study-aids etc. of the particular subject into a database and providing these on a unified interface.

In 2003 GDF created an experimental electronic distance system organised on computer with the adaptation of LCMS software for keeping data of the distance education system (including applied codes, forms, guides etc.) having been functioned for over one decade.

This system which meets international standards (LOM, SCORM, XML) is designed to integrate the following major services:

- Unified web-based data providing on GDF learning materials and supplementing data in connection (e.g. Internet sources, electronic literature advised, CD) from the data base containing learning material formed for this purpose;
- Online courses accessible on the web, a part of which contains multimedia, interactive, web-based teaching material;
- Development of computer supported electronic learning material;
- Organized, unified electronic communication among the students, members of student learner groups and teachers;
- Helping the learning process through the web (professional tutors, user assistants);
- Electronic dictionary of information technology, the most important words of any teaching material with promptly accessible definition (Kovács 1991,1998).

From 2003/2004 academic year, the specific subjects and education services are introduced in the system gradually.

Summary

Theoretic basis for modern and effective blended learning, its ICT requirements and the developing practice all came to the level, which makes possible institutional utilization in a mass educating higher education institution following open system distance education. Blended learning could be a useful tool for spreading individualized education services based on different learning strategies.

References

1. P. Baumgartner, H. Häfele, K. Maier-Häfele (2002) E-Learning Praxishandbuch. Auswahl von Lernplattformen, Innsbruck, 2002, Studien Verlag
2. O. Berge, A. Fjuk (2003) *Design of reusable learning objects for blended enviroments*, http://www.intermedia.uio.no/cool/docs/CSCL-2003_B&F.pdf
3. I. Falus editor (1998) Didaktika. Elméleti alapok a tanulás tanításához, Nemzeti Tankönyvkiadó, Budapest ISBN 963 19 1128 4
4. F. L. Greenagel (2003) *Lead Balloons, Stone Canoes, and Learning Styles*, Learning Circuits 15 September 2003, http://www.learningcircuits.org/2003/sep2003/greenagel.htm
5. A. Kárpáti (2003) A Leonardo da Vinci program keretében megvalósuló e-learning projektek tematikus értékelése (kivonat), http://www.tpf.iif.hu/upload/docs//palyazatok/leonardo/Segedanyagok/E-learning Tanulmany_KarpatiA.doc
6. B. H. Kahn A. Framework for Open, Flexible and Distributed E-Learning eLearn Magazine, http://elearnmag.org/subpage/sub_page.cfm?section=3&list_item=12&page=1
7. D. Kolb (1983) Experiential Learning: Experience as the Source of Learning and Development, Prentice Hall, 1983
8. M. Kovács (1998) *20 éves az LSI Oktatóközpont a Mikroelektronika Alkalmazásának Kultúrájáért Alapítvány,* Informatika, a Gábor Dénes Főiskola közleményei, 1. évfolyam 1. szám, Oct 1998, pp 5-8 ISSN 1419-2527

9. M. KOVÁCS (1991) Magyar-angol mikroszámítógépek alkalmazása értelmező szótár, LSI Oktatóközpont, Budapest 1991, Angol-magyar és magyar-angol informatikai hangos-szakszótár CD-n, Budapest 1998, http://e-szotar.gdf-ri.hu
10. T. J. KRIGER (2003) *Trends in distance education*, AFT On Campus September 2003, http://www.aft.org/publications/on_campus/sept03/technology.html
11. D. G. LAZEAR, H. E. GARDNER (1991) Seven Ways of Knowing: Teaching for Multiple Intelligences, IRI/Skylight Publishing 1991
12. R. MOREAU, I. PICART, J. SCHREURS (2002) *Blended learning and live sessions in lifelong learning.* A case study ICL Workshop, Villach September 26-27, 2002 http://elearning.unibg.it/convegno/bg270902/Presentazioni%20.PDF/Jeanne%20SCHREURS.pdf
13. F. PILLER, K. MÖSLEIN (2002) *Overcoming the Efficiency Paradox in the Management Education Industry,* Strategic Management Socienty SMS 22nd Annual International Conference, September 22-25, 2002, Sofitel Forum Rive Gauche, Paris, France
14. R. SCHULMEISTER (2003) Lernplattformen für das virtuelle Lernen. Evaluation und Didaktik, R. Oldenbourg Verlag: München u.a. 2003
15. R. SCHULMEISTER (2002) Virtuelle Universitäten und die Virtualisierung der Hochschulausbildung – Argumente und Konsequenzen, http://www.izhd.uni-hamburg.de/pdfs/Darmstadt.pdf
16. H. SINGH (2003) *Building Effective Blended Learning Programs*, Educational Technology Volume 43, Number 6, Pages 51-54, November-December 2003 http://www.bookstoread.com/framework/blended-learning.pdf
17. A. SZŰCS, D. ZARKA (2003) *Nemzetközi Tapasztalatok és Trendek az e-Learning fejlődésében*, Challenges and Opportunities of Vocational Training and E-Learning in EU Accession Countries, International Conference, November 12-13rd 2003, Budapest Dec 2 2003, http://www.conference.mimoza.hu/pres/dr_szucs_andras_zarka_denes.ppt, http://tlab.bme-tk.bme.hu/tud/presentations/031203/1110v4_elemei/frame.htm
18. C. VILLANTI (2003) *Making the pedagogical case for blended learning*, AFT On Campus October 2003, http://www.aft.org/publications/on_campus/oct03/technology.html

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THE SUCCESS OF E-LEARNING IN HUNGARY – FROM THE PERSPECTIVE OF THE LEARNERS' ATTITUDE

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In spite of the rapid world-wide spread of e-Learning, Hungary is still in the phase of experimenting. This is due to several factors: social, institutional and individual ones. Authors have been studying what e-Learning (blended training) providers (educational institutions, course designers and materials developers, tutors) can do to reduce the impact of the individual factors on the success of e-Learning.

First of all, it needs to be defined what authors mean by e-Learning.

In Hungary the time does not seem to have come for full on-line e-Learning in any sector of education. The solution is twofold blended learning or training:

- Blending e-Learning (for the parts of the given course that are easier to learn via distance or independent learning or respectively for the parts where the necessary individual practice varies greatly including languages, IT etc) with face-to-face tutorials (mainly practical lessons, and workshops, where learners engage in collaborative learning).
- Blending off-line with on-line e-Learning, primarily using the on-line mode for learner-tutor and learner-learner communication and using reference materials on the Internet.

While besides – in most cases – adding to the quality of teaching face-to-face education provides opportunities for monitoring and intervening in the learning process and, the lack of full on-line courses makes it impossible for educators to monitor learners' behaviour and gather important data on the connection of individual learning styles and learning performance.

To survey the reception and the effectiveness of our experimental e-Learning materials several surveys have been conducted in the framework of different projects organised and guided by SZÁMALK and with the participation of Dénes Gábor College. We use e-Learning materials in different formal two-year post-secondary courses (called higher vocational education and training, prior to academic higher education) to shorten the time spent at school; and in non-formal further training courses of various length (adult education). While the learners in post-secondary courses are between 18-22 and study full-time in most cases, those taking part in further training courses are generally between 25-50 and study besides working.

Our e-Learning materials can be divided into two categories:

- First-generation materials – mainly used in formal two-year post-secondary education and training (Adobe 5.0)
- Second-generation materials – used in non-formal further training courses of various length (Adobe 6.0).

After developing the first-generation materials we designed questionnaires for both the learners and the teachers to survey the reception of the materials.

27 "serious and more motivated" learners were chosen but all the teachers were asked to participate in the survey.

The responding learners were supportive. Their answers highlighted the key problem areas of our materials and greatly contributed to the upgrading of the materials:

Table 1: Students' evaluation of the first-generation of e-Learning materials, the necessary changes to be made and the potential causes

PROBLEMS WITH THE MATERIALS	CHANGES TO BE MADE ON THE BASIS OF THE LEARNERS' OPINION
Too long units (learning objects).	Shorter units. *It suggests that they prefer shorter periods spent with studying.*
The lack of the harmony between the learning objects and the self assessed questions, activities. (Good example: English language "coursebook")	More SAQs and activities and more motivating and various ones. *It shows that they need more "outside" control to be able to self-manage even short phases of learning.*
Too complicated self-assessment.	"Pop-up", printable answers.
Too "boring" materials.	More animations, audio- and video recordings, more vivid colours. *It is clear evidence of the fact that this generation has grown up on computer games!*
Useful, but too short summaries.	Longer summaries. *It shows that they do not like to make notes!*
Complicated use of the 'Help'.	A separate window for the 'Help'.
Lack of hands-on practice.	The possibility of changing to Windows and practicing instead of passive reception of knowledge. *It is again direct evidence of the positive reception of the interactive nature of computer games.*

The respondents are ready to use e-Learning materials but their answers suggest that e-Learning materials are only superior to traditional printed materials if they are colourful and vivid enough and make learning by doing possible instead of passive knowledge acquisition.

Their attitude and their remarks show that using a computer as an instructional tool does not pose a problem for them but they seek the emotions they attached to using computers as a means of entertainment in childhood.

Playing computer games in childhood seems to guarantee the success of e-Learning a few decades later.

Since the teachers had been informed of the aims of the pilot course and they did not object to participating, the lack of their answer readiness might indicate that using IT as a means of instruction is beyond their competencies. Educators need advanced IT competencies to use information technologies to support effective teaching and learning.

On the basis of the results of the survey and by means of the newer version of the Adobe program (Adobe 6.0) we have improved our materials creating the second generation. These materials are used in further training courses (adult education).

We have designed a new questionnaire to survey adults' attitude to the use of IT and their learning preferences.

The questionnaire collects information on the following:

- How much time adults spend at school or respectively learning independently,
- How regularly they learn,
- Where they learn,
- What modes of delivery they prefer,
- What ways of teaching / learning they prefer,
- How often they use information technology,
- Where they use IT,
- What they use IT for,
- Their previous DL / e-Learning experiences.

The reasons why we decided on drawing in a different target group – adult learners in non-formal adult education – into the survey are as follows:

- e-Learning, blended learning will not take hold in post-secondary and higher education in the near future among other things due to the inert Hungarian higher educational system, the lack of distance learning and e-Learning culture, and the demographic regression in the age group of those entering higher education. (Higher educational institutions will not need to provide DL courses to admit more students.)
- The target group of adult learners is much bigger than that of young adults and the expansion of education for them is of utmost importance.
- We suppose the learners' attitude towards e-Learning in this target group (25-50) is different from that of young adults (18-22), and if so a different support system should be designed or different services should be provided.

The survey started in March 2004 and ended in April 2004. 58 persons participated in the survey. The respondents attend different non-formal courses (part-time, correspondence course, DL, blended training) in different educational institutions (SZÁMALK, Dénes Gábor College, etc). The majority of them (43/58) are between 27 and 46 and are women (33/58).

The great majority of the respondents (52/58) work full-time. The amount of time they spend at school varies (between 3-5 times a week and 1-2 times a month) depending on the course they attend but most of them (33/58) are "satisfied" with the time spent at school (which is on average (much) less than the amount of face-to-face education provided).

Most of them (41/58) study on an on-and-off basis and only those study regularly whose course is based on continuous assessment. The great majority of the respondents (48/58) study at home; most of them (40/58 or respectively 34/58) prefer studying at home independently using printed materials or prefer face-to-face lectures, seminars! Some of them (26/58 or respectively 18/58, 10/58) need regular lectures and the teacher's managing the learning process and the teacher's assessment! Only a few of them (12/58) prefer self-managing the learning process.

The majority of the respondents prefer traditional face-to-face education with the teacher managing the learning process and assessing their performance and providing feedback. This is in correlation with the characteristics of the target groups of the selected courses. As all the courses are based on secondary school-leaving examination (post-secondary), the participants are not supposed to have good independent learning skills.

The great majority of them (46/58) uses the computer daily either for information acquisition (45/58), work-related purposes (41/58), studying (39/58), mailing (38/58) and other purposes. The great majority of them (47/58) use the computer at their workplaces and/or (45/58) at home. Most of them (34/58) are not satisfied with the level of their IT literacy and would like to better utilize the computer for work-related purposes (43/58), information acquisition (38/58) and study purposes (30/58) as well.

The IT literacy of the respondents is considerably better than expected. As it is clear from the findings the respondents are ready to use the computer for various purposes and would like to further-develop their IT competencies. We are fully aware of the fact that this readiness is the first step towards the wider use of the computer for study purposes. But the change of the students' attitude presupposes the change of the teachers' attitude. That is, first the teachers should accept the computer as a medium of delivery of full rights to encourage the students to take a positive attitude to the new medium. (However, the teachers' attitude to the use of the computer is a delicate and difficult issue.)

Despite all the opportunities of e-Learning and despite the positive findings of the survey, it e-Learning presents serious threats for the users as well. Information technology as a compulsory subject was introduced in Hungarian secondary schools in 1988. So using means of information technology as an instructional tool for anyone over 32 is educational culture inappropriate. Consequently, their application might be a pedagogical mismatch.

Of course it does not mean that people over 32 are IT illiterate. After the change of the political system and with the rising of unemployment IT courses were increasingly popular as a means of getting back to the labour market. The ECDL examinations were introduced in Hungary in 1998. In 2001 over 24,000 persons attended different IT courses. By 2003 1% of the Hungarian population had obtained the European Computer Driving Licence.

In spite of the impressive statistical data the hypothesis of the survey was that most students using e-Learning might need an intensive pre-course IT training to ease potential cyberphobia or respectively to develop their IT competencies to help them attach positive emotions to the use of information technology.

The next stage in our research work will be surveying how the learners and the teachers accept the new generation of our e-Learning materials.

Our future plans include a special course for teachers to develop their IT competencies and to make our materials more on-line to be able to log learner behaviour. These seem to be the most important steps in "upgrading" our courseware and support system.

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THE EUROPEAN eCOMPETENCE INITIATIVE – A NETWORK FOR eLEARNING EXCELLENCE IN HIGHER EDUCATION

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Introduction: EU eLearning policy and current innovation challenges in higher education

The European Commission has declared eLearning as a key element in the long term strategy of the eEurope Initiative, aiming *"...to ensure that the European Union fully benefits from the opportunities offered by the Information Society Technologies"* (EC, DG EAC 2003, eLearning, Better eLearning for Europe, page 3). Within the eLearning Action Plan, the DG EAC has identified the importance of *"...training of European teachers and trainers"*, as well as, the *"...facilitation of cooperation and networking between actors"*. (DG EAC 2001 eLearning Action Plan COM 172 final, 28.03.2001, page 12). The eCompetence Initiative is a direct response to these two components.

Frequently, eLearning implementations in universities do not fit well with existing institutional cultures, values, structures and pedagogy. Key issues that must be addressed in order to ensure effective use of ICT in European Higher Education include: the shift in emphasis from *teaching* to *learning*, the changing role of teachers, pedagogical approaches, the complex interactions between various specialists and departments, quality assurance and organisational change. Therefore, the issue of staff development and qualification in e-learning must be embedded in wider strategies for institutional innovation.

The concept of eCompetence

"eCompetence", requires careful definition that reflects the range of aspects spanned in Higher Education organisations. For example, the eCompetence of an individual staff member centres on their use of eLearning in a lecture or course, whereas the eCompetence of an institution focuses on strategies to implement eLearning in a complete study programme or set of courses.

In the context of Higher Education, we define eCompetence as the integration of pedagogical concepts and institutional frameworks into the process of technological innovation in teaching and learning. We believe that eCompetence will be one of the key, decisive factors in the full exploitation of the potential of new media. Further, sustainable diffusion of eLearning will be dependent on the competencies and the commitment of all those involved in Higher Education.

Profile and objectives of the European eCompetence Initiative

The European eCompetence Initiative is a highly specialised, large size network (26 partners, in total), which focuses on individual and organisational strategies for the integration of ICT in Higher Education. The partner institutions form the basis for four distinct workgroups, providing a manageable organisational structure.

The aim of the European eCompetence Initiative is the development of an appropriate qualification for academic staff (in Higher Education) in the use of ICT in teaching and learning. Specifically, it aims to undertake a wide ranging study of current eCompetence training, a needs analysis across the sector, and to develop examples of blended learning scenarios that combine face-to-face and online modules in a coherent manner. While eCompetence has been referred to in a number of projects funded under the eLearning Action Plan, there has been, so far, no substantial in-depth analysis or development of the theme on a European level for academic staff in Higher Education.

The European eCompetence Initiative addresses problems that are continually arising in a similar way in many universities when it comes to the integration of ICT. The combination of its two main objectives – qualification of individual actors (the human factor) and institutional commitment (the organisational framework) – deal with the core processes of educational innovation.

In order to achieve these objectives, the eCompetence Initiative defines four subtopics (see below for details) that are the basis for the four workgroups of the project:

- Subtopic A: Field-based analysis of eCompetence programmes in Higher Education
- Subtopic B: Policy-focused analysis of the integration of eCompetence programs into institutional innovation strategies in Higher Education
- Subtopic C: Building a European dimension for eCompetence consultation and support
- Subtopic D: Dissemination and application of the research results and of the European service platform for staff development

These workgroups define the research activities and the documentation that will be developed and disseminated during the project. The workgroups will produce reports and discussion papers offering insight into the analytical, evaluative and benchmarking tasks in European eCompetence programmes and institutional strategies. Guidelines and manuals will contain final summaries of the criteria for the qualification of teaching staff, innovative ICT integration into universities (including case studies) and a European accreditation system for eCompetence.

In a summary the focus of the eCompetence Initiative is set on the human factor and on the organisational framework as crucial points for the sustainable integration of e-learning into Higher Education. As final objectives the eCompetence Initiative aims:

- to achieve the integration of pedagogical concepts and institutional frameworks into the process of technological innovation of teaching and learning in European Higher Education institutions,
- to contribute to a sustainable improvement of the quality of learning as envisaged in the eLearning Action Plan and
- to help strengthen the market position of European universities in the global context.

Target group and expected benefit from results

The activities outlined and the expected results and outcomes address two target groups:

- HE staff developers and actors in the field of e-learning, directly involved in ICT-related education and training activities, who are open to educational innovation and who will serve as multipliers for the promotion of the eCompetence Initiative
- HE policy and decision makers who work on strategies for the sustainable integration of ICT-related staff qualifications into their core institutional business frameworks

The target groups will have access to well-designed criteria for an eCompetence qualification that are recognised at a European level and informed by an international needs analysis and critical review of the field:

- case studies of, and recommendations for, innovative ICT integration into universities;
- a database of key actors in the field of eCompetence;
- a forum for discussion and knowledge sharing;
- all dissemination documents resulting from the activities of the workgroups;
- a pilot European consultation service (offering training for academic staff).

Added value and innovative elements

Within the framework of the project, the workgroups will establish a web platform which will: provide access to a database of key actors in the field of eCompetence (spanning pedagogy, practice and policy);

- include a pilot European consultation service (offering training for academic staff),
- enable the publication of a set of well-structured and designed documents and
- allow dissemination of the outputs of the European eCompetence Initiative.

The field-based benchmarking process in Subtopic A will lead to qualitative indicators that can be used to assess the added value of ICT in teaching and learning processes. The outcomes of the assessment will be tightly integrated into the planned development of well-specified criteria and guidelines. These will be invaluable for subsequent educational innovation in related and developing areas.

Additionally, the policy-focused benchmarking process in Subtopic B will lead to qualitative indicators that can be used to assess the added value of specific elements within respective institutional innovation models. The results from this work will be embedded within a set of recommendations for innovation strategies that will aid the identification, and promote the dissemination of "best practice" activities in European HE institutions.

The consortium presents a formidable network of institutions, spanning a wide range of backgrounds, contexts and missions. This diversity provides a unique opportunity to share experience and expertise from a number of different cultural, linguistic, educational and organisational perspectives. The sharing of a common goal to achieve best practice in eCompetency training and institutional embedding, ensures a focus on the development of relevant, practical but general models (Subtopic C) and wide and effective dissemination (Subtopic D).

Main pedagogical approaches and concepts

The European eCompetence Initiative integrates various concepts and approaches that are applied within the partner institutions. The aim is to create a flexible pedagogical framework that:

- reflects the different cultural, institutional and subject-specific learning cultures and teaching modes,
- provides a coherent synthesis of the ongoing debate on the shift from teaching to learning, the changing role of the teachers and the new learning paradigms in ICT environments,
- indicates where the use of ICT adds value to the learning process and
- assures a high degree of quality in eLearning.

Organisation of the European eCompetence Initiative

The European eCompetence Initiative consists of four thematic subtopics that can be characterised and divided on the basis of their objectives:

Subtopic A: Field-based analysis of eCompetence programs in higher education (undertaken by Workgroup (WG) I)

A.1.1. Identification and involvement of the key actors in the field, on an institutional, national and trans-national level (What is the status quo? Who does what already?)

A.1.2. Assessment of the pedagogical concepts and practices that are used in eCompetence programs to develop qualification for the use of ICT in teaching and learning (Which pedagogical approach is favoured and why? What skills do the respective eCompetence programs support? In which way?)

A.1.3. Benchmarking of the strengths and weaknesses within the identified status quo regarding the respective eCompetence initiatives and elements (Which issues are perceived as essential? What is missing?)

A.1.4. Development of criteria for transferable qualification modules and individual innovation strategies that can be applied in similar contexts and future scenarios (Which eCompetences are necessary? How can they be developed and be made transferable? Which different subject areas such as pedagogy, informatics, interface design, content management, project management are agreed upon as essential for eCompetence?)

Subtopic B: Policy-focused analysis of the integration eCompetence programs into institutional innovation strategies in higher education (undertaken by WG II)

B.2.1. Identification and involvement of the key policy actors who develop and apply ICT-related staff qualifications into Higher Education human resources management (What is the current situation in innovative organisations? Who are the educational decision-makers that shape the underlying business models?)

B.2.2. Evaluation of comprehensive innovation strategies and implementation measures related to the integration of eCompetence in HE (What are the criteria for innovation strategies that focus on sustainability and add value to HE? Which institutions apply a comprehensive innovation strategy in the human resources sector?)

B.2.3. Benchmarking of the strengths and weaknesses within the identified status quo regarding the respective innovation strategies and business models (Which issues are perceived as essential? What is missing?)

B.2.4. Development of criteria for transferable institutional innovation models, for application in similar contexts and future scenarios (What should be done from the institutional perspective?)

Subtopic C: Building a European dimension of eCompetence consultation and support (undertaken by WG III)

C.3.1. Establishment of a flexible organisational framework for a pilot European consultation service between the eCompetence actors in the participating institutions

C.3.2. Integration of the above described subtopics into a European service platform for staff development (online database), posting supply and demand of material, courses, staff development experts and programs etc.

C.3.3. Development of a European wide network of eCompetence expertise based on peer-to-peer exchange of the local and regional experts

C.3.4. Realisation of a pilot European eCompetence consultation service offering training for academic staff

C.3.5. Development of criteria for a European accreditation and certification system for eCompetence courses and programs that have been approved and integrated into the common consultation service

Subtopic D: Dissemination and application of the research results and of the European service platform for staff development (undertaken by WG IV)

D.4.1. Documentation and exploitation of tangible and transferable outcomes within the database, brokerage platform and application of the consultation service developed in Subtopic C in the framework of the information portal for the eCompetence Initiative

D.4.2. Integration of field-based and policy-focussed results into dissemination documents in form of reports, manuals, guidelines, newsletters etc.

D.4.3. Realisation of dissemination actions that address the staff developers and policy makers at European HE institutions, thereby using the extensive communication channels of the participating network consortia as well as the channels of the DG EAC and including conference presentations, symposiums, workshops, peer-to-peer consulting etc.

Subtopics A and B deal with research activities, subtopics C and D consist of development activities that integrate, exploit and disseminate the results of the research done into the web platform and the pilot European consultation service.

The project does *not* focus on basic research in the field of eCompetence in Higher Education. The general research line is based upon already existing knowledge and expertise that is situated in the participating institutions. The research activities of WG I and II aim:

- to analyse, evaluate and summarise the expertise shared within the consortium in the field of eLearning and
- to work on concepts and strategies that contribute to a sustainable innovation in the teaching and learning processes, and in the universities.

Methodological approach of the workgroups

The methods to be used are a combination of desktop research on the information that is available and action research within the participating institutions. The research activities of WG I and II apply the same methodical stages:

1. The identification and involvement of the key field/ key policy actors
2. The evaluation of the pedagogical concepts/ innovation strategies
3. The benchmarking of the strengths and weaknesses within the identified local eCompetence initiatives/ innovation strategies
4. The development of criteria for transferable models and strategies is realised on the basis of the reports of stage 3. The results of the development processes will be summarised in guidelines that will serve as final summaries of WG I and II

The methods to be used in subtopic C and D are a combination of development of organisational frameworks and process accompanying evaluation of the development tasks. The tasks of WG III include methods such as:

- alignment of the expectations of the partners, a modus vivendi for cooperation and visualisation of the cooperation structure in an organigramm;
- development of the web platform and its database and directory structure (in association with WG IV's dissemination needs);
- development of a European wide network of eCompetence;
- establishment of an organisational framework that will offer a set of pilot courses in the field of eCompetence (the courses will be realised in real as well as in virtual settings, using the general concept of blended approaches);
- development of criteria for a European accreditation and certification system for eCompetence courses and programmes that can be developed on the basis of courses that have been tested and integrated into the pilot consultation service.

The main objectives of Workgroup IV are dissemination and application of research outputs generated in the project and of the pilot European consultation service for staff development. The dissemination strategy addresses staff developers and policy makers in European Higher Education. It uses the extensive communication channels of the network consortium as well as the channels of the DG EAC. Activities such as conference presentations, symposiums, workshops, peer-to-peer consulting and investigation of a range of innovative dissemination channels (e.g. streaming media, videoconferencing), etc. will be carried out. The professional dissemination of the whole project output at the European level includes activities such as:

- the integration of a news area into the web platform,
- the release of an electronic newsletter,
- edition of a final compendium that gives insights into the different components of European eCompetence.

The consortium partners have considerable expertise and experience in participation in large scale projects at both national and international levels and are embedded within a range of international networks such as ECIU, cEVU, EUNITE, EUA, COIMBRA GROUP and ICDE amongst others, that can be used as multiplicators for dissemination activities. The dissemination activities address a target audience that consists of policy makers, university decision makers such as Rectors and Presidents and university higher management (such as human resources and administrative management) and academic staff developers in higher education.

The network consortium

Coordinating organisation

University of Dortmund – Center for Research on Higher Education and Faculty Development

Partner organisations

The project consortium involves 26 European and international partners, who combine a high level of expertise in the field of e-learning and agree on the benefits for the innovation of European universities that a close cooperation in the topic of eCompetence offers.

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ZEUS: "SATELLITE NETWORK OF RURAL SCHOOLS"

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Introduction

Greece is a country with a particularity in terms of the geomorphology – many islands across the Aegean and the Ionion sea as well as mountainous areas – and consequently many relatively isolated and secluded areas. The population number in these areas is decreasing year by year as the inhabitants are facing serious problems in terms of their living conditions. The provision of adequate infrastructure for mainly education, health care and other vital sectors, is a challenging issue of key importance for addressing the demographic recession.

As regards the educational system in remote areas in Greece and more specifically primary education most of the schools in these areas are multigrade schools[1]. According to the data of the Ministry of Education and Religious Affairs (2001-2002), 44% of the primary schools in Greece are multigrade and 15% of the primary school teachers serve in multigrade schools. Teachers serving in multigrade schools are usually recently appointed. Although the function of the multigrade schools in the Greek educational system represents an institutional reality there are no relevant undergraduate courses in the curricula of the Greek Departments of Primary Education and the efforts for the teachers' professional enhancement in the field are occasional (seminars, workshops etc organised now and then by various organisations/institutions).

In the light of the above statements, it is obvious that the in-service teachers' training on multigrade education is more than a necessity. The only option for teachers in multigrade schools is to participate in open distance training programmes. First, because multigrade schools cannot afford to offer teachers educational leaves, second due to financial constrains (subsistence, travelling and/or accommodation expenses) and third because such a programme is not only meant to provide teachers with insight on teaching methodologies and pedagogical approaches rather to support them to deal with the specific demands, necessities and challenges of the multigrade educational environment that they serve.

The "ZEUS" Innovative Teachers' Training Approach

The overall development and implementation scheme of the ZEUS project lies upon the evolution of work on two main aspects: the pedagogical development and the technological development of the training programme. The task of developing and delivering a comprehensive in-service training programme is indeed a demanding one and for this reason an interdisciplinary group of experts in pedagogy, teachers' training, multigrade education as well as software developers and telecommunications experts and of course teachers serving in multigrade schools has been formed and will collaborate a) to develop the pedagogical framework and the content of the training programme and b) to adjust the Digital Broadcast Satellite Platform that will support the training of teachers in the participating multigrade schools according to their needs.

[1] As **multigrade** can be defined the school where the groups of students of different grades are combined in a single classroom. In most cases it is a single class in which pupils of two or more adjacent grade levels are taught in one classroom by one teacher. The multigrade class structure is known by various names in different countries; these include "composite" or "combination" classes, "double" classes, "split" classes, "mixed-age" classes and "vertically grouped" classes.

Aims and Objectives

The ZEUS project aims at developing a contemporary open distance training programme for teachers serving in rural multigrade schools in Greece that will be delivered using satellite communication services. The training programme has been designed to meet the teachers' needs in order to enhance their professional development and their daily teaching practices in the multigrade school environment. More specifically, the proposed training programme seeks after the following objectives:

- to evaluate cutting – edge technology systems and services for educational purposes and namely the use of satellite communication systems that offer the major advantage of serving very large geographical areas
- to develop a specialized training framework for teachers in multigrade schools in Greece that will meet the needs of the multigrade schoolteachers taking into account that a) the multigrade teachers work with heterogeneous groups of students; b) the methods of differentiated teaching which adapt to these learning differences and c) the multigrade schools around Greece have various socioeconomic backgrounds and address different educational needs
- to enhance the professional skills of multigrade schoolteachers and to develop their abilities to design didactic interventions (lesson plans, cross curricula applications, projects, activities) (Moulton, 2001)
- to provide a teachers' enhancement model that will encourage life long learning
- to integrate the uses of Information Communication Technologies to promote the development of the local communities (Miller, 1995; Moor & Witworth, 2001)
- to set standards concerning the teachers' in-service training in multigrade schools
- to enhance communication and collaboration between the multigrade schools and the educational community in general and to establish links with the scientific community that may support and guide the teachers' efforts.

Pedagogical Framework of the Training Programme

The development of the proposed training program is based on the adoption of a teacher centered approach and the implementation of the training program includes extended cycles of school centred work (Figure 1). Teachers will continuously provide the scientific group with their feedback in terms of their experiences gained in the classroom.

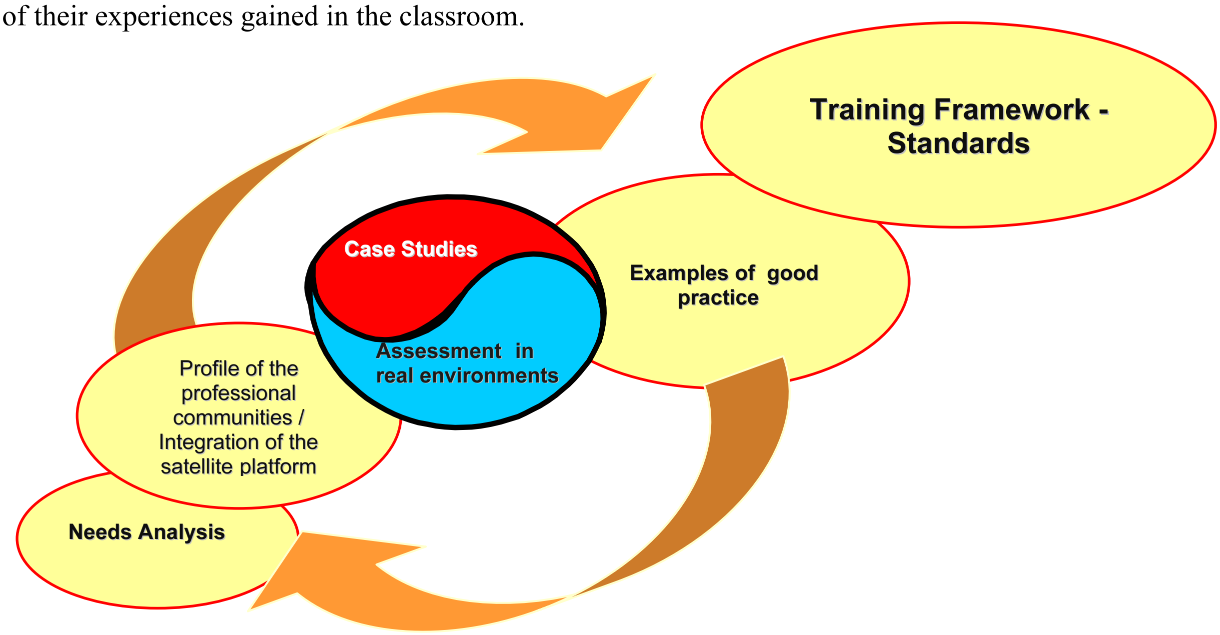

Figure 1: The project's approach: The pathway to high quality multigrade school teaching through the development of a common training framework

This not only increases the motivation of the teachers and gives weight to their practical experiences but also provides the necessary cross-links between theory and practice. Upon suggestions of the teachers, the instructors' team will perform the necessary adjustments to the training approach. Teachers' active involvement in the determination of the training parameters is expected to enhance their professional skills and is considered as a craft that requires commitment as well as collaborative skills, creativity and humour.

The training programme will elaborate along three main axes:

- *Methodological approaches and incentive-based strategies for multigrade teaching:* Multigrade teachers need to develop a wide repertoire of teaching techniques and classroom management practices. Multigrade research indicates several of such strategies (students' grouping, holding activities, staggered start, individual workbook method, differentiated direct teaching, peer tutoring etc.).
- *Introduction to the use of ICT:* Technology can be a valuable resource to improve and strengthen the multigrade teaching performance. Information and communication technologies can be used to deliver specialised educational content on demand, provide in service training and support and establish networking concepts to everyday teaching practices.
- *Cross-curricula applications and projects:* Teachers need to be trained on how to use the multigrade teaching strategies on designing, developing, implementing and evaluating cross-curricula applications and projects for their students and the local community. Such applications should be realised in order to stimulate and engage the different groups of students to related learning activities or to proceed on more effective teaching time distribution. This is going to be the most important part of the training curriculum.

The Digital Broadcast Satellite Platform

The emerging technological solutions, mainly in the communications' sector (e.g. satellite, GPRS, GSM) provide advanced and reliable channels for the provision of services independently of place and time. The launch of the Greek satellite HELLAS-SAT in May 2003 has brought a new era in the telecommunications' sector in Greece. Satellite technology, applications and services are relevant with the support of the delivery of an in-service open distance training programme in remote areas (such as islands or mountain areas), where terrestrial communications deployment is complicated and costly. The cost of satellite links proves low when compared with the cost of the corresponding earth links while the quality of the service suffers no loss. Therefore, satellite links provide an excellent solution to face the presented problems and to meet the identified needs. The use of satellite has significant advantages (generalized availability at competitive prices) comparing to conventional ways of training based on more traditional telecommunication services. It is apparent that satellite communications' solutions offer an ideal way of providing high quality, high bandwidth connection with more than a single user, anywhere, anytime and thus fully support an in-service training scheme.

The ZEUS educational platform is based on the OTE Digital Broadcast Satellite[2] of the Hellenic Telecommunications Organisation and to the MENTOR[3] e-Learning platform, developed by INTRACOM. The proposed solution enables to continuously provide in-service training for the teachers serving in multigrade schools and keep them updated at all times. The proven advanced transmission techniques of the platform provide the tools and mechanisms for conducting multimedia-rich training sessions in real time, with almost no restrictions on the number or participants and their geographical position. The platform was initially designed and developed to operate over satellite broadcast networks; nevertheless it does function equally well, offering the very same features, over any IP, multicast-enabled infrastructure. The whole platform has already been tested and used over various environments, including, but not limited to, terrestrial connections (Ethernet LAN, leased lines, etc.), as well as radio links supporting point-to-multipoint transmissions.

[2] Details on the OTE DBS may be found at http://www.ote.gr/oteweb/english/network/techs/dtv.htm

[3] Details on the MENTOR e-Learning platform may be found at http://www.intranet.gr/en/products/internet/mentor.htm

Training Scenario

The instructor (teacher) is located in a certain geographical point, for instance in Athens, and the multigrade teachers (users) in ten different remote locations around Greece. The teacher has to log in first and start the operation of the platform. By starting the MENTOR application, the users are entering an on-line classroom (they may also work off-line). The training environment offers numerous tools and utilities for instructor-trainees interaction, allowing all participants to easily exchange comments and ideas, giving a feeling of actually being in the same classroom.

The instructor may:	The teachers may:
• Transmit multicasting video via satellite link	• Receive video through satellite link
• Use satellite internet platform	• Receive internet material through satellite
• Send educational material	• Receive educational material
• Send & Receive e-mail, use chat, etc.	• Send & Receive e-mail, use chat, etc.
• Receive feedback material sent by teachers	• Use ISDN connection to send feedback to trainers i.e. through video
• Have parallel videoconferencing with trainees in different multigrade schools with satellite transmit and earthlink reception	• Have parallel videoconferencing with trainees in different multigrade schools and the trainers through multiple ISDN connection

Figure 2: Satellite in service multicasting training – multiple ISDN trainer response

Video as well as participants' list are always at first scene so the communication between the teacher and the users is assured (Figure 2). A real-time video stream is broadcasted from the instructor's site to all participants and is visible to them at all times. The interaction between the teachers at the same time is possible by using the chat tool although it is much more effective by using the audio tool that provides audio communication. The instructor of the session has the total control over the shared applications and resources of the system and may allow participants to communicate with him or each other, access the shared applications or restrict them from doing so, should he believe it is necessary to do so.

Figure 3: Environment tab – Participants' list, video and chat tool

All students have the possibility to submit their questions or comments, either by typing in the public chat utility or (should they obtain permission to do so) by speaking to their microphones and letting the platform broadcast their comments to all other participants. A number of collaboration and content presentation tools (e.g. shared whiteboard, shared text editor, shared HTML browser, application sharing, public/private chat, etc.) that enables all registered users to participate in a lecture and access the training material or create their own “notes”.

The platform also provides the tools and mechanisms for the efficient and reliable distribution of teaching material, using advanced multicast transmission techniques. The instructor may place training material and work with it (add new files, modify them or delete them, etc.) during the session under a root folder. The platform is automatically replicating this directory structure to all room participants, the moment the change takes place. For example, whenever an HTML page (locally stored on the instructor’s PC) is selected and displayed, all users’ immediately retrieve it from their local storage and display it too, without having to wait for the content to be retrieved through the Internet or other network resources. The instructor may also prepare teaching material even when the “class” is not online. All participants, as soon as they join the class, will synchronize and retrieve this material locally, for faster access.

The print screen presented below (Figure 4) presents an example where the instructor demonstrates to the teachers the AgroWeb project that was applied to rural areas in Europe (Sotiriou et al, 2002). The instructor intends to show to the teachers how they may design activities that link the school with the local community and may contribute to the development of the local community.

Figure 4: Demonstration of the AgroWeb e-shop

Such examples could motivate teachers to be actively involved in activities with high importance of the local community and the local community could in this way see the emerging benefits from the use of ICT. The creation of horizontal links out from a school or a group of schools to their local community is considered to be a major development. The advantages of this development are that it recruits parents and the community to support pupils’ learning and possibly to provide material and financial help to schools or vice versa. It is also provides experiences, skills and contacts that can help pupils gain the confidence and knowledge to gain employment and to establish themselves within the adult community. The role of the teacher is very important for the success of such a development.

The system also supports offline operation (i.e. an instructor or a student can use the applications and tools without participating in a "live classroom"). This mode allows participants to prepare teaching notes and review the material at their own pace, any time they feel they need to do so for their better understanding.

Future Plans

The partnership aims to establish a satellite network of rural schools and to widen it beyond the national and if possible the European boarders as well as to other professional groups that have similar training or communication needs. Taking into account the living conditions in rural areas, broadband communications are becoming a necessary tool for maintaining and improving the population's well being, economic activity and safety.

The isolation, the obstacles and the constrains that professionals in rural areas face may be partly alleviated by offering them the possibility to use the Internet for training and communication purposes via the use of satellite supported networks.

The applications will provide training and information in specific professionals' communities living in remote areas within already existing core nodes of the rural communities such as schools, municipalities, cultural centres, hospitals and other. The professional groups to whom such applications should be addressed at are school teachers, doctors, nurses and health personnel and administration personnel. Applications such as the ZEUS training programme offer the framework and the content for the professional development of the groups which are addressed and establish links with the core resource centres (databases, libraries, universities, information centres, etc.).

References

1. VEENMAN, S. (1995) *Cognitive and non cognitive effects of multigrade and multi-age classes: A best evidence synthesis.* Review of Educational Research, 65(4), pp 319–38
2. IOWA DE/AEA EARLY CHILDHOOD NETWORK. (1998) Fact sheet on Mixed-Aged Grouping
3. COLLINGWOOD, I. (1991) *Multiclass Teaching in Primary Schools,* UNESCO Office for the Pacific States
4. LITTLE, A. (1995) *Multigrade teaching: a review of research and practice,* DFID Education Research Monographs 12
5. MOULTON J. (2001) *Improving education in rural areas: Guidance for rural development specialists,* The World Bank
6. MILLER, B. (1995) *The role of rural schools in community development: Policy issues and implications,* NW Regional Educational Laboratory, Rural Education Program
7. MOOR, CR. AND WITWORTH, J. (2001) *All together now?* Social inclusion in rural communities, Local Government Association, http://www.lga.gov.uk/lga/rural/socialinc.pdf
8. SOTIRIOU, A. S. et al. (2002) "AgroWeb Handbook: An innovative approach to the usage of the Internet for interdisciplinary learning", EPINOIA, ISBN 960-8298-98-9

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MANAGEMENT AND COACHING (TUTORING) IN ORGANIZATIONS HOW TO CREATE ATTRACTIVE FIELDS OF STUDIES WITH NEW PARTNERS BUILDING INTERDISCIPLINARY COMPETENCE ACROSS TRADITIONAL SUBJECT AREAS?

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Introduction

The collaboration programme ”Management and coaching in organizations” involves the transformation of two separate areas of study: “Administration and management” and “Coaching”, into a new and flexible mutual field of study. Thus combining competence in coaching with competence in organizational theory and management, the result is an innovative management training promoting quality.

The structure and the professional contents are developed through the collaboration between The Institute of International Marketing at Aalesund University College and The Welfare Studies at Nord-Trøndelag University College. Similar offers have not yet been developed, but the ones currently in course of preparation will be based on the experiences made from previous projects on distance education and e-learning. When available, they will make it possible to reach new groups of users offering a sought-after and pedagogically well-adapted programme of studies.

Target group

The aim of the programme is management tuition and development, and is particularly oriented towards employees within maritime activities and public sectors. Naval officers with some years of experience and additional training in management and coaching represent key personnel in shipping companies, shipyards, insurance companies, banks, suppliers and so forth. An education like Management and coaching in organizations is furthermore often decisive to obtain these positions. For employees within the public administration the programme represents a meeting-place for developing professional competence in interdepartmental understanding by the means of a mutual user-oriented platform. However, the field of study is essential for a large number of other occupational groups as well.

Naval officers are among the target groups of the study programme. There are many challenges related to communication in this group when it comes to costs and technical issues. Naval officers have the world as their place of work. Even though the pressure of work on board is extensive, it is ideal to be able to study in their spare-time, as they otherwise are dependent on being present at their workplace. The officers are for instance 6 weeks on board and are equally long at home, and it is decisive that they can have as good a connection with the place of study as possible no matter where they are. If the communication conditions are functioning well for this group of students, they will probably work for most of the others.

Objectives

The purpose of the programme is consistent with the strategy plans of both university colleges when it comes to creating new and attractive fields of study which are based on the demands of the trade, and where the use of information and communication technology is substantially integrated.

Goals

- To develop action-oriented managers who are critically reflecting on their own role as leaders and coaches in the organization.
- To develop competence in coaching co-workers and users/clients to promote their professional and personal development.
- To reach groups of users who have problems attending ordinary studies at a university or a college.

Study Content and Organization

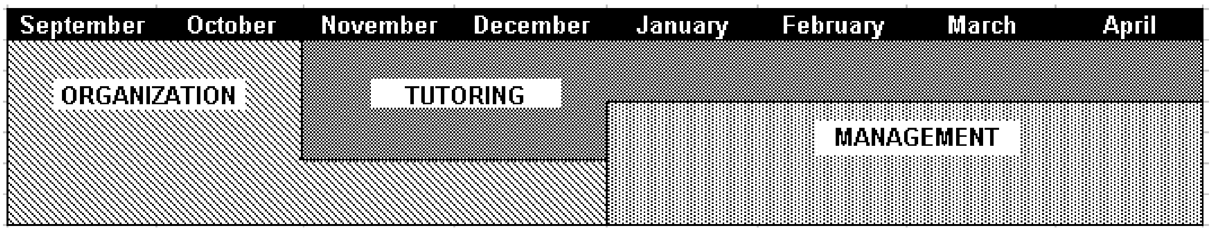
The common factor for the involved fields of studies in the collaboration programme is the fact that they comprise many concurred approaches to the problem, together with an overlap in scientific literature to a certain extent. The course of study totals 30 credits, and is designed as a flexible part-time e-study in one year. The multimedia-based teaching material developed in the project period will be presented on CDs and is adapted in many ways: audio-visual and slide lectures, video presentations and a text-based curriculum. Learning Management System (LMS) will be used for information, distribution of additional course material and for cooperation between fellow students. LMS is furthermore used for continuous tutorial contact, for instance in the case of mailing papers and responding to comments.

During the course of study 5 common assemblies will be arranged, each over 2 days. In addition to the professional themes presented and the opportunities to implement practical tasks, these assemblies will have an important social function which can be forwarded in the web-based collaboration system.

The curriculum is divided in terms of 3 main units:

1. Organization, 10 credits
2. Management, 10 credits
3. Coaching, 10 credits

Organizational model:



Forms of evaluation

Evaluation of documents

Related to each of the three main units: organization, coaching and management. Each group will receive 5 assignments, constituting a total of 15 hand-ins. One assignment from each theme is drawn, a total of 3 in which each is given equal weighting, and the consecutive evaluation will represent 75% of the examination grade.

Examination

The net-based individual examination counts 25% of the total grade achieved. To reach completion of the study programme, the grades to pass need to be obtained in both of the evaluations.

Development of the programme

In using the CD products as means of instruction it is highly desirable, by the help of a thorough structure and by the use of multimedia devices (combinations of texts, sounds, pictures and videos), to enrich the passing of knowledge, enhance the level of motivation and obtain a greater effect on learning, consequently followed by an improved student participation. Many of the content components in the actual courses are particularly suitable for such presentations.

1. A CD-based teaching method is going to be tested as a useful alternative according to the relevant target groups.
2. Furthermore, the CD-based teaching method together with an extensive use of multimedia components and e-learning support will be tested as a suitable educational offer with a highly qualified level according to professional content, presentation and practical functionality.

One of the main points with this project is to provide a flexible study programme to groups of users with limited access to benefit from internet-based solutions in their work situation. For maritime personnel, this kind of access is satellite-based and attached to great costs in extensive usage. The use of the Internet in other occupational groups may be regulated by concessions and/or legal conditions. A product designed for these groups may also be useful in other contexts. When it comes to the target groups, it is often a more practical arrangement to learn at the place of work. Thus, a far better utilization of the capacities inherent in the professional staff is gained, as well as an established basis for the exchange of experiences.

The international renowned guidelines regarding universal adjustment (W3C) is designed bearing the idea of accessibility to the Internet in mind. The CD products which constitute an essential part of this project will not be on-line based, but a device developed in a proper multimedia tool. Within the frames set by this tool one will adjust to the guidelines and give concerning universal adjustment in the best way possible. This implies among other things that also the multimedia components will have text-based alternatives.

Evaluation

Evaluation of the project is intended to have a professional, pedagogical and technical point of departure. An essential measure of the evaluation is to assess the technical solution and the pedagogical quality of the developed product.

Pedagogical: Does the method lead to an improved effect on learning? To what extent is the product experienced as motivating and stimulating for the students? How does the integrated components multimedia work? Does this eventually optimise the process of learning? To what extent is tutorial support and hand-ins required in this subject area? And to what degree is the product experienced as motivating and stimulating to the students?

Technical: Does the technical quality of the CD product have a satisfying standard? Is the solution user-friendly? Is it possible to apply the pedagogical, methodological and technical solution that is developed in other subject courses – eventually, what modifications and adjustments would be required?

Evaluation of the development stage: At this stage the internal process of developing the different components in the CD-based offer will be evaluated. This evaluation will be based on recording the developmental processes and a subsequent analysis of the collected information. The evaluation of the developmental stage will be concluded towards the end of this stage of the project.

Evaluation of the implementation stage: In this case the evaluation will primarily be oriented towards the students and the companies to which they are attached and their experience of implementing the study programme. In addition, it will be valid for the tutors and the professional departments who are in charge of the programme, as well as for the experiences acquired through their professional effort. The collecting of quantitative and qualitative data from questionnaires and eventual statistics from e-learning tool will be undertaken when possible. It might even become urgent to gather information from the students by interviewing some of them after the completion of the study programme. The evaluation of the implementation stage will be concluded by the end of project year 1 and conclusion of year 2.

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ARTIFICIAL INTELLIGENCE FOR DISTANCE AND E-LEARNING DEVELOPMENT IN KNOWLEDGE SOCIETY

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1. Introduction

Society based on knowledge and information as key resources to be used by anyone, anytime and anywhere is called Knowledge Society. In such society human knowledge should be currently updated. It is realized by continuing education (courses, workshops, postgraduate studies). Learning is a process that lasts through the whole life (Life Long Learning). Very quick development of new information and communication technologies (ICT) enabled the birth of new forms of education for Life Long Learning process. New forms of education involved institutional transformation. New educational forms are realized by the following new educational institutions:

- *Open University* – a school of high level education that offers courses independently of previous participants preparation (no documents are required). It is open for everyone;
- *Virtual University* – high level educational institution that ensures courses (it may offer certificates and degrees) by the use of Internet. It has not its own physical premises for education (only for supporting staff such as administration and technical staff);
- *Asynchronous Learning Networks* – people networks for distance education on global scale that permit learning at anytime and anyplace. They combine self-study with asynchronous interactivity between tutor and other students. They offer degree programs and certification courses.

The following tools and methods can be used for realization of high quality distance learning systems: artificial intelligence (expert systems, neural networks, genetic algorithms, fuzzy logic, intelligent agents, Bayesian networks, AI hybrid systems), modern presentation, distribution, and interaction technologies, telecommunications tools (synchronous and asynchronous). Computer technologies, being used in education, are new elements added to tools that support teaching. The pedagogical process does not change, only the tools. Computer technologies should be a set of cognitive tools, not only tools for gathering, storage and transfer of information. Networks (as opposed to CD-ROMs) can ensure access to actual didactic materials (currently updated) in different fields (also narrow specialities) and present achievements in science at national, regional and international levels. Use of Artificial Intelligence means in education gives possibilities for modernization of learning process (adaptation of learning process to individual learners considering their current knowledge, experience, preferences, customs and learning style). Use of artificial intelligence enables creation of intelligent learning environments.

The concept of an intelligent teaching system (according to IEEE LTSC standards concerning Learning Technology), the comparison of main features of artificial intelligence tools, the use of artificial intelligence for distance and e-learning development in perspective, the pedagogical aspects of intelligent learning environments, and the exemplary intelligent system solutions for realization of distance learning process are presented in the paper.

2. Learning Technology System Architecture

IEEE Learning Technology Standards Committee (IEEE LTSC) developed specification of Learning Technology Systems Architecture (LTSA) useful for the development of compatible distance education systems. High quality learning process requires more than content delivery and Internet connectivity. Systems for realization of Distance Education should be of open nature. Figure 1 shows general architecture of ODL (Open and Distance Learning) System.

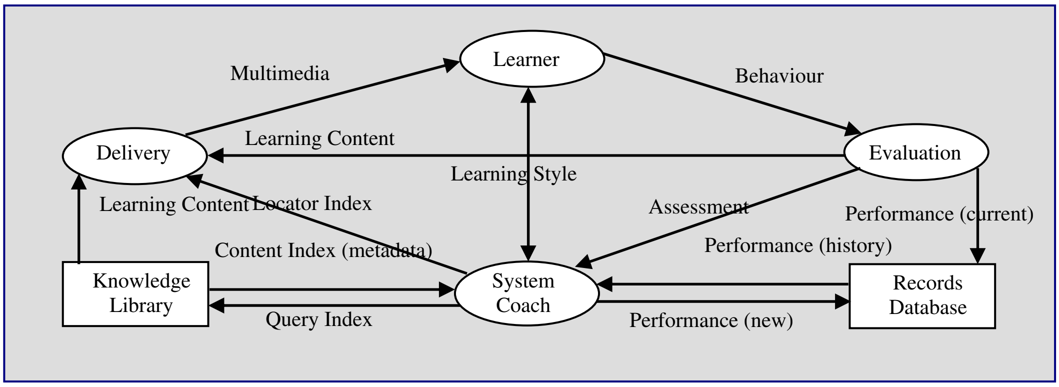

Figure 1. General architecture of ODL system

It comprises the following elements:

- *Processes* (Learner, System Coach, Delivery, Evaluation);
- *Memories* (Records Database, Knowledge Library);
- *Connections* (Learning Content, Multimedia, Learning Style, Assessment, Performance, Behaviour, Query Index, Content Index, Locator Index).

Learner process is the abstraction of a single person that learns or group of students. System Coach process is the abstraction of a teacher. Learner process receives multimedia presentation and its behaviour is evaluated in Evaluation process and the results are sent back to the System Coach process (teacher) and stored in Record-Database. Memories determine kind of information being stored and methods of search, retrieve and up-dating of the information. Connections determine their type (one-way or two-way), their nature (dynamic, static) and the kind of information being sent.

3. Artificial Intelligence means in intelligent learning environments

Each of artificial intelligence domains has advantages and limitations for solving complicated problems. Combination of representation and knowledge processing techniques used in different domains within one system tends towards hybrid systems. In hybrid systems positive features of one solution are used in order to eliminate or minimize limitations of other solution. Combination of different artificial intelligence domains ensures automation of knowledge acquisition, processing of uncertain and non-precision knowledge, explanation of problem solving and adaptation to varying environment. Therefore such systems are called intelligent systems.

Comparison of basic features (automation of knowledge acquisition, processing of uncertain and non-precision knowledge, explanation of problem solving) of different artificial intelligence domains is presented in the table 1.

Use of Artificial Intelligence tools enables creation of intelligent interactive learning environments that are able to adapt to learner needs. The adaptability ensures individualization of learning process: personalization of e-content (according to learner needs, current learner knowledge, learning styles, learner experience, learner preferences, learner customs) and learning in own pace. Particular Artificial Intelligence Domains can be used to facilitate different phases of learning process. Different intelligent system solutions (such as knowbots, pedagogical agents and intelligent teaching systems) were developed for realization and facilitation of Distance Learning Process (see p. 4). Knowledge robots use intelligent agent techniques. Instruction systems are expert systems. Pedagogical agents are based on an autonomous agent paradigm.

Intelligent teaching systems create and use learner models for adaptation to learner needs and characteristics. Learner model records information about the learner reflecting learner current knowledge state.

Learners can use variety of means for interaction with learning content. They can choose the form of learning material presentation (theory, examples, demonstrations), select supporting materials using rich search mechanisms, settle parameters for simulations.

It is possible (by the use of artificial intelligence means) to provide learners with automatic tutoring (interaction from teaching content). Learners can be provided with hints (during learning process) and feedback. They can be informed about their errors (in tests) with diagnosis and advices (what and how to learn or repeat). Diagnosis of learner mistakes can be done by comparison of a learner solution with the expert solution using solution graphs and rich search mechanisms.

Bayesian networks are another mechanisms for recording a learner knowledge. These networks in a probabilistic way assess learner knowledge state (based on learner interactions with the tutor). Each Bayesian network node has a probability determining learner knowledge concerning this piece of subject. Fuzzy methods can be used to represent uncertainty in the student model.

Neural networks may be used to monitor individual performance within distance learning courses. A neural network can imitate an experienced human teacher by detecting patterns of test answers in objective tests. Neural networks as intelligent classfiers contain also test results for all students of a particular course.

Neural networks as self-organizing networks can help learners to find appropriate supporting materials in the web. The neural network, by learning structures, can add new links, delete existing links and change coefficients values of existing links.

Table 1. Basic features of artificial intelligence domains.

Artificial Intelligence Domain	**Basic features**		
	Automation of knowledge acquisition	***Processing of uncertain and nonprecision knowledge***	***Explanation***
Expert systems	bad	bad	very good
Fuzzy systems	bad	very good	good
Genetic Algorithms	very good	sufficient	sufficient
Neural networks	very good	very good	bad

An appropriate user friendly learning environment (cosidering pedagogical aspects of learning process) is needed for effective learning. Learning environments (according to Kolb's experiential theory) can be of the following types: behaviourally complex, perceptually complex, affectively complex, symbolically complex. In a *behaviourally complex learning environment* the emphasis is on the active applications of knowledge and skills to a practical problem. In a *perceptually complex learning environment* the main purpose is to understand (to be able to define problems, to identify relationships between concepts). An *affectively complex learning environment* emphasizes experiencing what it is like to be a professional in the field of study. In a *symbolically complex learning environment* a learner is involved in trying to solve a problem (abstract) for which there is a right answer or a best solution.

Universities classify knowledge as the sciences, engineering, medicine, management, arts, humanities but it is not clear how people learn the subject area. Kolb's experiential theory classifies knowledge into one of the following types: convergent, assimilative, divergent, accommodative, each occupying one quadrant in the prehension and transformation dimensions (Figure 2). Each subject (physics, history, business, etc.) can be placed in the structural dimensions of experiential learning. It can be used for designing appropriate learning environments.

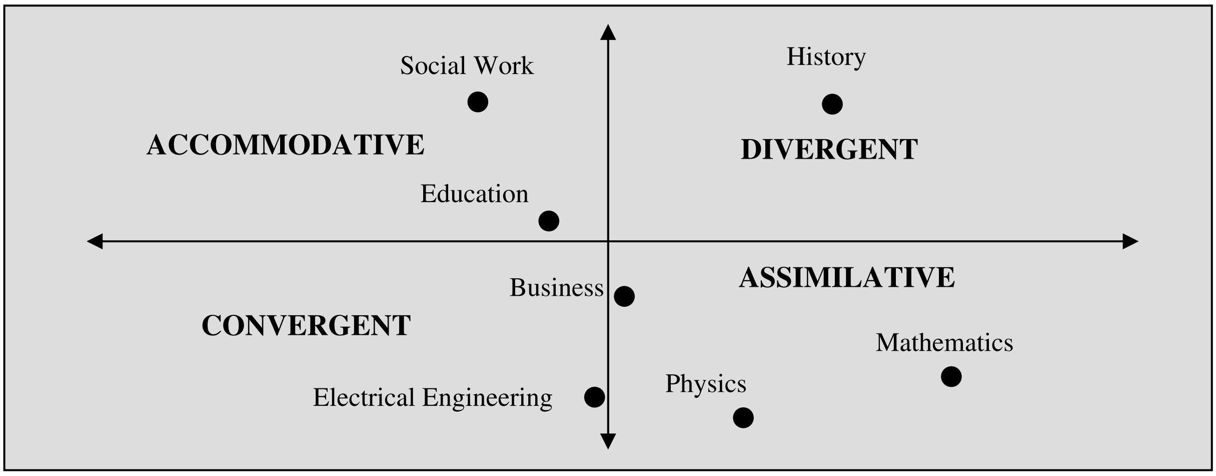

Figure 2. Experiential Learning Orientations of Several Academic Fields

Learning an engineering subject requires environment that is behaviourally and symbolically complex. Learning a scientific subject (mathematics or physics) requires environment that is symbolically and perceptually complex. Learning an economic or management subject requires environment that is affectively and behaviourally complex. Learning a humanity subject requires environment that is affectively and perceptually complex. The appropriate environment for learning a specific subject is rather semi-permeable depending on the learning style of a student.

4. Examplary educational intelligent systems

4.1 Intelligent teaching systems

An intelligent teaching system (computer teacher) should be able to adapt learning process to individual learner needs and learner characteristics. Figure 3 shows the concept of such a system in accordance with IEEE LTSC standards.

The learning engine is used for the steering, control and co-ordination of the components. Domain Knowledge contains learning objectives and contents. The Didactical Methods Base contains different didactical methods and concepts, supporting authors and educators. The Presentation component allows generation and presentation of learning contents in different ways. The Communication component determines the level of interactivity of a learning environment. The Evaluation component determines the performance of the learner providing tests.

The Learner Model stores information about the individual learner. Learner model is the set of parameters containing the information about learner's personality, experience and education. It is important for each system adaptive to a user (system with ability to change its behaviour depending on the environmental conditions). It is possible to distinguish some kinds of learner models. In the *overlay model* learner knowledge is a subset of expert knowledge. In the *deviation model* learner knowledge consists of a subset of expert knowledge and a learner "buggy" knowledge (misconceptions about a domain) for better remediation of learner mistakes.

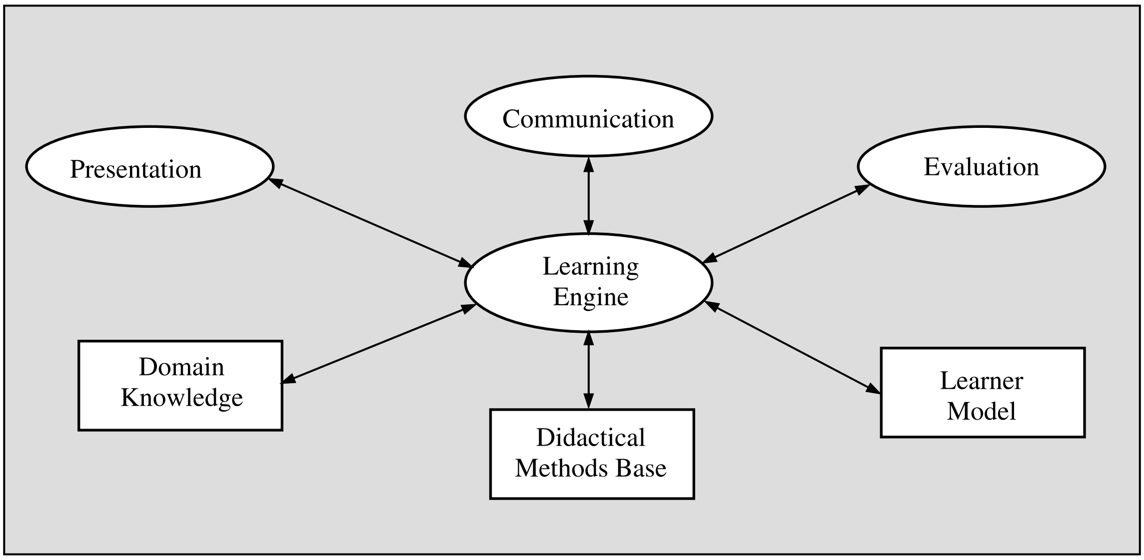

Figure 3. Intelligent Teaching System

4.2 Pedagogical Agents

Pedagogical agents are based on an autonomous agent paradigm enabling more natural interactions between learners and intelligent courseware by the use of animated persona. The pedagogical agent consists of two sub-components: animated persona and the reasoning engine. The animated persona can be used alone or incorporated into a larger applications.

The reasoning engine performs all monitoring (including learner interactions) and decision making. In the multi-user system the reasoning engine is server-based. The reasoning engine decisions are based on a learner model, a case task plan, and an initial state, which are downloaded from the server when a case is chosen, and on the agent's current state, which is updated as a learner works through a case. Pedagogical agents offer advantages over conventional intelligent learning environments because they enable closer and more natural interactions between students and intelligent courseware.

4.3 Knowledge robots

Knowledge robots (knowbots) use intelligent agent techniques for automation of repetitive tasks performed by human facilitator. Knowbots are placed between the learner and the teacher/facilitator, enabling the interaction. It is possible to distinguish the following types of knowbots: scheduled, on-demand and submission helper.

Knowbots are intelligent software agents used in online courses that simulate a human relationship, by doing something that another person could otherwise do. Learners appreciate immediate feedback and the ability to get help rapidly. They want effective immediate feedback (human or machine). Feedback can be provided by intelligent agents in an on demand mode. Knowbots can perform the duties of online facilitator (tutor) for routine tasks.

5. Conclusion

The paper is based on my research works concerning use of artificial intelligence means for learning process, analysis of modern computer educational systems solutions and applications, IEEE LTSC standards (of P.1484 series) concerning Learning Technology, my participation in virtual conferences, (EDEN-staffdev, 2003), S2-Net virtual seminar and virtual workshop (2004) and also events organized within EC Projects: IST-2001-32633 (Innoelearning Seminar, 2002) and IST-2000-29247 (I.C.T.'03 Symposium, 2003). Such virtual events are very useful and helpful to get practical experience in Distance Learning.

Use of wide Artificial Intelligence possibilities in education will ensure development of high quality distance and e-learning systems. It needs further appropriate research works. It gives large possibilities to facilitate teachers' work by automation of human routine tasks and countinuous adaptation to learner needs and characteristics.

In perspective intelligent educational systems used in networks will enable facilitation of teachers' work, individualization of learning process and globalization of distance and e-learning process ensuring anytime and anywhere access to rich and actual knowledge resources (currently updated) in many different fields, for a large number of learners, at national, regional and international levels by the use of Internet.

Intelligent educational systems enable evolution of the society towards ***Knowledge Society.***

References

1. CHEC J. (2001) *Global Aspects of New Forms of Life Long Learning* (in English). Proceedings of 10 Anniversary Conference of EDEN. Stockholm, Sweden, June
2. CHEC J. (2003) *Intelligent Teaching Systems for Education in Information Society* (in English). Proceedings of VI International Conference: Research for Information Society. NIT, Warsaw, Poland, October
3. CHEC J. (2001) *New Forms of Education in Knowledge Society* (in English). Proceedings of TechNet Baltic 2001. The First International Teleconference. Kaunas, Lithuania, September
4. CHEC J. (2001) *ODL System for Engineering Postgraduate Studies* (in English). Proceedings of 19th International Conference on Technology and Education. Florida State University, USA. May
5. CHEC J. (2002) *Pedagogical aspects of ODL for future engineers* (in English). Proceedings of 30th SEFI Annual Conference. SEFIrenze2002. Florence, Italy. September
6. CHEC J. (2002) *Pedagogical aspects of ODL System Creation* (in English). Innoelearning Seminar. Luxembourg, December
7. CHEC J. (2001) *Report on Asynchronous Learning Networks* (in Polish). WUT, Poland. March
8. CHEC J. (2003) *Use of Artificial Intelligence for Learner-Learning Content Interaction* (in English). Proceedings of I.C.E. Symposium. London, April
9. CHEC J. (2003) *Use of Artificial Intelligence in New Learning Environments* (in English). Proceedings of International Conference T.E.L.'03, Milan, Italy, November
10. D. MINOLI (1996) *Distance Learning. Technology and Applications,* Teleport Communications Group. Stevens Institute of Technology. Artech House, Inc.
11. JALN. ALN MAGAZINE (1997, 1998, 1999, 2000) Vanderbilt University, Volume 1, 2, 3, 4
12. Learning Technologies ELM, October, 2000
13. Learning Technology Systems Architecture (LTSA). IEEE LTSC Specification, v. 4.00, 1988
14. Proceedings of Scientific Session for 50th Anniversary of Electronics, Telecommunications and Informatics Faculty. Gdansk University of Technology. Gdansk, Poland, June 2002
15. SHAW E., JOHNSON W., GANESHAN R. *Pedagogical Agents on the Web* USC ISI, USA
16. SLEEMAN D. BROWN J.S. (1982) *Intelligent Teaching Systems* Academic Press

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NETWORKS OF COMPETENCE MANAGING OPEN AND DISTANCE LEARNING

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Introduction

The evolution from a highly-developed industry to information society affects all spheres of life and society. Information evolves to an independent factor of production. The access to information is the key for an efficient development in all social areas like education, business, administration and politics as well as for the individual development. Through the permanently increasing information overload the fields of work flow, information demand and information brokering are given top priority.

The validity of information and specialised knowledge is in decline. Things we once learnt become obsolete very fast. This speed-up of knowledge cycles forces us to a lifelong learning. Lifelong and E-Learning methods are used quite often when realising professional training. The mentioned methods combine education with the medium Internet in order to impart knowledge. The open and distance learning offers are part of lifelong learning cycles, linked to the new opportunities of Internet and Multimedia. These technologies support extended education projects in colleges and companies.

Physical networks are essential basics for distance and lifelong learning. Furthermore, organisational networks are important for managing the huge financial and personal impact for a single company in the access to these new technologies. The high quality of educational programmes – methodological concept, professional content, performance of the learning space – is crucial for the acceptance of projects.

Before starting to develop or apply new programmes of open and distance learning it is necessary to create organisational networks of competence, thus managing the requirements of supporting, integrating, and enabling the technology based system of open and distance learning.

1. Open and Distance Education in Lifelong Learning

Non scholae, sed vitae discimus. – Non vitae, sed scholae discimus.
Lucius Annaeus Seneca

The validity of specialised knowledge is in decline and things we once learnt become obsolete very fast. This speed-up of knowledge cycles forces us to a lifelong learning.

In future times people will not work just in one profession with the same fields of assignment but in several ones. Therefore, local and mental agility as well as willingness to acquire new knowledge and new abilities are needed. That is the concern of lifelong learning.

Companies use education projects to advance the abilities and qualifications of their employees. Qualification and lifelong learning are necessary in order to generate innovations with the help of all employees. Even after retirement people are interested in completing or accomplishing knowledge.

The old-fashion separation of education into kindergarten, school, apprenticeship and university cannot be kept any longer. There are new tendencies to be found. Thus more and more companies offer their employees advanced training opportunities, and increasingly more and more private persons study on their own.

Therefore it is a must to use all kinds of open and distance education methods in lifelong learning. ODL permits more individual and independent study process intensified by using new methods and technologies depending on the Internet and multimedia. Today these methods are used quite often when realising professional training.

Principal components of online learning programmes are offered in form of texts, pictures, animation, audio and video sequences. The access to such programmes can take place without any time or regional limit and the learner can study with the help of the computer at the work place or even at home. As online learning programmes are dynamic they can be combined optionally and can get updated easily, too. Via communication services like e-mail, chat or forums the learner can communicate with the teacher and also with other learners.

By using E-Learning or distance learning methods costs can be saved. According to the British E-Learning consultant Brandon Hall not only high travel expenses drop out but also 30 up to 60 per cent cost savings can be achieved compared to presence education [12]. Besides, E-Learning courses take only half the time of analogous traditional education courses.

2. Networking

Networking is one of the foundation pillars of distance and lifelong learning. Thus within E-Learning not only the co-operation of further-education providers with learners is based on networks, but also the co-operation of education providers (colleges, universities, academies) with external experts or with companies given the order to produce a special online learning programme. Subsequently, through networking the separation of costs and risks is also possible.

When combining science and economy via networks they should complement each other. On the one hand science needs the implementation in and the confirmation of economy. On the other hand economy needs the knowledge and the scientific perception based on highly-qualified human capital and the access to latest technologies.

Networking is generally defined as follows: a purposeful information exchange and the process of systematically promoting, communicating, or collecting information while moving from one contact to another. Entire enterprises, organisations, multitudinous specialists, developers and producers cooperate this way in order to advance, develop and transfer information, knowledge, experiences, know how and technologies. Therefore networks of competence are built basing on so called competence cells.

A competence cell is the smallest indivisible added value item. The model of a competence cell was developed basing on general theoretical production models, specific requirements of networking and surveys according to specific business procedures like marketing, labour organisation, production/assembling, quality assurance/service and logistics [9].

All human competencies (professional, methodical, social and personal competencies), all resources available (indications about stocks, personnel, work equipment, tools, and funds) as well as the subsequently accomplishable function are in the main focus of a competence cell.

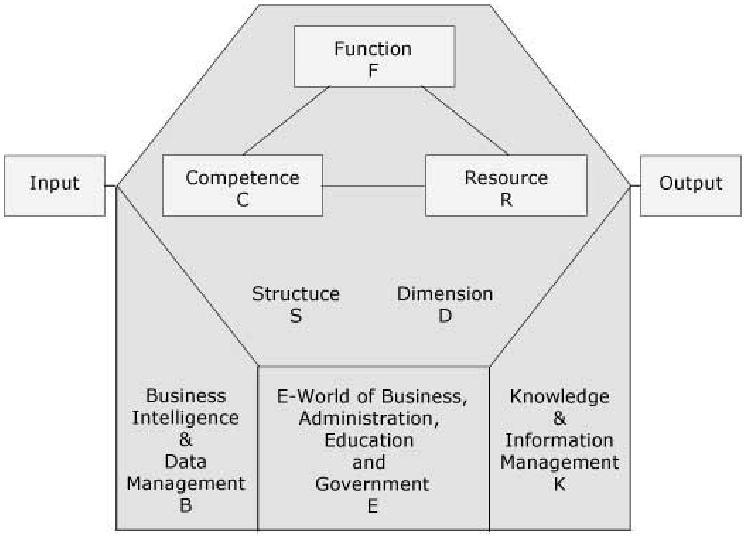

Figure 1. Competence Cell

Networks of competence can be established wherever networking, a thematic focus or the intensification of research and development co-operation is in demand aiming at improving the status quo and at increasing the business revenue.

Originally, theses networks were developed mainly for production networking including networking of knowledge transfer. Apart from general management and project management there exist the management of data, information, skills and knowledge. The common management is amplified by the knowledge management.

Especially small and medium sized enterprises (SME) are obliged to cooperate in networks where they can exchange knowledge, know how and innovations in order to assert their position, to survive on the global market and to save cash resources and time. Using networks and the technology of the Internet especially helps to minimise costs. High quality E-Learning programmes and web-based training replace normal seminars in SME because of the possibility to realise them independently of time and place.

3. Development & Production

The clear division of tasks is absolutely necessary within educational projects and also within networks. Thus it is easier to react to the situation on the market. Both objectives can be achieved by a well-defined and well-structured process and a flat organisational structure resulting in an efficiently managed workflow.

The customer, i.e. the learner, is of crucial interest. That is why didactic concepts and learning targets have to go conform to the learner’s expectation. The following production procedures like concept, storybook, production and application are aiming at him.

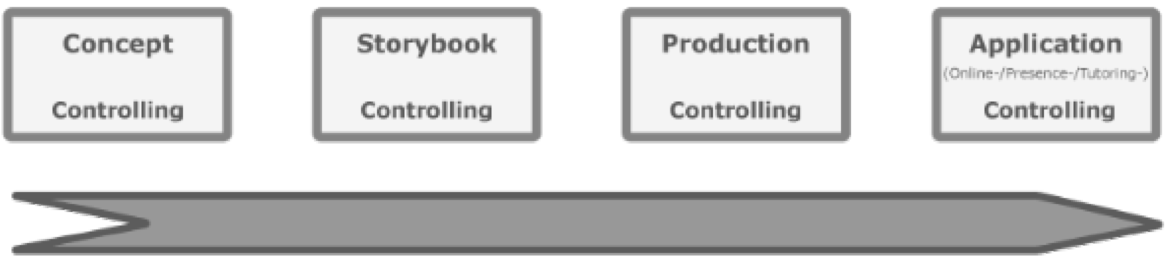

Figure 2. Workflow of an E-Learning Project

In order to ensure a high class level of the learning programmes, it is necessary to turn the principal attention to the quality assurance during the developing and, of course, during and after the production of the modules. The results of the preliminary work status can only be released for the next production step after turning out satisfactorily.

The quality can even be secured by a careful selection of specialised employees and highly-qualified external authors, with the creation of an advisory board and a panel of experts controlling and evaluating the programmes and the multimedia format and with a required feedback of the participants.

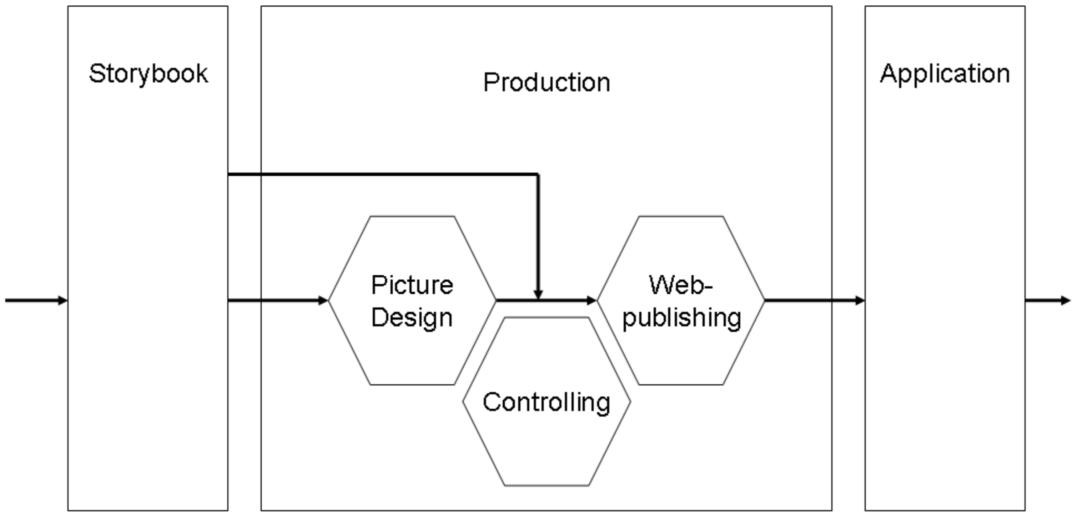

Figure 3. Competence Cells in the Production Process

Even in this case the competence cell is used. How a workflow can be organised is shown in the following production process being considered as an example. The production is divided into the two cells “picture design” and “web publishing” whereas the results and methods of both cells are observed by a controlling stage.

Due to the classification into competence cells the workflow is clearly divided into various steps of procedure. Therefore it is possible to provide them optimally with information and resources, but they can be outsourced as well.

If there does not exist any sufficient competencies referring to “picture design”, this competence cell can finally be outsourced, of course, always within the competence network.

4. Evaluation & Application

A high quality of E-Learning programmes is essential for their successful implementation. With the help of evaluation it is possible to assure and improve their quality.

The evaluation process can be realised for internal and external purposes. Both of them are aiming at serving all E-Learning participants: the authors, the producers, the tutors and the learners. In order to evaluate E-Learning programmes a criteria catalogue has to be established first of all considering concept, pedagogy, contents, design, usability and technical implementation. Besides, human capital, financial aspects and configuration determinations can be evaluated as well. Evaluations being published help to analyse the international market regarding E-Learning educational programmes in order to compare someone’s own E-Learning programme with others. The appropriate business model and the appropriate operator model assure the customer’s satisfaction and the profitability of the learning programme.

Within the competence networks there shall exist cells being able to realise this process optimally. These cells should have sufficient experiences in pedagogical methods, have international and national contacts, and they should offer their service at a price-performance ratio SME are able to pay. Competence cells covering all these demands are rather seldom in private enterprise. But public entities like universities and non-profit-organisations mostly meet the mentioned conditions required.

Universities and their institutes have been dealing with electronic learning for about more than 10 years. There you can find competence cells having adequate competencies, experience and capacity, the networks of economy especially SME are searching for. Supporting measures like controlling, evaluation and realisation of learning programmes are in great demand.

The central question of the right model can be clarified by realising market analyses in order to search for similar programmes and to determine target groups. Additional questions on software (licence, hosting, ASP), on hardware buying or hardware leasing and on the costs of that matter have to be resolved as well.

Michael Meating specifies four different business models [13]: The first model, the “integrated model”, demonstrates that procedures like the generating of contents, the developing of curricula, the realising of marketing measures, the delivering of products and the managing of customer contacts are carried out by only one company.

In the second one, the “affiliate model”, several partners share the work of generating contents and developing curricula. The realisation of marketing measures, the delivery of products, the management of customer contacts are outsourced partially or completely.

The so called “orchestrator-model” solves tasks like the generation of contents, the development of curricula, the realisation of marketing measures and the delivery of products in one company, or they can even be carried out by other providers. But the core business, the management of the customer contacts, stays within the company.

In the fourth model, the “navigator-model”, third parties, so called “navigators”, fulfil all the tasks except the managing activities.

Hardly any company has enough capacity to realise the so called integrated model. However, when publishing on the Internet the help of specialists is needed finally.

By means of the competence fields of each single cell a network is developed or at least a modification of it. In this case for SME the affiliate model suits very well.

Conclusions

E-Learning is a powerful tool to impart knowledge. Unfortunately, many SME willing to generate and to publish complex E-Learning programmes do not have enough competence and capacity to do so.

Thus, competence networks help especially SME to expand and to share knowledge efficiently. In producing the concepts of competence cells and of competence networks have turned out to be quite effectively. But these concepts can be applied to E-Learning projects, too. That is why mainly special competence referring to education, to pedagogy and aesthetics are focused on most companies cannot cover. The previous competence net of production has to be enlarged by new competence cells being familiar with picture design, web publishing and hosting of learning applications. Non-profit organisations and universities, for instance, can enlarge this competence net as they possess experiences in pedagogy and huge networks of experts. They are leading in the organisation and controlling of such networks of competence and also in managing ODL.

A new quality referring to knowledge management can be reached with an efficient input of networks of competence. Companies can achieve a new position on the market via creating a SME production net and they even can secure and expand their advantage in competition concerning secondary success factors. The latter can be obtained by enhancing the network regarding knowledge transfer by the techniques of E-Learning.

References

1. SCHUMANN, CHR.-A. ET AL. (1998) *Distance Education as Part of modular-design system for lifelong learning, XV.,* IFIP World Computer Congress, Proceedings, Vienna/Budapest, Austria/Hungary
2. SCHUMANN, CHR.-A. (1999) *Development and Using of Regional Network for Open Learning and Distance Education*, 19th ICDE World Conference on Open Learning and Distance Education, Proceedings, Vienna, Austria
3. SCHUMANN, CHR.-A. ET AL. (1999) *Hypermedia Based Distance Learning Systems and its Applications*, The Eight International Conference Information Systems Development ISD´99, Proceedings Boise, Idaho, USA
4. SCHUMANN, CHR.-A. ET AL. (2000) *Closing the Gap between School, university, and Further Education Systems in the process of life long learning*, EDEN - European Distance Education Network: Open Classroom Conference, Proceedings, Barcelona, Spain
5. SCHUMANN, CHR.-A. ET AL. (2000) *Humans and their Images in the Real and Virtual World of Learning, Training, and Working*, The Wanderstudent 2000, International Colloqium, KU Leuven, Belgium, Proceedings
6. SCHUMANN, CHR.-A. ET AL. (2003) *Regionaler Wissenstransfer*, LEARNTEC2003, Karlsruhe, Germany
7. SCHUMANN, CHR.-A. ET AL. (2003) *Process Support and Quality in WBT Content Development*, EDEN Conference, Rhodes, Greece
8. SCHUMANN, CHR.-A. ET AL. (2003*) Media Competence for the management (SME)*, EDMAN 2003, Brno, Ceska
9. MÜLLER, E.; RIEDEL, R. (2003) *Planning, Scheduling and Producing in non-hierarchical Competence Networks*, 5th International Workshop on Human Factors, Proceedings, Limerick, Ireland
10. HALL, BRANDON; LECAVALIER, JACQUES (2001) E-Learning Across the Enterprise – The Benchmarking Study of Best Practices, Brandon-Hall.com
11. (2002) Regionale Cluster in Europa, Beobachtungsnetz der Europäischen KMU
12. BAUMGARTNER, P.; HÄFELE, H.; MAIER-HÄFELE, K. (2002) E-Learning Praxishandbuch, Auswahl von Lernplattformen, Studienverlag Innsbruck
13. BENTLAGE, U.; GLOTZ, P.; HAMM, I. (2002) E-Learning Märkte, Geschäftsmodelle, Perspektiven, Verlag Bertelsmann Stiftung, Güthersloh

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PARTNERS WITH CLINICAL PRACTICE EVALUATING THE STUDENT AND STAFF EXPERIENCES OF ON-LINE CONTINUING PROFESSIONAL DEVELOPMENT FOR QUALIFIED NEPHROLOGY PRACTITIONERS

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Introduction

The inclusion of online learning technologies into the higher education (HE) curriculum is frequently associated with the design and development of new models of learning. One could argue that e-learning even demands a reconfiguration of traditional methods of learning and teaching. A recent consultation consultative e-learning strategy developed by the Higher Education Funding Council for England (HEFCE) acknowledges this:

> 'The Internet and use of new technologies are changing the total operation of HE. Learning and teaching are changing as we explore the possibilities presented by new technologies (HEFCE, 2003, p.2).'

However, this transformation in pedagogic methodology does not just impact on lecturers and teachers alone, as the HEFCE e-learning strategy continues 'these technologies are also bringing about new approaches in research, libraries and resources and administration' (p.2). Online learning has 'pervasive impacts and changes in other HE functions' (HEFCE, p.2). Thus, e-learning is a transformational process that posits new challenges for staff and students, both in educational methods and support.

One of the key elements of this transformational process is flexibility. Online learning is often described as providing more responsive modes of study for learners and theories of online course design frequently refer to the ability of e-learning to accommodate diverse learning styles and forms of delivery. For example, Palloff and Pratt (2001) state that 'teaching online requires a new approach to pedagogy' (p.12). This is important, they continue, because 'the online re-creation of the face-to-face classroom can be a dismal failure' (p.12).

> 'Teaching in the cyberspace classroom requires that we move beyond traditional models of pedagogy into new practices that are more facilitative. Teaching in cyberspace involves much more than simply taking old "tried and tested" models of pedagogy and transferring them to a different medium (Palloff and Pratt, 2001, p.20).'

Constructivist educational theory, in particular, is often used as a key tenet for online course design as this form of learning argues that 'people construct their own knowledge, and are socially influenced in all thinking and learning' (LTSN, 2004).[1] One source even goes so far as to argue that 'essentially, elearning is the realization of the theoretical/conceptual components of flexible learning' (elearnspace, 2004). Yet, while such flexibility is desirable and beneficial in many ways, the challenges and changes to traditional models of support for all users of such technology can cause problems.

Many political, clinical, financial and social influences impact on registered health professionals' ability to continue their professional development. This paper will present how a virtual learning environment (VLE) was developed utilising the pedagogic framework of *solution-focused learning*. It will demonstrate evaluation of the *students'* experiences compared to their traditional classroom experiences.

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[1] For an informative review of how consideration of online course design is posited in transformational flexible terms see the section on 'Models of Learning' in Sarah Cornelius (2002), *Learning Online; Models and Styles*, http://otis.scotcit.ac.uk/onlinebook/otisT103.htm

Statement of problem

Continuous professional development (CPD) in caring for people with kidney disease is limited in some regions of the UK and within Europe generally. This is compounded for all by limited resources for course fees and the lack of study leave granted away from the clinical area for full-time courses. This is set against recommendations from National and European governments, and renal clinical guidelines concerning expectations of CPD and clinical competency levels of renal nurses (Renal Association 2002, Benner 1984, DoH2001, Del Bueno 1980). In the past renal practitioners have been trained in all areas of the renal speciality by local Schools of Nursing linked to renal units based in large teaching hospitals. However, more recent changes in the structure of Health Care provision have led in some instances to a rationalising of post registration education delivery.

Description of project

The purpose of developing the multi-mode distance-learning course was to provide professional, academic and clinical development for nurses and other clinical practitioners in renal care, to ensure an evidence base underpins practice. The blended-mode style was utilised to address the variable computer skills reported by renal staff. The course has been designed with some optional study days, and the student continues with self-directed learning through a variety of methods delivered by the VLE. Tutorial support continues throughout the course through chat rooms, and electronic mediated communication. Hence, a student may be at a *distance*, but not a *distant* learner.

Outcomes

At City University, the online renal care course has been developed to deliver nurse education and training using an integrated model, where students undertake collaborative learning activities drawing on different learning resources (Mason, 1998). This model is highly suitable for autonomous learning in the renal care speciality in particular and is underpinned by the theoretical principles for adult learning and andragogy of Knowles (1980) which are:

- Adults need to know why they need to learn something
- Adults need to learn experientially
- Adults approach learning as problem-solving
- Adults learn best when the topic is of value.

Mason (1998) speaks of a pedagogical revolution in higher education in the rush to 'digitise, virtualised and globalise the campus'. But the importance of interactivity and the learning process may overlook the end outcomes to be achieved by undertaking this course. The World Health Organisation (1987) states,

> 'The explosion of scientific information makes traditional curricula increasingly irrelevant, because they are based on what is known today, to exclusion of how to learn what will be known tomorrow'.

In the past problem based learning was often regarded as a reliable pedagogic method of delivering adult learning in the e-learning environment. However, studying *problems* for nurses inevitably applies a biomedical model for care planning. The scope of *nursing* practice is more than addressing a person's problems, so may actually inhibit the attributes desired of those completing courses where analytical thinking, problem-solving and imaginative powers are mixed with personal experience to meet the diverse needs of the patients and families. These skills are also essential to be an effective multidisciplinary team member. Nurses need to be able to use strategies and frameworks to meet their patients needs and evaluate the ever changing and developing body of professional knowledge. *Solution-focused learning* seems to offer the dual purpose of satisfying professional needs, and satisfying the academic community, as it conceives theory as central to the understanding of problems. Hence *solution focused learning* was developed to renew the spirit of education, and address effective nephrology education for effective clinical practice.

Ensuring quality outcomes

In order to ensure that the learning opportunities have addressed the needs of the patients, the students, the purchasers, and the educationalist, an evaluative framework was established to track the course development. This presentation will discuss the result of this 2 year study and draw on themes and opinions gathered about the educational experiences of those undertaking the courses as well as those who have been instrumental in developing and delivering the materials. At the start of the project it was uncertain whether the renal nursing community had special e-learning needs for their CPD learning experiences especially when compared to other postgraduate university students. Market research conducted before the initial development of these learning opportunities indicated that these nurses had little experience of using computer software. This was further emphasized when students were asked to fill in a questionnaire that sought to profile their ICT skills during registration. So are there specific groups of adult learners that can be profiled for their e-educational needs who required specific support and need their educational materials designed in ways that are cognitive of these needs? Or are these students simply examples of the need of e-learning educationalists to be mindful of the specific needs of individual learners in the wider e-learner support structure? These learners are specifically undertaking CPD in the e-learning mode due to necessity, more often than from fundamental choice. Many universities in the UK and in Europe are not offering specialist niche courses, as they are perceived as not being economically viable with small numbers of places being bought on contract by local NHS workforce confederations. However, as emphasized above, this is in stark contrast to the clinical and political agendas that universities could tap into if they were only able to reflect on modes of learning required in the changing student market. There is acknowledgement here that at times an altruistic educational opportunity may be the primary reason for seeking collaboration with non-educational partners (in this case clinical institutions) before the economics develop to satisfy academic accountants.

The results of the study thus far have indicated that these students are not a ‘special group’, but need to be profiled very carefully in order that the institution does not set them up to fail in their CPD endeavours. Thus far there have been no significant differences in the outcomes of the e-learning students compared to their counterparts learning in the classroom. Although it would appear that the learning experience itself is vastly different. The evaluative questionnaires exploring the students’ experiences of their learning appear to be much richer than the classroom counterparts, and the students have a deeper relationship with the lecturer/course leader. It is thought to be due to the fact that the interactivity of the e-learners demonstrate very clearly the progress of their learning through the modules that the lecturer can monitor and facilitate critical reflection with the student should the need occur.

Of course the reason that the nurses are undertaking this CPD is to address their professional and clinical development needs. Hence the research had to ensure that the *outcomes* of the learning demonstrate an impact on professional practice. The assessment strategy sought to ensure that the student could be assessed in a competency framework (Del Bueno 1984), thus demonstrating practical/technical skills, reflective/evaluative skills, and communication skills. These are essential skills in professional practice to ensure that the multiprofessional renal care team have a holistic approach to care delivery with the patient at the centre of the working environment. Ensuring that the assessment is linked very carefully with the expectations of the practitioner’s performance at work post course, demonstrates continuing collaboration with the clinical environment. Clinical managers and students therefore see that the end points of the course fit with the aims of the clinical environment. It then ensures that the ‘theory-practice’ gap is minimised and the aim of the assessment has a wider relevance than simply to be awarded credit points.

So collaborative relationships between academic institutions that have recently been associated with effective delivery of sound e-learning modes of education need to be reviewed in the context of widening participation when addressing the changing market of the potential student population. In this case study collaboration between a IHE and the local and European clinical renal communities ensures relevant and continuing quality learning opportunities for those undertaking the educational opportunities. There is little danger of learning materials becoming irrelevant and stale, or the clinical academics finding themselves inhabiting a virtual ‘ivory tower’. The results gained so far indicate an evolution in continuing professional development is required for higher education delivery. Further developments of collaborative relationships with professional renal organisations are encouraging the development of renal *learning communities*. This framework seems to address more clearly the continuing professional development needs of *all* clinical practitioners. Modular deliveries from HE's in the past have simply served those accessing courses. This format does not really address the continuing professional needs of *all* those in renal care practice who have already gained first and second degrees, or gained all the credits they need for clinical skill mix planning. All practitioners will need to continue to update clinical knowledge, reflect on evidence-based care, and seek collaborative relationships with other practitioners for critical discussion and the sharing of best practice. Hence the development of a learning *community* in collaboration with the European Dialysis and Transplant Nurse's Association/ European Renal Care Association (EDTNA/ERCA) aims to provide educational and development opportunities for renal practitioners on a much wider and more flexible platform. This indeed becomes a true partnership between educationalists and clinical partners to ensure that the education and learning opportunities are evidenced in influencing clinical practice development with a sound pedagogic and academic evidence base.

The staff experiences

Often evaluative research concentrates only on the experiences of the students undertaking the e-learning courses. But what of the experiences of the *staff* involved in the development of such innovative learning opportunities. Another limb of this research sought to find out the experiences of the staff during reflective focus group activity. Themes that emerged from these efforts indicated that new ways of working were very evident. Not only were there different power balances amongst the staff in order to develop the materials, but also themes emerged as to how the staff as a working team had to manage change within their own institution. This often involved working form the 'bottom-up', rather than the institution essentially including e-learning into it's strategic and resource planning. It was interesting to see that senior academic staff in this institution essentially supported e-learning developments and were mindful of the developing markets that the institution could tap into. However dealing with the middle management (heads of department and line managers) proved more demanding and required the use of, or development of, essential leaderships skills for a successful outcome. Hence the course leader became the overall manager of the project (advertisement, clinical expert, IT developer, educational theorist, negotiator, researcher, diplomat and negotiator between collaborating bodies, etc) rather than simply the provider of expert clinical materials for the e-learning programme. Often the academic staff experiences are limited to the development phases of a project, and do not consider the longer-term issues. These staff demonstrated characteristics of what has been identified as being the 'champions' in an institution who then need to draw others into the continuing evolution of this mode of learning. The focus groups indicated how these 'early adopter' then sought to bring other interested parties in to the continuing development of e-learning opportunities; essentially becoming managers of a vision rather than simply undertaking the roles they had traditionally undertaken within the institution and that was in their basic job description.

Whether the staff were primarily working in an academic, learner support, ICT or learning resources capacity, another theme that emerged was the need to audit and evaluate the work in order to ensure continued development. The middle management appear to need evidence of the success, or not, of initiatives. Much educational research that is case study based has been criticized for its lack of research rigour and lack of apparent influence on the continuing development of wider e-learning opportunities and markets. However, this project has indicated that whilst that view is understood and longer-term educational projects are desperately needed, this evaluative type of research meets very clearly the strategic and developmental needs of institutions that are emerging into the realms and use of e-learning. Hence it is suggested that this sort of research should not apologise for its contextual relevance, but rather acknowledge that the call for standardisation and e-learning standards does not essentially recognise the huge range of learning contexts that e-learning is emerging into. To try and standardise will perhaps ignore the potential for new collaborations that may be relevant in parts of the world, but not in others. It may ignore specific learner needs in order to access educational opportunities and allow academic to retreat into virtual ivory towers. And essentially, I believe that standardisation will not address the fundamental developmental educational needs of CPD learners. Modular learning appears to have some value in CPD, but in the modern age IHE may need to address the fact that modular learning and programmes of study are only a very small aspect of the CPD needs of students. Hence to evolve learning opportunities that address the learner's needs of enquiry and implementation may actually require completely different modes of delivering learning. It is the development of specific learning communities that I suggest could address this within a specialized clinical/vocational context. For an IHE to be the developer and initiator of such education can only demonstrate collaboration, and insight of the changing influences and demands presented by its potential student market.

Relevance to other institutions

In conclusion it is important for clinical academics to understand the present needs of the renal clinical environment, and the dynamics and stressors of modern clinical practice. In order that renal practitioners can relate and apply evidenced-based learning to improving outcomes for their patients, traditional methods of CPD may not always be the most appropriate. CPD is essential in modern clinical practice to ensure patients are afforded competent and effective care. CPD is vital not only to address local service needs but also to respond to national and international guidelines for the provision of renal services (e.g. Renal Association Guidelines 2002, DOQI guidelines 2003). New technologies have much to offer the clinical educationalist as long as they enhance the students understanding and have a demonstrable impact on improving care delivery for patients. An effective assessment framework that ensures demonstration of skills and application of learning in practice has proved to be an effective method of closing the theory-practice gap.

The results of the evaluative research to date has demonstrated that research can be utilized to influence the continuing development of e-learning, and also be used to provide leadership and guidance for middle management who may not be experienced in the principles of e-learning. It has shown that academics need to utilise reflective and evaluative frameworks on their educational provision and delivery, and may well need to undergo personal professional development in order to achieve success with the changing student market.

References

1. BROWN, STEPHEN (ED.) (1999) Open and Distance Learning: Case Studies from Industry and Education (London: Kogan Page)
2. BENNER P. (1984) From novice to expert. Menlo
3. DEL BUENO, BARKER, CHRISTMAYER (1980) *Implementing a competency-based orientation program.* Nurse Educator. May/June, 16-20
4. DEPARTMENT OF HEALTH (2001) *Working together, learning together for lifelong learning for the NHS.* London: Dept of Health
5. ELEARNSPACE (2004) Flexible Learning, available www.elearnspace.org/starting/flexiblelearning.htm (visited 6th January 2004)
6. HIGHER EDUCATION FUNDING COUNCIL FOR ENGLAND (2003) Consultation on HEFCE E-Learning Strategy: Annex A, www.hefece.ac.uk/pubs/circlets/2003/cl21_03.htm (visited 6th January 2004)
7. KNOWLES M (1980) *The modern practice of adult education.* Chicago: Chicago Associated Press (revised edition)
8. LTSN (2004) Constructivism, Glossary of Terms in Learning and Teaching in Higher Education www.ltsn.ac.uk/genericcentre/index.asp?id=18201 (visited 6th January 2004)
9. MASON R. (1998) *Models of on-line courses,* Asynchronous Learning Magazine, vol 2, issue 2, Oct.
10. PALLOFF, RENA M. AND KEITH PRATT (2001) Lessons from the Cyberspace Classroom: The Realities of Online Teaching (San Francisco: Jossey-Bass)
11. KRANTROWITZ M., KAUFMAN A., MENNIS S., FULOP T., GUILIBERT J. (1987) Innovative tracks as established institutions for the education of health personnel (World Health Organisation, Geneva)

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FROM CURRICULUM DESIGN TO INTERNET DELIVERED M.Sc. THE IRISH UNIVERSITIES NUTRITION ALLIANCE (IUNA) EXPERIENCE

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This paper discusses the processes involved in the design, development and delivery of an Internet delivered set of innovative postgraduate courses in European Food Regulatory Affairs.

In 1999, The Irish Universities Nutrition Alliance (IUNA), a formal association of the nutrition units of Trinity College Dublin (IRL), University College Cork (IRL) and University of Ulster (UK) was awarded funding from the European Commission under the *Leonardo da Vinci* programme to develop a curriculum for a series of linked post-graduate taught courses – based around an M.Sc in European Food Regulatory Affairs.

A lack of formal training in the discipline of food regulatory affairs (FRA), identified by food sector stakeholders including the food industry and food regulatory agencies provided the impetus for the development of the courses. New entrants into the area of FRA were traditionally taught by "apprenticeship" within a company's regulatory affairs department or that of regulatory agency.

The process involved in developing the curriculum was broken down into a series of specific objectives.

- Establish a project management group of academic and industrial partners. The project management group formed the cornerstone of the project. The task of the PMG was to act in a consultative capacity to establish the curriculum for the M.Sc.
- Utilise the group expertise at a series of project management group meetings and academic group meetings to iteratively develop the curriculum.
- Decide on the graduate profile.
- Select a distance learning model.
- Decide on pedagogical issues.
- Determine course structure.
- Prepare course content.
- Source lecturers for all modules nationally and internationally.
- Prepare assessment strategies.
- Resolve organisational and academic and issues.

The profile of the ideal graduate, the knowledge base and skills required and the distance learning model for the course were determined at the outset. It was decided that a typical graduate would (i) understand the complexity of the food regulatory process at national, EU and International level; (ii) be capable of operating effectively in a post that requires a food regulatory background; (iii) understand the elements of Science, Law, Policy, Economics, and Ethics involved in FRA; (iv) propose particular courses of action in the short and long term on food regulatory issues to stakeholders; (v) understand best approaches to solving practical problems involving aspects of food regulation that impact on their organisation.

Skills would include (i) ability to research a problem; (ii) ability to think critically; (iii) to discuss issues with stakeholders; (iv) to critically evaluate conflicting data; (v) organisational ability; (vi) communication skills; (vii) effective writing skills; (viii) presentation skills.

Possible models of course delivery were proposed including a "roving scholar" model. It was decided that the course would be delivered *via* the Internet for the following reasons: a greater number of students could participate; the course could be made available to students in the enlarged EU and globally; time and space would not be limiting factors; fees would be lower if a residential component was not included; Internet based delivery would offer greater flexibility and convenience.

The option of Internet delivery raised issues of pedagogy related to an Internet delivered course. The aim here was to integrate technology and pedagogy, to explore ways in which developments in the communication technologies could be used to enhance teaching and learning in FRA. In other words "appropriate technology applied appropriately". For these courses it was essential that learners work with information at higher cognitive levels of analysis, synthesis and evaluation in order to fulfil the course objectives.

Course structure and delivery

The Course committee decided on a structured modular M.Sc. course designed to consist of six taught modules and a research project. Each module was mapped to course outcomes in terms intellectual qualities, professional and transferable skills. For each lecture set in each module learning objectives and an outline of lecture content was developed. No instructional materials were available for this interdisciplinary course, so lecture content was developed by subject matter experts identified within the project management group and globally. Each lecturer was then asked to prepare appropriate content incorporating appropriate instructional strategies e.g. problem based instruction.

Each was asked to consider their role as that of a constructivist facilitator. The tasks of the constructivist facilitator are according to Burge (2001), connecting learners to a mix of information resources, constructing purposeful group discussions, controlling effectively the use of time, confirming new learning, correcting misunderstandings, challenging learners to more sophisticated thinking, encouraging them to persevere through the difficulties expected in organising and applying new learning or when they experience blocks to achievement, creating new knowledge from experiental data as well as theoretical information, checking formally to get evidence of new learning.

Awarding of degree

No model for the award of interinstitutional degrees exists between the three IUNA universities. Pragmatically it was decided that the degree would be awarded by the University of Ulster and delivered via their online campus CampusOne using WebCT in collaboration with the other IUNA Universities.

Experience

Following course validation, the first set of 16 students from the various EU Member states, accession countries and Canada enrolled in September 2002. Immediately after enrolment and before accessing course materials students were required to complete a basic WebCT training module in order to familiarise themselves with the technology. From the outset students had access to an e-tutor for both technical, and academic support. This was essential during the early stages. During module evaluation, students cited this support as a key positive element. It should be noted that the retention rate for students on this course was >80%. During the course of the first semester the learning curve was quite steep for a number of the more mature students in terms of the technology, however this was no longer an issue during the second semester.

From the outset an attempt was made to build collaboration into the course. Students and staff were encouraged to post a brief resume and photograph onto the discussion board. This social interaction was designed to promote a sense of belonging.

Another key element of the course is the online tutorial. Students and facilitator login at a prearranged time into a designated WebCT Chat Room. The topic for discussion, often related to an assignment, is posted to students in advance. After the tutorial, the text is re-organised into a question and answer format. Misunderstandings are corrected and additional material or links to relevant materials incorporated into the text. This is then posted to all class members including those who for various reasons were not able to participate. Students have identified these tutorials as important in the learning process.

Another feature of the course designed to increase collaboration and build a learning community is the Group Project. Students are assigned to a particular group, are given a group topic and are assigned a group mentor. Collaboration typically takes place via designated Group Chat rooms. The group product is marked and in the event of dispute, the group mentor moderates.

The format used in the M.Sc. is likely to be the basis of further inter-university collaboration in e-learning in the area of Public Health Nutrition and Molecular Nutrition.

References

1. BURGE, E. (2001) Using *Learning Technologies: Ideas for keeping Ones Balance*. Educational Technology, 39 (6), pp 45-49

LEARNERS – TEACHERS ON-LINE MUTUAL SUPPORT

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Abstract

In the age of common access to computers and wide area networks there is an increasing demand for digital educational materials, exploiting Internet. Such materials mainly consist of lectures, descriptive exercises and tests enabling self-assessment. Preparation of educational materials is a time-consuming task. An idea to involve students in that process can be a constructive alternative. The paper presents the initiative itself and results of AGH University of Science and Technology of a project "Notes in Internet", which involves both students and their professors in the creation of educational materials in a digital form.

1. Introduction

Modern information technologies (IT) appear as the main driving force, which turns our contemporary world into the world of Information Society, defined often as the Society of Global Information. The Internet becomes an integral part of all areas of our life, giving new solutions and opportunities. An example of such new solutions is the introduction of Internet to the education process, not only as the source of information, but also as the way of teaching and learning.

Implementation of ICT into education creates a new scope for learning and teaching opportunities. However, among many obvious advantages, such as better communication and easy access to resources, some problems can be noticed. One of them is connected with difficulties in preparation of high quality teaching materials. In fact, it is considered as a bottleneck of the whole process of distance education, especially for traditional universities, where the F2F model of learning and teaching is still the leading one. The preparation process of digital educational content is expensive and time consuming. Therefore, in order to increase effectiveness and decrease the costs of the preparation of a digital course, common solution is building up a team of teachers who share their expertise, information and good practice, towards creation of e-learning materials. However, in case of traditionally organized universities it is not that easy. Teachers and academics are often involved in many different activities, which do not allow them to spend significant amount of time preparing e-learning materials. What is more, for some of them ICT still remain relatively difficult to implement in didactics.

According to S. Guri-Rosenbilt (Guri-Rosenbilt, 2004) the main responsibility of the team preparing the e-learning course "is vested in writing and composing self-study courses, and their skills as teachers are relegated aside", therefore the e-learning courses or educational materials should be prepared for specific needs, because they somehow replace the teacher. They should be of the highest quality, interesting and easy in terms of technology used. On the other hand, multimedia and interactive tricks alone do not improve the quality of weak base resources. Moreover, the e-learning course materials should be learners (users) – centred, which is the main challenge for the authors of these materials from the very initial stage. Therefore, the natural question arises; whether the participation of students in the process of the preparation of these materials can be possible and can help to enrich the form and content?

The main objective of the paper is presentation of initiatives of the AGH – University of Science and Technology connected with the implementation of e-learning process. The AGH – University of Science and Technology (AGH-UST) is the traditional, 85 year old, technical university, which is a leading one in Poland. In order to tackle the challenges of preparation of the high quality course materials in e-learning form AGH-UST has launched in 1997 an initiative, which allows both teachers and student to participate in this process.

2. e-learning initiatives at AGH-UST

2.1 University Campus as the model of the Information Society

AGH – University of Science and Technology is involved in many activities concerning distance and e-learning as well as information society development. One of the largest computer centres in Poland "CYFRONET" belongs to the AGH-UST. It provides the Internet Network to the whole municipality of Kraków. The AGH-UST, as the very first Polish technical university, started a project connected with the use of wide area computer network (and the Internet) for the educational and information purposes in 1997. The main goal of research within that project was examination of educational impact of common and easy access of students and teachers to the Internet.

The experiment was based on a University Campus, a small model of "information society" which "forms a model enabling at least approximate determination of phenomena and processes which occur in a developed information society as well as those characteristics for the process of transition to that new formation"(Tadeusiewicz, 2000). Such a model enables deep analysis of processes and interactions occurring in the Internet community of the University Campus (Tadeusiewicz, 1998b, 1998c, 1999a, 1999b). It also provides new dimensions to the functioning of the institution on civilizational and cultural level (Haber, 2001). The information micro-community provided essential data allowing examination of social and psychological processes in developing Polish information society.

The first step, the most costly and difficult one, was the networking of all educational objects of the University Campus and all student dormitories situated far from the main University buildings.

The second step was connected with the research aimed on the influence of the computer aided teaching and learning (e-learning) on the academic society. The population of over 30,000 students of our University gives quite highly general data set thanks to great differentiation of that population. The wide spectrum of observed didactic problems during the experiment increases the practical usefulness of obtained results.

2.2 "Notes in Internet" project

The key issue of the e-learning is the high quality content of digital textbooks, self-evaluation tests, virtual labs, etc. Therefore, the next step within the initiative of development of e-learning at the AGH-UST was oriented towards the preparation of high quality e-learning materials. Three main assumptions were made at the very beginning of that step, which resulted in launching the "Notes in Internet" project:

- collaboration between students and teachers,
- involvement of the students – prospective teachers,
- increase of awareness among both students and teachers.

Collaboration between students and teachers is believed to be an important factor in preparation of e-learning materials, and such teamwork is the key to success. It allows interchange of knowledge and information within a team. Reduction of costs is of no less importance. Thus the mutual support of the small teams (student – tutor) increases the quality and impact of the materials. "Notes in Internet" action involves the key actors: end-user (student) and tutor (teacher, producer of educational materials, scientist). Teachers' activities in "e-learning" are usually limited to two areas: preparation of the content and supporting the collaboration between tutor and learner. The content is often simply the content of the delivered lecture. One can ask why should the student be involved? Because he/she knows the needs, the difficulties and interesting elements of certain course whereas a teacher can provide solutions, materials and content essential to solve the problems occurring during the course (Tadeusiewicz 1998a).

Involvement of students as potential future teachers/tutors is the next important factor in preparation of e-learning materials. e-Learning tools and solutions become imminent in the modern educational process. When students are engaged in preparation of their own "projects" in e-learning method they are very likely to implement them in their future didactic work. What is more, they are motivated to explore e-learning opportunities. Very often, the student's point of view and his way of understanding are quite different of the way the teacher is used to explain. In such situation, student interference to the content and the methodology of presented course material is very vital for the high quality lectures. Participation of students as co-authors of the lectures has important practical dimension. It gives opportunity to increase not only the basic knowledge of given discipline, but also to increase the practical skill of IT tools, such as HTML, Java, XML and the like. That knowledge is of prime importance for the young people. They gain a better preparation for life in the Information Society.

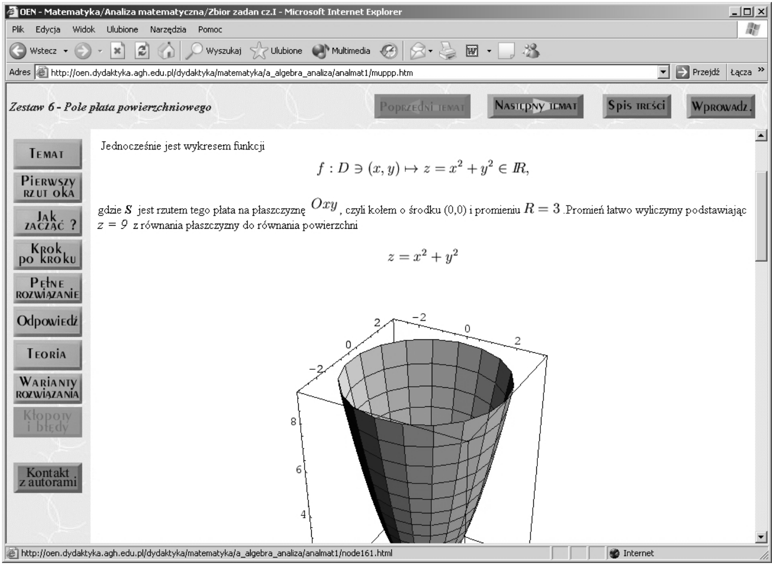

Figure 1. Example page of e-Mathematics

Finally, such mutual activity of students and teachers *increases awareness* of e-learning among them. Teachers may find out an increasing demand for high quality on-line educational materials whereas students may find such form of education attractive. Both students and teachers gain experience in preparation of the e-learning courses. It also shows the opportunities given by ITC and e-learning.

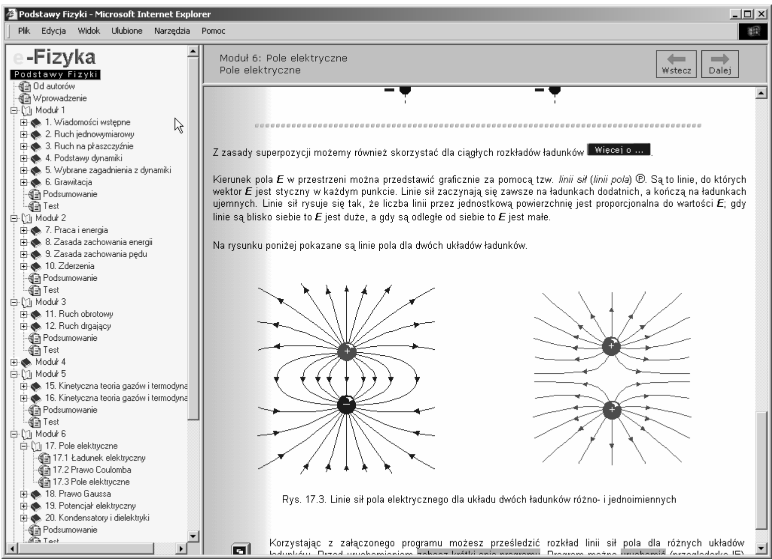

Figure 2. Example page of e-Physics

As the result of the project, some e-learning materials can be found on the University server (*www.agh.edu.pl*). Figures 1 and 2 show the examples of the pages of the on-line textbooks of "e-Physics" and "e-Mathematics". Teachers and students use them as support for teaching and learning of the Fundamentals of Physics and Mathematics. They include theory and many interactive exercises, and what is very important, files with digitalized video films showing real experiments elaborated and presented by the scientists in Physics and Mathematics laboratories. Some of the WWW pages are animated.

2.3 "Notes in Internet" – a competition for students

As the consequence of the "Notes in Internet" project, Professor R. Tadeusiewicz, the Rector of AGH – University of Science and Technology initiated in 1999 "Notes in Internet" – the competition for students. The main goal of that competition is encouraging students in creation personal web sites containing notes taken during lectures. These web pages can be a seed of the high quality e-learning materials.

In the foreword to the potential participants (www.oen.agh.edu.pl) the Rector indicated difficulties in access to educational materials. Such problem is mainly due to the fact of time-consuming process of preparation and publication. Thus he invited all students to publish their own educational materials in Internet – Intranet network. The quality of the content obviously may differ from this prepared by the academics nevertheless it is very useful idea for the teaching – learning process. In order to prepare high quality materials, students have the opportunity to cooperate with Distance Education Study Centre staff, where they can find technical advices and help.

The competition is held annually and there is a Jury to supervise the procedures and to evaluate the final results. The competitors can be students or graduates of the actual academic year. The web site prepared by the student must follow basic technological rules, such as www server at UNIX/Linux environment, server with PHP and PERL interpreter and PostgreSQL database.

Each student has his tutor, who supervises the content of the web site submitted for the competition. It is the tutor who makes preliminary evaluation of the web site and is responsible for the quality of the content. Formally, the web site submitted for the competition must be followed by a written tutor's acceptance for re-use and publication of notes of his/her lecture. It also helps to keep the high standard and relevance to curricula. It is important that the web site submitted for the competition must be free from commercial elements (such as banners). The submitted works are evaluated by the Jury and the end-users (students) themselves regarding four aspects:

- didactic level with respect to e-learning and distance learning methodologies
- technical level
- evaluation of the content and its relevance to the curriculum
- evaluation by the end-users (students)

Multi-dimensional evaluation assures the quality of the materials, its relevance and scope for further exploitation. The Jury consists of the academics and IT specialists who evaluate both content of the materials and technical aspects. They can assign points for the didactical value of the submitted work and its relevance to e-learning methodologies. Evaluation of technical level of web pages is done by IT specialists of the Jury. They evaluate design technology, browser independent feature and verify the web page in different environments (Windows and Unix/Linux systems). The content is examined with respect to the University's curricula.

Also the potential end-users (students) evaluate the work. Their opinion is of no less importance. They vote through Internet whether the materials are interesting, corresponding with the curricula and user-friendly.

The competition proves very successful. The total number of works submitted in 1999-2003 is 51 (Figure 3). All submitted materials are of high quality. Money prizes sponsored by the Rector of the University award the authors of winning works. The multilingual web sites receive the extra bonuses. The best web sites are published on the main e-learning server.

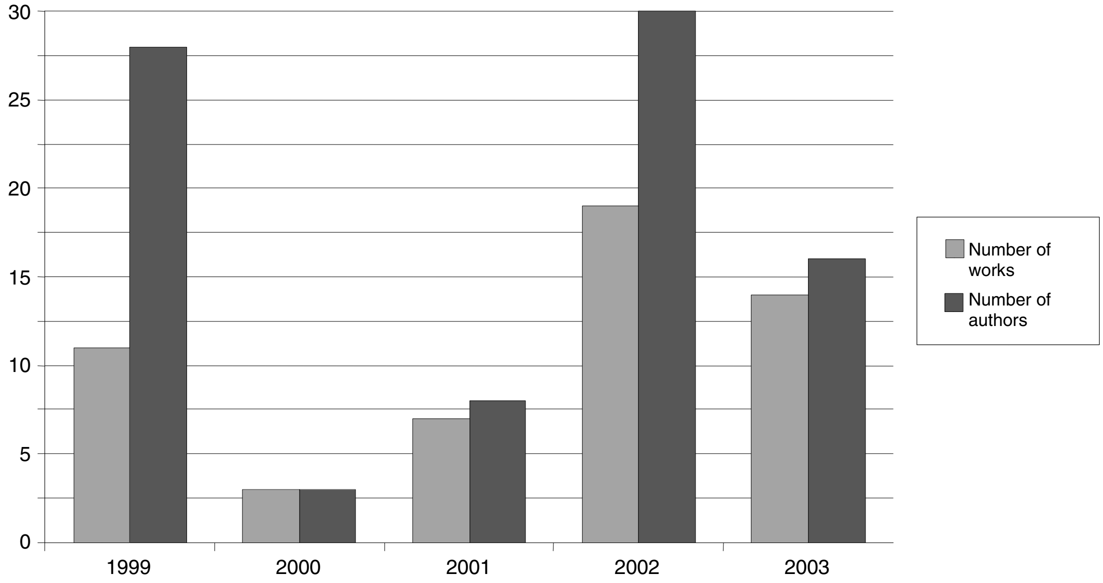

Figure 3. Number of works submitted and authors participating in the competition

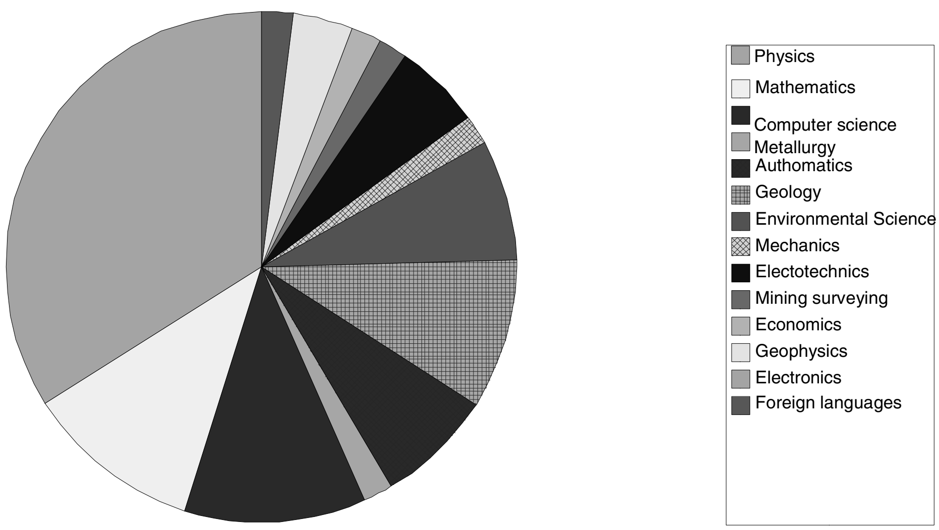

Figure 4. Distribution of submitted works according to the discipline

The submitted works are from various disciplines, sometimes distinct from the computer science (Figure 4). They contain not only simple notes of the given lectures, but very often content exceeds the required, basic knowledge. The materials are interactive and user-friendly despite often complex technological background. Sometimes it is hard to say that they were prepared by non-professionalists.

3. Summary

We do believe that small steps towards development of e-learning can lead to enormous changes. Presented experiences of the AGH – University of Science and Technology in that field prove, that students can play the essential role in preparation of high quality e-learning materials. The outcomes of the "Notes in Internet" competition show that students are very interested in participation in the preparation process of educational materials for the purposes of e-learning. It is especially important that students from different faculties, not directly involved in ICT, form a considerable number of participants (e.g. students of geology). It suggests that those students do want to gain experience in the field of e-learning and to be prepared for Information Society. Even if the materials prepared by students in frame of the "Notes in Internet" competition are not the full e-learning courses, they are usually very valuable and can be used as the support of the teaching and learning processes. The multi-dimentional evaluation also gives clear criteria of content-quality.

It also proves that there is strong demand for high-quality digital materials where full e-learning is not implemented. Such a support for students is imminent but it also sets goals to be achieved by the University. Student are aware of the potential of e-learning and blended learning but not often have the opportunity to explore it. Such an initiative helps to increase the awareness amongst teachers and potential tutors within the traditionally organised University.

Presented results of activities oriented towards the mutual cooperation of students and teachers in the field of e-learning show, that both actors can benefit from it. It has especially important impact on students, who will build the future Information Society. It also involves teachers and IT specialists and thus enables to build up an efficient team of experts who can prepare educational materials for the purposes of e-learning.

References

1. GURI – ROSENBILT S. (2004) *Distance Education Teachers in the Digital Age: New Roles and Contradictory Demands*, Proceedings of the 3rd EDEN Research Workshop, Oldenburg
2. HABER L. H. (2001) The AGH-UST Student Campus as an Information Micro-Society (in Polish), AGH, Kraków
3. TADEUSIEWICZ R. (1998a) Computer Aided Teaching. Teachers Preparation in Computer Science, Problems of Teachers' Studies, no. 13, 125-128
4. TADEUSIEWICZ R. (1998b) *Experimental Implementation at AGH of Methods of Computer Aided Teaching as a Research Element in the Laying of the Foundations of an Information Society.* Proc. 8 Polish-Wide Scientific Symposium "Computer Techniques in Educational Transmission", Kraków, 57-75
5. TADEUSIEWICZ R. (1998c) *Model of Information Society*. Academic Forum, no. 12, 28-30
6. TADEUSIEWICZ R. (1999a) *Computer Methods in Education as One of Characteristics of Information Society,* In: Woźniak J., Miller R.C. (eds.): Research Libraries: Cooperation in Automation, vol. 3, SBP Publisher, Warszawa, 11-22
7. TADEUSIEWICZ R. (1999b) *Development and Studying of a Small Model of Information Society at the University of Mining and Metallurgy.* Proc. Second Int. Conf. on Research for Information Society, National Institute of Telecommunications, Vol. A, 64-68
8. TADEUSIEWICZ R. (2000) *Virtual Teaching on the Base of Experiments in Computer Aided Teaching at the University of Mining and Metallurgy in Krakow*, Proc. Conf. EUNIS 2000, Poznań

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Distance Education Study Centre web site: http://www.oen.agh.edu.pl

MIXERPC: A TOOL FOR E-LEARNING

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Introduction

The global village that is opening up to the new generation through the Internet asks of them a greater capability in human and social inter-relationships. They must meet and face very different cultures and behaviour codes.

Mastering a foreign language becomes fundamental, in order to allow immediate and unencumbered associations. The global village, on the other hand, can be exploited in an effort to create virtual communities that gather to learn or deepen the knowledge of a foreign language. A very good example of this is represented by the Inter-University Consortium ICoN (http://www.italicon.it/) that began several years ago, operating worldwide to teach the Italian language [1].

The ICT infrastructure within which these learning communities operate is often represented by asynchronous structures that anyone can gain access to, using his or her own browser (Mozilla, IE, Opera, Galeon, Netscape, etc.). Each user works and thinks over the material that others have stored and in turn leaves his thoughts and suggestions according to the conduct of cooperative learning ("all for one and one for all") [2-3].

For technical reasons the synchronous events – those in which the participants communicate in real time – are restricted to a "chat", but this use proved to be particularly weak in the example that we looked at, where it was necessary to listen directly to the native speakers.

The consortium then decided that it was acceptable to exploit the new potential of the Web in order to enrich its own ICT infrastructure with synchronous tools based on the "voice over IP" [4].

The final solution, born of a collaboration between the consortium itself and the Computer Science Department of Pisa University, strengthens and modernizes even the most extreme learning framework.

The e-learning service Aristotele

At the Computer Science Department of Pisa University we built a synchronous service called Aristotele, (http://aristotele.di.unipi.it). This service creates on the web a digital room for long-distance meetings between professors and students. Aristotele guarantees the following to all participants:

- the possibility of communicating verbally with each other
- the possibility of reading and writing on a shared virtual blackboard
- the possibility to "show" one's paper to other participants to whom one might eventually pass on "the pen".

It is known that there exists some software (e.g. GnomeMeeting and NetMeeting) that has, as its basis, some of the above-listed functions; in particular, allowing the participants to use the blackboard and share applications or the desktop.

However, two reasons prevent the use of these software applications – the most important one concerns the requirement of vocal communication which allows only a "one-to-one" relationship. Moreover, other functions are also too "free" and there is no guarantee of privacy.

The service we offer – Aristotele – meets these requirements.

From a technical perspective we have divided our tasks according to the session and presentation layers (joined in the Internet architecture) of the ISO-OSI model. The server of the session layer, set up by specialists in this field, supports the H323 and SIP standards of the voice over IP and the unicast or the multicast mode. We have concentrated on the application level where we used a web server, and implemented two different clients for different privileges. One (the professor/teacher) may reserve the room and has total control over the use by students and their turn to speak.

It may allow everyone to speak, however, with a concern for “politeness” vis a vis the others present. Figure 1. shows the interfaces of the two clients.

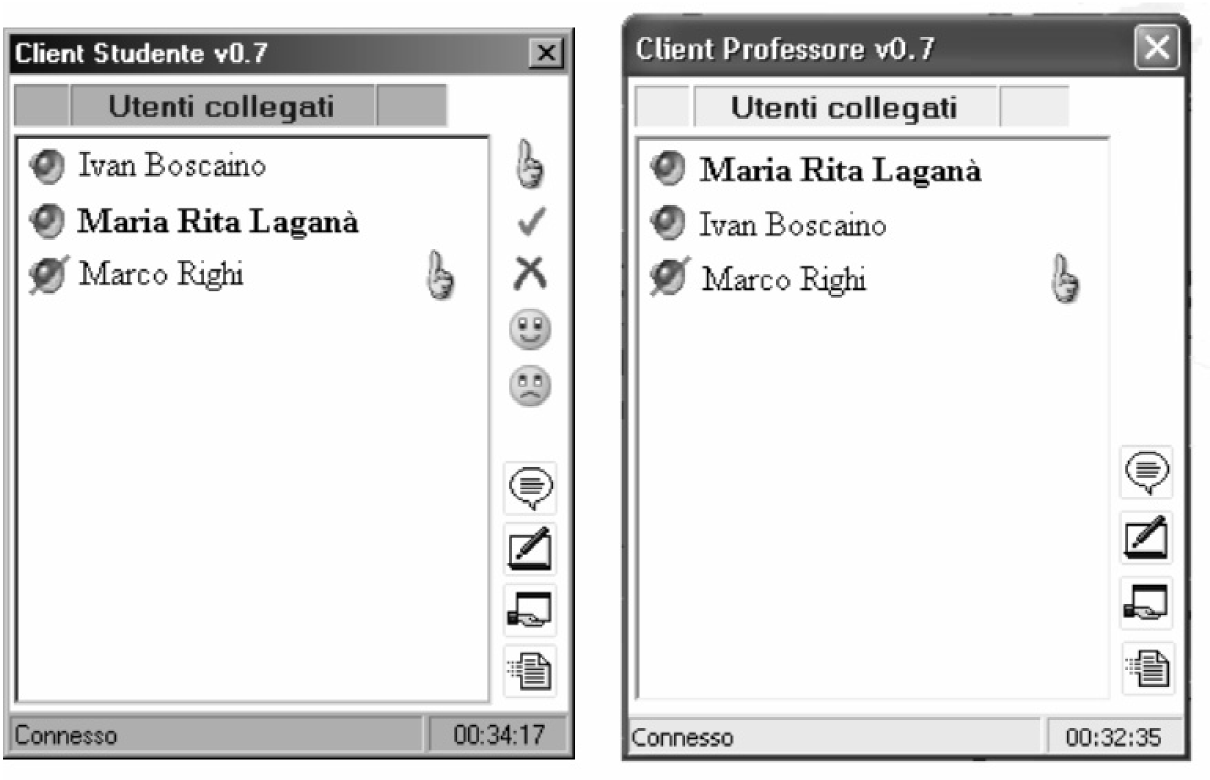

Figure 1

After learning about our service Aristotele, the ICoN Consortium involved us in its activity. Consequently, on their platform we integrated the possibility of letting registered users log on to Aristotele, enriching their lessons on the Net with synchoronous sessions. It was pointed out that the actual service availability was tied to an environment built upon old platforms and operative systems, like Windows 95, and on low speed PSTN analogic line-based connections analogic line-based connections.

We have chosen to develop our client with NetMeeting SDK in order to meet the needs of the user joined to a narrow band and their operating system. For the same reasons we did not use video functions that are integrated into the development system.

History

The service Aristotele began working – students and professors rapidly mastered the essential and efficient user interface. These first experiments led, not too long after, to an interesting discovery. The Consortium’s professors had, in fact, a rich digital recording heritage with which they begin their lessons. It is very important for the professor/teacher to be able to let all students listen to the recordings and to add his or her own comments, vocally, regarding those points he or she considers most meaningful. To this aim, a total respect for synchronization is fundamental.

This need or requirement born in this environment, can have, additionally, several different applications on the Net: for instance, it becomes possible to comment on the vocal interpretation by an actor – during a dramatic art lesson, or a movie scene, during a film lesson; and also a pianist's execution of a musical phrase during a music lesson.

Software tools that permit this real time mixing do not exist on a common platform, and it is not easy to create them.

So we decided to look for a hardware tool that, even if used within a Windows environment, would not have any limitation that could be related to a particular choice of operative system.

MixerPC was born.

MixerPC – A Tool for Synchronous e-learning

MixerPC is the name we chose for this device which provides a simple and essential interface.

The function of MixerPC is to provide any computer – equipped with an audio card – the ability to mix the computer microphone signal with one of a software player. As already pointed out, its introduction comes out of the demand to transmit simultaneously, from teacher to student, both reproductions of ICoN digital library heritage and possible comments from the teacher. Another interesting feature of this device is the possibility of allowing the transmission of only the teacher's voice or, if preferred, the transmission of the recorded audio, cutting out possible environmental noise.

Before describing MixerPC we would like to point out that it is carried only on hardware. Its independence from all software is total, and consequently it can be used easily with Linux, MacOS9, MacOS X, Windows, etc, and it is "open". The MixerPC circuit diagram and its electronic layout are released under Attribution License (http://creativecommons.org/). Anyone can build models using the published schematics and modify them according to his or her own aims and needs.

Usually, it is not easy to have detailed and complete specifications both for the function and the implementation of a device designed to develop the software for which it was built. The various components of our mixer are low in cost in comparison to the prices of other mixers that are on the market. Moreover, our device permits a much simpler use because it is designed around the electric features (impedance and passband) of the personal computer. Its particular name emphasizes its features.

MixerPC is professionally built and completely handcrafted. You can see it in Figure 2, below.

Figure 2

Our device (MixerPC) has a double interface: on one side toward the headphones and microphone, and on the other side toward the computer audio card (input and output microphone speakers) permitting an inside signal handling.

Actually the user makes the links shown on the console. The user manages the sound using two control sticks called WAV and MIC both in the ON and OFF positions. If WAV is in ON position, MixerPC allows it to send the audio reproduction from the computer player to the Internet. This does not happen when the WAV stick is in OFF position. If MIC is in ON position, the MixerPC allows it to send every sound recorded by the microphone to the Internet. Vice versa, when the MIC stick is in OFF position, the microphone is mute.

Conclusion

MixerPC in ICoN courses interact with the computer used by the teacher and linked to Aristotele. The students are in all parts of the world, while the professor/teacher is usually in Italy. The professor/teachers broadcast their voices to the students, emphasizing certain important parts of the text and the correct pronunciation of the text. In addition, they are able to give their students different language tasks according to the individual abilities of the students – translations, summaries and comments. They are also able – with this device – to speak with one student, while the others are carrying out individual tasks and waiting for communication with the professor/teacher.

Our device – MixerPC – has the potential of a vast and varied implementation in fields other than instruction and translation of language and we are hoping to have the opportunity to monitor its use in different areas of communication.

In fact, we offer an open electronic device ready to be used with all teleconference based systems. For example, GnomeMeeting together with the MixerPC, can provide, even one-to-one, a completely open toolkit.

References

1. MARCO SANTAGATA AND MIRKO TAVONI (2001) *e-learning: pensare l'istruzione di domani?,* il Mulino/num. 397/vol. 50, pp. 919-928
2. LEV S. VYGOTSKIJ (1934) *Myšlenie i reč', Psichologičeskie issledovanija*, Gosudarstvennoe Social'no-Ekonomičeskoe Izdatel'stvo, Moskva-Leningrad
3. ROBIN MASON AND ANTHONY KAYE (1989) *Mindweave: Communication,* Computers and Distance Education, Pergamon Press, Oxford
4. J. DAVIDSON AND J. PETERS (2000) *Fondamenti di voice over IP,* Mc Graw-Hill Libri Italia

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PLOVDIV ELECTRONIC UNIVERSITY: REGIONAL COOPERATION IN HIGHER EDUCATION ON THE BASE OF E-LEARNING AND E-LIBRARY

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1. Introduction

A contemporary trend in education is turning the distance education into electronic (virtual) one [6] realized through the so called electronic universities. The ***electronic university*** is a web-based environment which modelled the process of education. The electronic university maintains all participants in the educational process providing them with a variety of possibilities to reveal their activity.

The idea of shared usage of information resources is widely used as a characteristic of electronic education (e-learning). Besides dissipating means for individual development of the same courses, in different higher schools (HS) are supporting local libraries with library fund used only from respective HS. For the HS from the region of Plovdiv, Bulgaria about the ***shared use of information and library resources*** is developed in the project "Virtual Regional Network of Electronic Academic Libraries" (VREME~AB)[1.] The ***main goal*** of the project is to improve information and library maintenance of education, and from there its quality, with usage of information society technologies. The biggest six HS in the region (Plovdiv University, Medicine Academy, Agricultural University, University of Food Technologies, Academy of Music and Dance Art and Technical University) are participating in the project.

2. The project VREME~AB

VREME~AB gives opportunities for carrying out ***general regional university politics*** in the field of information and library maintenance of education and science researches, for common coordination and shared using by the network users of popular and authoritative data bases (DB) and virtual learning courses and textbooks as well. The general regional informational infrastructure will cause compatibility of learning plans and easy transfer of credits among HS.

Running VREME~AB breaks away dissipating the means for individual solving problems and gives the opportunity for creation of general virtual catalogue and Internet-presentation of electronic catalogues of Plovdiv university libraries. With the achievement of the main goal the opportunities for enrichment and virtual integration of funds of university libraries in Plovdiv with thematic electronic Internet-sources of information and their ***distance using*** from different categories of users (students, teachers, librarians, etc.) are provided. In the frame of the project ***5 main tasks*** are decided on:

- Enrichment and modernization of information funds of university libraries;
- Creation of local ***virtual libraries***, integrating information sources (electronic catalogues and DB, learning courses and programs, etc.) specific for each HS;
- Development of a virtual environment for distance education and authoring Plovdiv Electronic University;
- Development of a ***regional virtual academic library*** through the integration of local libraries, the environment for education and authoring, external electronic information sources and resources, etc.;

[1] The project VREME ~ AB is funded by the program of the center "Concurrent system for learning and management of higher education" of Bulgarian Ministry of Education and Science.

- Running VREME~AB and increasing the qualification of the users of information and library resources.

A transference environment for connecting individual Plovdiv HS (in particular local library networks) in one virtual high-speed local network for transfer of data – WLAN is in the base of the project. The environment is based on a local network in Plovdiv's area and enables 100 Mb optical Internet-connection with end points in all HS, included in the project.

3. Plovdiv Electronic University

As a result of research on European and world models for virtual education, organization of the electronic universities, requirements of the different categories of users (students, teachers, authors and administrators) and organization of the learning materials on the Internet, a virtual environment for distance education and authoring, called ***Plovdiv Electronic University (PeU 2.0)*** is designed.

The software system PeU 2.0 is realized on the basis of existing ***prototype PeU 1.0*** [5]. PeU 1.0 is the first Bulgarian attempt for the creation of environment for virtual education, on the basis of which is placed not a lecture (theme), developed from one author, but a set of (independent one from another) ***information units, collected in DB***. The system supports ***five types of users***: guests, students, teachers, authors and administrators. There are five subsystems realized – information, author, test, administrative and communication. Each learning course is built through electronic learning materials ***from different authors on the basis of concepts***. In the system ***twenty four types of test questions and assignments*** are supported, including in practice all known test types. The system is distinguished with the possibilities for distance publishing and editing learning materials. For the users, there are maintained three types communication – e-mail, chat and forum. PeU 1.0 is developed on the base of standards for e-learning IMS, LOM and SCORM.

PeU 2.0 is built on the basis of ***general principles and art decisions*** about the design and the user interface. The architecture and the topology are – ***one server*** (OS MS Windows) and ***many work stations*** with different operating systems, which does not set barriers in using it by the end users. The environment uses ***free products*** as Apache Web server with installed PHP module and DBMS MySQL. The system and DB (e-learning programs, courses and materials, information about students, teachers, authors, etc.) are accessible for ***authorized users*** (with different access rights for users' categories – student, teacher, author, administrator, system administrator and guest). PeU 2.0 [7] saves the main characteristics of its prototype and extends the functional possibilities of the ***five subsystems*** with one more (electronic library catalog of Plovdiv HS), using ***integrated DB*** with reusable learning units. The environment also supports links to local library electronic catalogs of universities. It can be used in the conventional education (as additional means for obtaining information and cooperation among participants in the learning process) as well as in the distance education.

3.1 Learning

On the basis of the virtual environment a ***model for planning of education on the base of resources and layers*** is placed [7]. Learning is built on the base of concept approach. Learning concepts can be presented in different points of view, called ***layers***. The examples of different layers in case of presenting one concept are introduction, definition, example, classification, comparison, application. Each learning material has characteristics, called ***resources*** [4]. The examples of resources are level, time, price, etc.

The main function of the ***information subsystem*** is to support ***virtual personalized learning*** in different educational programs and learning courses through a developed plan on the basis of resource and layer restrictions, specifying it for individual learners or groups of learners with similar beginning level of knowledge and skills. In the process of education are used learning information ***resources*** (materials and assignments***) in different formats*** – doc, pdf, txt, html, mp3, wav, midi, mpeg, mpg, avi, gif, exe. Learning resources are found and extracted from integrated DB and virtual library of Plovdiv HS by giving key words and resource and layer restrictions. Besides this the subsystem gives ***general information*** about the university (diplomas, personnel, students, etc.) and supporting means and services for the users.

The learner could be automatically enrolled in any of the free courses and might access the courses that they wish to study only upon enrolling in some manner. The course is composed of materials, which respond to the learner preliminaries (***individualized learning***). During the whole learning process of the given course, in the DB are saved ***tracking information*** about all passed learning materials and assessed assignments. According to the progress of the particular learner, the learning is changing dynamically (***dynamic learning***).

The learning subsystem gives means for ***offline work*** – enables the ***printing*** of the learning course (or of part of it) on paper, the ***downloading*** of the learning course as hypertext document (including on a CD-ROM disc) with possibilities for separate reviewing.

For providing ***regional, national and international cooperation***, the environment provides portability to/from other platforms by bringing out the structure and data of the integrated DB in ***XML format*** in one chosen from the user standards SCORM, LOM, IMS and ARIADNE.

3.2 Authoring

The environment PeU 2.0 is built on the basis of so called ***Reusable Learning Object*** (RLO) [2]. Using RLOs, multiple courses can be created using the same "library" of components. Reusable Learning Objects are small "blocks" of course content that may be used, and reused, in many different courses. RLO may be edited at any time; these changes will propagate, automatically, to any courses in which the RLO is used. Any objects (including images, video, audio, linked documents, subsections, quizzes and exams, individual quiz questions and feedback, or even individual paragraphs or sentences anywhere within the course) may be made into RLOs, not just "chapters" or "sections" of a course. Each individual course may be assembled using a collection of these Learning Objects. Reusable simply refers to the ability to use the same object in more than one course. RLOs can simplify course development and streamline course maintenance. The environment allows each visit to those resources to be tracked and reported. A course can also link to other RLOs that might present more information about a certain topic.

The ***author subsystem*** supports variants of ***reusable learning materials*** in one subject domain ***with different characteristics.*** Each learning material is described in the DB by learning concepts and their respective layers, and a list of couples (resource, value of resource). The learning materials, tests and learning courses are ***created interactively*** (using integrated DB) and ***published distantly*** from the own computer by the authors.

For the first time in the Bulgarian practice, a visual editor (Figure 1) for ***creation and modification of nonlinear learning courses*** is given to the authors and the teachers. It is using ***visual edition of a graph***, which nodes are different learning materials or groups of them, and arcs are ***relationships*** from the type ***successor_of***. Grouping allows carrying out automated learning through adaptation to each student: determining obligatory materials (a ***group and***); variety of learning – the student can choose alone the order of learning the materials (a ***group or***); branching (through assessing) the educational process in dependence of the learners progress, fulfilling the feedback with the teacher and overcoming the student failure (***check point*** or a ***group case***). During the creation of the graph, in the check points are placed test questions and assignments, from which will be set up the mark of the check point (current or final mark of the student). Passing over the check point can be done only after automatic assessment by the environment or after receiving the mark by the teacher.

PeU 2.0 ***automatically generates new learning courses*** (and selects the accompanying learning materials), tests and learning strategies through DB queries with pointing of ***global and local restrictions*** (ingoing level of students, logical links among learning units, estimation of the progress of each student, etc.), related with results, level, time, price, etc. The courses can be generated only from the author's learning materials and assignments (***author course***), as it is in the most similar environments or through the extracting accessible materials (shared from different authors) from the DB (***dynamic course***).

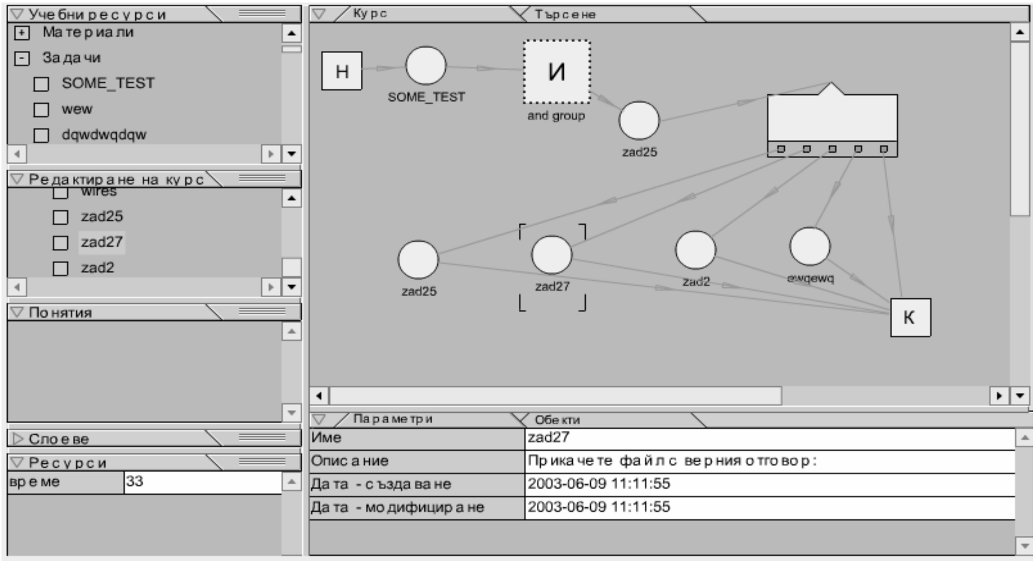

Figure 1. Authoring – Visual Graph Editor

3.3 Assessment

The ***test subsystem*** supports a rich variety of ***main types of test questions and assignments*** [8] – altogether ***9***, 6 of which (multiple choice, alternative answer, multiple answer, ordering, correspondence, filling in fields with multiple choice) are with response, chosen from a given set (structured response), 2 (filling in fields in the template of the answer, free answer) are with free answer, and 1 is with compound response. During realization they are divided into ***21 varieties*** in accordance whith the data type of the assignment condition, 13 are with the choice of the response from the given set, 7 are with free response and 1 is with compound response. ***6*** of the main kinds (13 varieties) are ***assessed automatically***, ***1*** kind (2 varieties) ***assessed by the teacher*** and 3 kinds, in which for each particular assignment should be determined whether it should be assessed automatically or by the teacher (6 varieties). The ability to create ***new (compound) types of assignments*** on the base of the main ones can be mark as an advantage of the test subsystem.

Each ***reusable test question and assignment*** as a kind of RLO is described in the DB by the assessed learning concepts in it and by the list of couples (resource, value of resource), that gives its resource restrictions. By using the visual editor of a graph, ***automatical generation*** (through searching according to set conditions – concepts to assess and resource restrictions) ***of tests*** is allowed as a combination of questions and assignments from different types (including adaptive and time tests). The environment carries out a distance examination by ***automatically checking and assessing*** the tests where it is possible, and if it is necessary, it establishes ***feedback*** with the teacher.

3.4 Communication

The ***communication subsystem*** proposes information and means for supporting different types of relationship among users:

- ***Asynchronic*** (e-mail, forum, calendar, reminder, shared files, personal web pages, SMS, phone);
- ***Synchronic*** (chat, audio conference, telephone conversation, face to face meeting).

3.5 Administration

The main task of the ***administrative subsystem*** is to serve the users, to support the ***DB with information*** about the different subjects and objects of education and to give a variety of ***reports*** and ***statistics*** about them. PeU 2.0 supports different kinds of settings – adding the new subject domains, concepts, learning resources, etc. The users register them with ***different access rights***. The subsystem provides ***administrative attendance*** of education – forming the learning groups, assigning the teachers to the groups, tracking information about the students, etc. PeU 2.0 is located on the URL address: ***http://peu.pu.acad.bg***.

3.6 e-Library

After the research of the positive European and world experience, gained in creating the environments of type "virtual library" and critical analysis of the organization of library activity at Plovdiv's university libraries and requirements of different user categories (students, teachers, librarians and administrators), an integrated environment for information and library services has been designed. The environment is built on the basis of electronic DB, Internet-sources of information and virtual learning materials. This environment provides opportunity for common usage of library information of all HS from each teacher and student, which expands vastly the amount of accessible library resources. The main elements of the environment are:

- ***General electronic catalogue*** of Plovdiv's university libraries on the Internet (containing also electronic learning materials and links to/from thematic Internet-sources);
- ***Webportal***, supporting access to information resources, created (and used) together;
- Visualization of ***electronic resources from 6 particular university libraries*** on the Internet (local websites) – bibliographical, full texts, etc.;
- Automatization of information and ***library activities*** and proposing them on the Internet;
- ***Remote access of the teachers and students*** from Plovdiv's HS to the common and local library and information resources, etc.

The ***common information resources*** are located on the central server in one of HS, which supports the links to the local sites of the particular university libraries with hyperlinks to the electronic resources, a search of library materials and a link with the rest of PeU 2.0. For a creation of a general DB with descriptions of the library materials, the necessary information from all existing local DB is converted in ***unified format UDC***. During the conversion, mistakes in the data from the local catalogues are automatically found and removed.

The webportal proposes opportunities for searching and ***requiring the library materials***, administration of users and requests, etc. The main library Internet service is ***searching data*** in the general catalogue, and if it is necessary the request automatically is resending to the local catalogue. The searching is realized with the usage of the logical operators (and, or) and the text templates (masks) of the fields – key words, author, title, publisher, UDK, subject/ thematic rubric, period of time, words and phrases from the description of the material, etc. There is an opportunity for a secondary search in the received report. The system helps by saving, editing and using the previous requests; also printing or saving the report in the text file. The results are sorted by different categories – author, title, date of publishing, type of material, etc. When using local catalogue, it is possible to receive the status of the library material. Other services are sending and processing the requests about scanning, for library materials, requests between libraries and orders for receiving secondary library-bibliographical information. The requests are administrated remotely from each computer in the local network from the authorized librarians.

4. Conclusion

The building of the virtual university network in the region of Plovdiv, which unifies information resources of HS in different fields of knowledge, is a ***contribution to creation of the national information infrastructure***. In this sense VREME~AB is a prototype of this infrastructure, and the gained experience and the introduced technical decisions – the basis for its building in the next years. The project is an important stage in systematically introduction of new educational technologies in our country, which can be used in traditional educational forms and in different forms of distance education as well.

The creation of VREME~AB provides ***general regional information infrastructure*** for the educational process with the usage of the technologies of the information society. Each participating university is obliged to support its own part of this structure and share the developed electronic DB and information resources with the rest HS. Sharing the information resources gives the opportunity of carrying out general politics in purchasing and providing licensed sources of information, providing learning plans and programs, developed from particular HS, etc. As a result, together with the introduction of credit system in Bulgarian higher education, it will lead to higher mobility of university programs.

PeU 2.0 is a ***contemporary platform of design, development and support of virtual learning environments***. The system is comparable to the best European samples [1] – it not only satisfies almost all of the 108 criteria for assessment and comparison of the virtual learning environments [3], but also possesses a number of unique functional characteristics:

- Modelling the ***learning course as an oriented graph*** with nodes containing grouped learning materials, linked with relations from type predecessor – successor;
- ***Grouping materials and large variety of test assignments***, including compound ones, into learning course nodes with logical relations from type and, or and case;
- ***Description of learning materials*** created from different authors through lists of learning concepts, layers and used resources;
- Automatic generation of dynamic learning courses and adaptation to the learners;
- Carrying out ***learning according to the student's progress*** with resource and layer restrictions;
- Supporting of an ***integrated DB*** including the subjects of learning, subject domains, learning materials, learning courses, educational plans, etc.;
- ***Friendly adaptive interface*** with elements of visual programming and almost all kinds of ***asynchronic and synchronic communication*** between users.

References

1. BRITAIN S., LIBER O. A Framework for Pedagogical Evaluation of Virtual Learning Environments, http://www.jtap.ac.uk/reports/html/jtap-041.html
2. Cognitivity, http://www.cognitivity.com
3. Evaluation criterions, http://www.edutech.ch/edutech/index_e.asp
4. MILANI A., POGGIONI V. (2001) *Automated Planning of Educational Goals*, Proceedings of the ICT&P 2001 Conference, Sofia, pp. 49-60
5. SOMOVA E. (2003) A shell for design, development and support of e-learning environments, PhD Thesis, Sofia
6. TOTKOV G. (2003) *Virtual Learning Environments: Towards New Generations*, Int. Conf. on "Computer Systems and Technologies Compsystech" 2003, Sofia
7. TOTKOV G., SOMOVA E. (2003) *A Planning Model with Resources in e-Learning*, International Journal "Information Theories & Applications", vol. 10, number 2, pp. 218-226
8. TOTKOV G., SOMOVA E., SOKOLOVA M. (2003) *Test assessment in the e-learning environment*, Conference "Computer science", Veliko Tarnovo, Bulgaria

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