Open Distance Inter-University Synergies Between Europe, Africa and the Middle East (ODISEAME)

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OPEN DISTANCE INTER-UNIVERSITY SYNERGIES BETWEEN EUROPE, AFRICA AND THE MIDDLE EAST (ODISEAME)

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ABSTRACT
The challenge facing new technologies is whether they can contribute to a qualitative step up and to *education for all* as a process of facilitating the development of creative people with the ability to think critically and to engage in socially relevant decision making. In this paper, we describe a project whose purpose is to develop a learning environment that takes into account current expertise in learning theory in order to facilitate productive collaboration in a way that leads to active construction of meaning.

KEYWORDS
New technologies, elearning, telelearning experiences, cohered elearning supplement, network infrastructure, software platforms, course design.

INTRODUCTION

There is a long standing aspiration that learning through new technologies, namely elearning, will not follow the same educational path as television and radio, which does exist in schools but is only discovered during cleaning and auditing of school equipment. Learning and instruction are not self-evidently influenced by new technologies or ensured by just distributing machines in schools. The potential of new technologies will be realized through systemic reform with clear educational goals translated into clear succinct policy statements for *what* must change, *how* it will change and *what* are the possible ways for bringing about those changes.

With or without new technologies, educational institutions need to innovate on means to achieve the required step up in the quality of education. For a long time, international evaluation have demonstrated repeatedly that the quality of learning in our educational system is well below expectations (Mullis et al, 1997, Mullis et al, 2003). In practice, the challenge facing new technologies is whether they can contribute to this qualitative step up and therefore contribute to *education for all* as a process of facilitating the development of creative people with the ability to think critically and to engage in socially relevant decision making.

Learning is not the same as browsing information; mental activity is more important than content; in engineering terms learning is closer to production than consumption; competence and understanding are social as well as individual cognitive accomplishments, and learning has more to do with feelings, confidence, human relationships and identity than fragmented disembodied knowledge. The elearning movement will need to take into account all aspects of our understanding of how learning is facilitated, organized and evaluated if it is to make a long standing impact on educational institutions. Current developments in elearning are concentrated at three levels: ongoing advances of the level of the network infrastructure strive to provide the required bandwidth for live multimedia communication; the development of alternative elearning platforms provides the necessary software resources for

interaction, knowledge organization, visualization and modeling tools; finally, the design of online activity sequences aims to promote meaningful construction of knowledge and demonstrable competencies. In this paper, we describe a project whose purpose is to develop a learning environment that takes into account current expertise in learning theory in order to facilitate productive collaboration in a way that leads to active construction of meaning which can be clearly demonstrated by the participants.

DESCRIPTION AND GOALS OF THE PROJECT

ODISEAME (Open Distance Inter-university Synergies between Europe, Africa and Middle East) is a project related to the fifth sector of application of the EUMEDIS initiative (Euro-Mediterranean Pilot projects in the field of Education). The project was launched on September 2003 and will last for three years (to 2005).

The goal of ODISEAME is to develop a methodology for the improvement of the educational systems of the partner regions by designing and implementing a web-based multilingual virtual space for collaborative learning focused on higher education. Specifically, ODISEAME aims to:

1. Elaborate hypermedia contents for higher education
2. Use these contents in telelearning experiences.
3. Establish a human network of students and teachers that facilitates the relations between the regions and communities taking part in the project.

PARTICIPANTS

Centro para el Desarrollo de las Telecomunicaciones de Castilla y León (CEDETEL) which is located in Spain is the coordinator of the consortium, which includes another 16 institutions.

The remaining partner institutions are shown below:

1. University of Salamanca (USAL) – Spain
2. University of Granada – Spain
3. Fachhochschule für Technik und Wirtschaft – Germany
4. Islamic University of Gaza (IUG) – Palestinian Authority
5. University of Jordan – Jordan
6. Institut Supérieur de Gestion et de Planification (ISGP) – Algerie
7. University of Malta (UOM) – Malta
8. Anadolu University – Turkey
9. University of Cyprus – Cyprus
10. Institut Agronomique et Vétérinaire Hassan II – Morocco
11. The Hebrew University of Jerusalem – Israel
12. Jordan University of Science and Technology (JUST) – Jordan
13. Frederick Institute of Technology – Cyprus
14. Cairo University – Egypt
15. University of Valladolid (UVA) – Spain
16. Retecal Interactiva S.A. - Spain

OUTCOMES

The content will be designed by an interdisciplinary workgroup of different specialists including pedagogues and psychologists, experts in business administration, telecommunication and computing engineers, graphical designers and content experts. The courses will be available in the partners' mother languages and in English. Each virtual classroom will offer several services including different synchronous and asynchronous communication means, an online calendar, note-taking and notice board areas. The communication space of the classrooms will be dynamic, and the content of the courses will be integrated in a collaborative learning space.

Once the collaborative virtual learning space and the on-line courses are ready (implemented and tested), several pilot projects will take place within ODISEAME. These projects will all utilize this specially designed platform and will provide a number of intercultural virtual learning experiences through active participation of teachers and students from more than one partner country.

Therefore, the expected results of the project will be:

- A multilingual virtual learning space, along with several courses of higher education in a hypermedia format.
- A number of virtual learning experiences with the participation of students and teachers from various countries in the mediterranean region.
- A handbook on the methodological design and implementing hypermedia content for educational purposes.
- A book describing the experience accumulated in the context of the intercultural telelearning activities.
- A group of teachers all over Europe and the Mediterranean boarder with the ability to create virtual course content and to participate in telelearning activities.
- A human network of students and teachers with the ability to participate in virtual learning activities with an intercultural component and to recognize benefit from these experiences.
- A series of case studies in the partner's institution; and the potential benefit of transforming traditional courses into an on-line mode or of developing parallel on-line course supplements.

BENEFITS

Most partners taking part in the project are institutions of higher education highly interested in starting virtual learning programs with their students and teachers. Experiences foreseen in the frame of ODISEAME are expected to increase the intercultural exchanges. Of added benefit is the multicultural aspect of the coordination process, which is anticipated to lead to a more readily accessible platform and course content.

A great number of countries face a double-speed labour market with a lack of new skills and an excess of old ones. As a consequence, a problem of structural unemployment, that can only be solved by retraining the human capital, has arisen. The students taking part in the virtual learning experiences of ODISEAME will acquire sufficient expertise in the use of new technologies, as well as enhanced knowledge on the topics concerned.

Moreover, these experiences can add flexibility to the learning process that becomes independent of the space, the time and the prior knowledge of the student. That can be of great help for different collectives such as people with physical disabilities or persons with labour or family responsibilities that may regard virtual learning as the solution for their training needs. Students will have an active role in the learning process, both in terms of guiding what they are interested in learning and in constructing meaning.

ODISEAME brings together an important number of institutions distributed across the mediterranean region. There is declared commitment that, through the project, the communities and the participating institutions of every country will interact, will exchange knowledge and expertise within the local and regional network, and will collaborate in developing a mutually acceptable elearning platform.

The resulting availability of virtual learning opens up potential for equality of opportunity to all, important reciprocal human development that could lead to opportunities for people in remote areas or disadvantaged circumstances to successfully share knowledge, to improve intellectual understanding and to work together. ODISEAME brings together many students, teachers and specialists of several knowledge domains, who will all play an active role in the development of the virtual telelearning environments. Apart from this, the project will constitute a starting point for new intercultural

experiences. For example, around 3500 students and 200 teachers study and teach at the University of Cyprus respectively. It is obvious that not all of them can participate in the telelearning experiences under the frame of ODISEAME, but, we expect that a basic template will entail more learning experiences for the participating institutions by the end of the project.

CONTRIBUTION OF THE UNIVERSITY OF CYPRUS

Title and abstract of the course

Apart from our contribution to the effort to develop the new collaborative virtual learning platform we will implement a compulsory course (Communication and Information Tools for the Teaching of Science in the Elementary School) for those pre-service students who take a specialization in Science Education at the Department of Educational Sciences. This will be the first course with a cohered elearning supplement in the department of Educational Sciences.

The course examines ways in which computer technology may support the teaching of Science in Elementary School. The purpose of the course is to make students aware of the computer as a simulation instrument and as a research medium, as a medium of applying the scientific method, as a medium to facilitate student interaction with the epistemological objects and, finally, as a medium for learning and instruction. The course places emphasis on the use of computer-based tools for developing modeling and investigative skills in science.

Objectives of the course

The course explores two fundamental approaches to teaching and learning in science and identifies the added value in authentic learning that results from appropriate use of communication and information tools in the science classroom.

A. Physical science can be characterized as a complex network of models interrelated by a system of theoretical principles. Models are units of structured knowledge used to represent observable patterns in physical phenomena. Accordingly, *physical understanding* can be perceived as a complex set of modeling skills, that is, cognitive skills for making and using models. The development of modeling skills enables students to make sense of their own physical experiences and to evaluate information reported by others. Modeling can potentially provide a backbone structure for constructing meaning in physical science. In this approach, students are guided to develop a set of generic modeling skills in one domain and to transfer those same skills in other domains, further elaborating and developing them with experience and practice. The modeling approach to learning is iterative in that it involves continuous comparison of the model with the reference physical system with the express purpose of gaining feedback for improving the model so that it accurately represents as many aspects of the system as possible. It is also cyclical in that it involves the generation of models of various forms until one can be found that successfully emulates the observable behaviour of the system.
B. Investigative thinking involves the process of identifying authentic problems of relevance to the every day life of the child and subsequently designing and implementing thorough sequences of experiments that respond to specifically formulated investigable questions with the aim of arriving at answers that can be supported in a rigorous manner by real evidence.

After completing the course students are expected to:

1. Have a basic understanding of the goals and objectives of teaching natural sciences in primary education.
2. Be aware of the most prevalent difficulties that children encounter in a process of constructing understanding in natural science.
3. Design, develop and assess curriculum, which utilizes effective modeling and inquiry tools in the learning process.
4. Facilitate the development of modeling and investigative skills as processes of effective learning in natural science.

5. Be able to use the basic electronic applications for supporting the planning of teaching in science: searching for information, communicating with colleagues internationally and examining educational databases.
6. Be able to use a range of computer based tools for teaching and learning in natural science.
7. Be able to choose appropriate software for the requirements of a lesson in specific grades.
8. Be able to modify the classroom organization and the didactical approach in order to best take advantage of the new potential offered by educational technology.

Course structure and content

The implemented course will be organized into four main units and will have the following structure:

1. Learning and Teaching in the Natural Sciences
2. Development of thinking strategies and science method skills with special emphasis on modeling as a teaching and learning approach, and system control as an indicative application.
3. Design, development and evaluation of curriculum in the Natural Sciences with special emphasis on webquests as a means to developing investigative skills
4. Cognitive tools for teaching and learning with special emphasis on open environments: sensors; data manipulation, representation and processing; concept mapping.

The first unit will focus on analyzing and exploring the patterns arising during instruction and learning in Natural Sciences. The second part of the course relates to the development of thinking strategies and scientific method skills. Videos showing authentic learning procedures will be discussed and analyzed. The electronic environment will include text, pictures, graphic representations, powerpoint slides, a discussion forum and specially designed curriculum (for developing modeling skills) that will require storage of student responses for the purpose of subsequent use by the students themselves but also analysis by the instructors.

As part of the third unit of the course students will design, develop and evaluate curriculum. They will use several software (sensor interfaces, simulations, microworld development environments, webquest templates). They will implement their curriculum in actual elementary schools, will collect children's work as a means to evaluate their planning and will analyze and present their results. The electronic environment will include powerpoint presentations, video of classroom implementation efforts, text and diagrams for discussion, examples of other students' work, a discussion forum as well as a student presentation forum for storing and analyzing children's work. The last part of the course relates to the use of open tools. Students will gather and analyze data using sensors, develop concept maps, as performance assessment instruments, and will use text representation and text processing tools.

DISCUSSION

The elearning paradigm has great potential in serving as a mechanism for education to undertake the required quality leap. For this to take place, development will need to continue to take place at three levels: network infrastructure, software platforms offering the necessary communications and collaboration tools, and course design with particular emphasis on sequencing learning activities in order to facilitate meaningful learning. All those lines of development need to rely on robust design and draw on carefully designed research. Project ODISEAME constitutes an attempt of addressing the research and development issues of the latter two levels. By combining cross-border expertise throughout the Mediterranean basin, and integrating research, design and development with classroom based evaluation we hope to take advantage of the multicultural context in order to develop a methodological framework for realizing the enormous potential of elearning.

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