Online education in UE, technologies and methodologies: state of the art

MARTINEZ USERO, JOSE ANGEL AND LARA NAVARRA, PABLO
jmartinezu@uoc.edu , plara@uoc.edu
Information and Communication Science Studies,
Open University of Catalonia, Avenue Tibidabo (BARCELONA), SPAIN

ABSTRACT: A study about the evolution of online education technologies and methodologies in the framework of the European research projects in this field is presented. The e-learning research proyects carried out in the V EU Framework Programme (1998-2002, having into consideration the Projects database of CORDIS) are analysed and presented in a tabular way. A set of methodological and technical variables have been established and the possibility of indentifying some kind of knowledge clusters is pointed out. The result of the research consists of a real state of the art in the ambit of European e-learning technologies and methodologies, in which some future research trends can be guessed.

TOPICS + KEYWORDS: e-Learning, policies e-learning, information management, knowledge management,.

PREFERENCE: Article

1   Introduction

In the last few years, the society has evolutionated from the post-industrial to the information or, even more extended, knowledge society. In this society the role of education is essential in all life stages in order to contribute to the human and economic development. Therefore, education is a key aspect in social and economical cohesion (UNESCO, 1996). Nowadays, it is basic to obtain new competences –technical, intellectual, social – to be able to live and work in a knowledge society and actively participate on it. So the new "digital culture" needs to be taken into consideration, together with the called "new basic competences" – foreign languages, business mind, communication skills – that are acquired in a long term basis (COM 2001, 172 final, p. 14).

In this context, distant education due to its characteristics and the potential of ICT is being promoted and stimulated. In this study, the research projects in the field of e-learning carried out in the V EU Framework Programme (1988.2002). The analysis .of projects tends to establish a theoretic state of the art related to technologies and methodologies used in European e-learning projects

2   Objetives

1. To specify the basic aspects to take into consideration in the development of an e-learning project.
2. To analyse the e-learning projects covered and financed by the V EU Framework Programme.
3. To determine the technologies and methodologies used to develop e-learning projects, to analyse the possible existing correlations between technologies and methodologies, and to show the state of the art related to present trends in this research field.

3   Key aspects in e-learning projects

Online education has been identified as different from traditional education. From Charles Wedemeyer – considered the parent of this educational trend (Moore, 2001)- who discovered the real opportunities of online education for these social groups or communities with difficult access to the direct (traditional) education, a series of authors have contributed to characterize this new trend (Holmberg, Peters, Kaye, Moore, Keegan, etc.), establishing some kind of differences and similarities.

When designing online educational projects, different ambits need to be taken on account to create a correct and well-oriented project (Duart, Josep M.; Sangrá, Albert. 2000):

- The technological ambit established the adequate technologies to elaborate the educational materials.
- The methodological ambit is considered as a wide range of possible ways to facilitate the learning process.
- The subject ambit is related to the knowledge field of the learning process.

E-learning technologies

In this new educational field based on information and communication technologies and with some new variables related to space and time, a series of appellatives can used to define specific nuances:

- E-learning: educational process based on the usage of ICT.
- Web-based education: generic term to describe the educational process based on web technologies.
- Online education: educational process via web that can be direct, semi-direct or virtual.
- Virtual education: educational process via web in which communication is non-synchronic.

E-learning methodologies

The educational process is carried out in a specific environment, in which a system to knowledge communication (synchronic, non-synchronic) determines the training variety. The next table shows the possible methodologies in e-learning. The selection of a model or another will depend on the learning process and the special needs of the trainees.

ENVIRONMENT	COMMUNICATION	TRAINING
Open/Controlled	Non-synchronic	Non direct on-line
	Synchronic	Direct on-line
	Non-synchronic < Synchronic	Semi-direct on line
	Non-synchronic > Synchronic	Virtual

4 EU policy on e-learning

The eLearning initiative is inserted into the framework of the "eEurope: Global action plan" (COM 2000, 330) whose objective is related with the creation of a Europe capable of overcoming the integration constraints and fostering the usage of digital technologies. Moreover, the "Report on the specific objectives for future educational systems" (COM 2000, 59 final) with a specific objective dedicated to information and communication technologies.

The European Commission adopted an Initiative on eLearning, (COM 2000, 318 final). This initiative presents the principles, objectives and action lines of e-learning, defined as "the usage of new multimedia technologies and Internet to improve the quality of learning processes and facilitate the access to resources and services, as well as interchanges and online co-operation".

The European Community manages a huge amount of resources, programmes and instruments that contribute to attain the objectives of the eLearning initiative. The main community instruments and resources for the implementation to this initiative can be identified as:

The V EU Framework Programme (1998-2002) covers eLearning objectives in two ambits. On the one hand, the IST Programme (Information Society Technologies). On the other hand, the Socio-economic research.

The Structural Funds are the main financial instrument for regional development, the investment in human capital and social cohesion. It is important to point out the initiatives in the framework of the Regional Development European Fund and the Social European Fund.

5 Results and conclusions

5.1. Basic technology

Main technologies used in the development of e-learning projects are analysed and grouped into three categories: a) web technologies: web technology is used as basis for the project. b) web technology + others: web technology and other complementary devices are used, such as: CD-ROM, databases, electronic books, printed materials, etc. c) No web technology: other technologies different from web are used to develop the project (tv, radio, etc.)

In Projects, web technology is predominant, but not in a pure way because in a high percentage web technologies are combined with others like CD-ROMS, databases and printed materials). In Results, the vast majority of projects are implemented using web technology. Moreover, projects with no web technology are not found.

Basic technology

|	Proyectos	Resultados
Web	38%	85%
Web + otros	62%	14%
No web	0%	0%
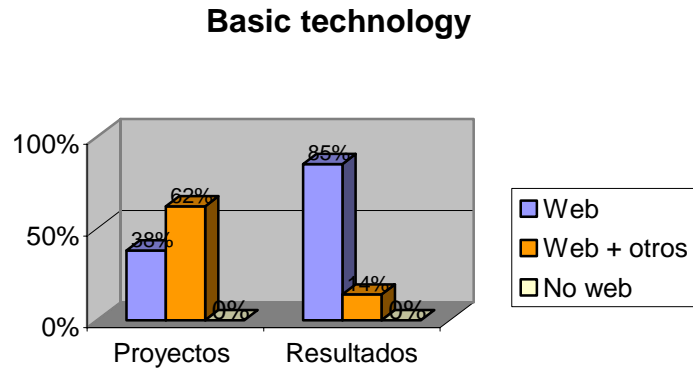
5.2. Learning environment

An initial classification in order to separate two kind of environments have been established.

Open environment, in which educational contents are communicated without access restrictions (Internet)
Closed environment, in which the access to contents is controlled by password, domain names or profiles (Intranet, Extranet or e-learning platform).

In Projects, a clear trend to closed environments, orientated to a reduced group with common educational needs is discovered. In Results, this trend is confirmed. So that 100% of analysed cases are based on closed learning environments.

Learning environment

	Proyectos	Resultados
Abierto	31%	0%
Cerrado	69%	100%
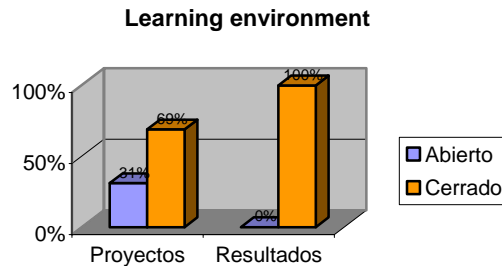
5.3. Usage of accessible technologies

In this section Projects and Results are analysed in order to check if they have been implemented according to a set of guidelines that try to facilitate the access of users with some kind of disability to the contents of a electronic learning environment. We call accessible technologies the wide variety of devices used by disable people to access to web services, such as: screen readers, screen magnifiers, Braille translators, etc.

In Projects as web as in Results, the usage of accesssible technologies is not taken into consideration in the design of a e-learning research project. Only three of the analysed projects mentioned some kind of accessible technology. Furthermore, it is important to point out the fact that these projects have been validated on 6th June 2002.

**Usage of accessible technologies**
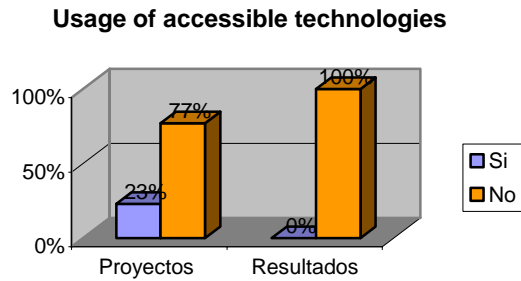
From this situation can be inferred that the publication in 2001 of a Commission Communication on web sites accessibility and its content, as well as the "consideration of individual differences in the learning process and the education for specific needs" as a research priority in e-Learning Action Plan have started to modify this trend and, it can be supposed that new projects will take into account some accessibility guidelines in the design of learning environments and its contents.

5.4.. Kind of communication

Kind of communication is the way how the interaction among the agents of a educational process is managed: student-contents, student-teacher, student-student. We have identified three kinds of communications:

- Non synchronic: the interaction is in a different time
- Synchronic: the interaction is at the same time
- Non synchronic + Synchronic: there is a combination of non synchronic (e-mail, e-board, etc.) and synchronic (chat, videoconference, etc.).

Non synchronic devices are predominant as communication methodology in Projects as well as in Results. Only two of the analysed Results include some synchronic devices, namely chats.

Kind of communication
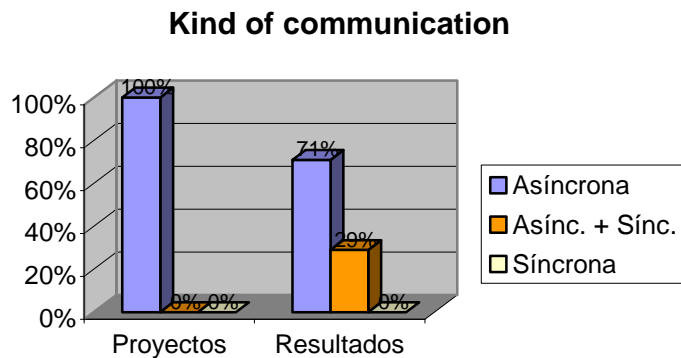
5.5. Kind for resources

We have classified the resuorces that can appear in a electronic document and therefore be part of the educational contents of a e-learning project into three categories: 1) Text: textual documents or text equivalent (interactive tests, forms, etc.) 2) Image: graphic documents with images or similar (interactive maps, 3d, etc.) 3) Multimedia: documents with a combination of formats (text, image, audio, video, etc.)

Multimedia is the predominant kind of resource in the majority of cases analysed. There is a clear difference between Proyects and Results and probably can be inferred that potentially commercial e-learning products (results) are multimedia and this could be a marked trend in the future.

Kind for resources
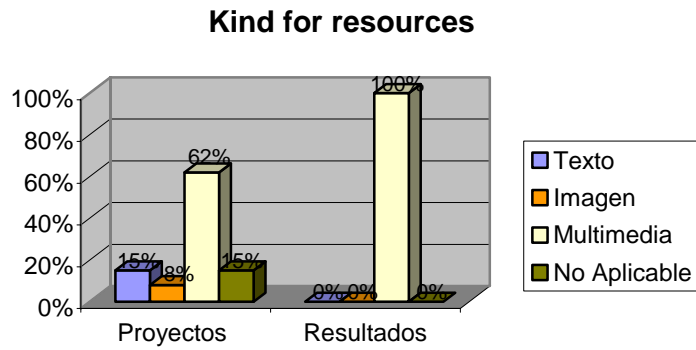
5.6. Support tools

We have outlined two groups of basic support tools in every educational process:

a) Pedagogical support tools: virtual teacher, virtual tutor, etc.
b) Administrative support tools: set of administrative tasks needed in a educational process (fees, applications forms, tests, marks, etc.)

It is important to enhance the lack of support tools in the e-learning Projects and Results analysed. This situation can be originated because many products are oriented to self-training or considered a mere complement of direct education.

Support tools
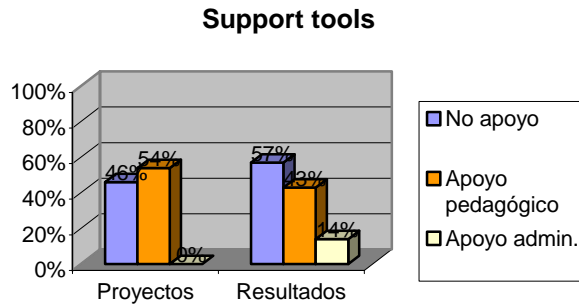
5.7. Knowledge field

Most of the analysed Projects and Results can be framed in the ambit of a very specific field. Only general projects tend to improve some aspects related to learning environments, such as: accessibility, language, knowledge management, etc.

Knowledge field
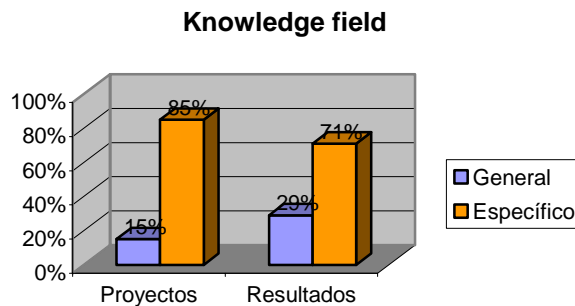
6. Bibliography

2001/C 204/ 02. Resolución del Consejo de 13 de julio de 2001 relativa al e-learning. DO C 204 de 20.7.2001, p. 3-5

COM 2000, 318 final, 25.5.2000. Comunicación de la Comisión. eLearning: concebir la educación del futuro.

COM 2001, 172 final, 28.03.2001. Comunicación de la Comisión al Consejo y al Parlamento Europeo. Plan de acción eLearning: concebir la educación del futuro.

COM 2001, 756 final, 12.12.2001. Informe de la Comisión. Actividades de investigación y desarrollo tecnológico de la UE. Informe anual 2001

CORDIS (2002) Base de datos IDT-Proyectos

CORDIS (2002) Base de datos IDT-Resultados

Dondi, Claudio. (2002). *Políticas europeas de apoyo a la "Open and Distance Learning"(ODL) y el caso específico de la integración de ODL en los entornos universitarios convencionales*. Cuadernos irc.com: Portal UOC. [Fecha de publicación: enero 2002].

Duart, Josep M.; Sangrá, Albert (2001). Formación universitaria por medio de la web: un modelo integrador para el aprendizaje superior. Portal UOC-Educación. (link)

Eisenstadt, Marc; Vincent, Tom. (2000). *The knowledge web: learning and collaborating on the net*. London: Knowledge Media Institute.

Jolliffe, Alan; Ritter, Jonathan; Stevens, David. (2001). *The online learning handbook: developing and using web-based learning*. London: Kogand Page Limited.

SEC 2001, 236, 28.2.2002. Comisión Staff Working Paper. eLearning: designing tomorrow´s education. An Interim Report

Stone, Martha (2001). Llegar a la comprensión mediante el uso de las TIC. Ciclo de conferencias sobre el uso educativo de las TIC y la educación virtual (6 de junio de 2001). Portal UOC-Educación. (link)

COM 2001, 63/CE. Decisión del Consejo sobre las directrices para políticas del empleo de los Estados miembros en 2001.

Duart, Josep M. ; Lara, Pablo; Saigi, Francesc. Visibilidad de información en el diseño de contenidos educativos online. (Articulo en proceso de publicación y citado con autorización de los autores. 20 de Junio de 2002).