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IMPLEMENTATION OF ADVANCED COMMUNICATION SYSTEMS AND DISTANCE LEARNING CONCEPT AT POLITECNICO DI TORINO WITHIN THE UNIVERSITY EDUCATION PERSPECTIVE

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ABSTRACT: New dimension and possibilities for teaching and education in all fields are offered by the use of information and communication technologies (ICT) and e-learning systems. The introduction of these systems will improve, supplement and aid traditional teaching methods and will also enable the beginning of different teaching and learning processes that are less limited in space and time. This offers also new insight into subjects that are not possible with traditional methods. The Centre for e-learning activities and the multimedia production and testing (CELMI) at Politecnico di Torino, aims to be the institutional reference for the coordination of support activities in the area of technology and multimedia training. The Centre puts the particular emphasis on skills in e-learning and open and distance learning and on the activities related to the release and testing of multimedia technologies. This paper is presenting the use of high technology communication systems at Politecnico di Torino, implemented with the purpose of improved university education. Also, the multidisciplinary working systems, communication models, multimedia and video production, videoconferencing systems and special services for disabled, are briefly described.
KEYWORDS: communication technology, e-learning, videoconferencing systems

INTRODUCTION

Modern society relies on efficient education with greater output for less money, and these demands can be satisfied through implementation of eLearning in education system. The use of eLearning in education provides easier access to lectures, making them more flexible and more widely available to students from geographically distant locations. Also, it provides numerous services to academic community and third parties in region. The particular dedicated centres which are primarily focused on eLearning in higher education are targeting both teaching staff and students.

The benefits the teaching staff will have from eLearning are:

eLearning permits lecturers to develop materials using the world-wide resources of the Web.

Allows lecturers to communicate information in a more engaging fashion than in text-based distance education programs. eLearning offers a wide-range of text, diagrams and images with video and sound, including virtual reality technology that in the future will improve the effectiveness of the approach even further.

Allows lecturers to access at any convenient time and from any convenient place.

Allows lecturers to package essential information for all the students that will access. Lecturers can then concentrate themselves on high level activities.

Retains records of discussion and allows for later reference through the use of threaded discussion on bulletin boards.

Generates more personal gratification for lecturers through quality student participation.

Reduces travel and accommodation costs.

The students will benefit from eLearning in the following ways:

eLearning fosters interaction among students and instructors. Interaction stimulates understanding and the recall of information.

Accommodates different learning styles and fosters learning through a variety of activities that apply to different learning styles.

Fosters self-paced learning whereby students can learn at the rate they prefer.

Makes convenient for students to access at any time and from any place.

Reduces travel time and travel costs for students.

Encourages students to browse information through hyperlinks to sites on the worldwide Web and there by find information relevant to their personal situations.

Allows students to select learning materials, or to be directed to content that meets their level of knowledge, interest and what they need to know to perform more effectively in their particular activity.

Provides context sensitive help (Electronic performance support systems) to computer users and helps them complete tasks on-the-fly.

Develops knowledge of the Internet that will

help learners throughout their careers.

Encouraging students to take responsibility for their learning and succeeding builds self-knowledge and self-confidence

CeLM, Centre for e-Learning and Multimedia at the Politecnico di Torino, is divided into sections of competence and production experience, with high-profile areas that cover some of the professional strategic communications and dissemination of educational, scientific and research content. The Centre has the following purposes:

To promote and coordinate the development of e-learning and open and distance learning within the University, providing the necessary services and organizational support

Work in close collaboration with other organizations, both Italian and foreign, operating in the field of e-learning and multimedia communication, even within national and European Community projects.

Enhance the professionalism and expertise in the field of corporate communication, interpersonal communication, multimedia and interactive complex media systems.

Develop and support in terms of technology and organizational activities related to institutional marketing, promotion and image promotion and communication of events and their design.

To promote the use of multimedia technologies within the Politecnico.

Provide assistance to teachers in the planning and teaching in the creation and preparation of materials for e-learning.

The interest areas of the centre multidisciplinary competence are: communication, multimedia production, services, special activities dedicated to disabled persons.

THE COMMUNICATION ACTIVITIES OF THE CENTRE FOR E-LEARNING

The **communication facilities** are divided into three main services, namely: OndeQuadre, Monitor Style and Polistream.

OndeQuadre is the web radio of the Politecnico, born to support internal community of the university: teachers, administrative staff and students. This radio is providing information, service and culture conveyed through entertainment and music. It is posed as a real amplifier of the voice, the potential and vitality of the University as a unique communication tool designed for students and by the students. Through the website link, users can access to the live streaming radio content.

OndeQuadre provides news, interviews and insights direct spread of the main events organized by the Politecnico and media partners for some of the main cultural events in Piedmont, which provides coverage with special broadcasts, podcasts and blogs.

Furthermore, the **MonitorStyle** takes care of delivering content through a network of monitors located throughout the university, providing a real means of communication for the Politecnico. The program consists of some fixed program, in which the School, the Departments, Centres and Services and external partners can give information their potential users. It is provided an interaction with the users through a series of items to which anyone can send its contribution. Last news service is also provided.

Finally, **Polistream** is born as an archive of documentary videos, produced by operators and related to the facilities at the Politecnico di Torino, available for free in streaming video and audio in the internet environment. This archive is saving the events related to the institutional life of the university such as the academic year inauguration ceremonies, the public parts of the Academic Senate meetings, conferences and conventions, seminars and hosted cultural events which are sort of a special interest and transmitted by live audio-video network.

THE MULTIMEDIA ACTIVITIES OF THE CENTRE FOR E-LEARNING

CeLM deals with video and **multimedia productions** in the area of cultural communication and training. The Centre is one of the pioneers in the creation of courses for teaching and learning. Activities include the design of integrated graphics and video material, direction and video documentation of conferences and events, the design and implementation of scientific and cultural documentaries, as well as institutional and promotional videos. The production centre features advanced hardware and software, and professional installation of two modern rooms, one designed for chroma key full-digital and one analogue. CELMA is able to follow the various project phases - design, production and post-production - making use of established professionals, and to articulate the complexity of the project according to customer requirements.

The provided **service** of the centre is mostly based on distance learning concept and videoconferencing activities. The **distance learning courses** constitute a valid and proven alternative to traditional ones. It is found an increasing interest by those who wish to resume their university studies, as well as by those who need retraining or continuing education. CeLM (in collaboration with the IT department) manages the operation of educational records. This service is making available an e-learning platform integrated into the Educational Portal of the recordings of lectures held in the classroom. The final scope is the production of material and services in digital format

and their distribution channels through computer accessible from anywhere and at any time, reducing time and space constraints in such a way that students can more easily and quickly use university services and therefore increase the efficiency of the services themselves.

These recordings are one of the tools provided to students enrolled at Politecnico, but are made available to students enrolled in special courses. In particular, since the academic year 2010/2011, the courses to which it is guaranteed to be available in streaming on-line, are both from bachelor and Master of Science level at the departments of Mechanics, Computer Engineering and Electronics.

Videoconferencing, in its most basic form, is the transmission of synchronized image (video) and speech (audio) back and forth between two or more physically separate locations, simulating an exchange as if the two (or more) participants were talking each other in the same physical location. This is accomplished through the use of cameras (to capture and send video from your local endpoint), video displays (to display video received from remote endpoints), microphones (to capture and send audio from your local endpoint), and laud speakers (to play audio received from remote endpoints).

To make easier the attendance at meetings is one of the simplest yet most popular uses of videoconferencing. For meetings that already regularly take place and require face-to-face communication, videoconferencing can substitute for the actual physical presence of remote participants (Figure 1). This reduces travel costs as well as travel time and makes meeting attendance more convenient. It can also make meetings more likely to occur. Frequent and/or ad hoc meetings that might not have been scheduled due to travel costs and timing can be enabled via videoconferencing and enhance the sense of teamwork among people at different locations but working on the same project. Videoconferencing provides remote participants with much of the face-to-face familiarity that comes with physical presence, including elements of facial expression, body language, and eye contact. So it is evident the advantages with respect to the phone conference, that are also used quite often, where the participants are not visible to each other. If videoconferencing is readily available on individual desktops, the cohesive effects of this enhanced communication can be even greater. Collaborative work can then be enhanced further through the integration of videoconferencing with collaborative electronic tools (data transfer, shared whiteboards, and shared applications.)

Distance education often comes to mind first when considering the former situation, but several other existing types of communications can also be enhanced or extended. These include organizational and cross-organizational meetings, counselling, foreign language and cultural exchanges, and telecommuting. Communication is already occurring in each of these applications, but could be made more compelling, more effective, or less expensive through the use of videoconferencing.
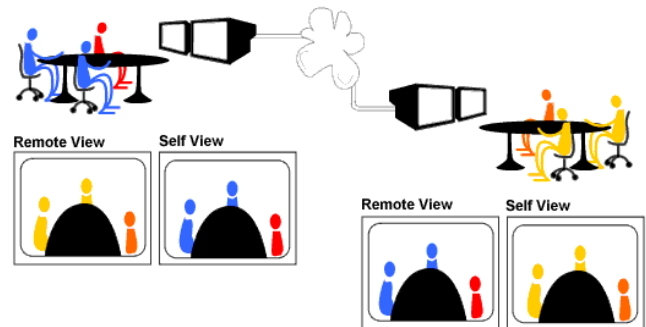

Figure 1. Group to group videoconference session concept

CeLM provides a consolidated and articulated service of videoconferencing (audio / video) and interactive (streaming) to support teaching, research and institutional events, such as:

lessons for traditional degree programs and distance learning studies to the campuses and various centres;

lessons for master of science courses at Italian and foreign universities;

thesis defence for the students who will achieve the double title "Italian-foreigner degree";

interaction between students of different universities, both Italian and foreign;

presentation of the training of the Politecnico of Turin to the high school institutions located throughout the country;

seminars and conferences with Italian and foreign universities;

coordination meetings of national and international projects

Finally, **services for disabled students** are also the target of the centre work. Some students with disabilities need support in terms of hardware / software, to use a PC and obtain a good autonomy in the study. For over 10 years CeLM, faced with specific cases, is able, after a careful study of verbal and mobility skills of the student, to propose a suitable IT solution through the use of assistive technology in order to solve the problems caused by disability. As part of this project, CeLM faced so far with two types of disability, visual and motor respectively, is proposing solutions and interventions targeted at different types.

In the frame of the same idea, the Laboratory for Information, Support and Access for the Disabled - LISAD was born as a computer lab equipped for disabled students of the Politecnico di Torino, who have the opportunity to use a proper space, laboratory services and a wide range of technological aids. This laboratory has developed a long series of interventions aimed at making the services more accessible to students enrolled on degree courses in distance and with particular attention to those who are in conditions of disability. Arise in this context also the design and implementation of the new web site in an accessible version. Web accessibility refers to the ability to use content and services independently of the disability and hardware and software availability. To achieve this, they follow the guidelines for Web Content Accessibility multimedia standard, WCAG 1.0, WAI - W3C trying to reach a level of compliance equal to the Double-A (AA WCAG 1.0). The development process was not limited only to the respect of technical requirements, but took into account the knowledge of the real problems and needs of users which are targeted, and research and field testing of technologically innovative solutions to resolve them. These elements have helped to characterize the web site of the new degree courses in distance.

THE OTHER ACTIVITIES OF THE CENTRE FOR E-LEARNING

Beside previously mentioned activities, the CeLM is also dedicated to other projects that are supporting the idea of sustainable education at Politecnico di Torino. The center produced the web site "IELTS Speaking Practice," according to the needs expressed by the CLA (Language Centre), designed to practice the English language in the form of exercises and listen to argument content varies, all supported by a dedicated vocabulary accompanied by audio recording of the words. The main purpose is to allow students who must be certified by the English language test IELTS (International English Language Testing System) to practice a path similar to the perception expressed during the exam. By the use of this service, the students are able to:

> *practice listening of the questions that will meet during the IELTS exam;*
> *try to answer the questions that are asked during the session of the IELTS test;*
> *check their pronunciation and vocabulary, the correct use of terms;*
> *independently evaluate and improve the level of their skill aimed with IELTS.*

CONCLUSIONS

Distance learning concept exploits interactive technologies and communication systems to improve the learning experience, also by use of modern videoconferencing communication systems. It has the potential to transform the way of teaching and learning across the board and it can raise standards, and widen participation in lifelong learning. It cannot replace teachers and lecturers, but alongside existing methods it can enhance the quality and reach of their teaching, and reduce the time spent on administration Implementing the eLearning solution will involve a complex mix of technical and "soft" skills training, systems integration and content development and customization that will make possible a truly ambitious education system for a future learning society.

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