

Teaching Quality on the Net¹

Penelope Markellou, Maria Rigou, Spiros Sirmakessis, Athanasios Tsakalidis

University of Patras
Computer Engineering and Informatics Department
Multimedia, Graphics and GIS Lab, 26500 Patras, Greece
and
Computer Technology Institute
Internet and Multimedia Technologies Research Unit
61 Riga Feraiou Str., 26221 Patras, Greece

Abstract

In this paper we present the architecture and functionality of a web based training system. The system is used to provide a virtual classroom for teaching Quality Management. The course addresses enterprise executives and its main objective is to inform and sensitise them on assuring the quality aspects of the activities of the respective enterprises. This objective is attempted through the presentation of methods and techniques for quality improvement and through the analysis of the advantages gained by the establishment of quality control and assurance systems.

1. Introduction

During the last decade a lot of work has been focused on distance learning tools. Education is defined as the developing of human faculties and powers through instructions or experiences. This is made accessible through various avenues. Education manifests itself physically, in the form of books, magazines, and periodicals and electronically as in television, video media and the world wide web. Traditionally, distant students were assumed to be adults. However, whole institutions of higher learning, such as the United Kingdom's Open University, etc., have been dedicated to providing distance education at the post-secondary level for decades. Singapore's Open University provides degree and postgraduate courses only.

At the secondary level, in most regions around the globe, funded distance education addresses the needs of small rural school districts or underserved urban school districts. It also offers the opportunity for students to enroll in courses to meet graduation requirements that their own districts are unable to offer. Additionally, it helps those who seek advanced placement, foreign language, or vocational classes. Those who are homebound or disabled also stand to benefit from it. At the elementary and middle school levels, distance learning usually takes the form of curriculum enrichment modules.

With the current boom in the Internet scene, distance education and more recently teletraining technologies are expanding at an extremely rapid rate. The explosion of

¹ Contact Person:

Mrs Maria Rigou

University of Patras,

Department of Computer Engineering and Informatics, 26500 Patras, Greece,

Phone: +30 61 997807, Fax: +3061 960 322, E-mail: rigou@cti.gr

Internet has not only expanded the learning opportunities but also blown away the physical boundaries that had long handicapped most distance learning. Instructional material designers and curriculum developers sometimes become overwhelmed by the latest technologies. So much so that, the underlying crucial issues of student characteristics and needs are often overlooked. The influence of media upon the instructional process, access to interactive delivery network, and the new roles of teacher and student in the distance learning process needs to be constantly monitored and updated accordingly.

The term "distance education" or "distance learning" refers to the separation of teacher and student in space and or time. It is also the voluntary control of learning by the student rather than the distant instructor and noncontiguous communication between student and teacher. Communication is carried out in print or technology aided medium such as the World Wide Web. Teletraining refers to instructions or training procedures demonstrated through the distance learning mechanism.

The conventional form of distance learning took place through correspondence courses in Europe. This was the accepted and only norm until the middle of this century. In the early stages of distance education, audio graphic teleconferencing using slow scan or compressed video and fax was a low-cost solution for transmitting visuals as well as audio [2]. The major drawback of using radio and television for instruction was the lack of interactive communications channel between teacher and student.

Mass media has transcended the conventional norm. We witness a trend in the form of evolution from print to instructional television or video, to current interactive media. At present, the most popular media is computer-based communication including electronic mail (E-mail), Internet, telephone-based audio-conferencing, and computer-based videoconferencing with closed-circuit cameras. Current trends resort to using a WWW browser, like Netscape or Internet Explorer, with graphical interface to the World Wide Web, to simultaneously view graphics, audio and video.

Each region has developed its own form of distance education. This is tailored in accordance with the local resources, target audience, and philosophy of the organizations that provide the instruction. A number of institutions, public and private alike offer University courses for self-motivated individuals through study programs. Usually students work on their own, with supplied course materials, print-based media with some form of teleconferencing and/or electronic networking. Student support from tutors is similarly enhanced via telephone or E-mail.

The Office of Technology Assessment finds that, "...teachers have to be allowed to choose, willing to make choices, and qualified to implement their choices effectively. OTA finds that, just as there is no one best use of technology, there is no one best way of teaching with technology. Flexibility should be encouraged, allowing teachers to develop their personal teaching approach utilizing the variety of options offered by technology" [3].

The success of distance education is highly dependent on various factors. That of primary concern is the way in which information is imparted to the student and the way in which the student digests and constructs sensible and new knowledge from the

material. As such, the chosen media to transmit the learning materials should be welcomed as a boon and not rejected as a burden. The key concept is that the teacher can transmit a fixed body of information to students via an external representation. An abstract idea represented as a concrete image is presented to the student. The student, in turn, comprehends, downloads, and stores it. The student then develops his own image and uses it to construct new knowledge, in context. This would be based on his own prior knowledge and abilities. The lecturer would encounter a scenario far removed from a conventional classroom, for the lecturer of instruction media becomes a facilitator of learning, rather than a communicator of a fixed body of information.

Matured students are voluntarily seeking further education. They have a wide variety of reasons for pursuing distance learning. Primary reasons are constraints of time, distance, finances, the opportunity to take courses or hear outside speakers who would otherwise be unavailable, and the ability to come in contact with other students from different social, cultural, economic, geographical and experiential backgrounds [4]. As a result, they gain not only new knowledge but also new social skills, including the ability to communicate and collaborate with widely dispersed colleagues and peers whom they may never have seen.

When incorporating the Internet into a distant delivered course, it is anticipated that all students in a course have a computer, modem and WWW access. This is to ensure equal opportunities for computer interaction and feedback. Students will be subjected to challenges of learning basic computer skills, new software, and appropriate online communication skills. Trouble-shooting student computer problems will probably become an integral part of normal instructional responsibilities. Help desk would prove handy at this juncture. Some students might initially be apprehensive in contributing to computer conferences or in sending e-mail because of a lack of familiarity with the proper protocols. Specifying a minimum number of e-mail communications per week might encourage active participation. Interaction and support with student may take place with time latency. Timely feedback and frequent contact are ideal in distance learning. Students may e-mail or fax questions to their instructors or fellow students. Teachers and peers, in turn, may respond at their convenience. Students, too, need guidance in putting information together, reaching their tutors, completing and submitting assignments, and charting their progress.

Following this attitude we have developed a web based training system. The system is used to provide a virtual classroom for teaching Quality Management. The course addresses enterprise executives and its main objective is to inform and sensitise them on assuring the quality aspects of the activities of the respective enterprises. This objective is attempted through the presentation of methods and techniques for quality improvement and through the analysis of the advantages gained by the establishment of quality control and assurance systems. In this paper we present the architecture (section 2) and the functionality of the web based training system (section 3).

2. The Architecture

The course includes text, graphics, sound and movies, aiming at the achievement of an integrated educational process. More specifically, inside the 215 different screens of the course, one may find 56 diagrams, 33 shapes, 24 tables and 17 examples taken from the production process. Trainees have the option of communication among

themselves and with the tutor, using the e-mail and IRC facilities. This course has also been developed in a stand-alone CD-ROM version, which is available in Greek for the partners of the project and any other potentially interested organization. Attending the course on CD-ROM mode does not require an Internet connection, but, on the other hand, does not support communication utilities.

The thematic subjects of the course comprise Total Quality Management and Hazard Analysis – Critical Control Points (HACCP), including sections such as:

- Introduction to Total Quality Management
- Quality Functional Deployment
- Techniques for Quality Improvement
- HACCP Definitions and Principles
- HACCP Development Methodology

The architecture of the system is presented in figure 1.

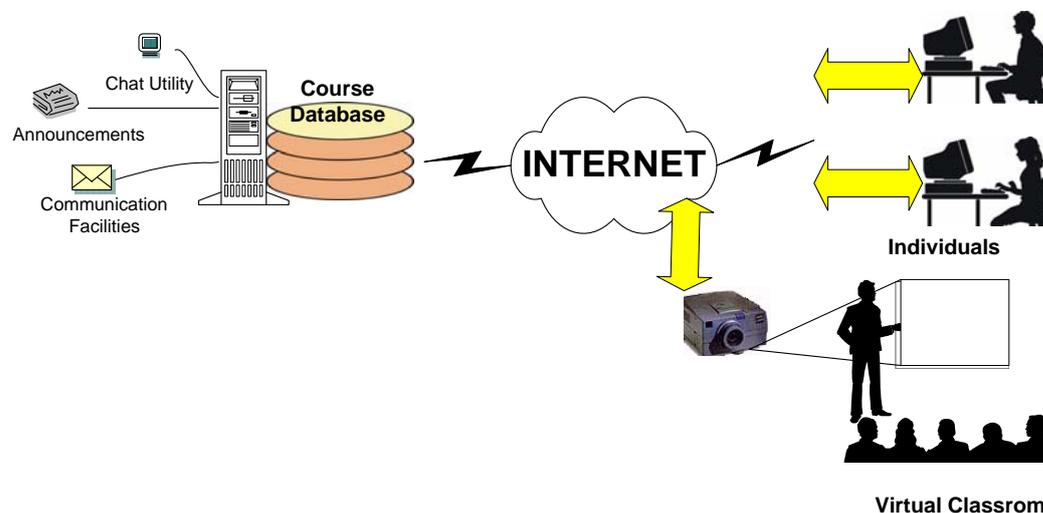


Figure 1. The system architecture

3. System Components

The course is designed so as to provide the user with a set of assisting options and a set of tools, available at all times. The assisting options addressing the mechanisms supported for the realization of the multiple educational scenarios, include:

- *Library* – selected documentation, ready to be downloaded.
- *Announcements* – a custom utility, where the user can insert an announcement after contacting the course instructor and/or read the announcements placed by others.
- *Co operation utilities* – listing of those attending the course, a chat utility with multiple chat rooms (figure 2) and a mailing list with all the course attendants.
- *Personal Info* – data on the profile of each student.
- *On-line Presentation* – the user can attend a live presentation. In the case that currently there is no such presentation taking place, the system provides information on the date and time of the next live presentation.

These tools are always available through a menu bar on the left of the screen (Figure 3)

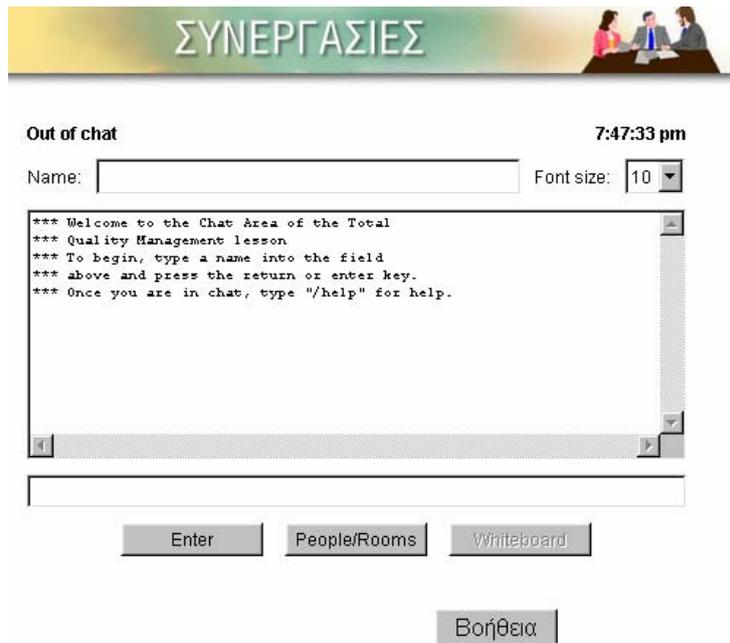


Figure 2. The chat utility

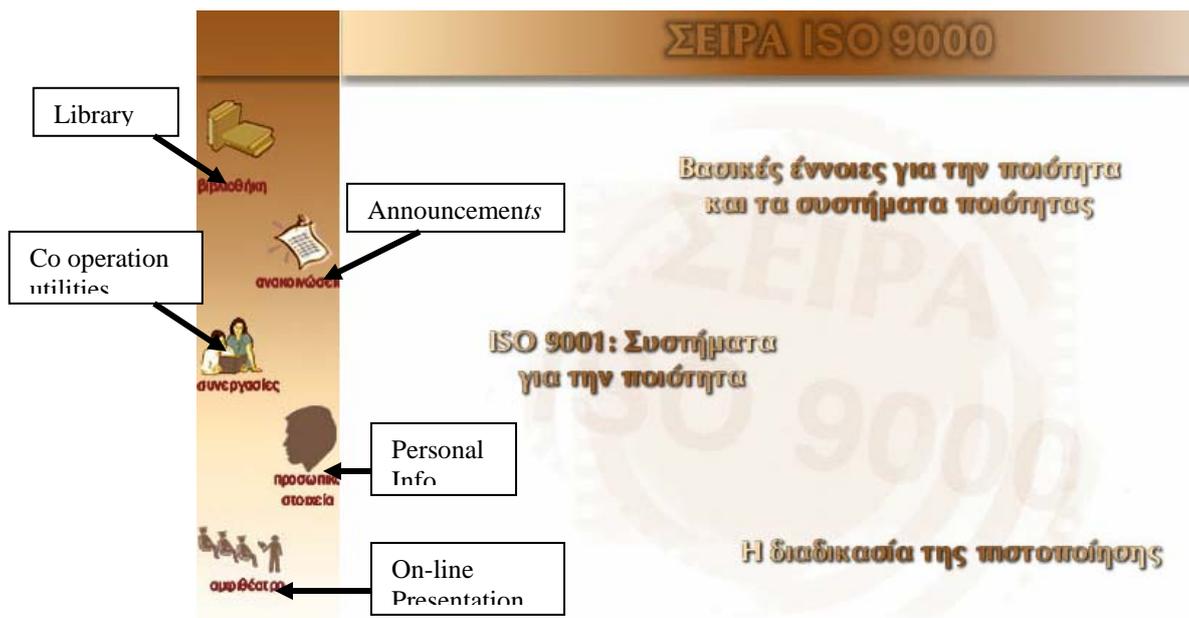


Figure 3. The main window of the application

There is also a set of different tools provided to each distant learner in order to enhance his/her learning process. These tools are available through a small toolbar, always available at the bottom of each screen (Figure 4)



Figure 4. The bottom toolbar of the application

These tools consist of:

- *A Course Map* – functioning as a schematic secondary navigation option. The student can always see a graphical representation of the structure of the content. The current position on the course structure is presented as a colored box (figure 5).
- *Personal Notebook* – a text entry field the contents of which can be saved as a text file.
- *Glossary* – an alphabetically sorted list of all the terminology introduced throughout the course.
- *Help* – instructions on the way to attend the course and the available options
- *Navigation Controls* – the three basic controls for navigating one step forward, one step back and to the immediately upward level.
- *Self-evaluation Questions* – a set of multiple-choice questions. After the student submits the answer, the system provides an immediate result along with the correct answer.

Detailed description of all the system components, as well as the self-evaluation methodology used, will be available in the full-paper version of our work.

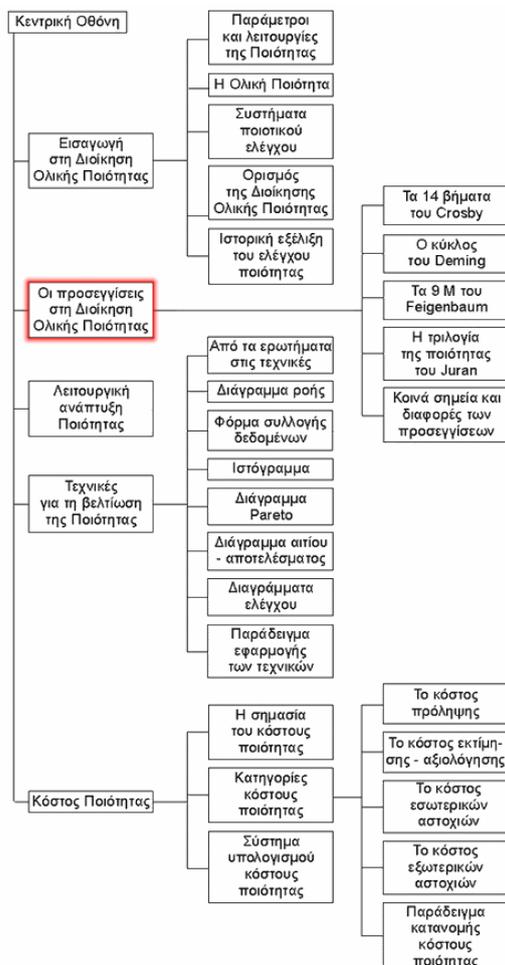


Figure 5: An instance of the course map

4. References

- [1] Hudson, Heather .E (1992) "Application of new technology in distance Education: Telecommunication policy issues and options" south melbourne center of International research on communication and info. tech.
- [2] Terry .h, Evans (1994)"*Understanding Learning in Open and Distance Education*" London kogan Page, Institute of Education technology Open University.
- [3] Bruce, MS, & Shade, R.A. (1994). Teaching via compressed video: Promising practices and potential pitfalls. DEOSNEWS [On-line journal], 4(8).
- [4] VanderVen, K. (1994, April). Viewpoint: The power and paradox of distance education. The On-line Chronicle of Distance Education and Communication [On-line journal] 7(2). Available Usenet Newsgroup alt.education.distance, May 3, 1994.