13 Development of an ICT Open Learning Environment for Teaching Multimedia

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Abstract

The paper presents a multimedia open learning environment in a local area network. The environment is composed by a teaching method, a multimedia application; a number of Internet based learning modules and an ICT assessment. Each module includes an interactive glossary, Internet resources database, a comprehensive bibliography, homework, applications and examples, computer-based self-assessments, interactive communication via e-mail and discussion forum. The method and the development process are new in Romania and have been adapted to the abilities of the Romanian students. The designed environment has proved his efficiency and it is used constantly in the "Politehnica" University of Timisoara for students at the Audio-Video and Multimedia Technologies specialization.

Keywords: ICT environment, Teaching multimedia, Romania

1. Introduction

During the last years, the field of education is more and more subject to economy measures all over the world. It has to be able to renew itself, both structurally and pedagogically. The role of networks in a learning environment is becoming more and more important. Educational technology is expected to bring in new solutions for both distance and traditional teaching. This concept is generally known as Open and Flexible Learning and use different teaching methods for the entire learning process.

Learning environment for individual students is most often the basis for development of new open learning environments. The ability to use information technology, interaction and teamwork skills, and interaction between small groups is the starting points for projects in the context of an information society.

2. Goal of the work

The goal of the present work was to develop a multimedia open learning environment on a local area network. The production costs, as well as of the hardware and software support, should be kept at the minimum and use the existing equipment in the Multimedia laboratory (mainly achieved through EU PHARE TEMPUS Programs). The addressed application is teaching course of Development of Multimedia Applications and TV Journalism for individuals or groups of students at the Audio-Video and Multimedia Technologies specialization. A good efficiency could be obtained if students would be able to assist interactive courses over the Internet. The course producer or lecturers are able to update the content of the courses and should have a kind of control over the presence and the activity of the student to that course.

The final product is formed by a multimedia application; a number of Internet based learning modules and an ICT assessment accessible over the Internet or on a local network.

3. Educational and technological goals

The primary purpose for building the ICT environment was to improve the experience of the students and teachers and to use intensively the learning time for better results.

At the beginning an analysis of the current classes for students at the Audio-Video and Multimedia Technologies specialization runned in the old academic way has been done.

The main questions raised were: what are the factors that waste time on the learning process, lessen the effectiveness of learning, make it more difficult to for the students to learn, increase the cost of offering the class, which are the advantages of the subjects taught (McCormack 1998). The

results were mainly: the learning time allocated to the courses are too short for the demand of acquired know ledges, constant feedback with bibliographical texts from teachers or library was more and more difficult (due to economical reasons just one piece of each book was available in the specialization library), the information available on the Internet expands and change yearly and students find it more difficult to access it all. The conclusion was that some of the subjects are practical oriented and can be adapted for the ICT environment.

A deep knowledge of computer network programming is required to develop a remote laboratory from scratch with major initial constraints both for the students and the teacher, and with a limit of the development of a number of practical examples. To overcome these problems it was proposed computer architecture based on the existing local area network, a flexible communication protocol between client and servers computers, and a set of programs and libraries. The friendly, interactive programs and the libraries were intended to help teachers to develop continuously the course and environment, and also to help other teachers in the university to develop further classes. The Intranet network has direct access to Internet through the RoEduNet academic Romanian network and some of the modules are available on the Internet.
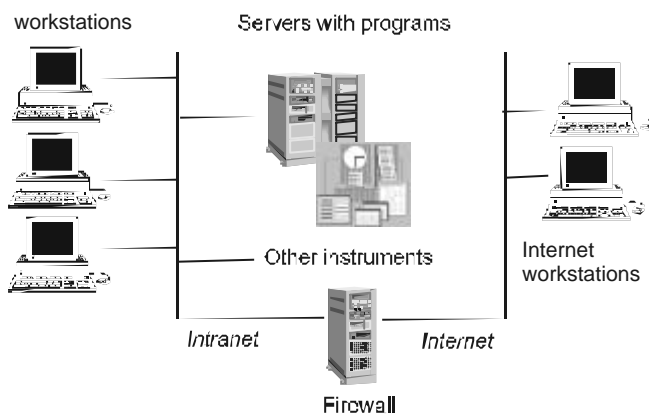

Figure 1. Architecture of the multimedia laboratory

Several advantages are obtained by using this configuration. First of all valuable and expensive instrumentation can be shared between many users. Different programs may be available to the students, depending on the actual need of the course. The network topology supports a high flexibility and access if more students decide to use the same programs and test in the same time, the server programs grant the access in timesharing fashion with suitable priority policies.

4. Scenario of the ICT environment

The environment is composed by a teaching method, a multimedia application; a number of Internet based learning modules and an ICT assessment. Each module includes an interactive glossary, Internet resources database, a comprehensive bibliography, homework, applications and examples, computer-based self-assessments, interactive communication via e-mail and discussion forum. The addressed application is teaching the course of Development of Multimedia Applications and TV Journalism for individuals or groups of students at the Audio-Video and Multimedia Technologies specialization, short-term higher education (college) degree. The same application has been adapted for the students in the new degree in Multimedia through Distance Education. The method and the development process are new in Romania and have been adapted to the abilities of the Romanian students.

The application implements a new student-centred learning method based on Information and Computer Technologies. It uses audio and video applications, interactive computer methods, Internet based learning software and the World Wide Web as a resource tool. The method is a result of several years of experience in teaching these courses and experience in developing multimedia applications. The course producer or lecturers are able to update the content of the courses and have a kind of control over the presence and the activity of the student to that course. The final product is formed by some course modules accessible over the Internet or on a local network and different other resources, with track on their activities.

5 Development of the ICT environment

The ICT environment has been developed by using different software and also the extended experience in developing web-based and multimedia materials of the authors. A team has been established and also some students were involved din tools developments.

5.1. TV journalism multimedia application

The multimedia application has been developed by using mainly Macromedia Director with extensive scripts in Lingo and it is mainly for the TV journalism course. It is based on 13 teaching chapters, 68 activities and examples (mainly videos or photos), self-assessment exercises, an extensive glossary with direct links to the hot words in the course notes. The application is personalized to each student who needs to enter his name at the start and his activities on the application are tracked and supervised by the teacher. The application is installed on the faculty intranet and it is also given to students on CD-ROM.

The Internet based learning modules have been developed in 2 stages. They are available on the Internet and the student's access suing their username and passwords. This allows also the teacher to track each student activity in order to better assess his knowledge, to help and support him during semester.

5.2. The TV Journalism on-line course

The course of TV Journalism was developed on HTML using all the characteristics of web-based training: easy and quick access to information, search tool, structured information with constant references to glossary, library, schematic drawings, on-line support (Driscoll 1998).

It has 10 chapters and several photos, plus a library with links to interesting websites.

Figure 2. TV Journalism course on CD – content page – personalized

Figure 3. TV Journalism course on CD – one of the inside pages – with link to glossary
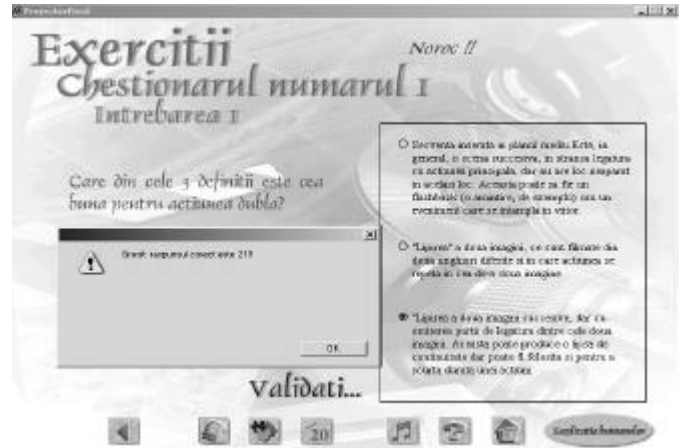

Figure 4. TV Journalism course on CD – one of the self-assessment pages – multiple-choice test with the answer
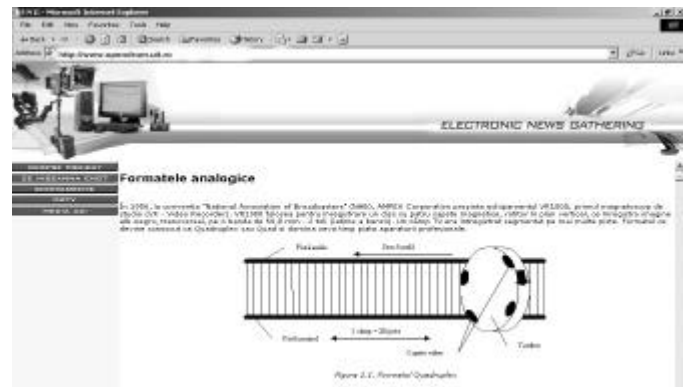

Figure 5. TV Journalism on-line (Electronic News Gathering)

Figure 6. TV Journalism HTML Source

5.3. The Development of Multimedia Applications on-line course

The other Internet tool developed was the course of Development of Multimedia Applications (course notes, activities, glossary, library, assessments, etc). The authors choose to implement it using WebCT environment, which after that has been extensively used for implementing also other courses. The WebCT offers different facilities: password protection, different level of student' access, students'

activity track, assessments checks) which are fully used on this course.

Figure 7. The WebCT interface on www.opendrum.utt.ro

Figure 8. The main page of the course

Figure 9. One of the inside pages of the course

So, the system allows the teacher to track the student progress during the academic period. Moreover, the system provides some statistical tools to determine the global progress of a group of students and to compare the theoretical and experimental difficulty level of the tests.

5.4. The self-assessment tool

All the 3 tools are used in parallel by the students in the second, third and fourth year of study. They are registered students and all the access to all the applications is with username and password. This increase the security, allow the student to see exactly what knowledge he has achieved and allow the student activity track by the teacher.

On all the applications there are different exercises for the self-assessment. It is worthy to consider that students have no obligation to do all the exercises although depending on the grade they obtained in the self-assessment history; the course final grade can be increased. The final grade of an exercise is the average grade of all the attempts.

In each year the teachers realized that an increased number of students are doing the exercises on self-assessment and their final results are better than those who don't pass all the exercises.

6. Evaluation

It has been tested for 2 years and assessed using different methods. The quality of the application is assured by using standard higher education quality methods and the expertise of the external auditors. The evaluation process started earlier, during the progress of the environment development. The evaluation comprises different performance indicators concerning also the process of teaching/learning and the environment products. The process aspects data that was quantitative and qualitative evaluate were: enrolments, numbers using all the facilities, learners' workload, problems experienced by the learners/teachers, etc.

The students have also done an assessment by questionnaires and conversations with the staff. The evaluation goal was to assess the ICT environment and to collect information and suggestions in order to achieve an improved version in the future. At the end of each term and module of the courses students were asked by e-mail to fill in the on-line questionnaire about the tools utility, course structure and assessment tools. The questionnaire was organized in two parts: a set of closed questions (with multiple-choice answers) and a set of open questions.

It proved mainly the effectiveness of the environment with a passing percent increased with 25%, a larger number use the facilities, they access a larger amount of information and data, their knowledge and skills have been certainly improved.

The use of ICT tools in higher education should also be considered from the economical point of view. It is proved and has been verified by our experience that the initial development of such tools is quite expensive. This is why the

initial costs per student are higher compared to the traditional teaching. As far as the number of students is increasing, the costs tend to become comparable to the traditional ones. On the other hand, once the system is tested and becomes stable, the administration costs are lower than the traditional ones. This assertion generally applies to the use of ICT tools, but becomes stronger when we address technical education, that involves anyway high costs related to the use of equipment. This is why, our experience allows us to consider the use of ICT tools of great benefit not only from the point of view of the interactivity involved and the pedagogical one, but even from the economical point of view.

7. Conclusion

The ICT environment developed by the multimedia staff has been in full use since 2000. Several attempts of partly developed tools existed before in the multimedia lab. The designed environment has been proved his efficiency and it is used constantly in the "Politehnica" University of Timisoara. Constant update, both on the course content and of the resources are possible and done continuously.

With adequate content the ICT environment can be implemented for any subject (partly the process started for other courses at the Audio-Video and Multimedia Technologies specialization) to be taught.

For more information or to see the courses demo please visit the URL http://www.opendrum.utt.ro/online.

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