DESIGNING A COURSE MATERIAL FOR E-LEARNING

PROIECTAREA UNUI CURS PENTRU E-LEARNING

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Abstract. *Distance learning via the Internet (e-Learning) technologies is considered to be among the most efficient ways to improve the quality of teaching and studying. E-Learning design and development is driven by transformational learning, i.e. learning that improves long-term performance through facilitating behavior change as well as enhancing complex decision-making, problem-solving and the generalization of learning in novel situations. Using Moodle open-source software, various tools for producing the user interface, the knowledge pages, multiple-choice quizzes, and interactive learning programs are described. Results for the course "Biophysics and Agro-meteorology" are presented. The described design and production of e-learning courseware can be applied to other fields as well. The derived course material is embedded into a more complex e-learning service under development within a Grid Computing project that was initiated by four universities and a research institute of Iasi, Romania. The e-learning service for agricultural sciences is one of the tasks that The University of Agricultural Sciences and Veterinary Medicine of Iasi are developing as project partner.*

Rezumat. *Tehnologiile e-learning sunt considerate în prezent printre cele mai eficiente metode de predare şi studiu individual. Prin e learning se îmbunătăţeşte pe termen lung calitatea educaţiei prin formarea unor deprinderi noi de învăţare ce se obţin prin plasarea studentului în situaţii de rezolvare creativă a unor probleme, prin stimularea interactivităţii şi cooperării în timpul studiului. Lucrarea prezintă elementele generale ale un proiect de curs realizat folosind mediul de dezvoltarea Moodle pentru aplicaţii de e learning. Luând ca studiu de caz cursul, „Biofizică şi Agrometeorologie", adresat studenţilor de la specializări din ştiinţele agricole, sunt abordate instrumentele pe care mediul de dezvoltare le pune la dispoziţie. Maniera de realizare a cursului prezentat poate fi aplicată şi pentru alte proiecte. Acest curs este inclus într un serviciu de e learning mai complex, aflat în curs de construcţie în cadrul unei reţele academice de tip Grid computing dezvoltată prin colaborarea a cinci universităţi şi un institut de cercetare din Iaşi.*

INTRODUCTION

E-learning means much more then using electronic support to provide learning tools. It is a whole suite of education technologies and that can use the Internet, a network, or a standalone computer [2]. However, e-learning would not be possible without a modern computer infrastructure. E-learning applications include Web-based learning, computer-based learning, virtual classrooms, and digital collaboration. Content is delivered via the Internet, intranet/extranet, audio or video tape, satellite TV, and CD-ROM.

E-learning can be categorized with three types [3]. The first type is an *open-university education*. Another type of e-learning is *short courses*, which last only a few weeks and comprise a single subject. A third type is *self-study by means of tutorials*.

The e-learning platforms represent virtual realities which change the way people experience and interact with computers. Using online learning through the Internet, individuals can share information through remote interaction with each other. Students can collaborate to learn, solve problems, can meet and interact. The virtual environments can be used in the field of education, having the potential to facilitate more active student and instructor collaboration, and help to provide distance education. E-learning software environments allow the instructors to teach courses according to their pedagogical and technological choices. On the other hand, students get a real classroom experience even while accessing the courses remotely [4].

AN E-LEARNING SERVICE FOR STUDENTS IN AGRICULTURAL SCIENCES

In 2006, four faculties and a research institute in Iasi, Romania started a collaborative research project named Academic Grid for Complex Applications. The acronym of the project is GRAI. The Faculty of Horticulture from The University of Agricultural Sciences and Veterinary Medicine of Iasi is one of the partners. One of the tasks that it undertook within the project is the development of an e-learning service for students in agricultural sciences.

The curricula in different specialties of Agriculture (Agronomy, Horticulture, Animal Husbandry etc.) include a large diversity of courses. Previous expertise shows that teaching disciplines like Physics, Mathematics or Economics is quite difficult, as the core knowledge of students in agricultural sciences is remote from those areas, and their skills in dealing with the respective concepts are not always very strong. As e-learning technologies are considered to be among the most efficient ways to improve the quality of teaching and studying, it looks to be a good idea to use them in teaching the above mentioned topics. In future, This service will be enriched with more and more modules to cover a larger spectrum of topics in agricultural sciences and to provide a modern and efficient learning environment for all types of educational frameworks.

For the design and of the e-learning service, the **Moodle** development environment was chosen. **Moodle** [5] is an ongoing development project designed to support a social constructionist framework of education. It is provided freely as Open Source software (under the GNU Public License). **Moodle** has the following main modules.

Site Management. This module is used for managing the website site of the course. This application incorporates authentication mechanisms, which enables students to create their own login accounts which are verifiable by confirmation.

User Account Management. Using this module, different sets of accounts can be created. An *admin* account has administrative privileges and controls course creation and user accounts. Every individual has one account assigned by the administrator Access privileges may vary for these accounts.

Course Management. The teacher can set the course formats by week, by topic or by social format. An array of course activities such as Quizzes, Forums, resources, assignments, etc can be developed. Activity reports can also be generated for logging and tracking access information. Graphs and visual information can be embedded in these reports.

Assignment module. This module is used to post assignments with due dates wherein students can upload their assignments. It also provides a time-stamp feature for student submissions and to display grades.

Chat module. This module is, as obviously, text-based communication.

Forum Module. This module enables discussions between teachers, teachers and enrolled students, or between students.

Quiz Module. The quiz module relies on a database of questions and is able to generate a quiz for every student. Questions can be sequential or random. The module allows quizzes to be created automatically and inserting the time-frame for each quiz. At the teacher's discretion, quizzes can be set for students to attend multiple times and can also include images, true or false questions, short- answer questions, embedded answer questions, etc.

The pedagogy of a courses is based on the fact that students have different education background. During the courses the progress of the learning is tested by the participants themselves (self-tests) and/or by the teacher. The design of a courseware is planned in accordance with its contents, which is given by the curricula.

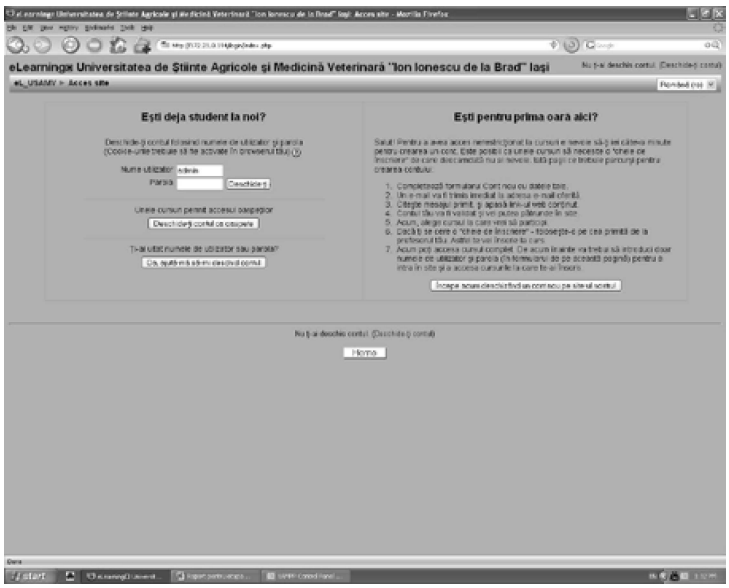

Fig. 1 - First page (start page)

The participants in the e-learning courses must have access to the Internet, a browser (for example Internet Explorer) and an e-mail program. The teachers post lessons, literature, assignments and comments to the participants; the participants send answers and questions to the teacher; participants can be monitored. A calendar informs about the schedule of the course. Communication between the participants and the teacher can also be carried out by means of chatting, where several persons can take

part at the same time. Besides the electronic means of communication, hard-copy material such as books and CDs, may be handed out to the participants of the courses.

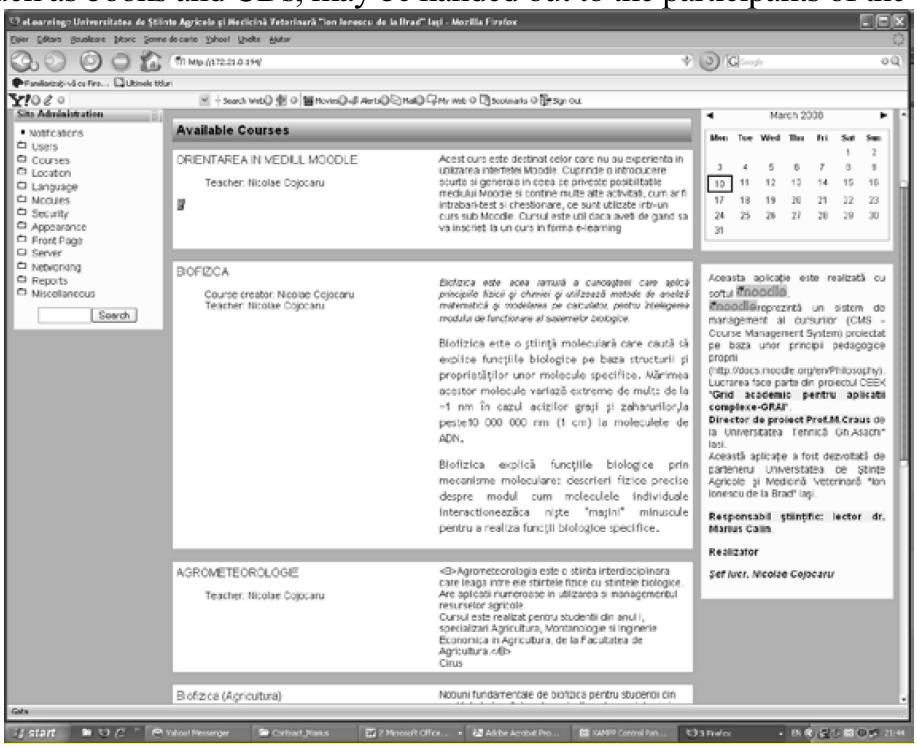

Fig. 2 - Available courses

CONCLUSIONS

Nowadays, e-learning technologies are considered to be among the most efficient ways to improve the quality of teaching and studying.

E-learning can improve the efficiency of teaching in all areas of agricultural sciences and its usage would have a beneficent effect.

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