USING MOODLE TO BUILD A COURSE IN APPLIED MATHEMATICS FOR STUDENTS IN AGRICULTURAL SCIENCES

UTILIZAREA MOODLE ÎN CONSTRUIREA UNUI CURS DE MATEMATICĂ PENTRU STUDENȚII ÎN ȘTIINȚE AGRICOLE

CĂLIN M.[1], CHIRUȚĂ C.[1], COJOCARU N.[1]
e-mail: mcalin@uaiasi.ro

Abstract. The curricula in different branches of agricultural sciences (Horticulture, Agronomy etc.) include courses in applied mathematics. Previous expertise shows that teaching such a discipline is quite difficult, as the core knowledge of students in agricultural sciences is remote from this area and their skills in dealing with the respective concepts are not always very strong. Such difficulties are more visible when working with distance learning students. Nowadays, e-learning technologies are considered to be among the most efficient ways to improve the quality of teaching and studying. The paper presents an e-learning project for teaching applied mathematics. The software used to build such a course was Moodle.

Key words: e-learning, Moodle, distance learning

Rezumat. Programele diferitelor specialități din științele agricole includ cursuri de matematică aplicată. Experiența arată că predarea acestor cursuri prezintă dificultăți specifice care sunt generate de nivelul anterior de cunoștințe pe care îl posedă studenții la aceste specializări. Aceste dificultăți se constată cu atât mai mult la studenții de la învățământ la distanță. Tehnologiile e-learning pot fi un ajutor în creșterea accesibilității acestor cursuri. Articolul prezintă proiectul de realizare a unui astfel de curs de matematică aplicată folosind ca suport tehnic pachetul software Moodle.

Cuvinte cheie: e-learning, Moodle, învățământ la distanță

INTRODUCTION

E-learning means education via the Internet, network, or standalone computer. However, e-learning would not be possible without a modern computer infrastructure, as it uses electronic applications and processes to learn, and transfers skills and knowledge via network. E-learning applications and processes include Web-based learning, computer-based learning, virtual classrooms, and digital collaboration (Höhle J.).

The e-learning platforms represent virtual environments that change the way people work and interact within the educational process. The virtual environments can be used in the field of education, as a technology having the potential to facilitate more active student and instructor collaboration and learning, and help to provide distance education. They allow the instructor to

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[1] University of Agricultural Sciences and Veterinary Medicine Iasi, Romania

teach courses at their own technological comfort level by providing templates for course management. A student should get the real classroom experience even while accessing the courses remotely (Jeffery C. et al., 2005).

MOODLE

The design and implementation of courseware, allowing remote student-teacher interactions, can be achieved by using the features of **Moodle** a software package for producing internet-based courses and web sites. As its developers present it [3], Moodle is an Open Source Course Management System (CMS) that educators can use as a tool for creating online dynamic web sites for their students. The most recent Moodle version 2.0.2 was made available in February 2011.

Moodle supplements the traditional face-to-face learning by providing online-classes, is user friendly, simple, efficient, easy to install on any platform that supports PHP. It can be installed either on a web server or on a personal computer. Moodle has the following main modules.

There are three categories of people that use Moodle:

The **administrator** is the one that has complete control of the installed package and assigns different access rights to the others

The **teacher** is the one that designs a courseware, provides resources within, designs quizzes and tests. The teacher keeps in touch with students, and makes everything needed for them to perform the learning tasks.

The **student** is somebody that enrolls in a course, uses all its resources to learn, co-operates with other students, with the teacher, makes homework, and passes tests.

These three categories of users have different access rights to use the various courseware modules like **Site Management, Course Management, Resource, Forum, and Quiz.**

THE STRUCTURE OF A COURSEWARE IN APPLIED MATHEMATICS FOR STUDENTS IN AGRICULTURAL SCIENCES

Teaching applied math to students in agricultural sciences can be made more efficient if the courseware is built using a large variety of teaching resources like intuitive examples, self testing procedures, chatting with the other students, keeping in touch with the teacher etc. Moodle provides such resources.

Following is a discussion on the features that Moodle has and their application in an ongoing project of a math course.

The chapters names accompanied by brief explanations would be firstly displayed such as the student can get acquainted with the contents (figure 1).
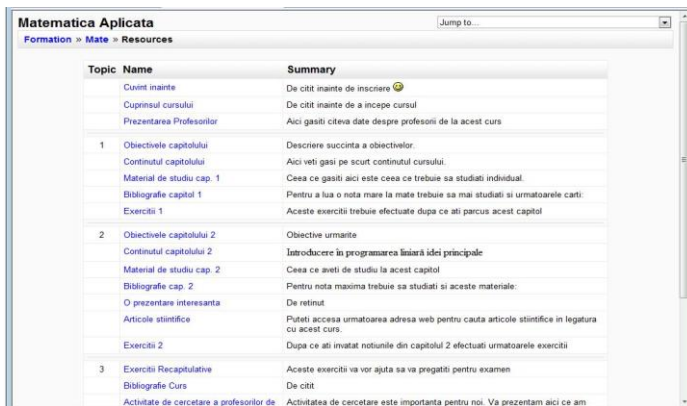
Fig. 1 – The course contents with brief descriptions

The resources that the student has access to appear to him on the first page. All of the links the he needs are here: teachers' profiles, teachers contact, course and tests calendar, the course itself, homework (figure 2).
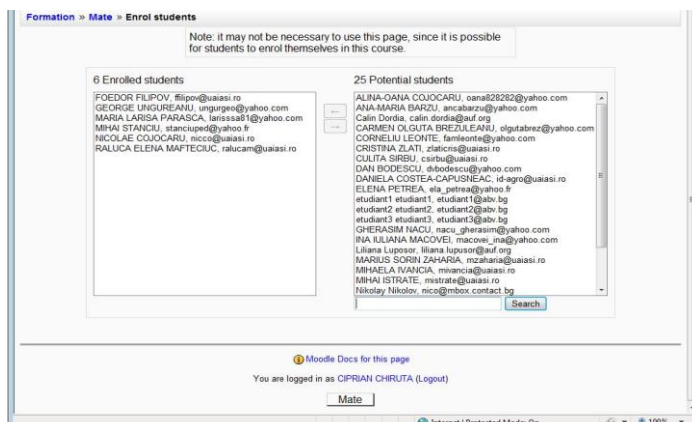

Fig. 2 – The starting page of the course

Fig. 3 – Students can be enrolled and grouped in various ways

The teacher can enroll and organize students, supervise the amount of time that each student spends with different activities (figure 3)

Students can download the different study materials, can follow links and upload their essays and homework (figure 4).

Fig. 4 – Students can download learning support documents

Several advantages arise: the teacher can use various techniques in building his course (pdf documents, PowerPoint presentations, video clips etc.). Moreover, the teacher posts links to different Internet resources that can offer more explanations and points of view (figure 5).

Tests and quizzes can have various forms according to different pedagogical methods. Features like fixed solving time, or online notification of results are available (figure 6).
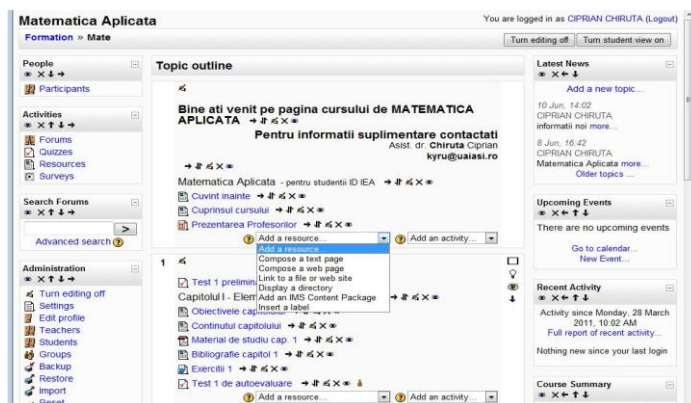

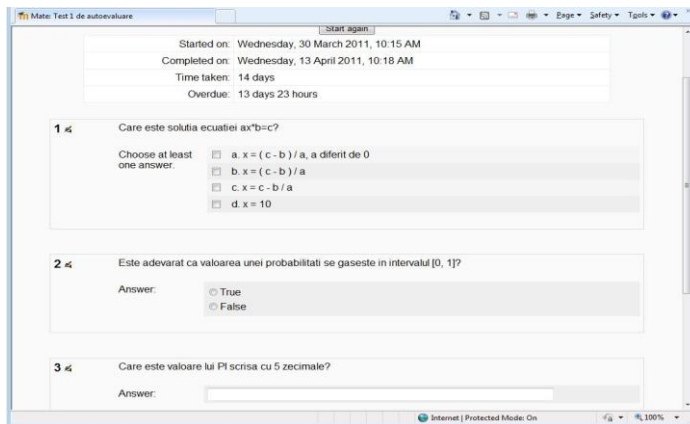**Fig. 5** – Learning resources that can be used by the student

Fig. 6 – Different types of questions within a quiz

The teacher can perform statistics on the results obtained during the testing activities and draw conclusions for the future teaching (figure 7).

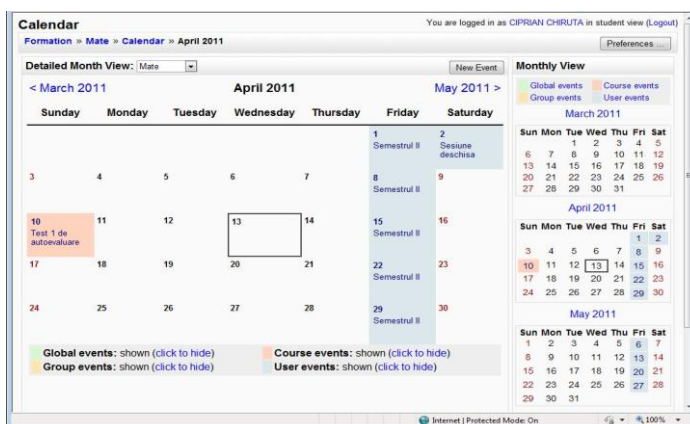**Fig. 7 –** Statistics on the test results

Fig. 8- The calendar

69

Each student can have his own calendar to keep of the duties and activities he has to perform within the course (learning, homework, testing, teacher contacting etc.). Figure 8 shows such a calendar.

CONCLUSIONS

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

Moodle is a suitable Open Source development environment for creating and using e-learning course materials.

E-learning can improve the efficiency of teaching in all areas of agricultural sciences, but would have a special effect in teaching topics in sciences like applied mathematics.

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