

BENEFITS OF THE E-LEARNING PLATFORMS AND CLOUD COMPUTING IN THE BIOTECHNOLOGY EDUCATION

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Abstract

Online education represents a new approach of learning process, in which substantive elements remain the same, only the means of exchange of knowledge and learning is different.

Few benefits of the e-learning platforms and cloud computing in educational area are: a reduced infrastructure and IT costs, an increased accessibility, a better collaboration, and allow organizations more flexibility. But cloud computing is having other effects as well, which have the potential to greatly change how education works, both in online and offline (traditional classrooms) courses like: no more expensive textbooks, no more outdated learning materials, no expensive hardware and software required, reaching more diverse students.

Key words: biotechnology, education, e-learning, internet, MOODLE.

INTRODUCTION

The future is about internet access, online learning and collaboration, both locally and globally. Schools of the future could have a traditional cohort of students, as well as online students.

In the field of education, in recent years, there has been notable progress in terms of teaching and learning techniques. Using the Internet and modern technology in education has resulted in changes of substance.

But sometimes technology can be a barrier to teaching and learning. Preparing teachers to use ICT (information and communications technology) in teaching activity effectively occurs such as desideratum in the coordination of the educational process. In this context, the educational „*E-learning* type” platforms represent reliable tools for so-called computer assisted learning.

E-learning solutions are the result of evolution of technologies that support these features. Thus, due to large storage capacities, classic distance education using printed materials sent by mail has been replaced by electronic books. Subsequently, interactive communication technologies have become elements of new models of education using the electronic support.

Computer and electronic (digital)/ multimedia materials are used as support in teaching,

learning, assessment, or as a means of communication.

There are three generally accepted patterns in the world of online education, each occupying a roughly equal share of this market:

Online independent education represents the model whereby individual user takes the course over the Internet or on CD, studying it by himself. This model represents the advantage of a very large amount of information that can be accessed in a short time, as well as extensive multimedia facilities, but being very rigid in terms of instructor-student communication.

Online asynchronous education allows transmission of information at any given time, but to only one partner in instructor-student relationship. The instructor can provide information to students but they can't interact while receiving. The major advantage, in this case, is that the student keeps the facility to work at his own pace, and also getting answers to his requests in an acceptable time frame.

Online synchronous education allows interactive information transfer with any other user at any time. For example, the instructor and students are transferring information during the class or seminar, usually in real time. This model is the most advanced in terms of facilitation of communication, audio as well as video integrated methods creating the concept of the *virtual classroom*.

Unlike traditional educational system, e-learning can enumerate as **advantages**: geographical mobility; accessibility of on-line; individualization of learning process; various pedagogical methods; low cost of distribution; reduced time for study; synchronous and asynchronous interactions and it is based on a dynamic technology.

Among the **disadvantages** of eLearning learning system are: high rate of drop-out students; this system requires experience in the use of computers and a high cost for design and maintenance.

MATERIALS AND METHODS

Faculty of Biotechnology (U.A.S.M.V. of Bucharest) has developed its own ICT infrastructure since its founding in the mid-90s through:

- Purchase of computers (desktops, notebooks, servers, projectors, multi-function printers, etc.) and specialized software (operating systems Windows suite of applications: Office, etc.);
- Aided calculator editing textbooks, laboratory notebooks and university courses;
- Connection to INTERNET to all faculty buildings and offering free access for all teachers but also students through wireless connections, both in lecture halls, laboratories, seminar rooms, and also outside them.

All these were followed by a natural shift from the classical manner of course presentations to the computer and projector aided courses, through PowerPoint and multimedia presentations.

Together with the faculty leadership, we have developed some strategies to ensure the concept of eLearning resulting in a **MOODLE type platform** dedicated to faculty staff and graduate students.

MOODLE, an acronym for *Modular Object - Oriented Dynamic Learning Environment*, (<http://www.moodle.org>) is a free and open-source software learning management system written in PHP and distributed under the GNU General Public License that lets developers build an education solution for institution needs.

MOODLE is used for blended learning, flipped classroom and other e-learning projects in schools, universities and other sectors.

With customizable management features, MOODLE allows for extending and tailoring learning environments using community sourced plugins.

RESULTS AND DISCUSSIONS

The online educational platform is accessible at <http://moodle.biotehnologii.usamv.ro>

By using this platform student have the following benefits:

- Technically the platform allows the simultaneous access of a large number of users;
- The platform provides access to all registered users, regardless of where the access is requested;
- The platform allows the simultaneous access of users who use different types of connection;
- The platform allows the simultaneous access of users who use different types of equipment (desktop, laptop, tablet, smartphone, etc.);
- The platform allows the simultaneous access of users who use different types of operating systems (Windows, Linux, MacOS, Android, iOS, etc.).

Some suggestive screenshots of the platform of the faculty are given below. The screen shots are taken from the course *Operation and computer programming* (Figure 1- 6).

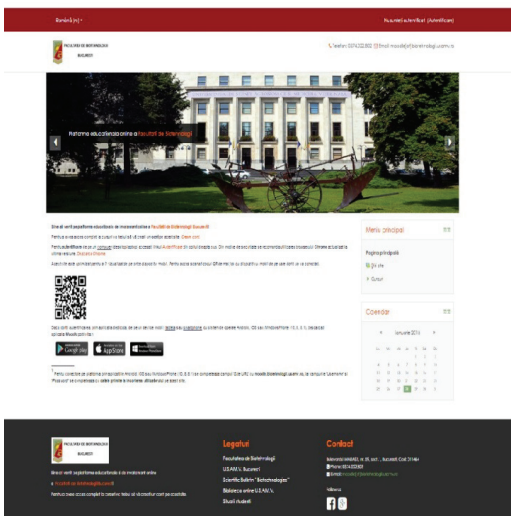


Figure 1 Homepage of the e-learning platform

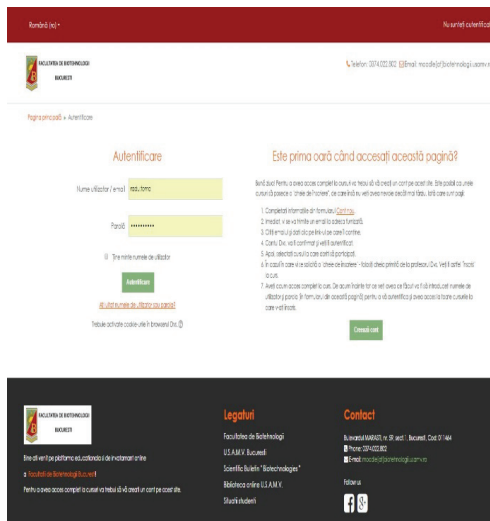


Figure 2 The login area

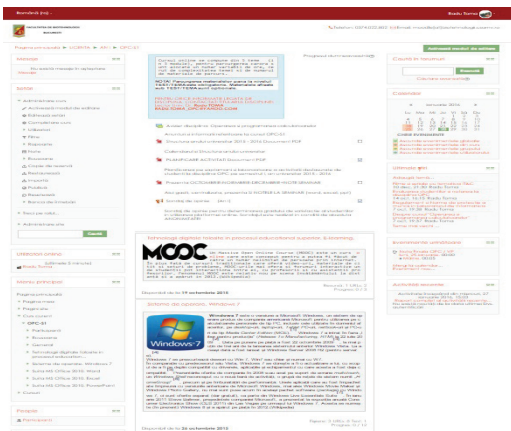


Figure 3 Presentation of the course resources

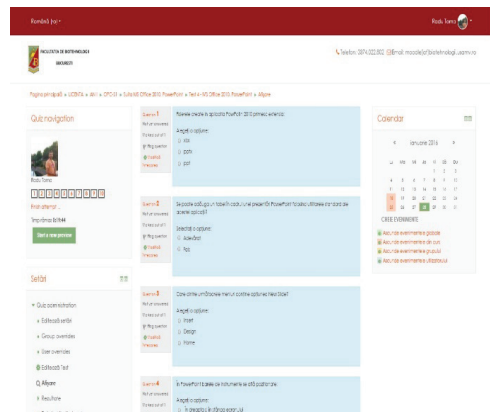


Figure 4 The online examination. Quiz questions

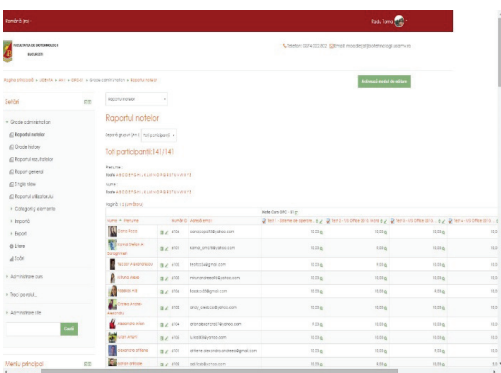


Figure 5 The grades situation of students enrolled in the course

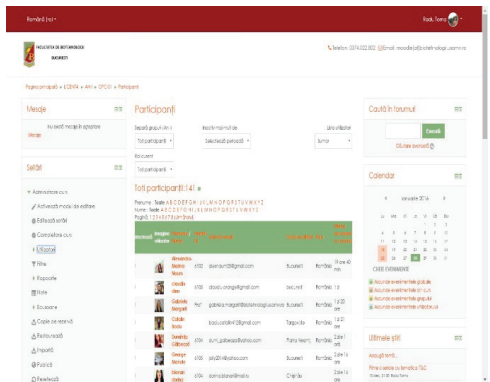


Figure 6 The online presence of students enrolled in the course

Some considerations about the using of the online platform:

- It is necessary to accumulate a certain number of hours logged on the platform in order to be considered and noted the presence in a classic format;
- The student is required to complete a minimum number of resources in each chapter to be regarded as he has passed the course material / seminar;
- The grading is done in a blended format both online examination through online quiz questions and/or essays plus other forms of online examinations as well as in the classic format through direct examination, face to face teacher and students, for two main reasons:
 - Faculty structure contains no "at distance" programs, having only "with frequency" specializations;
 - The Romanian online education system is at the beginning and is not fully developed in all cases and the students don't have a culture of assuming the grades exclusively through the prism of their own performances so fraud attempts are possible in order to obtain bigger grades.

CONCLUSIONS

Online education represents a new approach of the learning process, in which substantive elements remain the same, only the means of exchange of knowledge and learning is different.

Few benefits of the e-learning platforms and cloud computing in educational area are:

- A reduced infrastructure and IT costs;
- An increased accessibility;
- A better collaboration, and allow organizations more flexibility.

But these systems are also having other effects as well, which have the potential to greatly change the way education works, both in online and offline (traditional classrooms) courses like:

- No more expensive textbooks. It's no secret that university-level textbooks are expensive. Cloud-based textbooks can solve this problem as digital content, that is

significantly less expensive than printed content;

- No more outdated learning materials. Cloud-based applications can be run on Internet browsers, but most are compatible with mobile devices as well. This means that schools and students do not need to own expensive computers. Students also don't need to purchase external storage devices as there are companies, like Google, that offer free cloud - based storage (<http://drive.google.com>);
- No expensive hardware and software required, reaching more diverse students. Many software programs are now available either free or on a low-cost subscription basis, which substantially lowers the cost of essential applications for students. For example, instead of purchasing a single Microsoft Office student license, students and their families can purchase a cloud-based subscription for five computers and five mobile devices for a modest fee monthly. Even better, they can use Google Docs for free or other suites like OpenOffice, Kingsoft Office, etc.

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