E-learning Platforms in Higher Education. Case Study

D. Benta[a], G. Bologa[a], I. Dzitac[a,b,*]

[a]*Agora University of Oradea, Department of Social Sciences, Piata Tineretului 8, RO-485526 Oradea, România.*
[b]*Aurel Vlaicu University of Arad, Department of Mathematics and Computer Science, Elena Drăgoi 2, RO-310330 Arad, România.*

Abstract

This paper describes our experience in using e-learning platforms to support face to face instruction in academic field. We used Moodle as interactive e-learning tool to motivate students and involve them in resolving single and collaborative homework tasks. However, while many universities in the world use e-learning platforms, in our case this was for the first time used and it was a great teaching/learning experience. This paper aims to be easy to read and understand by proving the importance of using e-learning platforms in higher education.

Keywords: Moodle, e-learning, higher education, homework tasks.

1. Introduction

The concept of e-learning and the idea to apply Moodle (Modular Object-Oriented Dynamic Learning Environment) in university course came after a series of international internships we were involved and after a series of on-line classes and platform configuration for improving teaching projects. There are many benefits of using on-line education including communication, interaction between students, group development and a higher access to knowledge. Despite those benefits, many Romanian universities often agree to remain in traditional teaching with no other additional support.

Moodle is a learning platform originally designed by Martin Dougiamas (first version of Moodle was released on 20 August 2002). Moodle, as a robust open-source e-learning platform, was used and developed in the next years by global collaborative effort of international community. Moodle is designed and continue improved to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments. Now, on 27 March 2014, is available already Moodle 2.6.2.

We consider Moodle a Web-based adaptive collaborative learning environment that contains all components described by (Wang, Li & Gu, 2004)[8]: discussion forum and one-on-one peer help, user model, collaborative strategy

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* Corresponding author: Cell phone: +4-0722-562-053; Fax +4-0359-101-032.
  E-mail address: ioan.dzitac@uav.ro

model and adaptive component. Some authors were also interested in interaction and human communication on a Web-Based Collaborative Learning Environment (Zhang, Luo, Jiang, Liu & Zhang, 2004)[9] while other authors call these Virtual learning environments (Knight, 2010). Similar experiences of using interactive e-learning tools as Moodle were described by other authors (Beatty & Ulasewicz, 2006)[1]. Some of them well pointed in their papers (Shen & Huang, 2006)[6] that using Moodle can develop students' cognitive schema, help to construct their knowledge, promote students' positive attitudes towards discussing and cooperating with peers, and increase students' skills to undertake lifelong learning by using the information technology.

Alternatives in terms of Web-Based Collaborative Learning are given by (Pfahl, Angkasaputra, Differding & Ruhe 2001)[4]. In this flexible on-line community for learning, students interact with course resources and are able to develop new skills and to structure their own learning trajectory.

Applying this e-learning platform, we took advantage of students free time and their availability to spend and structure their actions in order to submit homework respecting a firm deadline.

2. Materials and Methods

For this study and analysis we used server logs collected on the e-learning platform during second semester of academic year 2011-2012. A number of 29702 records were collected over a period of approx. 3 months (29.02.2012 first record and 10.06.2012 last record) including details about users authentication and activity.

This paper presents results of using Moodle in Romanian higher education. To compare results we used a group of students that attended courses, used the e-learning platform with electronic resources and submitted homework using this solution (a number of 98 students) and a group of students that attended courses, used classic paper/listed resources and submitted homework by e-mail in traditional way (a number of 104 students).

Moodle platforms was installed online and initial settings done (http://moodle.univagora.ro and http://online.uav.ro). Courses were grouped on categories. Each course was created and resources allocated. The course was created using Topics format and at each topic we have defined homework tasks. First topic and tasks were allocated as homework between first and second laboratory, second topic and tasks were allocated as homework between second and third laboratory, third topic and tasks were allocated as homework between third and fourth laboratory and so on. Deadline was defined for homework and from the admin user we have defined only student and professor roles. Assignments were defined as Advanced uploading of files section.

Each student was enrolled to the course with student role and our account was enrolled to the course with professor role. At first laboratory meeting, students received their homework tasks and deadline for each of the task and a complete presentations and description of the e-learning platform. A short user manual was create where all necessary steps were described (how to access, log in, view resource and homework, upload files for a homework in preliminary version, view feedback, modify homework files and upload them in final version for grade). After first laboratory meeting, each student from our first group received authentication details by e-mail and laboratories structure. Our second group attended classes in traditional way with no e-learning support. Their material was on paper and homework task were resolved and send as attachments by e-mail.

3. Results and Discussions

Using this platform improved professor-student communication and increased students satisfaction for courses. Another encouraging aspect was that this approach (with the e-learning platform) changed a lot students perception regarding homework and their importance in the educational process. Comparing the two situations, some remarks can be made. In traditional way students had to register to the faculty secretary and attend courses and laboratories, using printed resources and submitting homework by e-mail. In this case, from all students, a number of 83% attended classes while 17% were absent (Figure 1 a.). In the other case, when using an e-learning platform, students had to request by e-mail to register to this course to receive authentication details. They used electronic resources and courses and homework were submitted via platform (first in preliminary version, then in final version after receiving feedback). The attendance percentage is significantly higher, 96% of students attended classes while 4% were absent as presented in lower figure (Figure 1 b.).
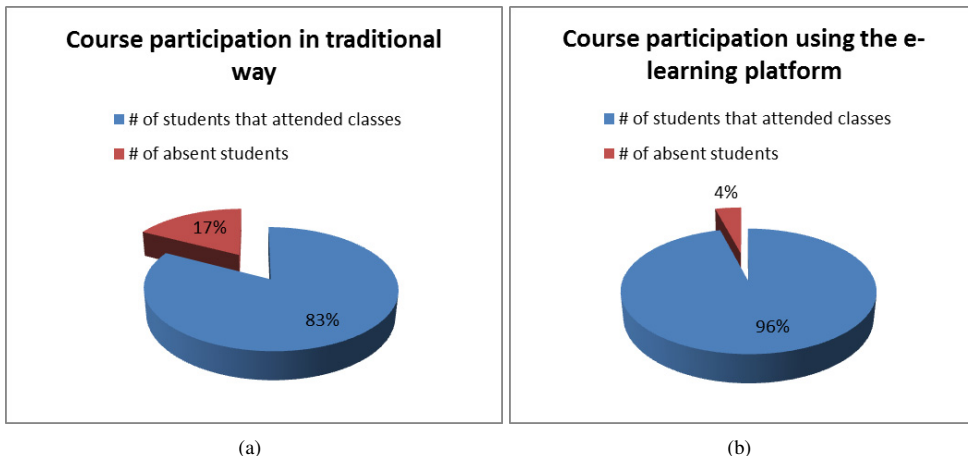
Fig. 1. Course participation in both situations (traditional and e-learning)

Comparing these two approaches, differences are not notices in terms of number of presences and absences from total face to face meetings (Figure 2). In both situations, a percentage of 62% of presences and a percentage of 38% of absences were recorded for laboratories. Weve expected to obtain a higher percentage of absences from laboratories when using e-learning but it seems that students interest does not decrease after adopting this platform for laboratories activities.
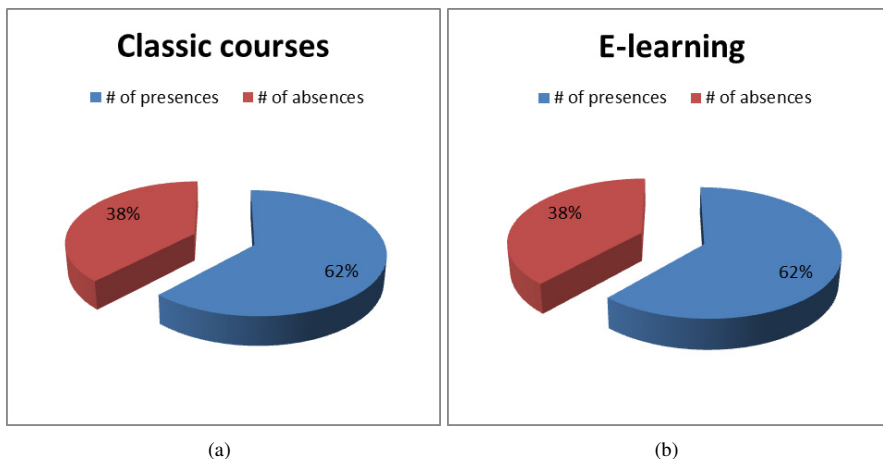
Fig. 2. Evidence of presences and absences

In terms of security, we observed that a user logout option is used increasingly less. Most of the participants chose not to sign out after using the platform. We consider this choice as a result of using personal computers and most of the time their behavior is to close the browser without signing out. This situation is widespread among students for all kind of platforms that use a user authentication interface.

In the analyzed situation, we have counted a number of 3169 user login actions and only a number of 1013 user logout actions (Figure 3). It means that only 24% of users activities were finished with logout. In terms of authentication succeed, a percentage of 83% was recorded, login error being 17% (Figure 4). We consider that error rate is generated by human error or by copy/paste solution using an extra space. For example, authentication details (user and password) are received by e-mail and in a copy/paste operation, the password received is selected from e-mail
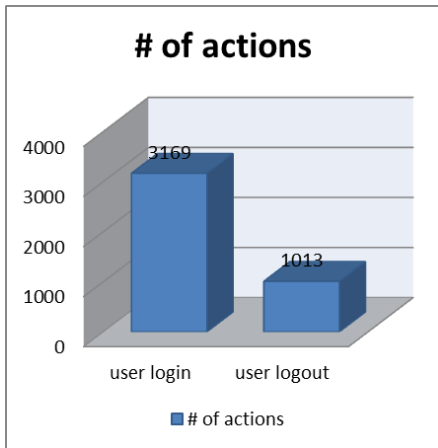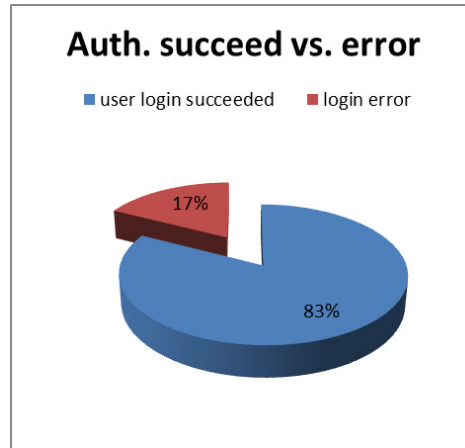
Fig.3. User login vs. User logout

Fig.4. Authentication succeed vs. error

and pasted in platform as password (with one extra space). Regarding platform visits during semester, we observed a high access during course period in March-April-May (Figure 5 a.) but their interest for the course does not end with course end, and resources were accessed even after course completion (Figure 5 b.). So, this platform is good because the professor-student communication does not end with course finish and final grades.
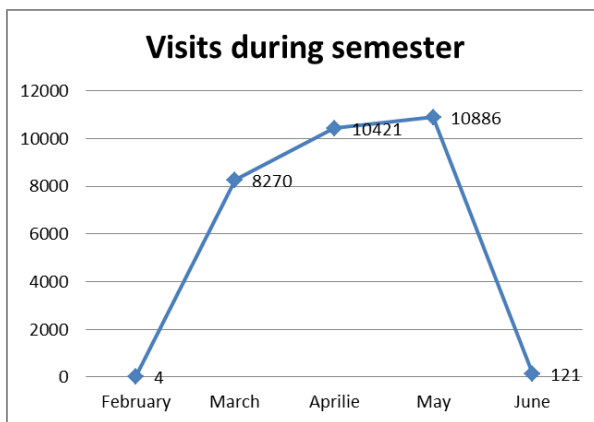
(a)
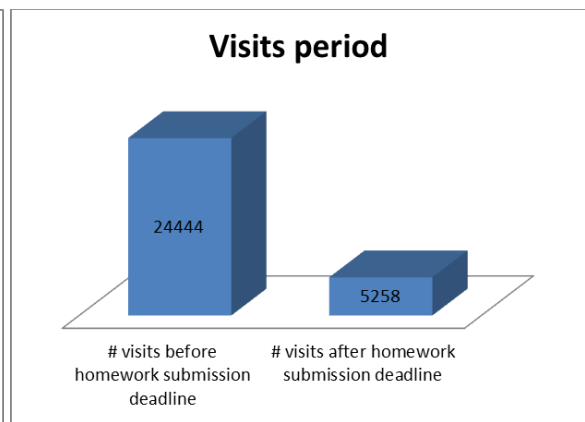
(b)

Fig.5. Visit statistics

Platform has proved useful in homework submission actions. A high number of homework was submitted using Moodle comparing to classic way of submission by e-mail (Figure 6). Difference is very significant, using e-mail to submit homework resulted in 38% of submitted homework from total amount of homework while using e-learning platform to submit homework resulted in 84% of submitted homework from total amount of homework.

Using the e-learning platform had an important role in course communication, group development and homogeneity. As previously pointed in (Benta, Nitchi, Suta & Pop, 2011)[2], where are mentioned the stages of group development best described in (Tuckman, 1965)[7] that proposes four stages for the group development, defined and coined as forming, storming, norming and performing, in this case the group reached faster performing phase. In this phase, results were quick visible and the members were task oriented with few or none interpersonal conflicts. Students were interested by their group structure and colleges. On average, each student viewed the course colleges list for 5.41 times (509/94 - Figure 7).

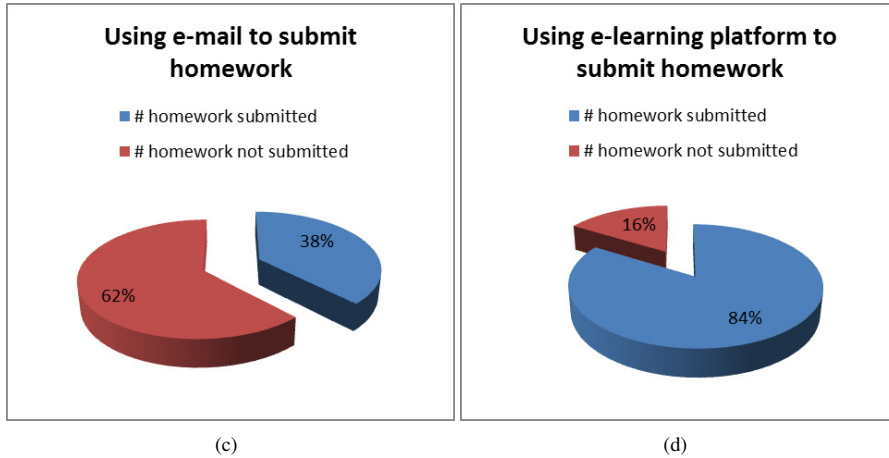(c)   (d)

Fig.6. Submit homework in traditional way (e-mail) and using platform (e-learning)
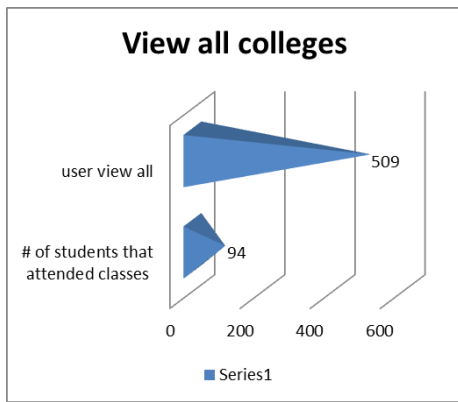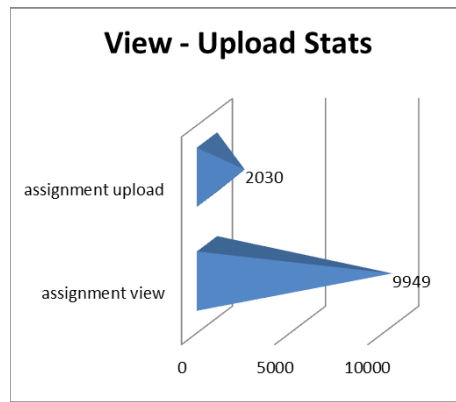

Fig.7. View all colleges

Fig.8. View homework vs. upload homework

Homework sections proved to be the most accessed and an assignment upload action (homework send) was performed after an average of 4.90 assignment view (homework view) as described in Figure 8 (9949/2030). Next observation is on percentage of students that chose to change their random generated password received on e-mail at course registration. Only 7% of total created accounts changed their initial password (Figure 9). This action was performed because most of the students use personal computers and save their password in browser to automatically log in for next visits.

Not all of the homework tasks were similar, in some cases students were asked to resolve some task with no support, in some cases after watching a demo and in some case to stimulate creativity. For example, in a task they had to create an application using Yahoo! Pipes but they received no support only an on-line link with tutorial. In this case, they were stimulated to search similar on-line resources and to access e-learning platform link to successful complete the task. The ratio between URL view (with a short tutorial for homework) and assignment upload action (homework submission) was recorded at the rate of 1.49 to 1 (Figure 10) the tutorial was accessed 1.49 times to successful resolve and submit the related homework task. Applying an e-learning solution guides students to search accurate and useful on-line content. Some studies about giving students incentives to do homework and to improve their performance were performed by (Radhakrishnan, Lam & Ho, 2009)[5].

Finally, this perspective proved to influence students grades (Figure 11). Students that obtained higher grades accessed more frequently the platform while students with lower grades accessed less frequently the e-learning platform.
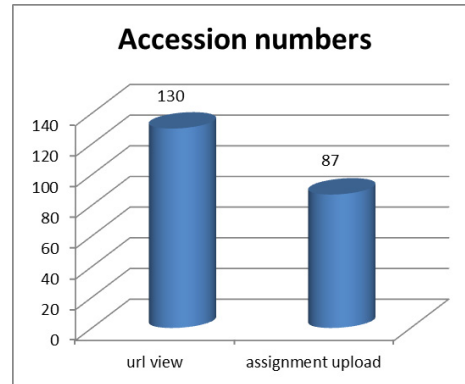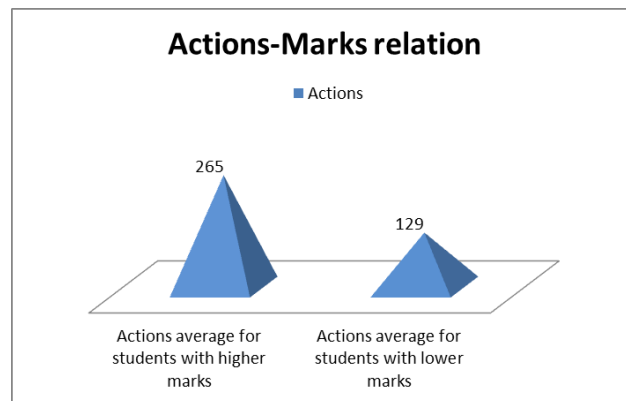
Fig.9. Password change

Fig.10. Tutorial access

Fig.11. Actions-Marks relation

4. Conclusions and Future Works

We consider that from this perspective, we managed to and to allocate more time and resources for the course. It also stimulates their creativity and spirit of responsibility as their major objective was to resolve and submit correct homework respecting the deadline. It was for the first time when at our faculty we used such an e-learning platform. We intend to use this approach for future courses and extend using e-learning at university for each faculty and department.

Using this platform was a real challenge that changed students perceptions about homework and their importance. Students proved to be more receptive and wiling to solve more complex homework. An e-learning platform is also a proper solution that helps in class management and avoids potential errors in identification of homework senders real name (as happened many time in via-email submissions). From this experience, we can conclude that using Moodle at classes as e-learning platform is very efficient and increases students interest for laboratory activities and homework.

For our future work, we intend to use an eye tracking system to identify first perceptions of students when accessing an e-learning platform and sections of the course resources that are first observed.

Another interesting aspect is to identify and classify students preferences in order to create homogenous groups according to their perceptions of homework and educational process. From such an analysis we can determine relevant characteristics that may influence, for example, delays in homework submissions. A Reference Class Forecasting approach may be used.

Acknowledgments.

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