

# E-learning Development through the Course Management Information Systems

KARMELA ALEKSIC-MASLAC

ICT Department

DINA VASIC

ICT Department

MIRNA KORICAN

Management

Zagreb School of Economics and Management

Jordanovac 110, Zagreb

CROATIA

[karmela.aleksic@zsem.hr](mailto:karmela.aleksic@zsem.hr)[dina.vasic@zsem.hr](mailto:dina.vasic@zsem.hr)[mirna.korican@zsem.hr](mailto:mirna.korican@zsem.hr)[www.zsem.hr](http://www.zsem.hr)

**Abstract:** - At Zagreb School of Economics and Management (ZSEM) we use a combination of traditional teaching with intensive use of e-learning. Each teacher is required to develop e-learning course in accordance with default 11 standards developed by the e-learning group. In this way at ZSEM we currently have about 1,100 students and about 120 advanced e-learning courses. Management Information System (MIS) Course students at ZSEM take in 7th semester. In this paper we will show how to connect all the elements of Course Syllabus with e-learning system: online tests, discussions, WebCT activities, exercises, etc. Special attention is given to group projects and ability to project groups to jointly discuss, submit weekly reports and to project documentation within the LMS system. The research will show whether there is a correlation between the activities of students in a closed discussion among project groups and final grade.

**Key-Words:** - discussion, project, e-learning, student activity, information and communication technologies, learning management system

## 1 Introduction

Since its founding in 2002, Zagreb School of Economics and Management (ZSEM) has used a number of advantages that carries the introduction of new technologies in the process of education [1]-[3]. We use hybrid model of education - classical teaching with intensive use of e-learning. [4, 5] At ZSEM is loaded systematic use of e-learning, which means: [6]

- E-learning is an obligation for all teachers and students. Every professor is required to develop his own course in e-learning format by default standards and update it regularly. Students are required to check all the courses and news at e-learning system on daily basis.
- For all courses there is used the same Learning Management System (LMS), which is WebCT. [7]

In order to track the quality of the developed e-learning courses, e-learning group has developed 11 standards that can be divided into three groups: static, dynamic and administrator standards. [8, 9]

There is currently developed around 120 e-learning courses. In this paper we will analyze the course Management Information Systems (MIS), which is among the leading courses in the quality ranking of developed e-learning courses with 95 of maximum 100 points.

## 2 Description of the course MIS

Course Management Information System is a regular course at the Zagreb School of Economics and Management and is taught in the 7th semester. Among this course students get acquainted with the basics of information system (IS) and Enterprise Resource Planning Systems (ERP). At Table 1 is shown Course Syllabus.

Regular Syllabus Elements	
Exam 1	12%
Exam 2	12%
Exam 3	12%
Case	14%
Exercises	5%
Project	20%
Class Activity	5%
Final Exam	20%
Additional Activities	
Student Presentation	5%
Forum 1 Activity	5%
Forum 2 Activity	5%
WebCT Activity	
Online quiz	

Table 1 Course Syllabus

## 2.1 Online Exams

During the semester there are held 3 online exams and each exam carries 12% of the total grade. The test usually consists of 15 questions; each question has 5 possible answers - of which only one is correct. Correct answer carries 5 points, and incorrect -1 point. (Figure 1)

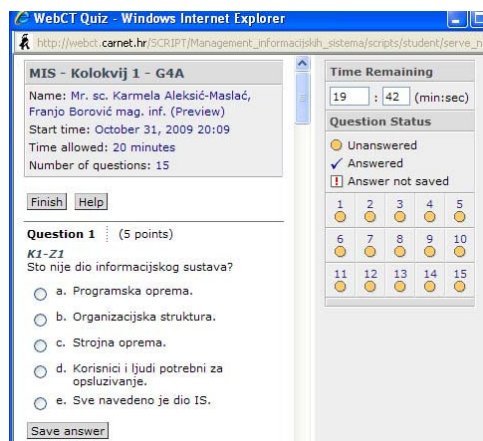


Figure 1 Online quiz

Online exam is held in a computer classroom and after the exam students can immediately see their results and get the feedback. [10] How to make students better prepared for the mid-term exam, they can check their knowledge with example online simulation exams. Since these exams are designed for learning, they can be accessed more often and their duration is much longer. Unlike regular student group, PTS (Part Time Student) students are solving mid-term exam remotely. [11]

## 2.2 Project

The project is done in groups of 4 or 5 students, and all projects are different. Project teams, for the opening presentation, should prepare and explain the theme of the project, select a project manager, and make the distribution of work within the project team and define timeline. Each project team is required once a week, by a certain deadline, to submit a report on the project through that week and make a presentation that should be presented at the lecture. In this way we can continuously monitor the project progress and in joint presentations and discussions with other project teams, students can get new ideas on how to make a better project. All members of the same project team are connected at WebCT in closed group discussion that can only be seen by members of the group. In that group, there is done a regular submission of weekly reports and at the end of the project - documentation. All deadline's are registered so that the lecturer can easily see whether they exceeded the time limits to provide certain deductions. Inside the closed discussion groups, students regularly communicate and jointly participate in the

project and make decisions. At the end of the semester all projects are about to be presented. On total project percentage; the project quality, project presentation, and each deadline exceeding (punished among negative points) are affecting.

## 2.3 Exercises

Exercises are individual and students hand them on through WebCT, folder "Assignments". At one place lecturer can immediately see a list of all submitted assignments, and details about the status of the exercise - whether it is delivered on time, whether it is corrected and the final grade (Figure 2). When exercise is corrected, student automatically receives feedback with a comment about the exercises and the final grade.

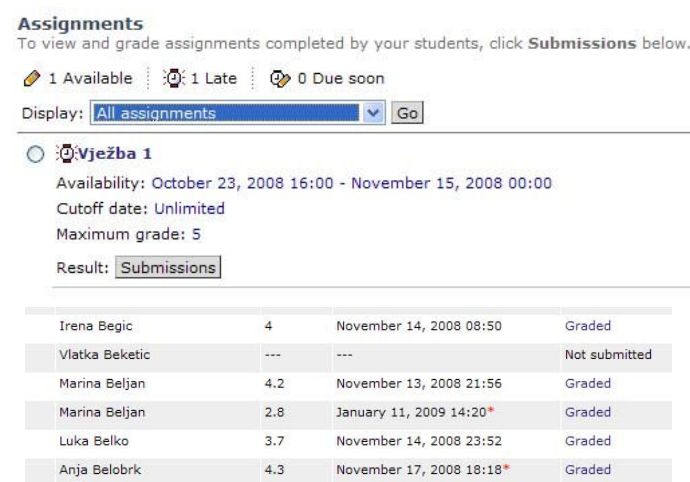


Figure 2 Assignment – designer view

## 2.4 Other Required Elements

Cases take 14% of final grade. It consists of various cases that are analyzed in groups among class. During the semester, usually there are processed 6 or 7 different cases that encourage teamwork. Class attendance is mandatory and is not extra rewarded, but for instance - the student activity among class is rewarded.

The next chapter will specifically analyze the online activity.

## 3 Online Activities

### 3.1 Opened and Closed Discussions

Particularly important part of any e-learning systems are discussions. [12, 13] In paper, "Important role of Asynchronous Discussion in e-learning system", the authors define the open discussions that are optional and are not related to teaching materials and closed discussions that are related to teaching materials; and can be a professor-student and student-student. [14] In discussion teacher-student, teacher is the moderator. As

the literature encourages student discussion because of a balanced level of knowledge [15] in closed professor-student discussions – professor is the one who opens the discussion, and students are mutually discussed. It is interesting that the same students more motivated to participate in discussions among the 1st rather than the ones in the 7th semester.

General closed student-student discussion in this course didn't seem to be interesting, and among them were opened only a few topics. However, students were active in the second group of closed student-student discussion, among their project teams.

A special part of the additional online activities are quiz-questions in the field of MIS and new technologies that are set by professor in addition to motivate students to regularly visit e-learning course. The first student who correctly answers the question gets additional points. Table 2 shows the participation of students in certain discussions that are used in the MIS course. Closed professor-student discussions and elementary student-student discussions are quite underdeveloped in relation to the discussions in first semester of courses in ICT and Sociology [16]-[18], course and only 16.7% and 6.2% students participated in them. However, among MIS course there are highly developed closed discussions within the project group and 58.6% of students participated in these discussions. In open discussions largest percentage took quizzes with 13%.

<b>Closed Discussions</b>	
Professor-student	– 16.7%
Student-student	
Elementary	– 6.2%
Project Groups	– 58.6%
<b>Opened Discussions</b>	
Professor-student	
Quiz	- 13
Student-student	– 9.3%
Student-professor	– 12.3%

Table 2 MIS Course Discussions

### 3.2 Online Activity Results

In Table 3 there is shown distribution of online activities among MIS Course. [11]

Online element	Average	%
Homepage	149.99	24.6
Organizer Page	71.28	11.7
Assignment	18.46	3
Online quizzes	25.78	4.2
Calendar	35.03	5.8
Mail	7.30	1.2
Other	67.53	11.1
Discussions	234.05	38.4
Passive discussions	226.21	
Active discussions	6.85	
Original	0.99	

Table 3 Online Activities Distribution

38.4% of clicks counts on the discussion, and most of them are passive. In the active discussion a student writes a post, while in the passive discussion they only read the discussion post, with no replying. After the discussion there comes a homepage with 24.6% of clicks and organized and various other pages with about 11% of a clicks. Other elements take less than 10% of clicks (Figure 3).

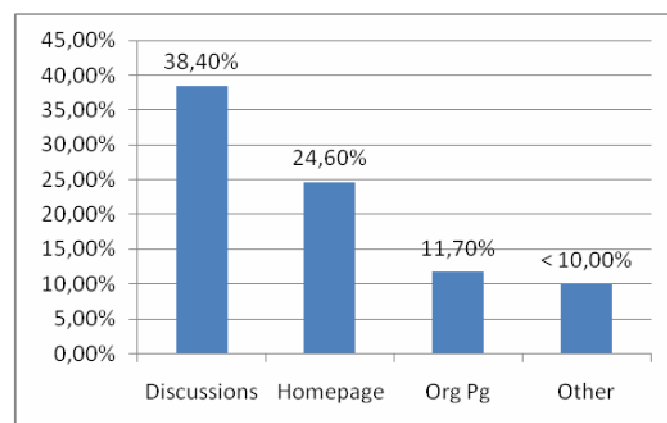


Figure 3 Online Activities Distribution

## 4 Research Results

### 4.1 Hypothesis

For our research we proposed three hypotheses.

1. Results will show statistically significant correlation between online project group activities on the WebCT discussion and points that student received for the group seminar. Also, we expect statistically significant and positive correlation between online project group activities and final grade for the course.
2. Analysis among three groups of students – inactive, medium-active and super-active – will show statistically significant differences in the final grade

for the course and final grade/points for the project.

3. We expect that individual online activity on WebCT closed project discussion will not be correlated with final grade in the project and final grade for the course.

## 4.2 Results

To test the first hypothesis, we used Pearson correlation coefficient and correlated students' results (N=158) for online group activity (summed activity of all group members per different groups of students), grades for the project and grades for the course. Results showed that made hypothetical assumptions are proven and that there is a significant correlation between online group activity with grades for the project and course. We can assume that students who are more motivated will spend more time with their team members on the online discussions and also get better grades in the project and the course.

	Online group activity	Grades for the project	Grades for the course
Online group activity	1	0,234**	0,164*
Grades for the project	0,234**	1	0,629**
Grades for the course	0,164*	0,629**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 4 Correlations – group activity and grades

Since we wanted to find out if we can draw more solid conclusions, we decided to group students according to their online group activity result. The least active were put in the group of inactive students, ones that were active intermediately were grouped in the medium-active students. The most active students were grouped in the super-active group.

		N	Mean	Std. Deviation	F
for the project	Inactive	45	11,29	3,95	99,396**
	Medium-active	58	16,59	1,76	
	Super-active	55	18,07	1,32	
for the course	Inactive	36	2,89	0,95	28,170**
	Medium-active	55	3,73	0,93	
	Super-active	55	4,38	0,91	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 5 ANOVA

Since ANOVA showed that there is statistically significant difference among the student groups in final

grades for the project and for the course, we can accept our second hypothesis. It seems that activity in online WebCT discussions can be a good predictor for the future in terms of grades.

As expected, third hypothesis was accepted because correlations among personal student online activity on the WebCT discussions and grades for the project and course did not show significant. As expected, to obtain good grades on the course students need to be active in teams and be proactive in working online.

	Online personal activity	Grades for the project	Grades for the course
Online personal activity	1	0,073	0,012
Grades for the project	0,073	1	0,629
Grades for the course	0,012	0,629	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

Table 6 Correlations – personal activity and grades

## 5 Conclusion

E-learning offers many possibilities for motivation of students to be more active in their education process. This paper offers the Management Information Systems course analysis, which students take on Zagreb School of Economics and Management during 7th semester, and it shows connection between students active participating in close discussion groups and their final grade.

Based on student evaluation feedback, and with willing to motivate students for active participation during classes, there are certain changes in Syllabus every semester. In accordance with this, we canceled one mid-term exam in generation 09/10, and the greater grade was given to projects, which now participate in 30% of final grade. The news is that students, from now on, must manage their projects through the MS Project application. As it was in past years, all projects will be presented during lectures, and at the end of the semester, we will organize a large student conference under the title „First MIS student conference“ where students will have chance to present top 5 projects of this class in front of the field experts, professors, and other students. This will be good opportunity for students to gain experience in publishing of professional and scientific work, and also a great chance to introduce themselves to experts from leading companies from the field of ERP and information systems. Of course, contest by itself, is additional motivation for all students to create and publish a better project.



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