Correlation Between the Activities in the Online Course for Education and Online Course for Educational Support

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Abstract

Quality management forms an important part of every e-learning system. Ever since it was founded in 2002, the Zagreb School of Economics and Management (ZSEM) has systematically been using e-learning in its teaching programs. All courses have been developed for e-learning platforms, and using e-learning system was made obligatory for teachers and students alike. All courses use a common Learning Management System (LMS). In order to ensure the quality of e-learning at ZSEM, over 200 e-learning courses are constantly being gauged by a yardstick of eleven standards that ZSEM itself has developed. The standards, divided into 3 modules, measure the quality of the static content, the constant communication between students and professors, and the updates of students in the database. This paper shall analyze as to whether there exists any relationship between the activity level of the students and lecturers engaged in mandatory curricular e-learning courses, and the activity level of those students and professors in the courses from the same LMS that has been developed so as to offer educational support.

Keywords: *E-learning, quality, Learning Management System, Online courses, Activity.*

1. Introduction

Quality management is an important part of every e-learning system [1], regardless of whether the analysis is undertaken from the viewpoint of the user [2]-[4] or the instructor. [5]-[7] In a paper titled „Quality Standards in E-Learning: A matrix of analysis", Frydenberg conducts an analysis over 9 standards relevant to the e-learning system.[8] We shall conduct an analysis of the 4th standard "Instrucitonal Design and Course Development", by using the Zagreb School of Economics and Management (ZSEM) as an example. [9] [10].

Zagreb School of Economics and Management (ZSEM) is thoroughly using the e-learning systems in its teaching practice ever since its inception in 2002. This means that the professors are obliged to regularly develop new content, and regularly maintain communication with the students. Alternatively, the students are required to regularly follow all the information feed in the e-learning course itself. Besides, it is very important that the same LMS (Learning Management System) gets used in all the courses. Extensively used at ZSEM in the period 2002-2011, the WebCT [11] was discontinued thereafter. For that reason, the ZSEM has decided to migrate to LMS Blackboard [12] [13]. So far, we have developed around 200 e-learning courses at both undergraduate and graduate levels, as well as in domain of educational support.

2. E-learning system at ZSEM

2.1 Measuring quality of the e-learning course

In his research, Janossy suggested the so-called „level-model" for measuring the quality of the developed e-learning courses [14], with the model consisting of 5 different levels: level 0- an inexistent e-learning

course; level 1 – systems used only for teaching content; level 2 – communication within the LMS; level 3 – test models; level 4 – advanced models development. [10] In their paper „E-Learning Course Development – Quality Standards" [9] the authors have developed a similar model, consisting of 11 standards earmarked to measure quality of the already developed e-learning courses. Level 0 of the Janossy's model is immaterial in the ZSEM setting, because all the courses have already been developed in an e-learning form. The rest of the courses have been developed as separate, independent standards that can be divided into three modules: static, dynamic and administrative (Figure 1).
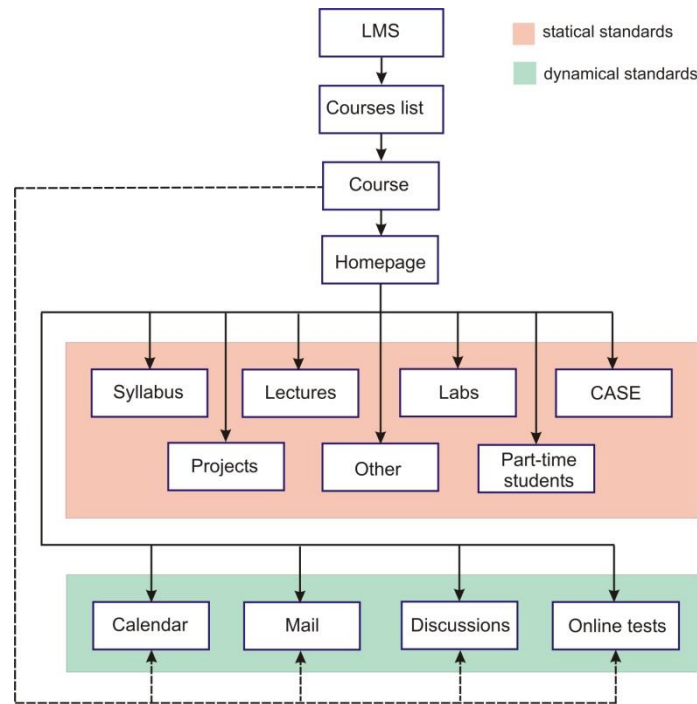

Figure 1. The structure of the e-learning course.

Static standards are related to a mandatory part of the e-learning course, which is updated regularly, even though it is not directly linked to the communication between professors and students. It encompasses the following aspects: Design as well as look and feel of the website; Syllabus that is updated regularly at the beginning of the semester, and placed on the top of the title page; Folders with lectures; Exercises; Case studies; Projects; etc. The static standards were the first things to have been developed in the making of certain courses. The dynamic standards are tied to the communication among professors and students, and they can be reached through the hyperlinks that appear as news headlines on LMS. These include discussions, on-line quizzes, calendar of events, e-mail, announcements, etc. Administrative standards pertain at questions as to whether lecturers regularly update student databases, and the like. As such, they are unrelated to student evaluations. However, there exists nevertheless a correlation between student evaluations and administrative standards: Lecturers who more frequently converse with students and take more active part in the e-learning system are generally more successful in the maintenance of students' database. [10]

2.2. Complementary e-Learning Courses
In their paper "Correlation between online course quality and student activity in the courses" the authors have shown that the students are more active when attending courses that have been given more attention on the part of the professors, as well as those courses with better evaluation rankings [1]. Given that the use of e-learning systems is mandatory for all the students and professors, it was only logical to provide e-learning courses for educational support. The question arises whether both the professors and the students are equally active in the non-curricular e-learning courses designed to offer educational support. It is also important to mention that these courses are entirely online. Following is a more thorough description of

the two courses designed to offer support for professors: "Research and AOL," and "Teacher and Administration Notice-board" as well as "Student Notice-board".

2.2.1. E-learning course "Research and AOL"

The rationale for this course was first and foremost to prepare the faculty members for the requirements arising from AACSB accreditation (The Association to Advance Collegiate Schools of Business). Accordingly, the course is used for Research and AOL (Assessment of Learning). The course is dominated by a differentiated static content, such as information on projects, calls for journal publications and conferences, as well as all kinds of information on intellectual contributions. Among the dynamic elements, announcements, assignments and on-line quizzes are most widely used. Assignments element is used for submission of updated biographical data; here, a professor may take down the last version of his or her CV, and then at the beginning of a new calendar year, he or she may submit an updated version. After the deadline, the assignments element closes down, and the analysis of the submitted CVs commences. It is important to point out that during the preparations for the visit of AACSB Peer Review Team, ZSEM staff was extensively using online quizzes for simulation, which allowed the professors and the administrative staff to test their knowledge.

2.2.2. E-learning course "Teacher and Administration Notice-board "

This course is used for the auxiliary internal communication between the professors and the administrative staff. It includes the calls of International Office for cooperation, Career Centre-provided information on various workshops, Student Assistance Service-provided information on examination dates, course schedules, etc.

2.2.3. Course "Student Notice-board"

The Student Notice-board was in the first phase designed so as to provide communication between the student guides and the students themselves. The course is very dynamic and it grows on daily basis, replete with numerous modules that are constantly being added. Via this on-line course, students have the opportunity to find all the information, such as that arriving from the Student Assistance Service, information on a highly developed international cooperation, various internships offered to students, student membership clubs, etc. Usual features of these courses are various student surveys. Announcements are most widely used among the dynamic elements.

3. Research

According to the established standards, ZSEM gauges once a year the quality of the developed e-learning courses. Feedback is then sent to the professors-designers, who then present the results at Faculty meetings. Figure 2 shows the quality attained among the e-learning courses in last three years. Average grade is 76.4 in core course and 51.84 in elective course. In this figure, the continuous growth of e-learning core courses quality is evident. [9]
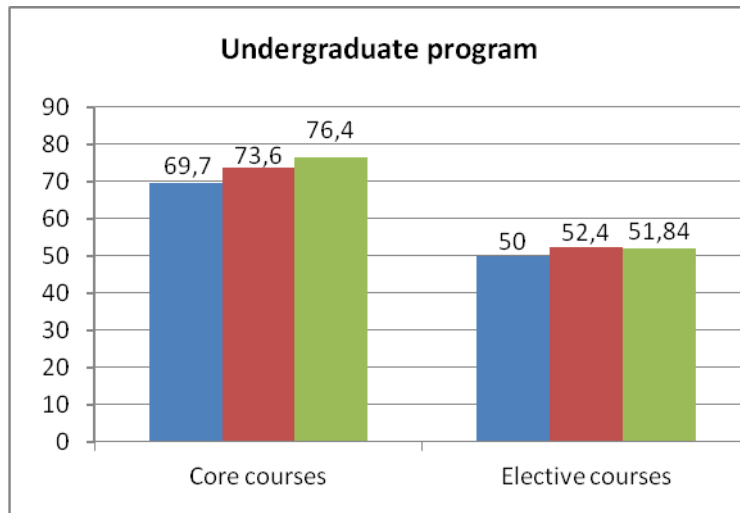
Figure 2. Evaluation of course quality in last three years.

Figure 3 shows the average number of hits in the period between 1 September 2013 and 12 February 2014 for three support courses included in the analyzed. These hits are in fact the total number of mouse clicks on any content within the support courses developed on Blackboard. For example, it includes mouse clicks on announcements, calendar, messages, discussion, etc.
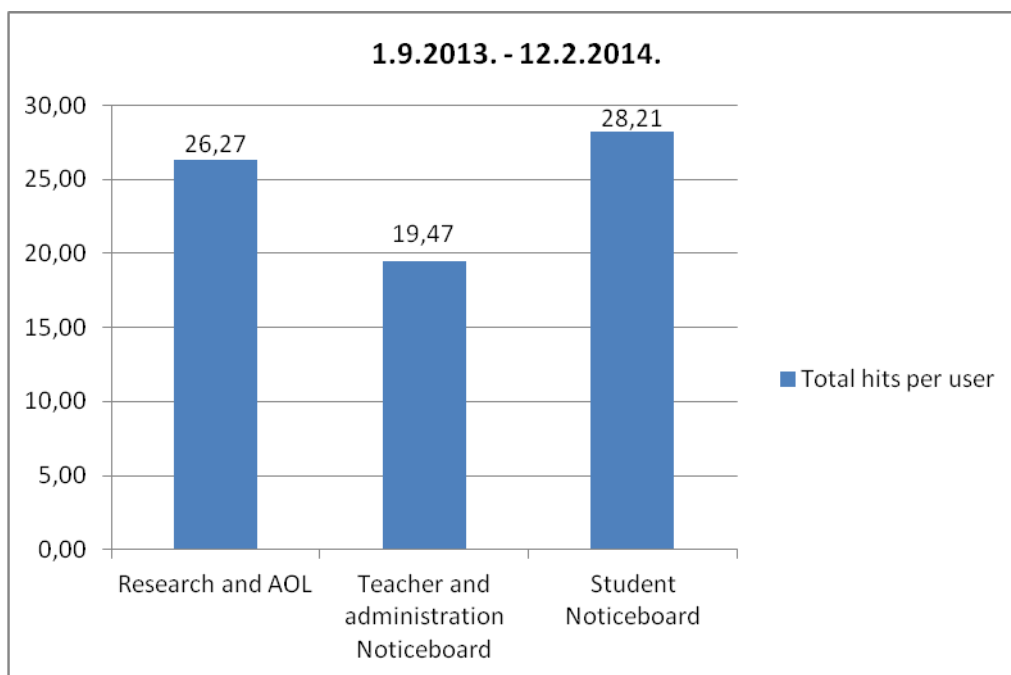

Figure 3. Number of hits on the support courses included in the analysis.

The analysis show that the professors are far more active in the courses related to research and science, than in the courses related to general information, while the students are on average more active than their professors.

Courses assessed by the authors can be divided into two groups:
1. Mandatory courses for all the students, which form part of the ZSEM curriculum and study programs,

2. Support courses designed so as to inform students about the events at ZSEM, to inform the professors on news and intellectual contributions on the part of the staff, as well as on the new projects, calls and invitations to conferences, etc.

Within the group of curricular mandatory courses, two stand out for being ranked as the best in the quality evaluations of the developed on-line courses. These courses are taught in freshmen and senior years, which renders the observed sample as relevant. Besides on-line part of courses we have been analyzing, it is important to mention that the courses involved are hybrid which means they are not entirely on-line. They all have classroom lectures as well. These courses are, namely:
1. Information and Communication Technologies (ICT) – taught in 1st semester [15]
2. Management of Information System (MIS) – taught in 7th semester [16]

Among the group of on-line support courses these three were selected:
1. Student Notice-board
2. Teachers and administration Notice-board
3. Research and science course

Table 1 summarizes the average number of hits by students enrolled to various courses. As expected, students have shown a significantly higher level of activity in the courses included in the curricula, than in other courses. The ratio of mandatory to support courses is 4:1.

Table 1. Number of hits by students in various courses.

	ICT and MIS	Student Notice-board
Total hits of students in given period	**51 418**	**12 116**
Average hits per student	**140,49**	**33,10**

Table 2 shows the average number of hits by professors in various courses. Professors are at least 10 times more active in the curricular courses they teach, than in the support courses.

Table 2. Number of hits by professors in various courses.

	Their own courses	Teacher and administration Notice-board	Research and science course
Total hits of professors in given period	**13 602**	**944**	**1322**
Average hits per professor	**251,89**	**17,48**	**24,48**

4. Results of the statistical research

This research includes the analysis of the total number of hits by students and professors in the selected courses included in the LMS Blackboard. Analyzed data was derived from a general report generated by Blackboard, pertaining at the period between 1 September 2013 and 12 February 2014. Mandatory courses included in the ZSEM curricula have been executed within the cited period, and the sampled students and professors have been actively taking part in the courses.

The following two hypotheses were posited:
1. Students who are more active in the mandatory curricular Blackboard courses are at the same time also more active in the Blackboard courses devised to offer support and additional information.

2. Professors, who are more active in Blackboard courses they teach are at the same time also more active in the Blackboard courses devised to offer support, transfer of information and provide news on intellectual contributions.

4.1. Testing of the First Hypothesis

The Authors supposed that the students, who are more active in the ICT and MIS courses, are also far more active in the Student Notice-board course. In order to test the first hypothesis, the Pearson's correlation coefficient has been used on the sample of 366 students, who had actively taken part in the aforementioned courses.

Table 3. Correlation between the total number of hits by students enrolled in ICT and MIS courses, and the Student Notice-board support course.

Correlations

		OPS_total_hits	ICT_MIS_total_hits
OPS_total_hits	Pearson Correlation	1	,460**
	Sig. (2-tailed)		,000
	N	366	366
ICT_MIS_total_hits	Pearson Correlation	,460**	1
	Sig. (2-tailed)	,000	
	N	366	366

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

The results of the comparison of the total number of hits on ICT and MIS courses, and the total number of hits of the same sample of students on the Student Notice-board, show a statistically significant correlation. The level of confidence is up to 99%, given that the significance level is 0.000. Therefore, there exists a correlation between the total number of hits, which means that students, who are more active in the ICT and MIS courses, are also more active in the Student Notice-board.

4.2. Testing of the Second Hypothesis

In order to test the second hypothesis, we must compare the total number of hits by professors in the courses they themselves teach, in the Research and Science Course, and on the Teachers and Administration Notice-board. A total hits taken from a sample of 54 professors, who took active part in all the three courses shall be compared. We shall also use the Pearson's correlation coefficient, which will help us to arrive at a correlation between individual courses.

Table 4. Correlation between the total number of hits by professors in the courses they themselves teach, in the Research and Science Course, and on the Teachers and Administration Notice-board.

Correlations

		COURSES_total_hits	AACSB_total_hits	OPNA_total_hits
COURSES_total_hits	Pearson Correlation	1	,626**	,365**
	Sig. (2-tailed)		,000	,007
	N	54	54	54
AACSB_total_hits	Pearson Correlation	,626**	1	,690**

	Sig. (2-tailed)	,000		,000
	N	54	54	54
OPNA_total_hits	Pearson Correlation	,365**	,690**	1
	Sig. (2-tailed)	,007	,000	
	N	54	54	54

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

The results of the analysis lead to a conclusion that there are significant correlations between individual hits on the e-learning courses. Professors who took a more active part in the courses they teach have also been more active in the support-oriented Research and Science Course, with the level of confidence of 99%, given that the level of significance is 0.000. In accordance, professors who more actively participate in their own courses are also more active in the course Teacher and administration Notice-board, with the level of significance of 0,007, which also represents the confidence of 99%. Finally, if we compare activities of the professors in the course Research and Science Course and the Teachers and administration Notice-board, we can observe a significant correlation between the hits, with the significance level of 0,000. From the aforementioned correlations we can arrive at the conclusion that professors who take more active part in their own courses are also more active in the courses not related to the ones they themselves teach.

5. Conclusion

This paper has shown the research made on the basis of course reports related to student and professor activity in online courses. Based on the results, one may notice a trend of closer relationship between the activities of students and professors in mandatory curricular courses, on the one hand, and the activities in the courses designed to offer educational support, on the other. On basis of a sample of 365 students and 54 professors in the courses taught in the period between 1 September and 12 February 2014, the testing of the hypotheses posited in this paper gave us some interesting results. The testing of the first hypothesis has proven that students, who are more active in the mandatory courses, also take a more active part in the support courses. The second hypothesis testing gave us similar results for professors, which means that those professors who are more active in the courses they themselves teach, are also more active in the courses designed to offer support in education. The correlation between the two elements is considerably significant and leaves room for further research. Additional analysis could include correlation between the activities of the professors and the students within individual static and dynamic elements in the selected courses belonging to different groups.

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