

Correlation between student activities and on-line discussion

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Abstract: - Zagreb School of Economics & Management (ZSEM) is one of the few higher education institutions in Croatia that systematically uses e-learning in teaching. Systematically means that all courses are developed in e-learning form and that among all courses is used the same LMS (Learning Management System). At ZSEM there are currently enrolled around 1100 students, and it has developed around 100 different e-learning courses.

Discussions are very important part of each e-learning system. In this paper we will analyze the online discussion in the framework of the course Information and communications technologies, that are taking place in 1st semester. Especially, we will analyze the impact of closed discussions on the final grade of the student and see whether there is correlation among closed discussion and other Syllabuss parts as well as with the basic parts of e-learning systems such as quiz activity, calendar, mail or other sites.

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

1 Introduction

A very important part of each e-learning system are discussions. Through discussions, students can communicate regularly with lecturers, but also they can hold discussions among themselves. Discussion allows students to consider other people opinions and responses to them in a clear and meaningful way. Unlike the classical teaching methods that is limited to a lesson, in online way students can achieve better discussion.[1]-[3] In paper "Important role of asynchronous disussion in e-learning system" [4] there are defined open and closed discussions. Open discussion forums are intended for constant communication on optional topics. Discussions can be held between teachers and students and between students only. As opened discussions is an integral part of education there is no need for further reward for it. Open discussion includes professor-student, student-professor and student-student discussions.

Closed discussions are discussions related to teaching materials, and are intended for the active participation of students in the education process. Depending on who opens the discussion there can be a professor-student and student-student discussion.

At ZSEM we have the classic classes in combination with intensive use of e-learning.[5]-[9] As part of the course, Information and communications technologies, we do not reward students' arrivals on classes, but we do reward their activity in lectures.[10] However, some students are diffident and more difficult to occur in the group. WebCT [11] forum discussions allows this

students to be more active. In the professor-student discussion approximately every week professor opens a topic that students comment. In this way we provide an opportunity to students who are more introvert to trigger off and give their opinion.

In literature special attention is devoted to student-student discussion [12, 13]. According to Kremer & McGuiness [14], there is a small chance that an imbalance between professional knowledge among the participants in discussions (teachers and students) can contribute to an open discussion. At the same time, discussions that are lead by students, creates a special atmosphere in which students freely set of questions and confront other people opinions. Thus, in a closed professor-student discussion professor is only the one who has opened the discussion. Because of the importance of student-student discussions, we have specially stimulated and rewarded this type of discussion.

In Figure 1 is shown students activity in open and closed discussions in the academic year 2006/2007 and 2007/2008. Activity in open discussions has increased from 25% to 36.6%, in the closed discussions from 25.9% to 37.6%. Students are increasingly motivated to participate in discussions. The introduction of some news, like quiz questions [10], contributed to the significant increase in share of students in open discussions.

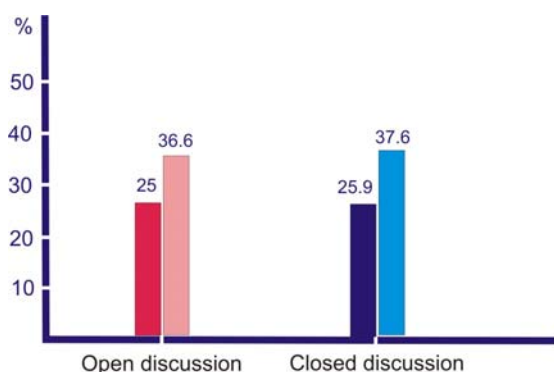


Figure 1 Distribution of students in open and closed discussions.

In his research Steimberg & etc.[15] analysed three groups of participants who took part in online discussions: active ones – participants who write messages, passive ones – participants who read messages but do not reply on them and participants who do not take part in online discussions at all. Some better LMS systems, such as WebCT have the ability of registering a passive participation in discussion. Even 95% of students were either passive or active participants in our online discussions, and on the average each student read during semester 751 post.

2 Research Methods

We conducted research to test if we can predict student’s activity on the WebCT discussion boards which is not an obligated component for getting the grade. We used a course in Information and Communication Technologies (ICT) that is thought in the first semester at 1st year of the undergraduate program. On this course we had a pull out of 250 students and we used data from their grading components and their online activity on the WebCT. These course components and online activity reports were collected during one semester period, or to be more exact, during a 15 week period of time.

Grading components	WebCT components (number of clicks)
Percentage on the first test	N of c on the Homepage
Percentage on the second test	N of c on the Organizer Page
Percentage on the third test	N of c on the Quiz
Class presence	N of c on the Calendar
Class activity	N of c on the E-mail
Class grade (in percentage)	N of c on other pages
	N of c on the discussion board (passive)

Table 1 Components used in the study

For testing our hypothesis we used simple correlation method and Multiple Regression method, and all data analysis was done in SPSS Program.

3 Research Hypothesis

Even though activity on online discussion was not a component of the grade for this class, we predicted that maybe class grade in general, and some other components of the grade will be positively correlated with this variable. Also, we were certain that some WebCT activities will be positively connected with online activity on the WebCT discussions. So, we posed three hypotheses, as follows.

There is a statistically significant correlation between student’s activity on online discussion and class activity, class presence and final grade of the student.

Student’s activity on online WebCT discussion is correlated statistically significant with online activity on the WebCT expressed through number on clicks on the Homepage, Organizer Page, Quiz page, Calendar, E-mail, other pages and number of clicks on the discussion board.

It is possible to predict student’s online activity on discussions posted on the WebCT using some grading components and components of online activity.

4 Research Results

To test our first hypothesis we used Pearson correlation analysis and correlated activity on online discussions on the WebCT with all of the grading components and final grade for the course in ICT.

	Activity - Disc	% for grade	% for Test I	% for Test II	% for Test III	Activity - class	% of class presence
Activity-Disc	1	0,426**	0,188**	0,172**	0,247**	0,237**	0,071
% for grade	0,426**	1	0,660**	0,712**	0,688**	0,177**	0,492**
% for Test I	0,188**	0,660**	1	0,518**	0,432**	0,097	0,438**
% for Test II	0,172**	0,712**	0,518**	1	0,549**	0,058	0,461**
% for Test III	0,247**	0,688**	0,432**	0,549**	1	0,106	0,457**
Activity-class	0,237**	0,177**	0,097	0,058	0,106	1	0,155**
% of class presence	0,071	0,492**	0,438**	0,461**	0,457**	0,155**	1

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

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

Table 2 Correlation matrix for activity on discussions and grading components

As we predicted, activity on the WebCT online discussions was statistically positive correlated with class activity ($r=0,234$), final grade of the student ($r=0,426$) and all written tests (rtest I= $0,188$, rtest II= $0,172$, rtest III= $0,247$). The only component that was not correlated with activity on discussions was class presence. Strongest connection of WebCT online discussions is with percentage of grade. So we can claim

that students with higher grade are in general more active on the online discussions and vice versa. Students that are active on online discussions on the WebCT for the ICT course are more like to get higher grades at the end of the semester period. Active students in class will most probably be active online, and vice versa. Also, interesting finding that active students on online discussions are ones that usually get higher grades on tests conducted during a semesters period.

In other words, if we try to provoke student's activity in the course through several components (tests, present in the class and activity in the class) we are probably motivating students to participate in online discussions.

One component of the grade, class presence, is not statistically correlated with the online activity of students. Reason for this is that this variable does not have a normal distribution. Distribution of this variable is shown on Figure 1 with histogram bars, while line is showing a normal distribution line. In average, 77% of students were visiting class lectures and standard deviation is relatively large (s=19,89).

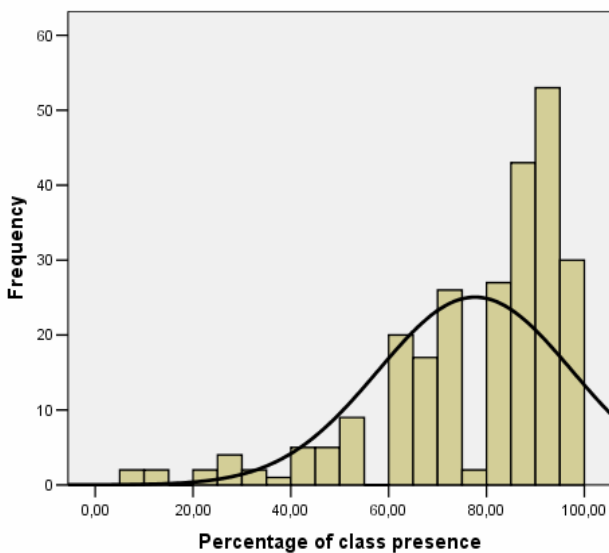


Figure 2 Distribution of the variable class presence

Our second hypothesis was that student's activity on online WebCT discussion is correlated statistically significant with online activity on the WebCT. To test it, we correlated activity on the online discussions with rest of the activities on the WebCT.

	Activity on Disc	C Homepage	C Organizer pages	C Quiz	C Calendar	C on Mail	C on Other	C on Discussion (passive)
Activity on Discussions	1	0,282**	0,346**	0,208**	0,159*	0,106	0,344**	0,469**
Clicks on Homepage	0,282**	1	0,549**	0,564**	0,501**	0,285**	0,368**	0,521**
Clicks on Organizer pages	0,346**	0,549**	1	0,403**	0,316**	0,342**	0,347**	0,461**
Clicks on Quiz	0,208**	0,564**	0,403**	1	0,410**	0,309**	0,202**	0,370**
Clicks on Calendar	0,159*	0,501**	0,316**	0,410**	1	0,064	0,447**	0,507**
Clicks on Mail	0,106	0,285**	0,342**	0,309**	0,064	1	-0,035	0,087
Clicks on Other	0,344**	0,368**	0,347**	0,202**	0,447**	-0,035	1	0,649**
Clicks on Discussion (passive)	0,469**	0,521**	0,461**	0,370**	0,507**	0,087	0,649**	1

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

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

Table 3 Correlation matrix for activity on discussions and activities on the WebCT

As the results show, activity on WebCT discussions is statistically significantly correlated with the rest of the activities on the WebCT – clicks on the homepage (r=0,282), organizer pages (r=0,346), quiz (r=0,208), Calendar (r=0,159), other pages (r=0,344) and discussion (passive looking without interaction; r=0,469). So, these results show us that students who are being active and frequently looking at WebCT platform for ICT course, either homepage or some other page, are more active at online discussions.

So, in motivating students to be more active online on the WebCT by posting materials, information in Calendar and making WebCT more interesting we can in part influence their activity in online discussions.

Only WebCT component not correlated with online activity on discussions was E-mail component. Reason for this is that this component was least used in the course (Table 4).

	Minimum	Maximum	Mean	Std. Deviation
Clicks on Homepage	0,00	1376,00	200,59	168,76
Clicks on Organizer pages	0,00	999,00	104,88	83,96
Clicks on Quiz	0,00	149,00	39,34	24,54
Clicks on Calendar	0,00	306,00	62,65	60,68
Clicks on Mail	0,00	72,00	7,06	8,77
Clicks on Other pages	0,00	804,00	61,68	110,61
Clicks on Discussion (passive)	0,00	2346,00	732,96	625,99
WebCT clicks	0,00	4475,00	1217,01	905,13

Table 4 Descriptive statistics for activities on the WebCT

As we predicted to find positive correlation among online activity on the WebCT and two groups of variables, grading components and WebCT components, we were interested to find out whether these components can predict online activity on discussions on the WebCT. To test our third hypothesis we used Multiple Regression model (Enter method) in which we inserted all variables as predictors.

Multiple regression coefficients showed rather high correlation $R=0,556$ which means that our set of variables (predictors) in the analysis is statistically connected with activities online. These predictors explain $R^2=32,1\%$ of the variation of activities online on the discussion variable. Taking into consideration that we used small number of variables and did not use any demographical variables or variables which are connected with subject's psychological results, we think that this is a good finding.

To look which variables are best in predicting online activity on discussions on the WebCT we looked at Beta – coefficient and their significance (Table 5).

	Unstandardized Coefficients B	Std. Err	Standardized Coefficients Beta	t	Sig.
(Constant)	-0,077	0,422		-0,183	0,855
Percentage for grade	0,049	0,010	0,548	4,982	0,000
Percentage for Test I	-0,054	0,043	-0,093	-1,268	0,206
Percentage for Test II	-0,105	0,046	-0,180	-2,270	0,024
Percentage for Test III	-0,013	0,039	-0,025	-0,329	0,742
Activity in the classroom	0,139	0,051	0,153	2,711	0,007
Percentage of class presence	-0,011	0,006	-0,119	-1,798	0,073
Clicks on Homepage	0,000	0,001	0,034	0,441	0,660
Clicks on Organizer pages	0,003	0,001	0,161	2,309	0,022
Clicks on Quiz	-0,001	0,005	-0,014	-0,195	0,846
Clicks on Calendar	-0,002	0,002	-0,071	-1,033	0,303
Clicks on Mail	0,003	0,012	0,014	0,231	0,818
Clicks on Other pages	0,003	0,001	0,174	2,630	0,009

Table 5 Coefficients from Multiple Regression Analysis

From the Table 5 it is visible that several variables are significant predictors of student's activity on the WebCT discussions. Those five variables are: percentage of grade, percentage on the test II, activity in the classroom, looking at organizer pages, looking at other types of pages.

In other words, students with higher grade, higher percentage on test II, higher activity in the classroom, higher number of clicks on the homepage and other pages are more likely to be more active on the WebCT discussions.

5 Conclusion

Activity on the online WebCT discussions was positively correlated with class activity ($r=0,234$), final grade of the student ($r=0,426$) and all written tests (rtest I= $0,188$, rtest II= $0,172$, rtest III= $0,247$).

Activity on the WebCT discussions is positively correlated with the rest of the activities on the WebCT – clicks on homepage ($r=0,282$), organizer pages ($r=0,346$), quiz ($r=0,208$), Calendar ($r=0,159$), other pages ($r=0,344$) and discussion (passive looking without interaction; $r=0,469$).

Variable activity on the online WebCT discussions can partially be predicted ($R=0,556$; $R^2=32,1\%$) using several variables. Those variables are: percentage of grade, percentage on the test II, activity in the classroom, looking at organizer pages, looking at other types of pages.

As it was said before, activating students in different fields and parts of course, and keeping them active during semester, can positively affect their activity on not obligatory elements of the course, such as online WebCT discussions.

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