The Role of Discussion Boards in Facilitating Communities of Inquiry: A Case of ICT and Sociology Courses at Zagreb School of Economics and Management

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Abstract: - The study focuses on the use of technology to design an electronic learning community for students. The importance of social experience in education and social participation through communication is examined through discussion boards of two different freshmen courses offered at Zagreb School of Economics and Management (ZSEM). Effectiveness and communication dynamics of discussion boards is analyzed through comparison of students' participation rates according to the topic, discussion type and quality of discussion. The focus is not on individual student learning and achievement outcomes, but on student digital interaction from a pedagogical perspective. Based on social constructivist principle and the assumption that knowledge creation is a shared, rather than individual experience, the study examines how and why online discussion represents a valuable tool for enhancing online collaborative learning experience.

Key-Words: - discussion boards, e-learning, quality, collaborative learning, online communities of inquiry, information and communication technologies, sociology

1 Introduction

Effectiveness of online learning primarily depends on interactivity. Many authors dealing with online learning environments [1]-[3] frequently point out that discussion boards are an important part of every e-learning system, since an effective online communication is „at the heart of all forms of educational interaction." [4].

Unlike the traditional, teacher-led classroom discussions which are limited in terms of time and number of participants, online asynchronous discussions enable all the students to be active and choose the conditions that best fit them. [5, 6] Besides managing their own time which helps students to create better work habits and attitudes toward learning, discussion boards provide opportunity for collaboration. Students can work together in their own artifact construction with the goal to understand and explain what they are learning. Based on long-term, interdisciplinary and student-centered activities, online discussion practices create an inquiry-based environment in which teachers are facilitators of learning rather than "vessels of knowledge." Therefore, discussion boards are valuable tools that promote understanding over knowledge and enable teachers to help students in the process of discovering knowledge themselves.

In their research, Steinberg & etc. analyze three groups of participants in online discussions: active participants that write posts, passive participants that read posts, but do not reply to them, and students who do not take part in discussions.[7] This study divides active participants into those that reply to posts and those that are moderators. Almost all LMS systems (Learning Management System) have the possibility to detect not only active, but also passive discussion participation. [8]

The study „Important role of asynchronous discussion in e-learning system"[9] the authors have defined two types of discussions:

- Open discussions – not obligatory, both students and professors can be moderators. Topics reflect different issues within class materials, but also real and relevant examples from the students everyday lives.
- Closed discussions – related to course materials and directed by professors. Besides closed student-professor discussion, the authors of the paper „The Development of the E-learning Course Sociology" [10] have also defined closed student-to-student discussions.

According to Aleksic-Maslac etc. [11] at Zagreb School of Economics and Management has developed 11 standards that measure the quality of e-learning courses. Those standards may be categorized into three groupings:

- Static – connected with the basic elements of the e-learning course: Syllabus, lectures, web layout and design (in Table 1 shown as S1, S2, S3 and S4)
- Dynamic – related to the communication between the professor and the students – discussion boards, e-mail, chat, calendar and online tests (in Table 1 shown as D1, D2, D3, D4)
- Administrative standards – involve managing the student database (in Table 1 shown as A1 and A2)

Table 1 shows comparison of those standards in two courses; Information and Communication Technologies (ICT) and Sociology. Both courses use online technologies in addition to traditional course setting and both have been taught to the same groups of students at Zagreb School of Economics and Management in the Fall semester 2008/2009. According to the notion that "a community of learners is an essential, core element of an educational experience when higher order learning is the desired learning outcome," this study compares online discussion activities of the two "communities of learners" [4] represented by students attending these two courses.

Standard	ICT	Sociology
S1 – Syllabus	10	5
S2 – Lectures	10	10
S3 – Part Time Students	10	5
S4 – Design	10	5
D1 – Calendar	10	10
D2 – E-mail	10	10
D3 – Discussion	15	15
D4 – Online tests	10	10
A1 –Students Database	5	5
A2 – Self-registration	5	0
O – Other	0	0
Total	**95**	**75**

Table 1 Distribution of quality standards for ICT and Sociology courses

During 2008/2009, total sum of the quality standards for ICT course was 95, while Sociology had 75 (using the scale from 0-100). However, according to dynamic standards, both courses have reached maximum of 45 points and were positioned on the top of the list among 108 courses that were evaluated within graduate and MBA programs at ZSEM in 2008/2009. For that reason, the study focuses primarly on the analysis of dynamic standards, and places special emphasis on the role of discussion boards in creation of communities of inquiry.

2 Closed discussions

Communication dynamics for ICT and Sociology course at ZSEM is analyzed through comparison of closed discussions in both courses. Table 2 displays discussion types depending on whether discussions are mandatory or not.

Discussion type	ICT	Sociology
Closed Professor - student	Not mandatory	Mandatory
Closed Student-to-student	Not mandatory	Not mandatory

Table 2 Discussions types

This distinction is important because similarly to traditionally taught classes, students often treat mandatory online discussion as a means to complete a particular task, rather than as an opportunity to engage in rich discussion and debate with their peers and instructors. In this sense, it is useful to make a note that although students are generally motivated to participate in online discussions, this activity must be viewed through the course organization and Syllabus prescribing such activity as obligatory or not. ICT closed discussion is optional and active students may get up to 5% of their final grade for professor – student discussion and up to 5% for student-to-student discussion. [8, 12]. Closed professor-student discussion is mandatory in Sociology class and makes 30% of the final grade while the closed student-to-student discussion is optional with maximum of 8% of the final grade. [13]

Figure 1 shows students' participation in specific discussions. 43.4% of students have participated in professor-student discussion in ICT course while having this activity as a mandatory, Sociology course had as many as 85.5% students that participated in this type of discussion. The questions in professor-student discussion were structured and included open questions such as „make a suggestion" or „propose a solution" and more

specific questions. Unlike those, closed student-to-student discussions were unstructured and optional in both courses. This is reflected in smaller percentages compared with professor-student discussion. 29.3% of ICT and 61.7% of sociology students have participated in student-to-student discussion. Although this was an optional activity, in many cases in student-to-student discussion, certain topics remained active long after the semester was done and the students had already received their grade. This exhibits change and growth in student interaction patterns over time suggesting that instructors must continually think about pedagogical structure and advantages of using technology to create a shared space among learning participants.

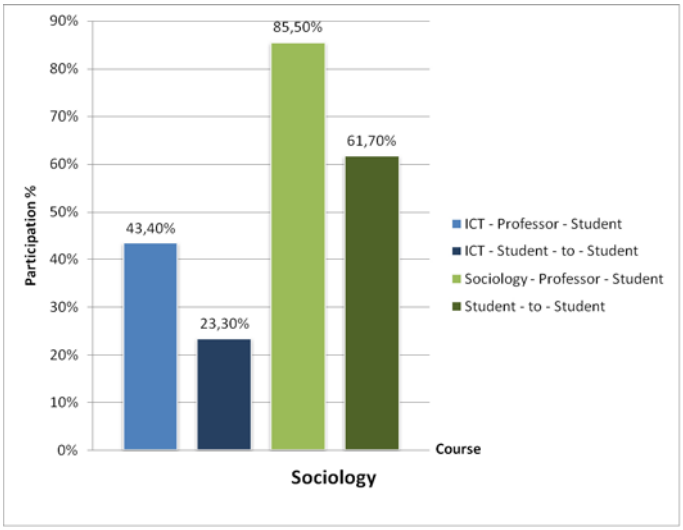

Figure 1 Student participation in the discussion

It is interesting to compare the ranking of students according to the number of posts in both courses.

Student	Active discussion participant	Passive discussion participant	Moderator
S1 (S10)	96	1113	4
S2	84	2515	2
S3 (S2)	82	1060	17
S4	78	992	1
S5 (S3)	67	420	7
S6	66	882	5
S7	57	884	0
S8 (S7)	53	2299	4
S9 (S5)	45	1395	2
S10	44	2400	3

Table 3 Ranking of students according to their discussion activity in ICT course

The same five students make up the top five most frequent participants in both courses. Although there is no significant correlation between the number of active and passive discussion [13] (see tables 3 and 4), students that read what the others have written are not necessary going to reply and participate. However, unlike those who have not been active at all, students that have been active in discussions tend to also be moderators.

Student	Active discussion participant	Passive discussion participant	Moderator
S1	145	1941	1
S2 (S3)	119	1669	9
S3 (S5)	101	499	34
S4	100	1889	11
S5 (S9)	89	1996	0
S6	78	1596	7
S7 (S8)	74	5139	12
S8	65	2983	9
S9	64	2227	4
S10 (S1)	63	1120	10

Table 4 Ranking of students according to their discussion activity in Sociology course

3 Results

The research was taken among 290 students of ICT and Sociology courses at Zagreb School of Economics and Management in Fall semester 2008/2009.

3.1 Hypothesis

1. There is bigger correlation between student activities within closed student-to-student discussion then professor-student in two different courses - ICT and Sociology.
2. Dominant participants are active in discussions in different courses. However, there is no significant correlation between moderators in student-to-student discussion and dominant participants.

3.2 Research results

Although Garrison etc. have developed several methods of content analysis, [14, 15] this research relies on traditional methods. Figure 2 shows scatter diagram in professor-student discussion for ICT and Sociology courses. The focus of the analysis is not participation in the discussion, but the quality of the discussion.

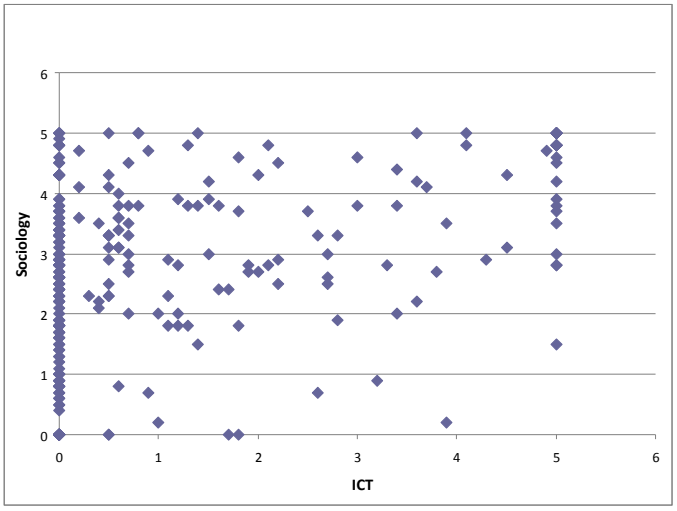

Figure 2 Scatter diagram – professor-student discussion

Calculated Pearson's correlation coefficient of the contribution student-professor discussion is 0.3896. The result reveals a weak link between students' discussion contribution in the ICT and Sociology course. This implies that students with more interest to discuss in one course do not neccesserily show the same interest for the other course. This suggests that the activity largely depends on student's individual motivation. Also, it is important to point out another strong motivational factor and that is the organization of the course which directly influences the participation; professor-student discussion being obligatory in Sociology, while ICT had it as optional.

Research has shown that there is a significant difference when discussion is lead by professor or student. According to Kremer & McGuinness [16] it is less likely that inbalance between the knowledge among discussion participants (professors and students) will contribute to an open discussion. At the same time, authors claim that discussions lead by students create a special atmosphere in which the students openly ask questions and confront each others' opinions. Figure 3 shows discussion quality scatter in student-to-student discussion.

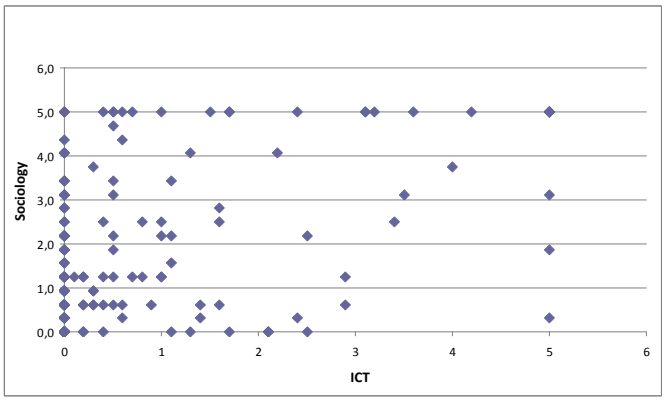

Figure 3 Scatter diagram – student-to-student discussion

Correlation coefficient in student-to-student discussion has increased compared with professor-student discussion and is 0.5387. Students that take part in discussions in one course, are more likely to freely express their opinions in other courses too.

3.3 Dominant discussion participants

According to Dixson & Kuhlhorst [17] the presence of dominant participants in an online discussion increases the quality of discussion. It is interesting to see if there is a correlation between dominant participants in discussion for both courses, ICT and Sociology. Table 5 shows all dominant participants in both courses. The focus of analysis is the quality of discussion in both open and closed professor-student i student-to-student discussions. Only 5.5% students were dominant participants in both courses.

Student	ICT	Sociology
S1	**10**	**10**
S2	**10**	**10**
S3	**10**	**10**
S4	**10**	**10**
S5	**10**	9.8
S6	**10**	9.8
S7	**10**	9.6
S8	**10**	8
S9	**10**	7.8
S10	**10**	7.8
S11	**10**	6.8
S12	**10**	3.4
S13	5.5	**10**
S14	3.8	**10**
S15	2.3	**10**
S16	1	**10**

Table 5 Dominant participants

25% of dominant participants had minimum participation in another course up to 4 level of quality. Within 5 to 8 interval, there were 31.25% participants and 9.5-10 18.75% participants. 25% of dominant participants were dominant in both courses. Students that were dominant in discussions in one course were more motivated to participate in discussion in another course. Student dialogue and ownership over the learning process is key for greater student comprehension and processing of information. According to Palicsar [18], this method is similar to reciprocal teaching wherein the student takes on the role of the instructor in presenting the information for their peers to digest.

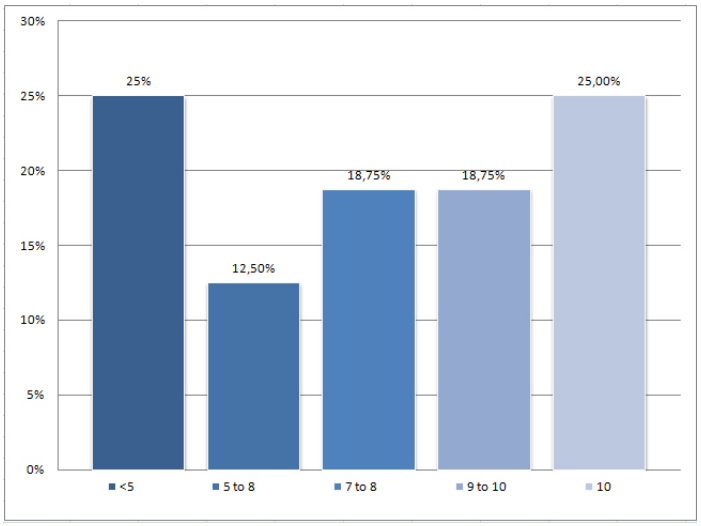

Figure 4 Dominant participants distribution according to the quality of discussion

3.4 Moderators in student-to-student discussion

Numerous research studies point out the significance of moderator's role for electronic interaction process. In student-to-student discussion, moderators have a specific role since they are trying to open potentially interesting topic that will attract fellow-students to participate. During the Fall semester 2008/2009, ICT students have opened around 70, and Sociology students around 100 different topics. Topics that had less than 5 posts, were not taken into consideration. Figure 5 shows the number of posts for each topic. It is interesting that both courses had up to 20 students with participation in most topics (in ICT that was the case with 89.8% topics, while in Sociology they participated in 81% topics). 20 to 40 students were active in only 5.7% ICT discussions and 14% Sociology discussions. More than 40 participants were attracted only by the most interesting topics such as the Facebook or media diary (ICT – 4.5%, Sociology 5%). The fact that interaction patterns change over time is evidence of why teachers have to continually find new ways to enhance two-way interaction and opportunities for extended dialogue and knowledge negotiation. It is not possible to confirm whether moderators and dominant participants were connected. They both make up the group of most active students, but the fact that they are the most active students in one course does not necessary mean that they will initiate online discussion in that course.

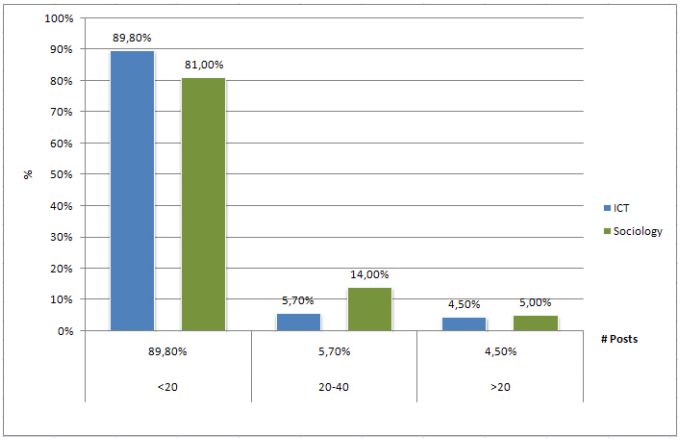

Figure 5 Number of posts within different topics in closed student-to-student discussion

4 Conclusion

Asynchronous online discussion is analyzed as an effective communication tool that facilitates the development of communities of inquiry online. The content and communication dynamics within two different courses online discussion boards, ICT and Sociology, show how online discussions foster student social interaction and dialogue. Research results exhibit focused and deep discussions outside of normal class time and suggest the potential of online discussion as a rich instructional system. Furthermore, comparison of electronic participation in both classes demonstrates that students dominate the discussion, not the instructors. This is evidence of student centred learning environment where students have the role of instructors and discussion participants. Taking these roles, students become more motivated and comfortable within a learning setting that gives them control in managing the learning process. Each student has the opportunity to be a regular contributor to the class while participation is largely freed from time constraints. Offering such flexibility and valuable peer feedback, discussion boards document how digital environments encourage collaborative learning experience. The challenge of extended role of teachers as facilitators is to continually seek opportunities for students to reflect, interact and make choices.

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