

USING COMMUNICATION AND COLLABORATION TOOLS ON AN E-LEARNING PORTAL

Julija Lapuh Bele
B2 Vocational College

Joze Rugelj
University of Ljubljana
Slovenia

Abstract

Our research focused on collaborative learning using chat rooms and forums integrated in an LMS system. We investigated which tools were selected by students for different communication and collaboration activities and how often they were used. Like in the traditional classroom, students using LMS do not communicate very often. If the teacher does not specifically foster communication or collaboration, students generally do not participate in such activities. Themes and posts in forums are mostly used in assignments. Surprisingly, students prefer to ask questions about course activities or to participate in peer discussions in chat rooms rather than in forums.

Introduction

In recent years, there has been an increase in the awareness of possibilities for using e-learning strategies. One possible approach is computer supported collaborative learning. Forums, chat rooms or technically more advanced social software (e.g., wikis, blogs, Facebook) can be used to foster communication and collaboration among students and teachers.

In many institutions collaborative learning is supported and encouraged by means of a learning management system (LMS). Many LMS systems integrate communication tools (e.g., forums, chat rooms, e-mail, Skype) to enable collaboration and communication in a learning environment supported by LMS.

One of the research questions was which communication tool integrated in LMS system is used for which purpose. We found out that themes and posts in forums were mostly related to assignments. Chat rooms proved very important in the process of student socialising in distance learning, as they helped learners to get to know each other.

Similar to the situation in the classroom, learners rarely ask questions, make comments or express opinions via LMS tools. Unfortunately, they did not take full advantage of opportunities to gain more knowledge in collaboration with teachers and/or larger groups of schoolmates.

Part-time students of B2 Vocational College participated in this research. The school offers two types of course delivery: traditional face to face (TL) and distance learning (DL). For both learning settings, e-learning materials were delivered via e-learning portal, powered by eCampus LMS system. All students were also encouraged to use forums and chat rooms provided in the LMS system.

Theoretical Framework

Most of the part-time students are employed adults. They need a usable virtual learning environment, very efficient courses and effective learning materials to achieve learning goals (Ardito et al., 2006).

The Technological Framework

As a delivery system, LMS system eCampus provides tools for course creation and delivery, tools for collaboration and communication support, administrative tools, assessment tools and e-portfolios.

The eCampus is a web-based application, designed for creating learning contents and different kinds of e-courses as well as for supporting web-based independent and blended learning. Tools that give automatic feedback to the students are available (e.g., online questions, various types of tests). The mentor can offer non-automated or partially automated feedback using collaborative and communication tools (e.g., forum, e-mail, chat). Furthermore, the system keeps records of students' learning activities. It provides personalized access to the mentor of the e-course, to the tutor, and to each particular student.

The Pedagogical Framework

E-learning offers several advantages that are meaningful for employed adult students: flexibility in time and place of learning, support for active learning, learning at an individual pace, and catering the specific needs of students. Unfortunately, there are also disadvantages, such as lack of motivation in independent learning and social isolation. Therefore, the pedagogical design of the programme and courses must support students in order to prevent or at least to minimise dropouts.

It is not recommendable to transfer the existing practice in face-to-face (F2F) learning to e-learning environments. The use and design of e-learning have to be grounded on a theoretical approach (Dalsgaard, 2007) as well as on recent research findings and best practices. Many researchers suggest e-learning based on constructivist and socio-constructivist theories of learning. These theories

imply design which is student-centered and provokes active learning. The focus is on the student and on the learning process. It is important to know the student's previous knowledge and experiences as well as his/her needs, motivations and characteristics, such as personal abilities, learning strategies and learning style (Ardito et al., 2006). The teacher is no longer the transmitter of knowledge. He/she is the facilitator and provides scaffolds to students. The teacher (mentor) and students discuss the subject, the students' understandings, and their problems in learning. The student is guided to find knowledge himself. The widely adopted implication of constructivist theories is that students should be cognitively active in an online learning environment (Sweller, 2005). Cognitive activity can be achieved using online questions with instance feedback, online tasks, online tests, discussions, etc. However, ICT tools are needed to facilitate active learning and collaboration.

Chickering and Gamson (1987) state seven principles for good practice in undergraduate education: encourage student-faculty contact, encourage cooperation among students, encourage active learning, give prompt feedback, emphasize time on task, communicate high expectations, and respect diverse talents and ways of learning. Chickering and Ehrmann (1996) argue that implementing these principles is essential also in technology-based education.

These principles can be implemented using tools in LMS. Motivating students and providing relevant information is an essential functionality of a LMS.

In each school social life is important. In distance learning social life could take place in virtual classrooms implemented by LMS tools or by means of social software. Tutors need to encourage such activities. However, the research results show that students are not satisfied with such tutoring. They suggest that tutors should encourage them to work harder, motivate them to regularly accomplish scheduled tasks, provide reliable information and communicate their opinions or requests to the school management (Lapuh Bele et al., 2008). Therefore, at least in distance learning programmes, it is recommended that a professional tutor is employed. He/she regularly supervises students' learning, encourages and motivates them, contacts individuals who do not achieve expected results, gives students general information, organizes social meetings, etc. The same teacher works with students less than two months since the DL courses are delivered sequentially. However, the same tutor supervises and advises the students for the whole academic year.

Distance Learning Course Design

Each of observed DL course begins with a F2F meeting and ends with the exam in the classroom. All other activities take place at a distance.

In distance learning, it is the teacher's task to present the course; announce learning goals, learning tasks (e.g., project work, assignments, assessments), and the code of behaviour within the course; and to give advice on e-learning

strategies. Most learning activities run asynchronously. Nevertheless, once a week some activities are arranged synchronously via the Internet. Students learn from e-content and perform learning tasks according to a weekly schedule that determines events (e.g., real-time online meetings organised as videoconferences or chat sessions), readings (learning contents that students must read or view) and other activities (discussions, project work, online assessments). All activities have deadlines and students can carry them out according to their own schedule. Teachers can use the following activities to facilitate learning (Horton, 2000; Ko & Rossen, 2004):

- follow students' work and monitor their progress using e-learning platform tools,
- motivate and encourage students,
- stimulate communication and collaboration among students,
- actively participate in, promote and lead interactive discussions, and
- provide answers to questions, feedback and recommendations on course activities.

Methodology

All students and the college staff can use collaboration and communication tools offered by LMS (e.g., forums, chat rooms, personal messaging). In this study, we observed the use of forums and chat rooms.

Participants

The study involved 359 students (i.e., 251 traditional, 108 distance learning), 18 teachers, 2 tutors and 1 system administrator from B2 Vocational College. The codes of the participants were used to protect participants' personal data.

Procedure

The model of e-learning was presented and described in the previous section. Traditional students attended traditional e-learning courses and used LMS only for some learning activities. Although teachers suggested that they use LMS tools for communication and collaboration (LMS CCT), they have no obligatory activities. Distance learning students learnt mostly through the LMS. Teachers encouraged them to use LMS CCT and provided some obligatory learning activities using forums.

We wanted to find out which content type (i.e., discussion, learning materials exchange, information on course activities, questions about scheduled activities and school process) was used in the selected tools (i.e., forum, chat) by different user (i.e., TL student, DL student, teacher, tutor, administrator). We were also interested in learning how many students used particular tool, and how often in each group (i.e., traditional, distance).

The data about LMS CCT usage was collected during one academic year. The participants were not informed about the research in advance. The researchers were not involved in the procedure. They just collected the data at the end of the academic year and analyze it.

Measurements

The data was collected in the e-learning portal databases.

Independent variables were participant (ID, gender, age, type: traditional or distance learning student, administrator, teacher, tutor) and communication tool (forum, chat room).

Dependent variables were communication activity (number of posts in forums, number of posts in the chat rooms) and post content.

Statistical Analysis

Descriptive statistics was used to analyse numerical data. The content of posts was analysed using the method of text analysis (Splichal & Bekes, 1990).

As posts in the forums and chat rooms are public, we examined them in detail and defined the content type of each. In addition, we determined how many students used the specific mode of communication and how often.

Results and Interpretation

Participants

The demographic data for the 359 active¹ students who participated in the study is provided in Table 1. The students ranged in age from 19 to 55 years; 37% of participants were males and 63% were females; 69% of participants attended traditional programmes and 31% of them distance learning programmes.

The 18 teachers ranged in age from 42 to 62. The mean age was 53; 56% of them were females.

Table 1: Demographic Data

Learning mode	Men	Women	Total	Average age
Distance learning	40	68	108	32
Traditional learning	93	158	251	32
Total	133	226	359	32

¹ Students who regularly carry out their learning tasks.

Forums

In the observed portal, we found two types of forums: course forums and general forums. Course forums were designed for collaborative learning activities within the courses. The purpose of general forums (e.g., Admin corner, student to student, student to school) was to exchange opinions, experiences, issues, and initiatives which did not fall within the scope of the course subject, but were related to the e-learning portal issues, information delivery and various school activities.

We reviewed 2114 contributions to all 49 forums that were opened in the period under examination.

Using forums was mandatory for DL students and optional for TL students. Authors of the posts were e-learning portal administrator, teachers, one of two tutors and students. Frequencies of contributions posted by specific type of user are shown in Table 2.

Table 2: Users and Posts in Forums

User Type	Users		Posts		
	Number	Percentage of all	Number	Rate	Mean
Teacher	18	100%	683	32.3%	38
Tutor	1	50%	19	0.9%	19
DL student	108	100%	1045	75.2%	10
TL student	84	33.5%	345	24.8%	4
Administrator	1	100%	22	1.0%	22
Total	212		2114	100%	10

Although most posts in the forums were written by students, one student (out of a total of 192 participating) wrote on average only 7 posts. On average each participating DL student wrote 10 posts and each participating TL student wrote 4 posts. Teachers wrote 38 posts on average.

Each active DL student posted at least once in a forum. As will be shown later, most of them posted their assignments. Only 33% of TL students wrote at least one post.

There were significant differences among teachers' activities. Ten teachers in TL mode of delivery wrote less than 10 posts. Eight teachers who delivered DL courses wrote more than 30 posts each.

We also found that students' forum communication depends on teacher facilitation. However, it is not enough to invite students to share experience and knowledge. Unfortunately, students do not collaborate unless they are strongly

motivated with obligatory tasks. Therefore, teachers have to create learning activities that require cooperative or collaborative learning.

The results (Table 3) show that 54% of the students posted five or fewer posts in the forums. The two most active students wrote between 30 and 40 posts (one 32 and the other 37). Of the teachers 44% wrote 41 posts or more. The most active among them wrote 194 posts.

Table 3: Rate of Student and Teacher Forum Posting

Posts	Number of students	Rate
1	34	18%
2	27	14%
3-5	43	22%
6-10	39	20%
11-20	37	19%
21-30	10	5%
31-40-	2	1%
Skupaj	192	100%

Posts	Number of teachers	Rate
1	2	11%
2	3	17%
3-10	5	28%
11-30	0	0%
31-40	2	11%
41-80	4	22%
81-194	2	11%
	18	100%

We conclude that students and teachers differ in communication activity via forums, like in traditional oral communication.

Posts were classified, according to content, into the following categories: learning content (e.g., instructions, advice, learning strategies, discussions, learning materials, exam questions); assignments (i.e., everything connected with seminar work, including feedback); general academic affairs; motivation; technical matters; and chat.

Table 4: Posting Frequency by Content Type

Forum type	Assign.	Subject content	General affairs	Motiv.	Tech. matters	Chat	Total
General	7	30	27	0	73	2	139
Learning	1611	238	50	31	25	20	1975
Total	1618	268	77	31	98	22	2114
Rate	77%	13%	4%	1%	5%	1%	100%

The vast majority of contributions in learning forums (i.e., 1618 or 82%) refers to assignments. A closer examination of the contributions shows that students asked about the tasks or attached their seminar work to posts. Teachers explained tasks and sent feedback.

Only 12% of posts in learning forums refer to the course subject (e.g., instructions, tips and learning strategies, discussions, questions and explanations, additional learning materials, examples of old exams, etc.). As part time students have a lot of experience, we expected questions about the learning content and discussions. But it turned out that students, like in the typical Slovenian classroom, rarely ask or comment. Of all posts, only five questions were related to the learning content. A forum is a public place. Students cannot hide behind a pseudonym. They obviously do not ask questions that may embarrass them. Their questions are mainly related to the requirements of the course, examinations, additional materials, notes, etc.

Table 5 shows that DL students used forums more than TL students. They had to send their seminar papers or accomplish their tasks using forums.

After reading the posts, we found the given answers rather inadequate. Although the original message can be read several times, the communication often led to misunderstandings. Providing a brief and direct answer can jeopardise a good relationship. The answer may affect the individual's emotions. The same answer is more problematic if communicated via a public forum than face to face. However, learning to communicate via electronic media is recommended both to teachers and students.

Table 5: Type of Posts in Learning Forums by Learning Mode

Learning mode	Seminar	Subject	Other	Total
Distance	1359	131	96	1586
Traditional	252	55	82	389
Total	1611	186	178	1975
Rate	81.6%	9.4%	9%	100%

The words with the highest frequency were *task* and *seminar*.

Chat Rooms

There were four chat rooms (i.e., one for each study programme and a common one) in the observed portal. Chat rooms of two programmes, which were delivered in traditional and in distance learning mode, were the most popular. As Table 6 shows, almost 79% of posts were written by students of business administration.

Table 6: Chat Room Posting Frequency

Chat room	Post freq.	Rate
B2	58	1.5%
Informatics	14	0.4%
Economy	761	19.5%
Business Admin.	3070	78.7%
Total	3903	100%

Chat rooms or technically more advanced social software are very important means for socialising DL students. Tutors create virtual social environments at the beginning of the academic year and encourage communication to establish friendship and trust among the students. Students who know each other and have a good relationship are more likely to support and motivate each other. They are willing to share learning materials, experience and information.

Table 7 shows that teachers and tutors encouraged chatting. Each tutor wrote 81 posts on average, while participating students wrote 42 posts on average. Only 84 of 359 students (i.e., 23%) participated. While only 12% of TL students wrote at least one post, 57% (i.e., 62 of 108) of DL students did the same.

The DL students wrote more posts than TL students for two reasons: they were more encouraged to post than traditional ones and they wished to communicate with their schoolmates in cyber space as they did not meet them in the real world.

Table 7: Posting Frequency in Chat Rooms by User Type

User type	Users		Posts		Mean
	Freq.	Rate	Freq.	Rate	
Mentor	10	10.4%	252	6.5%	25.2
Tutor	2	2.1%	161	4.1%	80.5
Student	84	87.5%	3490	89.4%	41.5
Total	96	100%	3903	100%	40.7

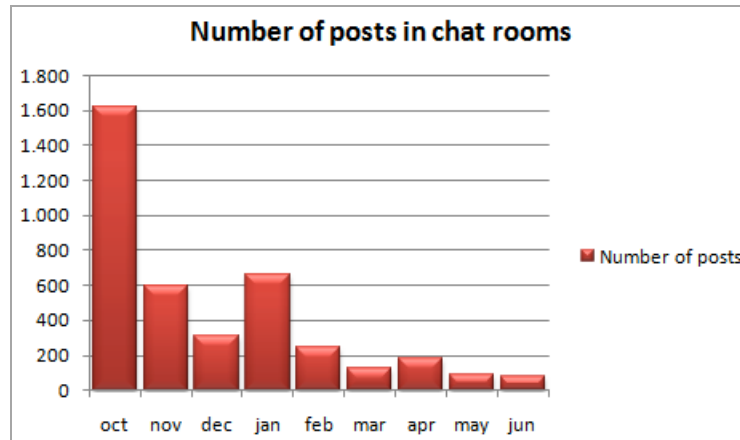
Some DL students posted very actively. The rates of TL and DL students who posted specific number of posts are shown in **Error! Reference source not found.** Student Chatting Activity

Number of posts	Rate of TL students	Rate of DL students
0	88%	50%
1	5%	5%
2-3	4%	6%
4-10	3%	7%
11-50	0	18%

51-200	0	11%
201 do 686	0	3%
Total	100%	100%

The frequency of chatting during the observed academic year is shown in Figure 1.

Figure 1: Posting Frequency in Observed Months



When students are familiar with each other and establish relationships, they (as they told us) move personal communication out of LMS to a more private environment and form groups of their own friends.

Regarding the content, posts were classified into salutations (e.g., hello); chat; subject content (e.g., instructions, advice, learning strategies, discussions, learning materials, exam questions, learning tasks); general academic affairs; motivating; and technical matters. The label chat describes posts where students talked about things not connected with school or learning such as work, family, jokes, congratulations, holidays and festive goodies, arranging private meetings, and sending YouTube links.

As shown in Table 8, chatting dominated. Surprisingly 20% of posts were related to course subjects. Students exchanged information about F2F meetings, notes, examples of exams, learning tasks, learning strategies, course requirements and features. Sometimes students asked colleagues to comment or interpret the matter, terms, etc. It is interesting that in forums, where such topics are supposed to be, specific questions of students about learning issues significantly missed. There are two possible explanations:

- While forum posts are archived, posts in chat rooms are deleted together with any silly questions.]

- Forums provide asynchronous communication, while chat rooms enable synchronous communication. Students can get answers immediately.

Table 8: Post Types by Content and Chat Room

Chat room	Post type						
	Salut.	Chat	Motiv.	Tec. issues	Acad. affairs	subject	Total
B2	8	41	0	5	3	1	58
Informatics	0	3	0	1	3	7	14
Economy	47	415	36	8	164	91	761
Bus. admin.	159	1691	71	52	431	666	3070
Total	214	2150	107	66	601	765	3903
Rate	5%	55%	3%	2%	15%	20%	100%

As tutors regularly participated in chat sessions, students asked them about academic affairs, such as scheduled school activities, exam dates, dates of publication of the results of exams, choosing elective courses. Tutors motivated students and answered questions. Although there were relatively few motivational messages, they were essential to some DL students. Students also cheered and encouraged each other. At the beginning of each course, students complained about the subject matter and assessed learning activities as difficult. After the exam they expressed happiness and pride.

In chat rooms, the word with the highest frequency was *exam*.

Forums vs. Chat Rooms

We compared the intensity of communication between participants in forums and chat rooms.

Eight students (i.e., 2%) published more than 100 posts in chat rooms. A record holder was a female student who posted 686 times. In forums, the most active student published only 37 posts.

Women did not prove more communicative than men.

Most active students in the chat rooms (i.e., students that posted more than 10 times) were not the most active in forums. It seems that students choose the form of communication that suits them best.

In chat rooms, where participation was completely voluntary, 23% of all active students participated. There were 53% of active students who posted at least once

in the forums. However, some forum activities were obligatory for DL students. We find that forum activity is very low unless it is obligatory.

In forums and in chat rooms DL students were more active than TL students. While DL students took advantage of using technological tools to socialise and to get access to information, TL students could get together and exchange information live.

Although chat rooms were designed primarily for chatting and socialising, there were more posts on course subjects than in forums. We found 20% of posts with professional subjects in chat rooms (i.e., 765 of 3903) and only 13% of such posts in forums (i.e., 268 of 2114). Students prefer seeking help from fellow students using a synchronous communication tool that allows immediate response.

Conclusions

Like in the classroom, students rarely ask questions in e-courses. If the teacher does not foster communication and collaboration, students mostly do not participate in such activities. Teachers have to create learning activities that require cooperation or collaboration. If this is not the case, themes and posts in forums are mostly related only to assignments. Students prefer asking questions about learning subjects or participating in discussions in chat rooms rather than forums. Chat rooms and other social software enable socialising in virtual space. Teachers and tutors should foster the socialising of DL students, particularly at the beginning of their studies. Students who know each other and establish a good relationship are more likely to support and motivate each other. They are willing to share learning materials, experience and information. However, electronic communication may also jeopardise a good relationship. Although the original message can be read several times, the communication often leads to misunderstandings. Therefore, learning to communicate via electronic media is recommended both to teachers and students.

We are planning to study personal messaging in our future research.

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