Analysis of Communication Tools of the Learning Management Systems of Moodle and WebCT

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Abstract: The study focuses on analyzing of communication tools which can be used by students and teachers in the Moodle and WebCT Learning Management Systems (further mentioned as LMSs). This study was motivated mainly by the fact that most of the faculties of the University of Hradec Kralove have been leaving the WebCT (Blackboard) for the Moodle. The core of the study is formed by a survey of communication tools and the following evaluation of these tools made by students during an experimental teaching process.

Key-words: E-learning, Moodle, WebCT, Blackboard, Blended learning, Forum, Chat, E-mail

1 Introduction

E-learning represents one of the possibilities how information and communication technologies can be effectively used in education. In the American point of view, “e-learning” is understood as a term with a more general meaning than in our country; the synonymous expression for “e-learning” is “technology-based learning” (i.e. learning supported by technologies). This concept covers a wide set of applications and processes, as for example computer-based learning (i.e. learning supported by computers) and web-based learning i.e. learning supported by web technologies). [1], [2]

2 Theoretical bases

E-learning exists in several basic forms characterized by one shared feature – educating contents are offered in the electronic form. According to the way how information and communication technologies are used, e-learning can be sub-classified into the on-line form a off-line form.

The off-line way of learning and teaching does not require the computer to be connected to the network. Teaching materials are distributed on memory media (e.g. CD-ROMs, DVDs, discs). In spite of the fact that this way of education is on the decline, it is still very often used especially as a form of homework for pupils working with teaching programs. E-learning which uses teaching programs has been introduced mainly to primary and secondary schools, where the direct face-to-face way of education is supported by e-learning (so called blended learning).

The on-line way of learning and teaching uses the computer network for distributing of teaching materials. The most frequently used types of networks are Internet or Intranet (a local computer network). Information, however, can be also shared trough other types of networks (e.g. mobile networks). The on-line learning/teaching exists in two forms:

- synchronic,
- asynchronic.

The synchronous learning/teaching requires a permanent connection to a network. Thanks to that, communication between a teacher (tutor) and a student is realised in the real time. This type of communication requires the tutor and student to be connected to the network at the same time but not at the same place. The learning and teaching process is realized in a so called virtual classroom [3], in which the students and tutor appear at the time which has been agreed on. The following communication tools are most frequently used within the framework of synchronic learning/teaching:

- Chat. Nowadays the best known and the most used tool, thanks to which the participants can realize a text discussion in the real time. Besides text chats there are also chats supplemented by other multimedia elements. Communication can be realized in various virtual environments.
• Instant messaging. Another very widespread way of communication, quite similar to chat. It uses special programs (messengers), which have to be installed. However, there are also messengers which can be activated from an internet browser. Although messengers are primarily designated for synchronic communication, their advantage is a possibility to use them also for asynchronic communication. If a participant in communication is not connected at the given moment, s/he can still be sent messages which will be shown at the moment s/he gets connected.

• Audio a videoconference. They can be realized in two basic forms. The first one presupposes the computers to be connected to the computer network and to be equipped with a software needed for communication in a real time. These simple conferences can be realized thanks to e.g. programs for internet telephony. The second form is represented by telephone conferences where the participants first dial the already given telephone number and then they can communicate with each other.

• Shared whiteboard. More or less it is a certain analogy to a classical blackboard. Whiteboard is a software shared environment into which the connected users can draw and write. This tool can be found in various communication programmes and virtual study environments.

• Shared application. Thanks to this tool it is possible for students to see what exactly the teacher is doing on his/her computer. The appropriate software usually needs installing; some communication programs, however, already contain a support for sharing of applications.

The asynchronic learning/teaching is represented by a kind of communication when the participants are not present at the real time. They communicate with each other through messages in discussion forums or through e-mail. Discussion forums can be used by students for communicating with the teacher and also for communicating with each other. Teaching materials can be transferred to and saved in the student’s computer and the learning process can then be continued also in the off-line form. This form of learning is more flexible in terms of time and less demanding in terms of investments; however, it requires students’ high motivation.

„Blended learning is the term referring to a combination of e-learning and a direct face-to-face teaching process. These two components are then used in varied ways. Blended learning can, however, refer also to a real combined way of studying – i.e. a combination of the full-time and distant forms of studying.” [4] Within the combined form of teaching/learning it is possible to simply mix the direct face-to-face form with teaching/learning supported through Internet or teaching/learning supported by various multimedia aids. The term of blended learning is not precisely defined – it is very flexible and offers a big potential for future education (see [3], or [5]).

Some forms of blended learning are already used by a big number of teachers, even if they are not fully aware of that. The combination of the direct face-to-face teaching with various e-learning supports is not limited to the sphere of education at schools – it is successfully used in small, middle-sized and big companies and also in a big number of state institutions. The use of an educating content distributed on multimedia CDs and DVDs belongs to the most wide-spread forms of blended learning. However, if a teacher is just starting to use blended learning or if s/he is considering whether to start using it, s/he should make a simple analysis.

The Moodle (Modula Object – Oriented Dynamic Learning Environment) LMS belongs to the most frequently used system within the framework of e-learning (or blended learning) in the Czech Republic. This system works on the UNIX, Linux, Windows and any other system which supports the PHP (Hypertext Preprocessor). The first version was launched in 2002, and in 2003 the Czech localization started being worked on. Version 2.0 exists at present. The WebCT (Web Course Tools) System was developed at the University of British Columbia, the first version was presented in 1996 [6]. The WebCT has merged with Blackboard [7].

3 The Project

Due to the fact that the University of Hradec Kralove will use two LMSs (Moodle a WebCT-Blackboard) since the academic year 2011/12, these two systems have been researched from various points of view. The research is based mainly on the following sources: the study by David Bremer and Rueben Bryant [8] from 2004, the study carried out at California University Humbolt [9] in 2005 and the study by Michael Machado and Eric Tao from 2007 [10].

3.1 The project Aims

The basic aim of the project was to carry out a comparative analysis of the WebCT and Moodle LMSs in the conditions of the Faculty of Education
of the University of Hradec Kralove. One of the sub-aims was the analysis and comparison of the communication tools and the possibilities of their use by students. The Product Comparison was drawn upon (see Tab. 1)

Tab. 1 Communications Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Moodle</th>
<th>WebCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Forum</td>
<td>Three types of discussion forums are offered. A discussion can be displayed according to the date, thread or author. The main branch discussion can be ramified into a new discussion.</td>
<td>One type of the Discussion Forum where a student can reply to discussions without creating topics.</td>
</tr>
<tr>
<td>Internet Email</td>
<td>Reading of messages is enabled after logging in.</td>
<td>Messages can be sent at one time to all the students or a group of the students or to individual students / an individual student. Files can be attached.</td>
</tr>
<tr>
<td>Real-time Chat</td>
<td>The chat tool supports images. The system creates archive logs for all chat rooms. Instructors can view chat logs and share these with students. Instructors can schedule chats using the course calendar. Students can see which other people are online within their course and send an instant message to them</td>
<td>The Java-based chat tool supports private rooms and private messages. The system creates archive logs for all chat rooms. The chat tool supports up to four simultaneous group discussions.</td>
</tr>
</tbody>
</table>

3.2 Methodology

Two courses were created for the subject called “Use of Information and Communication Technologies at the Lower Primary School”. One course was realised in the WebCT Campus Editional 6.0.3 and the other course (a similar one) in the Moodle 1.9 environment. The courses were used as the support of training. In both the courses similar instruments were used. Both the courses were divided into two parts (with regard to the topics presented, either of these two parts presented one half of the contents of the whole course). The access to only one part of the course in the appropriate environment was enabled for the students. [1]

3.3 Research Tool

While selecting the research instrument, the authors drew upon studies realised earlier [8, 9, 10], and created a non-standardised electronic questionnaire. Most of the questions were closed, dichotomised ones, or those using so called “scale” answers. At the end of the questionnaire there was a possibility for students to express their opinions concerning the issue given. The first part of the questionnaire focused on the basic demographic data (sex, age, type of studies) and experience in e-learning, the second part focused on comparisons of instruments and possibilities of the researched LMSs. As it has been stated above, the questionnaire was an electronic one.

3.4 Research Sample

The research sample was constituted by undergraduate students majoring in teaching at
lower primary schools (in both the full-time and combined forms of studies). The students were randomly divided into two groups. One group did the first half of the course in the WebCT, the other group did the same in the Moodle. Then there was a change of the systems. In total 57 full-time students and 26 students in the combined form participated in the experiment, out of which there were 5% males and 95% females, which is in correspondence with the gender configuration of teachers involved in primary education in the Czech Republic. All the students had already had certain experience with training supported by e-learning. They had passed one subject which was supported by a course created in the WebCT. None of the students had had any experience with the Moodle before. [1]

3.5 Research Results
Only selected results of the research are presented here (the ones which appear to be interesting and fruitful regarding further work). Our main interest was in evaluation of the tools of Discussion Forum, Chat and E-mail. Figures 1, 2 and 3 give the evaluation results (the students marked the tools from 1 to 5; mark 1 being the best and mark 5 being the worst evaluation).

From the results of the Discussion Forum it is clear that the Moodle environment was more convenient for the students. The statistical significance of the difference in the evaluations was tested, and this difference was confirmed (see Fig 5).

The E-mail tool was better evaluated in the WebCT (Fig. 4). The statistical significance of the difference in the evaluations was confirmed (see Tab. 2). The statistical significance of the difference in the evaluations was tested through Student’s T-test and Mann-Whitney’s test. The significance level was selected to be α=0.05.

From Fig. 3 it is possible to come to a conclusion that the Chat tool was evaluated similarly in both the environments. The statistical significance of the difference in the evaluations was not confirmed (see Tab. 2).

Fig. 1 How do you evaluate potentials of the tool of Discussion Forum?

Fig. 3 How do you evaluate the tool of Chat?

Fig. 4 How do you evaluate the tool of E-mail?
### Tab. 2 Testing of statistical significance of the difference in the evaluations

<table>
<thead>
<tr>
<th>Tool</th>
<th>T - value</th>
<th>Z - value</th>
<th>H_0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussion Forum</td>
<td>-2,0750</td>
<td>-2,3270</td>
<td>Reject</td>
</tr>
<tr>
<td>Chat</td>
<td>0,1909</td>
<td>0,1165</td>
<td>Accept</td>
</tr>
<tr>
<td>E-mail</td>
<td>3,4042</td>
<td>3,3902</td>
<td>Reject</td>
</tr>
</tbody>
</table>

### 4 Conclusion

The aim of the study was to compare two LMSs. The comparison was realized in the blended learning environment of the selected subject. The attention was focused on the communication tools of the LMSs concerned, other issues (e.g. financial costs and standards supports) were not evaluated. According to the results of the comparative analysis of three most frequently used communication tools, neither LMS can be definitely proclaimed as better (Tab. 2).

### References:


