

## CHALLENGES IN THE BLACKBOARD PLATFORM USAGE AT KNOWLEDGE VERIFICATION IN MASTER TRAINING

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**ABSTRACT.** A study have been made of the options for creating and conducting tests in the BlackBoard platform for testing the knowledge of masters at the "G. S. Rakovski" National Defence College. Various possibilities for creating and conducting tests have been tested. The tests are adapted to the limitations of the communication speed of and to the system requirements in the tests conduction process. The possibility for stable operation of the BlackBoard platform has been tested. Some limitations in the operation of the platform have been identified during its loading by many users and recommendations have been given for improving its work.

**Key words:** distance learning, Blackboard, tests

### ПРЕДИЗВИКАТЕЛСТВА В ИЗПОЛЗВАНЕ НА ПЛАТФОРМАТА BLACKBOARD ЗА ПРОВЕРКА НА ЗНАНИЯТА ПРИ ОБУЧЕНИЕ НА МАГИСТРИ

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**РЕЗЮМЕ.** Направено е изследване на възможностите за създаване и провеждане на тестове в платформата BlackBoard за проверка знанията на магистри във Военна академия „Г. С. Раковски“. Проверени са различни възможности за създаване на тестове и тяхното провеждане. Тестовите са адаптирани към ограничения в скоростта на комуникация и към системни изисквания в процеса на провеждане на тестовите. Експериментирано е създаването на типови фалове с няколко различни видове въпроси и тяхното автоматично зареждане в създаваните тестове. Проверена е възможността за устойчива работа на платформата BlackBoard при провеждане на едновременно тестово изпитване на много обучаеми. Констатирани са някои ограничения в работата на платформата при нейното натоварване от много потребители и са дадени препоръки за подобряване на работата с нея.

**Ключови думи:** дистанционно обучение, платформа Blackboard, тестове

### Introduction

The study aims to identify some major challenges at the usage of the Blackboard Learn 9.1 distance learning platform (hereinafter the platform, the system) to test the master program students knowledge in the process of their training and to propose approaches to improve performance. The following tasks have been solved to achieve this goal: clarifying the possibilities of the platform for teaching and control of learning materials, analysis of identified imperfections and proposing possible approaches and solutions to improve work with it. The results of the analyzes can be used by teachers and administrators who use the distance learning platform Blackboard Learn 9.1 to teach and control the acquisition of learning material in the process of teaching bachelors and masters. The proposed approaches and solutions to improve the usage of the distance learning platform may be important with their usefulness in overcoming some of its limitations and imperfections.

Only the platform's possibilities for teaching and control of the studied material's assimilation have been analyzed for study's purposes. This stems from the aim of the study, which is to analyze the main challenges in using the Blackboard Learn 9.1 platform to test the master degree students' knowledge in the process of their training to outline

approaches and solutions to improve work with it. The capabilities of the learning control platform depend not only on its main characteristics, but also on its ability to teach it.

The hypothesis of the research is by revealing the main reasons for the imperfections in the use of the platform for testing the students' knowledge, the main approaches and solutions for improving the work with it could be found.

The methods of analysis, data processing and comparison have been mainly used at the research of the Blackboard Learn 9.1 platform capabilities for teaching and control of study material learning.

### Blackboard Learn 9.1 platform teaching capabilities

In order to explore the main challenges in using the distance learning platform, the question must be answered: what are the main factors influencing the assimilation and control of the learning material?

The first main factor is Blackboard Learn 9.1 platform teaching capabilities. The web-based system "Blackboard Learn" 9.1 fully complies with the requirements for online learning and administration of the learning process, allowing students to access electronic textbooks, lectures,

presentations, electronic self-preparation tests, exams and additional information about their student's status.

One of the important elements of any information system is the control of access to it. Each user can access the web-based system "Blackboard Learn" 9.1, after checking his unique username and password. This is a standard approach to controlling access to civilian information systems, while military communication and information systems require reliable identification procedures (Aleksandrova, K., 2010).

E-textbooks are created by teacher (s), and they can be written and oriented depending on the audience for which they are intended (according to the specialty of the students). The content of textbooks and lectures can be both textual and supplemented with charts, pictures, video and audio files.

The creation and conduct of qualification courses is one of the good features of the web-based system "Blackboard Learn". For example, only in the field of security and defense logistics, 3 electronic courses for targeted qualification for distance learning have been created and tested, developed by a team at the Logistics Department of the Command and Staff Faculty, in which students are enrolled and trained (Marinov, G., 2015), as follows:

- at the course "Healthy and safe working conditions" - 76 students;
- at the course "Systems for planning and management of logistics in NATO and the European Union" - 81 students;
- at the course "Information systems supporting the management of security and defense logistics of the country" - 23 students.

A total of 180 students have been tested and evaluated so far, through tests conducted after each lecture and certification tests at the end of each course in the electronic platform "Blackboard Learn".

The system has the opportunity to give additional literature to students by publishing it in the form of files. This is done by selecting "Upload files" from the menu "Content collection" and from the menu "Uploading" a window opens (Fig. 1), from which you can choose whether to upload a single file or multiple files. The default is to upload a single file. Then click on "Select file" to open the window (Fig. 1), where you can select the file you want to upload.

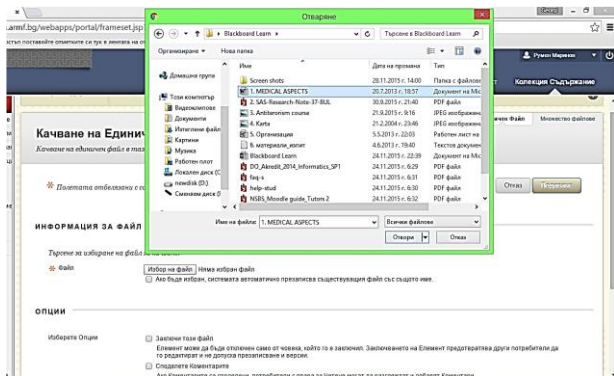


Fig. 1. Selection of a file to upload

Additional training literature can be provided to learners by posting links to various sources on the Internet such as Wiki, specialized sites and others. Using chat with learners is another opportunity to support the teaching of learning material. Through it, in a text mode of communication, various questions from the taught material can be clarified, different

questions of the learners can be answered, etc. This form of communication with students is a good feedback for the teacher, but there is one significant drawback - it does not offer audio and video connection and cannot make "live" contact with students. This lack of a live connection negatively affects the learning process and therefore other applications that have the potential for this type of connection must be found and used.

## Blackboard Learn 9.1 platform's testing capabilities

Master knowledge testing is carried out in each discipline studied or in each qualification course after the introduction of the platform in 2014. It was used for the students' knowledge control during the pandemic by COVID- 19 too.

### Blackboard Learn 9.1 platform capabilities for creation of various students' knowledge control forms

The Blackboard Learn 9.1 platform has great capabilities for learning control of teaching material. Its main capabilities are for creating and using tests, but it also offers other forms of control such as checking essays, term papers, and checking other students' written work (Blackboard Inc., 2010).

### Tests creation possibilities

The analysis here is made mainly of the possibilities for creating, conducting and reporting test results. In the platform there is an opportunity for each teacher to choose whether students to test their knowledge at the end of each lesson and / or to test their knowledge through self-preparation tests. The self-preparation tests can be generated by each student at will, as he asks the number of questions from each topic that he wants to get in the test in a given subject. For this purpose, the lecturer needs to introduce in advance the bank of questions with different degrees of complexity and in different thematic areas of the subject he teaches. This gives students a good opportunity to test their knowledge and also creates interest in working with the system.

Every teacher has rich opportunities to create tests. Access to the menu for their creation is very convenient: the teacher enters his account and in the menu "Disciplines" selects the submenu "Exams / Tests" and in the opened window of this submenu in the top bar selects the drop-down menu "Creation and assessment" and finally "Test" (Fig. 2).

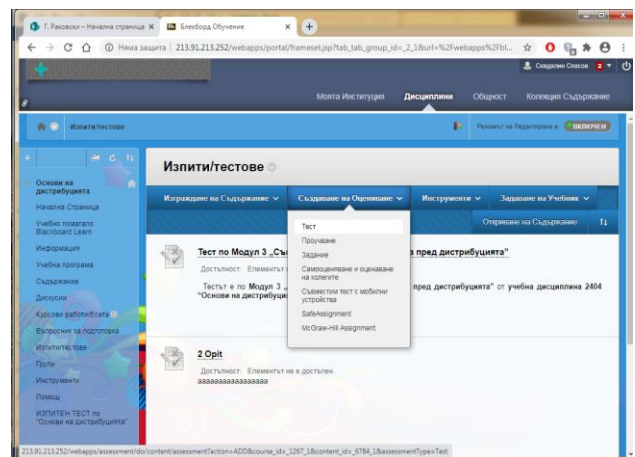


Fig. 2. Access to the tests creation and edition menu



Table 1 System's crashes statistic data

№	1	2	3	4	5	6	7	8	9	10	11
x	354	238	169	241	198	314	174	157	226	187	279
$\bar{x}$	230,64	230,64	230,64	230,64	230,64	230,64	230,64	230,64	230,64	230,64	230,64

The data in Table 1 show that a system failure occurred in a different number of users working simultaneously in the system, but their average number in which it occurred was equal to 230 people. Of course, this result is influenced not only by the number of users working in the system at the same time, but also by the status and quality of the Internet connection.

In order to get an idea of how much the data varies around the arithmetic mean ("x upper slash"), the standard deviation "s" has been calculated according to expression (1):

$$s = \sqrt{\frac{\sum_{i=1}^N (x - \bar{x})^2}{N - 1}} \quad (1)$$

where N - number of values in the sample;

x – number of concurrent users at the time of system outage.

The number of values of the sequence N in the denominator of expression (1) is reduced by one, because the sample is small ( $N \leq 30$ ).

The value of the standard deviation is obtained equal to  $s = 20.02$  at this case. This is a relatively large value, as the deviation of the data in the series is a not low.

## Conclusion

The Blackboard Learn 9.1 platform has very good capabilities to represent learning material by allowing learners to access e-textbooks, lectures, presentations, and additional information about their condition. Students can be provided with additional literature for preparation by publishing links to various sources on the Internet such as Wiki, specialized sites and others.

The Blackboard Learn 9.1 platform has great capabilities to test knowledge of the students. Its main capabilities are creating and using tests, but it also offers other forms of control such as essays checking, term papers and checking other written work of students.

Nevertheless the above mentioned advantages, there are some challenges to test knowledge of the magister program students using the Blackboard Learn 9.1 platform. They can be summarized as follows:

- Lack of live visual and audio communication between students and teachers, especially at the time they have to enter the system together and communicate with each other;

- There are interruptions in the process of solving the tests for technical reasons: mainly due to interruption of the Internet connection or overload of the system's servers;

- Lack of constant control over the learners - distance learning requires strict discipline and its result depends on the abilities and consciousness of the learner;

- Need for a sufficient number of practical classes for students to work with the system.

The web-based system "Blackboard Learn" 9.1, fully complies with the requirements for learning in the Internet environment and administration of the learning process, giving students access to electronic textbooks, lectures, presentations, electronic tests for self-preparation, exams and additional information about their condition.

There are two main disadvantages of the system: lack of visual and audio communication in real time between students and teachers and interruption of the test due to overload of the system's servers. To overcome them, the following suggestions can be made:

- To use the Teams application from Office 365 for visual and audio communication between students and teachers in combination with BLACKBOARD LEARN 9.1 in teaching and to test knowledge of the learners;

- Use hot backup on both the Blackboard Learn 9.1 database server and the application server to avoid overloading the platform when many users log in at the same time. In addition, the lack of constant control over the learners and the need for a sufficient number of practical classes for students to work with the system can be overcome by motivating the learners and by administrative measures so that the learning process goes smoothly.

Experience from the Blackboard Learn 9.1 platform usage shows it has the potential for further use, especially by expanding its capabilities and by combining it with other systems that complement or improve its features.

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