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Analysis of the MOODLE Platform at Bukhara State University

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Abstract. The COVID-19 pandemic has changed the global educational system. Bukhara State University was no exception, the educational environment of which has undergone drastic changes. The COVID-19 pandemic has activated the mechanisms of distance learning, which has been successfully used in the world for more than a decade, but in Uzbekistan it became popular in 2020. One of the distance education systems is the Moodle educational platform, which operates at Bukhara State University. Moodle is a free learning system that can be linked to other services and modified to suit your tasks thanks to open-source code. The purpose of this article is to study the technical capabilities of the Moodle learning platform. A special survey was conducted among teachers on the use of Moodle. The purpose of the survey was to find out which features of the platform are adapted and used by lecturers.

INTRODUCTION

E-Learning plays an important role in the learning process in the modern world, and ready-made training courses help a lot in a pandemic. Such courses facilitate the acquisition and dissemination of knowledge using electronic devices [1]. In our country all universities are adapting the e-learning environment as the main tool for teaching and training students in the context of a pandemic. Learning management systems are complex applications offering tools to assist students [2].

E-Learning platforms have a greater impact on teaching and learning methods in higher education institutions. The last few years have brought progress and growth in terms of the use of Learning Management Systems (LMS) and online education. The availability of open-source learning platforms and their ease of configuration have led to an increase in the use of the e-learning platform [3, 4]. The integration of LMS into our training programs forced us to reconsider the training strategy. Successful implementation of information and communication technologies in education makes education accessible to a wide audience without temporal and spatial barriers [5, 6].

Distance learning has a number of advantages that ensure the flexibility of the educational system. With the development of digital technologies, the means of communication that underlie distance education are improving.

Distance courses provide:

- interactivity of the educational process between teachers and students, where communication in a group is possible as well as communication in a confidential form;
- timely monitoring of the degree of completion of tasks;
- provision of educational materials in electronic form, excluding trips to the library, where it may turn out that there is no necessary educational literature;
- flexibility of the training schedule for students and teachers (if it is not possible to attend class lessons);
- development of independent work skills when completing course assignments uploaded to the server;

- development of skills in working with network technologies. These skills will be used by students in the future after completing the courses;
- individual approach to each of the students who needs help in completing the course tasks.

When using a distance education system, it should be taken into account that the information quickly becomes outdated so the creators of the course should actively update the content in order to interest students in their studies, otherwise the system will lead to a decrease in the quality of education.

Today several learning management systems are available. They are both commercial and open-source systems such as Docebo, Moodle and Canvas. Moodle is one of the most popular open-source learning platforms with a huge number of implementations. Most universities, educational institutions and professional schools in Uzbekistan have implemented Moodle.

MATERIALS AND METHODS

This article presents a study of the features of Moodle and assesses the work of the platform: the activities and resources of teachers of Bukhara State University. Improvements to the system's capabilities are also considered by adding plugins that provide platform flexibility. When evaluating the capabilities of Moodle, the QWA approach (qualitative weight and amount) was used. QWA is a modern approach to evaluating software products. The weight of the criterion determines the range of values to be measured [7, 8]. For this purpose, a questionnaire was developed, which was sent to university teachers. The survey participants were teachers of different faculties, namely: information technology, tourism and sports, pedagogy, and others. The evaluation criteria in this research paper focus on the features of adding resources and creating activity in Moodle LMS. The questionnaire included questions of three categories. The first category included general questions such as the experience of ordinary teaching, the experience of using Moodle. The second category included questions to evaluate Moodle's capabilities for adding activities to the course such as assignments and tests. The third category included the question of evaluating the possibilities available for adding resources to the Moodle course. When using a distance education system, it should be taken into account that the information quickly becomes outdated so the creators of the course should actively update the content in order to interest students in their studies, otherwise the system will lead to a decrease in the quality of education.

RESULTS

The survey results are presented in the form of a diagram below in Fig. 1.

Figure 1 demonstrates the distribution of participants across various faculties at our university, their teaching experience and experience using Moodle. More than 51% of respondents have teaching experience of 5 years or more, while 42% of respondents have been using Moodle for more than 5 years.

The use of the function is calculated by converting a multi-criteria task into a single criteria task. The usage of each function is calculated by adding the sum of all criteria together with their weights and subtracted from the "does not matter" criterion. A simple equation is derived to calculate the usage of each function:

$$Q = (\sum_{i=1}^n a_i - b) / 30 * 100\% \quad (1)$$

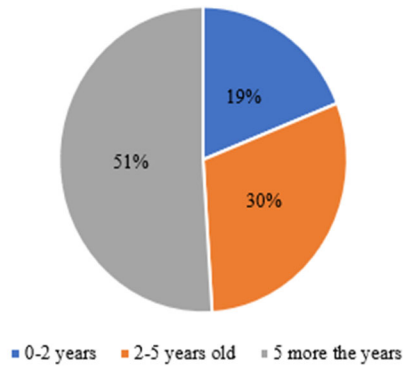
Q is the percentage of use of the object, a is the weighted values: minimally valuable, valuable, very valuable, extremely valuable and important for the object, b is the weighted value: not valuable.

LMS Moodle of Bukhara State University hosts more than 1000 courses. Before the pandemic, most courses were offered as regular courses through contact lessons while only 8% (in correspondence departments) of them were conducted entirely online. Approximately 90% of respondents reported that they use Moodle to distribute course-related materials and related resources, 30% of them use it as a tool for tracking students progress, 25.8% of teachers use it as a communication channel with course participants, 61% create assignments and evaluate them in Moodle [6].

Some indicators were used to determine the flexibility of the Moodle platform: the possibility of using various plug-ins that improve the capabilities of the Moodle platform. There are about 1600 of them and this is not the limit.

The Moodle platform at Bukhara University has been used since 2017 but the system passed special tests during the COVID19 pandemic. As it turned out there are many inconveniences in the system that need to be eliminated. The elimination of these shortcomings was possible with the help of special plugins that are available on the official website moodle.org. Since the Moodle platform is open source, it is possible to develop the necessary plugins from the platform users which makes it much easier to use the software product since it can take into account special customer requests. This is what allows you to increase the flexibility of Moodle.

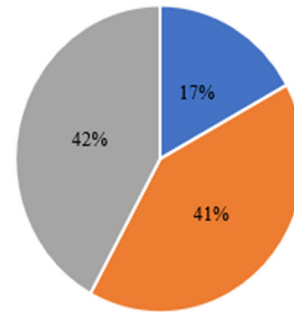
Pedagogical experience of the participants



■ 0-2 years ■ 2-5 years old ■ 5 more the years

a)

Participants' experience in using MOODLE



■ 0-2 years ■ 2-5 years old ■ 5 more the years

b)

FIGURE 1. (a) Pedagogical experience of participants; (b) experience of participants in using Moodle.

In a desire to improve the capabilities of the system specialists of Bukhara State University have connected many plugins. After plug-ins were connected to the Moodle platform at Bukhara State University, a survey was conducted among teachers and students about whether it is necessary to use this plugin in the platform.

The plugin which provides the possibility of using Cyrillic in file names allowed older teachers, who find it easier to work in Cyrillic, to be more active while using the platform. This plugin was developed by specialists of Bukhara State University and implemented into the University's distance education platform.

At the beginning it was impossible to upload files with names created in Cyrillic which led to certain inconveniences and it was necessary to delete downloaded files and rename them using numbers or Latin letters.

While another plugin, Moodle-plugin allows the integration of Zoom with the Moodle platform: the creation of calls and meetings, synchronization, evaluation and backups of meetings. This plugin allows you to conduct online trainings via video.

The plugin turned out to be convenient providing messages to the course participants in their personal space and that is the opportunity to conduct a personal conversation.

The survey result showed that not all plugins are particularly necessary for training. For example plugins such as QUESTOURnament — a module for creating a quiz, Game Activity Module — an extension with simple games were not very popular.

TABLE 1. Survey results on the use of special plug-ins in the Moodle platform of Bukhara State University.

Name of the plugin	Survey results	Survey results
	(+)	(-)
Using the Cyrillic alphabet	98%	2%
Integration with ZOOM	60%	40%
Conducting a private conversation	87%	13%
Creating a quiz	35%	65%
Extension with simple games	44%	56%

Thus, the possibilities of the plugins connected Moodle platform can be observed according to the arithmetic progression formula [9]:

$$P_n = \frac{(a_1 + a_n) * n}{2} + s \quad (2)$$

P is the capabilities of the platform, a is plugins, n is the number of plugins, S is the capabilities of the server of the educational institution.

To conclude, special plugins increase the flexibility of the system and facilitate the work of users of the Moodle platform.

The survey (Table 1) and formula 2 present what we should take into account when enabling special plugins. Such plugins sometimes make the platform and the capabilities of the server of the educational institution harder and cannot always meet the needs of users.

The requirements of bettering the convenience of education lead to an improvement in the technical support of educational institutions.

DISCUSSION

During the pandemic special courses were created on the use of this educational platform for all participants, from the rector to the student, and a special training portal was also created with the support of the Ministry of Higher and Secondary Education of the Republic of Uzbekistan. With the introduction of universal quarantine all universities in Uzbekistan were transferred to the LMS Moodle platform. The ZOOM application and the Telegram messenger were also widely used. However, after some time it immediately became noticeable that the Moodle platform has a clear advantage!

The ZOOM application has time limits: in order to have more time you need to pay for services (which can be economically unprofitable). There is no possibility of placing resources and it requires high quality communication (sometimes classes are interrupted at the very peak of the presentation), students from remote areas do not always have the opportunity to connect to ZOOM at the right moment.

Telegram messenger provides good quality communication but it is difficult to organize control over the execution of tasks here. Since an increase in teacher contacts leads to distraction. Thus some messages (files with completed tasks) may remain unseen which leads to confusion while evaluating students.

Currently the HEMIS (Higher Education Management Information System) platform is also widely used in Uzbekistan. It was developed by Uzbek specialists and this management information system is being implemented into the higher education system of Uzbekistan. The system is also implemented in the educational system of Bukhara State University.

It should be noted that this platform is still working in test mode and has a number of disadvantages that should be improved. There are no interactive tasks in this system, the volume of downloaded files that are included in the content of classes is limited which leads to the fact that a teacher has to constantly monitor the volume of the interactive presentation.

The availability of potentially powerful technologies does not guarantee their effective use in any field. Improving the efficiency of a modern university as a complex social system, designing and bettering management systems in modern conditions should be carried out on the basis of scientific approaches, in particular a systematic approach. Such platforms should ensure the formation of the basic principles of university management, the definition of management functions in accordance with the main strategic goals and objectives of the university. Building an effective organizational structure, creation and implementation of new information technologies in education management should also be taken into account.

The Moodle learning platform at Bukhara State University offers a huge number of courses for students [10]. The Moodle LMS system is configured and has several distinctive features that are available to teachers to help them assess student performance. In this case, the LMS is used to provide course content, a plan for its completion, evaluation, creation of events, collecting feedback about the course and communicating with course participants. Among several functions, only some of them have integrated our local software tools such as assignments, feedback, tests and modules for seminars, etc. The university is very widely using the function of electronic journals of the Moodle system helps to track the conduct of training sessions and student attendance which are monitored by the deans of educational faculties to make appropriate decisions regarding students and teachers. Here you can easily get reports without resorting to routine paperwork. There is also a well-established system to manage the schedule of classes by the deputy deans of faculties. The schedule is compiled in conjunction with the course teachers. The schedule table is available to teachers and students.

A study of the Moodle system at Bukhara State University shows that the capabilities of the system have a wide range which, thanks to the open code, can be used uniquely. In order for the training courses to be as convenient as possible for online learning, a decree of the Ministry of Higher Education of the Republic of Uzbekistan was developed according to which the content on the topics of classes is downloaded. The decree provides for 16 points each of which determines the availability of one or another resource in the platform. For each of the topic's teachers need to create

a video tutorial, upload it to the YouTube platform and install a link to this video. It is also necessary to download electronic publications on the subject while for each of the classes it is necessary to specify the pages in the publication concerning the topic of the lesson. The convenience of this function is that once you download a textbook or other literature a link to an electronic publication can be used any time and not only at a particular time.

A glossary is created for each course helps to understand the meaning of the terms used in the disclosure of the course topics. the glossary is also useful because it can be supplemented by students of the course, thereby expanding their horizons.

The bulletin board that is used in the course allows you to conveniently and quickly distribute teacher announcements that need to be conveyed to students.

Also, teachers are required to upload their curriculum for this course, it is approved by the vice-rector for the academic part of the university in order to avoid deviation from the subject of the course. This provides legal protection for teachers from attacks of students who miss particular classes. Currently a credit-modular education system is being actively introduced in Uzbekistan that will bring global changes to the education system. At the same time these changes will also affect the creation of courses in the Moodle system. Namely, the way to enroll in teachers' courses will change, the content and interface of the course will change (this is under development).

CONCLUSION

Moodle is a free learning environment that is publicly available and offers adaptive features. The user can customize his own course in accordance with the requirements and easily use functions which allows a closer acquaintance with modern information technologies. That makes a wide variety of teaching methods more in demand. A feature of the Moodle system is its integration with other systems and this makes this learning environment even more flexible and popular.

The scientific component of this article consisted in studying the software capabilities of the Moodle platform, based on the addition of special plug-ins that expand the capabilities of the system. The coefficient of necessity of using certain plug-ins in the Moodle platform of Bukhara State University has been determined, which determines the flexibility of this system, that is, the possibility of improving the quality of remote service.

The survey table also shows the result of a survey of the study's opponents, which determines the percentage of the need to use certain plugins of the Moodle platform of Bukhara State University.

Thus, the authors of the article came to the conclusion that the Moodle distance learning system has great opportunities for organizing the educational process, although it has such a disadvantage as a large amount of occupied machine memory, which requires special attention to the technical support of distance education.

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