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Problems and Opportunities of Using LMS Moodle before and during COVID-19 Quarantine: Opinion of Teachers and Students

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***Abstract* – Before the spread of coronavirus infection (COVID-19), LMS Moodle was used by universities as an alternative and additional tool to support the educational process. It demonstrated low effectiveness, primarily because of its episodic use by teachers and students. Mass transition to distance learning in the conditions of self-isolation has led to the increased demand for the platform, but at the same time, it has revealed the obvious problems of using this resource. The article provides the data from an opinion study about the problems of using LMS Moodle conducted among university professors and students. It also presents the results of a correlation analysis of factors that affect the satisfaction of the LMS Mobile consumer audience. The complications of using LMS Moodle that arose prior to COVID-19 pandemic are analyzed and some suggestions for improving the platform are offered in the article**

Keywords - LMS Moodle; communication; interaction of participants in the educational process; resistance; COVID-19

I. INTRODUCTION

Currently, the widespread informatization of education is reinforcing the tendency to use various technical devices and online Internet platforms [1]. There is a need to search for new, innovative ways of organizing the educational process and allowing interaction between teachers and students [2, 3]. This, in turn, contributes to the spread of various distance learning systems, one of which is LMS Moodle [4]. However, despite the fairly wide functionality of this system, various problems occur when this tool is used.

The current stage of education system's development is characterized, first of all, by the wide spread of information and communication technologies, which leads to the creation and growth of a variety of technical solutions and tools, resources and services, online Internet platforms [1]. This, in turn, leads to the mass distribution of various information systems and learning management systems (LMS), such as Moodle [4]. The variety of proposed models, technologies, and tools creates many problems for users and administrators, namely the problem of choice, the problem of quality, and the problem of user-friendliness.

The problem of choice motivates the search for the most effective way of organizing the educational process and the interaction between teachers and students [2, 3] and focuses on the comparative characteristics, key advantages, and features of various systems. It contributes to the development of competition and a clearer understanding of target audiences.

The problem of quality has been identified as particularly relevant during the spread of COVID-19 when e-learning has become not only mass, but also the only possible form of education. Governments and universities rightly believe that the quality of training, regardless of its form and the use of technologies, must meet the same requirements. In this regard, both the developers and the users of e-learning systems have come to the attention of researchers and practitioners, since the quality of training largely depends on their motivation, willingness to use technical teaching aids, proper organization of the learning process, and facilitation of interaction between teachers and students [5].

II. PROBLEM STATEMENT

The organization of the educational process using these communication technologies requires additional preparation, specifically involving students and teachers in the use of these tools, ensuring sufficient technical support and availability of the necessary equipment, timely access to assignments, etc.

Nowadays, the transition to distance learning has made LMS Moodle the main tool for teacher-student interactions at Herzen State Pedagogical University and other universities in Russia, e.i., St. Petersburg State University, Peter the Great St. Petersburg Polytechnic University, Moscow State Pedagogical University, Ural Federal University, and many others. At the same time, a study conducted at Herzen University showed that 48% of all the available courses in Moodle had not been attended by students prior to COVID-19 quarantine, while the rest of the courses had been attended by 1 to 100 students; only 34 university online courses had been attended by more than 100 students. Moreover, the courses run by teachers most often contained from one to five modules out of possible 16. Thus, almost 70% of all the system resources remained unclaimed.

The problem of simplicity and user-friendliness of technical means and learning systems has arisen because the modern information environment has become an integral part of academia, the flow of information has greatly increased, and the

load of distribution channels has grown. Teachers and students who interact entirely online now have to intensively exchange electronic messages, files, links, articles, organize video conferences, chats, etc. Therefore, it is required to have both the ability to find and structure the necessary data and information and to choose the most suitable ways to share it. To achieve this goal, the means of electronic communication are currently used almost everywhere:

- E-mail (Mail.ru; Yandex.Mail; Gmail.ru);
- Social networks (Vkontakte; Facebook; Twitter);
- Instant messengers (WhatsApp; Viber);
- Learning platforms (Moodle).

However, the organization of the educational process with the use of such means of communication requires special competencies and the willingness of both students and teachers to use these tools. Moreover, sufficient technical support and the availability of equipment has to be guaranteed to provide timely access to assignments and other activities.

Our analysis focuses on one of the possible ways of ensuring teacher-student interactions with the use of electronic resources - LMS Moodle.

III. METHODOLOGY

LMS Moodle is a course management system (e-learning), also known as a learning management system or virtual learning environment. It is a free web application that allows to create sites for online learning. One of the advantages of this system is its multipurposeness and a wide range of tools for communication [6].

LMS Moodle provides the following options for allowing interaction between teachers and students, students with each other, teachers and administrators, inspectors and technical specialists:

- file-sharing of any format;
- organizing discussions of various learning and assessment problems in forums and chats;
- exchanging personal messages and commenting on tasks, discussing individual problems in personal online communication;
- assessing the results of completed assignments promptly and with detailed teacher comments;
- sending out notifications about current events and tasks that allow to inform all the course participants instantly;
- checking attendance, students' actions, and the time they spend on their academic work in the system.

It is obvious that Moodle combines diverse means of communication that other electronic communication channels may provide and it allows not only to perform many functions, but also to integrate them into one platform.

However, despite these advantages, the use of this tool may cause some problems.

It is confirmed by the results of two studies that we conducted. One of them was aimed at identifying how various factors of the learning environment could influence the level of activity of teachers and students in Moodle. It was carried out before mass transition to distance learning. The other one was an opinion survey conducted to clarify what problems the teachers and students of Herzen University experienced when using Moodle. It was carried out two months after a switch to distance learning.

Sociological survey methodology was used in this research. The achieved results were carefully analyzed, some of the answers were subjected to correlation analysis to determine the factors that affected customer satisfaction of using LMS Moodle.

The sample of the study consisted of teachers and students who work and study at the Institute of Economics and Management of Herzen State Pedagogical University (97 people in total). 79 students participated in the survey, most of them were sophomores and juniors. 18 teachers were also interviewed; the majority of them were associate professors (67% of respondents). After a pilot survey, we repeated it and chose a larger representative sample which consisted of 540 teachers and 1795 students of Herzen State Pedagogical University.

IV. RESEARCH RESULTS

The results of the study showed that both students and teachers preferred to use the same means of communication for social and personal interaction with each other, namely e-mail (Mail.ru; Yandex.Mail; Gmail.ru), WhatsApp messenger, and social network VKontakte. The respondents' answers indicated that LMS Moodle had not been a means of their active communication prior to COVID-19 quarantine. The frequency of using this tool was rather low: 43% of the students we surveyed rarely used it; 44% of the teachers we surveyed had the experience of running courses in Moodle, but, despite that, they rarely used this learning management system in their work.

The next round of our research was aimed at assessing the respondents' resistance to using Moodle. We were able to identify three basic groups of students and teachers. The first group did not experience any discomfort when using the system and was ready to work in it. The second group could not clearly express their attitude to using Moodle. And, finally, the third one encountered strong internal resistance to using the system (the respondents were not prepared to and did not want to use Moodle).

Our attempt to determine the correlation between the frequency of using Moodle and the strength of the respondents' internal resistance provided the following data. The correlation coefficient for students turned out to be equal, it was 0.16; and the correlation coefficient for teachers was 0.25 (See Figure 1, 2). It means that the strength of internal resistance had little effect on the frequency of using LMS Moodle.

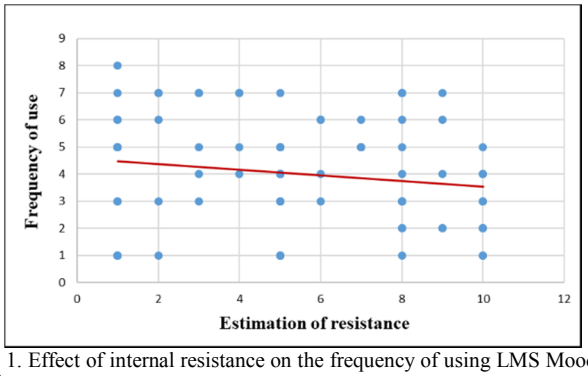

Fig. 1. Effect of internal resistance on the frequency of using LMS Moodle by students

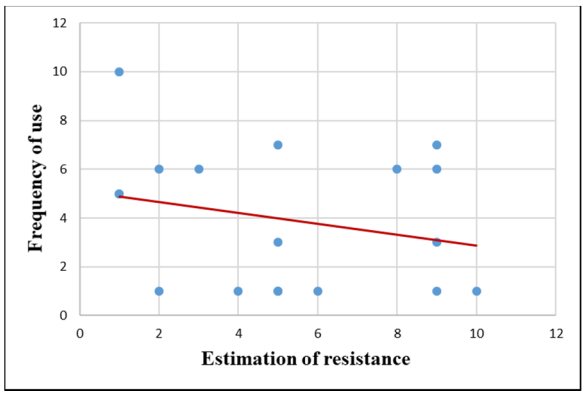

Fig. 2. Effect of internal resistance on the frequency of using LMS Moodle by teachers

Further research was aimed at identifying the main causes of resistance to using LMS Moodle (See Table 1).

TABLE 1. REASONS TO RESIST USING LMS MOODLE

Reasons	Opinion that using the system complicates the learning process	Reluctance to spend time on mastering the system	Lack of understanding of the purpose and the benefits of using the system	Lack of motivation to work in the system
Students	29%	24,6%	39%	31,9%
Teachers	28,6%	42,9%	21,4%	78,6%

The study of difficulties that teachers and students of Herzen university encountered when using LMS Moodle gave the following results.

Only 7% of 1795 surveyed students did not experience any technical difficulties while switching to distance learning and using LMS Moodle. Other students encountered the following problems while using the system regularly:

- instability of the system - 79.4% of respondents;
- quality of Internet connection - 40.7% of respondents;
- difficulties of integration between various platforms and hardware - 39.4% of respondents.

In general, when rating the functionality of LMS Moodle, students gave it only 4.6 points on a ten-point scale; and it indicates their dissatisfaction with the quality of the system. According to the majority of respondents (38%), the quality of training rather decreased than increased after the transition to distance learning.

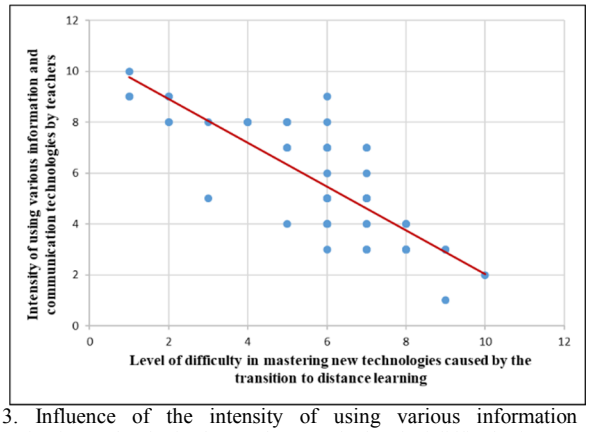

Fig. 3. Influence of the intensity of using various information and communication technologies by teachers on the level of difficulty in mastering new technologies caused by the transition to distance learning

The results of teachers' survey also indicated that those who had been actively using different communication channels to interact with their students before switching to distance learning because of COVID-19 quarantine adjusted much easier and faster to these new circumstances. We analyzed the correlation between the intensity of using various information and communication technologies by teachers (e-mail (Mail.ru; Yandex.Mail; Gmail.ru), social networks (VKontakte; Facebook; Twitter), instant messengers (WhatsApp; Viber)) and the level of the difficulty they encountered when mastering the technology used for distance learning. The correlation coefficient turned out to be rather high - 0.75 (See Figure 3), and it indicates that the less past experience the teachers had, the more serious problems they faced during the transition to distance learning.

The respondents named the following problems they encountered while using LMS Moodle:

- technical issues with chat software - 50.5% of respondents;
- only text-based communication between teachers and students - 36.5% of respondents;
- inconvenient and not user-friendly interface - 30% of respondents;
- size limits of attached files with tasks - 25% of respondents;
- slow speed and unstable system performance that limited access to study materials - 28% of respondents;
- lack of a calendar with reminders of all the course activities - 23% of respondents.

V. CONCLUSIONS

Thus, according to the results of the study, the following conclusions can be drawn:

1. Before mass transition to distance learning, students and teachers lacked understanding of the purpose and benefits of

using LMS Moodle and believed that the use of this system would only complicate the learning process.

2. Both students and teachers prefer to use the same means of communication for social and personal interaction with each other, namely e-mail (Mail.ru; Yandex.Mail; Gmail.ru), WhatsApp messenger, and social network VKontakte. Moreover, LMS Moodle was not a means of their active communication prior to COVID-19 quarantine.

3. Inactive use of the system before the quarantine was partly due to students' and teachers' internal resistance to using this additional and onerous, in their opinion, tool. However, contrary to popular belief, this factor was not crucial. At the moment, the main problems of using LMS Moodle are related to its technical characteristics. The instability of the system led to a fairly critical assessment of its quality and low scores that students gave it (4.6 points on a ten-point scale).

4. The teachers who had been actively using different communication channels to interact with their students before mass transition to distance learning adjusted easier and faster to these new circumstances.

Thus, the following recommendations may be offered to increase the involvement of students and teachers and their satisfaction with the quality of performance of LMS Moodle:

1. The interface and the design of the system should be improved, and a technical upgrade should make it more user-friendly.

2. It should be possible to download task files of any format and size.

3. The "Reminder" plugin should be added to inform about deadlines for completing tasks and other important events.

4. The interface design should become intuitive and minimalistic, there should be an option to enable or disable the display of functions, user-friendly and convenient icons, prompts, auto-complete feature, etc.

5. The chat should be modified to eliminate the problem of an abrupt ending of a session and to provide an opportunity to enter a common chat at any time and see previous messages, etc.

6. The stability of LMS Moodle should be guaranteed.

7. A video-chat or video-call plugin should be installed into the system to provide an opportunity to conduct online lectures and make visual contact during student consultations with teachers.

8. A notification system for new messages should be created.

9. Moodle mobile application should be connected to Moodle website (a student should be identified if the mobile application is used to login into the system, instant notifications and updates on incoming tasks and changes in deadlines should be received, etc.).

REFERENCES

[1] Federal Law of December 29, 2012 No. 273 – F3 "On Education in the Russian Federation" (as amended on August 03, 2018). 135p. (In Russian)

[2] Kamneva, The use of information and communication technologies in higher education. ZHurnal «Skif. Voprosy studencheskoj nauki» [Magazine. Scythian. Student Science Issues]. St. Petersburg, 2018, no.3 (19), pp. 22 – 28. (In Russian)

a. Papashvili, O.Mukhlynina, Effective interaction of participants in the educational process based on communication technologies. Vestnik nauki i obrazovaniya [Bulletin of science and education]. 2017. vol. 2. no. (29). pp. 86 – 92. (In Russian)

[3] F. Mukhametzyanova, A. Kamaleeva, S. Gruzkova, R. Khadiullina, Organization of interaction of subjects of the educational process using distance learning platforms. Nauchno-prakticheskij zhurnal «Otkrytoe obrazovanie» [Scientific and practical journal "Open Education"]. 2016. no. 3. p. 36 – 42. (In Russian)

[4] O. Babanskaya, G. Mozhaeva, A. Feshchenko, Quality management as a condition for the development of e-learning in a modern university // 8th International Conference on Education and New Learning Technologies, July 4-6, 2016 - Barcelona, Spain, - p. 4367-4373. DOI: 10.21125/EDULEARN.2016.2057.

[5] N. Zavodchikova, U. Plyasunova, M. Suvorova, Using the Moodle distance learning system to organize the independent work of full-time students. Vestnik Kostromskogo gosudarstvennogo universiteta. Seriya: Pedagogika. Psihologiya. Sociokinetika [Bulletin of Kostroma State University. Series: Pedagogy. Psychology. Sociokinetics], 2016, vol. 22, no. 4, pp. 170 – 174. (In Russian)