Using Learning Content Management System Moodle in Kryvyi Rih State Pedagogical University educational process

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Abstract. The article analyzes the results of the survey of 75 lecturers on using learning content management system (LCMS) Moodle in the educational process. It is defined that more than 75% of the respondents use LCMS Moodle. The lecturers up to 30 or over 60 years old, with up to 3-year-work experience in Universities need methodic assistance. Textual e-learning resources are widely used in developed courses while video and audio are not used enough. LCMS Moodle is mostly used during exams or tests and student work, and using LCMS Moodle should be intensified in lectures, laboratory and practical classes. Among the most demanded resources are label, page, file, URL, book, assignment, attendance, glossary, quiz. Thus, the popularization of other resources is identified as one of the most important. An action plan how to improve LCMS Moodle usage: increasing the IT competencies of both teachers and students – planned long-term courses "IT in full-time (blended) learning"; seminars, consultations, (group and individual forms) both on general issues, and according to the specificity of the specialties; methodic handouts and recommendations; improving logistics; improving logistical support – ensuring constant access to the Internet, updating and equipping computer classrooms; creating of transparent, predictable and attractive for authors content of the regulatory framework.

Keywords: learning content management system Moodle, LCMS Moodle, survey.

1 Introduction

According to EDUCAUSE Horizon Report 2019, "key short-term (one to two years) trends of accelerating higher education technology adoption are redesigning learning spaces and blended learning designs" [2]. Teachers prove that blended education gives the possibility to combine advantages of traditional and innovational types of learning. Andrii M. Striuk defines blended learning as "the way of realizing the content of learning that integrates classroom and online learning activities with pedagogically balanced combination of traditional, electronic, distance and mobile learning technologies with the aim to achieve learning goals most efficiently" [32, p. 19]. Yurii

V. Tryus and Inna V. Herasymenko refine the given definition, saying that blended education is "the process aimed at obtaining knowledge, skills and habits, assimilating ways of cognitive activity and the development, as well as the creative abilities of those who are participants of education system, on the base of the complex and system usage of traditional and innovational pedagogical technologies and rules to achieve the improvement of the educational quality" [36, p. 304].

According to the European University Association report, 91% of universities use blended learning [8]. The organization of blended learning was investigated in the researches of Volodymyr M. Kukharenko [16], Olga V. Bondarenko, Svitlana V. Mantulenko and Andrey V. Pikilnyak [5], Iryna S. Mintii, Natalia A. Kharadzjan and Svitlana V. Shokaliuk [21], Nadiya O. Holiver, Tetiana V. Kurbatova and Iryna H. Bondar [10], Natalya V. Rashevska, Serhiy O. Semerikov, Kateryna I. Slovak, Andrii M. Striuk [27; 29] and etc.

To implement blended learning, the great part of the Ukrainian pedagogical universities use learning content management system (LCMS) Moodle [3; 4; 6; 7; 9; 11; 12; 13; 14; 15; 17; 18; 19; 23; 24; 26; 28; 33; 34; 38; 39; 40; 41; 42], which is considered to be the mostly widely-spread LCMS all over the world – in 2019 it is used in 242 countries [22]. The reason of LCMS Moodle popularity is in its functionality, free prom money, open admission (Open Source), wide set of instruments and interface with many languages.

Among Ukrainian scholars the use of LCMS Moodle in educational process is investigated by Hanna M. Shalatska, Olena Yu. Zotova-Sadylo and Ivan O. Muzyka [30], Andrii I. Abdula, Halyna A. Baluta, Nadiia P. Kozachenko and Darja A. Kassim [1], Pavlo P. Nechypurenko and Serhiy O. Semerikov [25], Svitlana V. Shokaliuk, Iryna S. Mintii [20; 37], Yevheniia M. Smyrnova-Trybulska [31], Yurii V. Tryus, Inna V. Herasymenko, Vasyl M. Franchuk [35] and others.

Some teachers of Kryvyi Rih State Pedagogical University were among the first in Ukraine who started working on LCMS Moodle. Finally, it caused the affirmation of Concept of Development of E-learning Environment in Kryvyi Rih State Pedagogical University. According to it, there are three stages in Kryvyi Rih State Pedagogical University.

The first stage involves developing the infrastructure and providing the conditions for the construction of e-learning environment: training of scientific-pedagogical and pedagogical staff for implementation of e-learning technologies; a primary fund formation of electronic didactic and methodological materials and placing them within LCMS; creation of a control system and evaluation of the quality of e-learning resources.

During the second stage, according to the Concept, the elements of e-learning system were implemented: testing the developed e-learning resources while students' training; improving existing e-learning resources and filling the database with new ones; creating and developing electronic evaluation system of students' achievements; analysis of changes in the quality of students' learning as a result of the introduction of e-learning elements.

The third stage deals with the full-scale deployment of the e-learning environment (2019-2020): completing the formation of information, methodological, technological

and organizational components of e-learning environment; constant monitoring of the quality of e-learning resources and the performance of students' educational activities; formation of open e-learning resources, providing citizens' access in order to create conditions for lifelong learning; establishing cooperation with Universities (both home and foreign) in the field of e-learning; exchange of experience.

2 Methodology

The purpose of this article is to systematize the information relating to using LCMS Moodle in Kryvyi Rih State Pedagogical University educational process, formulate the conclusions, and determine the prospects for development. The survey method was used to obtain the data. A Google form (https://forms.gle/s8DZ7qYcDENUikZE7) "Using LCMS Moodle in Kryvyi Rih State Pedagogical University Educational Process" was prepared, containing 14 questions, one of which is optional (surname, name, middle name). The lecturers were able to access the survey via email.

The interview term lasted from 12.03.2020 to 18.03.2020. Seventy-five (75) lecturers participated in the survey (quantitative data of the lecturers in the chairs is shown in Table 1).

Table 1. Quantitative data of the lecturers in the departments

| No	Department	The number of survey participants
1	Department of the Ukrainian Language	10
2	Department of Chemistry and Methods of its Teaching	8
3	Department of Sociology and Economics	7
4	Department of Mathematics and Methods of its Teaching	7
5	Department of Computer Science and Applied Mathematics	7
6	Department of Pedagogy and Methods of Technological Education	6
7	Department of Pre-School Education	6
8	Department of Physical Geography, Regional Studies and Tourism	4
9	Department of Fine Arts	4
10	Department of Physics and Methods of its Teaching	3
11	Department of Pedagogy	3
12	Department of the English Language with Methods of Teaching	3
13	Department of Ukrainian and World Literature	2
14	Department of History of Ukraine and Law Studies	2
15	Department of Applied and Decorative Arts and Design	1
16	Department of Botany and Ecology	1
17	Department of English Philology	1

The percentage distribution of respondents to the question "Do you use LCMS Moodle?" is given in Fig. 1.

It should also be determined what percentage of respondents has experience in course development. The distribution of respondents to the question "Do you have experience in developing courses in Moodle?" is given in Fig. 2. As can be seen in Fig. 2, more than 20% of those who use Moodle have no experience in designing

courses. Therefore, they need methodological assistance to increase their IT competencies.
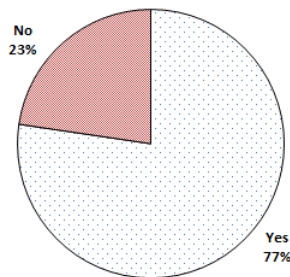
Fig. 1. The distribution of respondents in response to the question
"Do you use LCMS Moodle?"
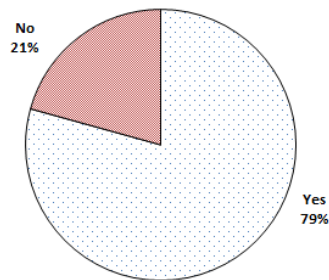
Fig. 2. The distribution of respondents in response to the question
"Do you have experience in developing courses in Moodle?"

In addition to mentioning to a particular department, one of the questions was "Specify your age". The purpose of this question was to identify the correlation between respondents' age and using LCMS Moodle (the obtained distribution is shown in Fig. 3). Analyzing the results, we can conclude that lecturers who are up to 30 or over 60 years old use LCMS Moodle the least. When planning seminars or courses how to use LCMS Moodle, special attention should be given to lecturers of these age categories.

The next step was to define the relationship between work experience in a higher educational establishment and using LCMS Moodle. The results are presented in Fig. 4.

Fig. 4 makes us conclude that it is necessary to provide methodological assistance to lecturers with the least work experience in universities.

The Concept was adopted in 2017, although some lecturers used LCMS Moodle long before that. That is why one of the questions was "When did you start using LCMS Moodle?" From this issue on, only responses of the lecturers who use LCMS Moodle have been analyzed. Therefore, the survey shows that only 12% of the respondents

already used LCMS Moodle during 2004-2012. The number of lecturers who started using LCMS Moodle has increased sharply since 2014 (Fig. 5).
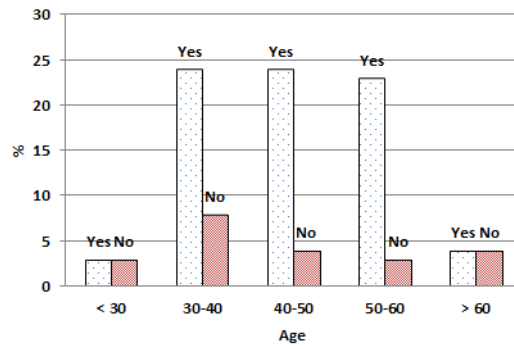

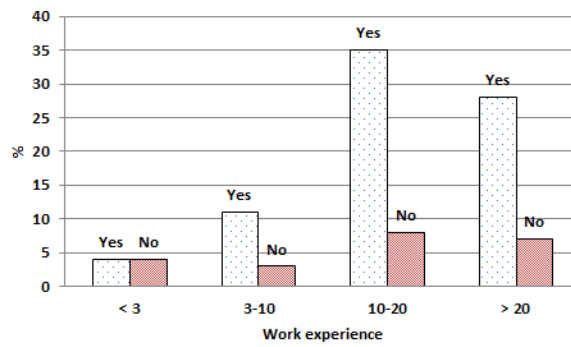**Fig. 3.** Distribution of respondents by age and using LCMS Moodle

Fig. 4. The distribution of respondents according to their work experience in universities and using LCMS Moodle
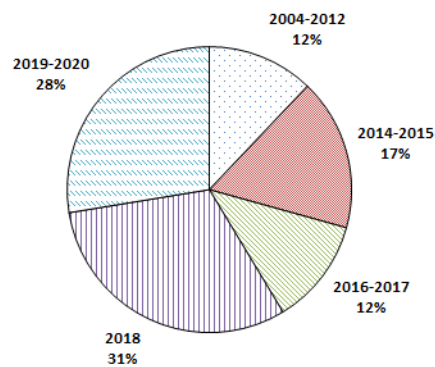

Fig. 5. The distribution of respondents according to starting using LCMS Moodle

Researching the intensification of using Moodle the reasons for this should be identified. That is why, the courses of advanced training of teachers of "IT in Full-Distance (Blended) Training" were held in Kryvyi Rih State Pedagogical University in 2014 for the first time.

So, in response to the question "How do you increase your competencies in using Moodle?" the following answers have been proposed: 1) self-education; 2) communication with colleagues; 3) webinars, workshops, seminars; 4) the courses of advanced training of teachers of "IT in Full-Distance (Blended) Training"; 4) your option. The distribution of respondents to this question is shown in Fig. 6.
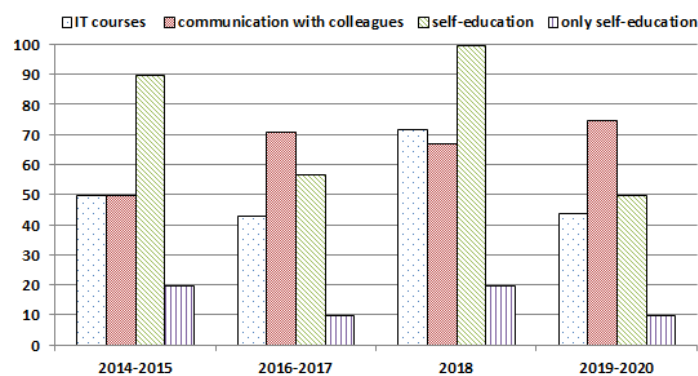
Fig. 6. Ways to improve Moodle competencies

The great majority of lecturers have indicated several ways – mostly self-education, communication with colleagues, and courses. Only 20% (2014-2015, 2018) and 10% (2016-2017 and 2019-2020) have indicated that they increase their level of competencies only due to self-education. Thus, we conclude that the implementation of courses plays a significant role in enhancing the use of LCMS Moodle.

According to the Concept, the university is implementing a full-scale Moodle deployment now. Therefore, it is worth researching the e-learning resource types lecturers use in their courses.

Options for answering the question "What types of e-learning resources do you use in LCMS Moodle courses?": 1) text (*.doc, *.docx, *.pdf and etc.); 2) graphics (*.bmp, *.png, *.jpg and etc.); 3) tables (*.xls, *.xlsx and etc.); 4) sound (*.mp3, *.wav and etc.); 5) video (*.avi, *.mp4, *.mpg and etc.); 6) multimedia (*.ppt and etc.). The distribution of respondents to this question is shown in Fig. 7.

Analyzing the data, we conclude that lecturers more often use text files in the Moodle courses (this is the only type of e-learning resources that received values "periodically" and "mostly" 80%, and multimedia – 50%). Communication with the respondents shows that the most common materials in the courses are programs, texts of lectures, literature, etc., and presentations to lectures, which correspond to the obtained results completely. However, at the same time, audio and video resources are not widely used. Therefore, using e-learning resources audio and video courses should be popularized.
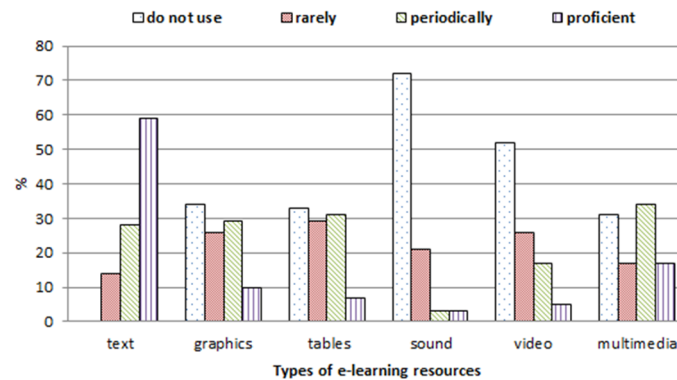
Fig. 7. Distribution of respondents regarding using different types of e-learning resources

Classes in Universities are held in various forms – lectures, laboratory classes, practical classes, exams, tests. Do lecturers use LCMS Moodle in all classes to the same extent? The distribution of respondents to this question is shown in Fig. 8.
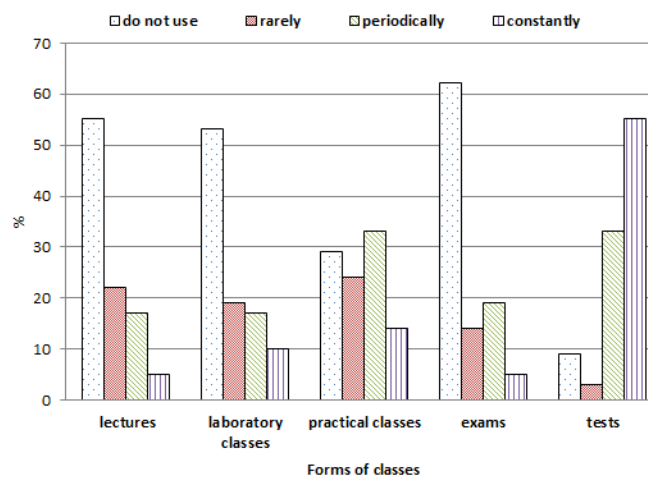

Fig. 8. Using LCMS Moodle according to the forms of classes

Only 3 lecturers (5%) use LCMS Moodle in the lectures regularly, 6 (11%) use LCMS Moodle in laboratory classes, 8 (14%) use LCMS Moodle in practical classes, 3 (5%) use LCMS Moodle in exams, 26 (46%) use LCMS Moodle in tests. Lecturers should be encouraged to use LCMS Moodle, because it will intensify the educational process, regardless of the form of the class. For example, LCMS Moodle provides students with an opportunity to re-watch a presentation to a lecture or a video after the lecture if necessary. What is more, it makes possible to place the list of references, as well as links to the literature, the plan of the lecture, etc. Furthermore, it is available to develop a task as a resource "Assignment" and to choose an option "to submit" the answer

online in laboratory or practical classes. Due to this, even skipping classes the students will know the tasks. They change the file only in their cloud storage to correct the answers, and lecturers link to the updated file immediately.

During tests the lecturers post questions for study, a list of recommended literature (as references to resources) with page indication, design tasks as a resource "Tasks", and evaluate students' works in the form of testing, etc.

Regardless of the form of class, only 3 teachers (5%) of those who use LCMS Moodle in the educational process follow this procedure in all classes.

LCMS Moodle has a large set of tools. They can be conditionally divided into information resources (which only give access to certain information and do not provide any reporting) and activity resources (which provide some reporting on their implementation). Fig. 9-11 show estimating of the level of proficiency in using LCMS Moodle resources.
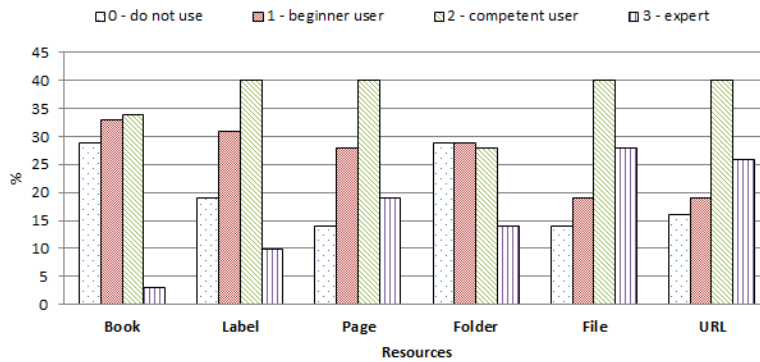

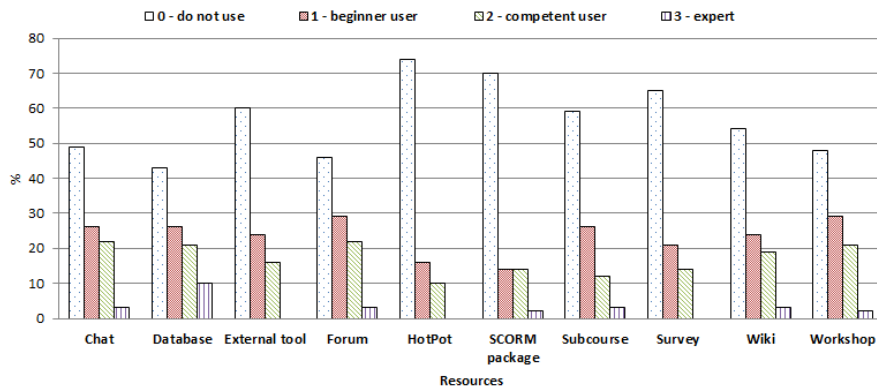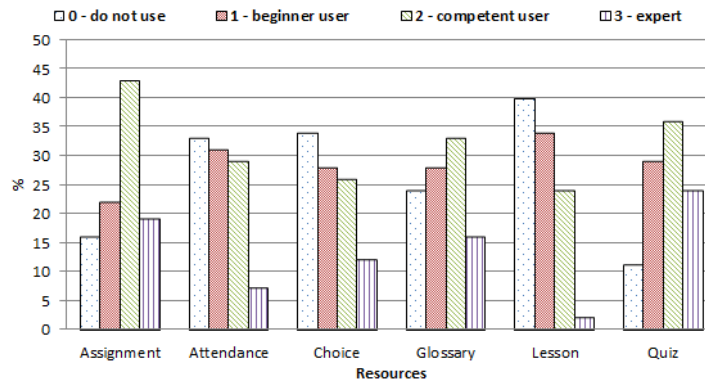**Fig. 9.** Levels of proficiency in using LCMS Moodle information resources

Fig. 10. Levels of proficiency in LCMS Moodle activity resources
(resources for which the sum of levels "2" and "3" < 50%)

Fig. 11. Levels of proficiency in LCMS Moodle activity resources
(resources for which the sum of levels "2" and "3" > 50%)

The obtained data help us conclude that most lecturers need methodical support for using a wide range of activity resources. The examples of them are instructions for using these resources, and demonstrations of these resources in existing courses, etc.

One of the most important questions answered by the interviewed lecturers is "What prevents you from using LCMS Moodle?" The response to this question was separately analyzed for lecturers using LCMS Moodle and for educators who do not (Fig. 12).
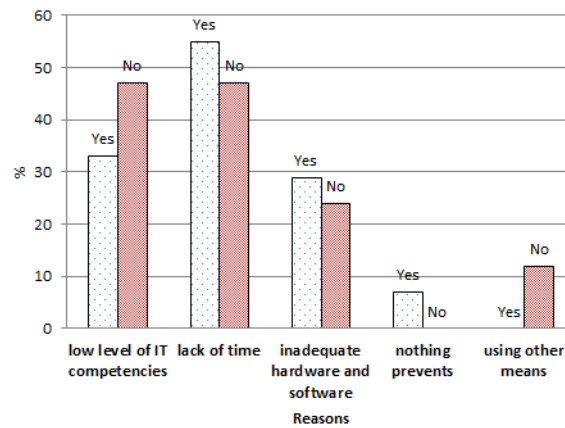
Fig. 12. Reasons preventing from using LCMS Moodle

Most of the respondents noted such reasons as "a lack of time", "a low level of IT competencies" and "the nonconformity of hardware and software". We can conclude that it is necessary to intensify the methodical assistance to lecturers because developing e-learning resources of the proper quality is time-consuming what restricts the use of LCMS Moodle. Many processes can be automated (for example, by importing tests, glossary entries, enrollment, etc.) with the right level of IT competencies.

The lecturers have stated their wishes how to use LCMS Moodle in the educational process efficiently, (parentheses indicate the number of persons who stated the same wish):

— providing computer classes of some University buildings with the necessary equipment (10);
— stability of the site (2);
— possibility of participating in webinars (e.g. via BigBlueButton (3));
— various forms of encouragement of lecturers (including bonuses);
— conducting seminars, consultations on LCMS Moodle features (for example, electronic booking an appointment with an expert for individual or group consultations) depending on the specificity of the specialty (12);
— conducting full-time IT courses (blended) training (3);
— developing methodological guidelines of using individual elements in the educational process (2);
— increasing the relative importance of the development of the e-learning resources as a form of methodical work of the lecturer (2);
— internal and external expert evaluation of the content and presentation quality of courses;
— creating transparent, predictable and attractive for authors content of the regulatory framework, including a clear sample course;
— developing methodological materials for the assessment of competencies acquired in the course;
— enhancing students' IT competencies in using LCMS Moodle;
— creating applications in Ukrainian that can reflect specificities of particular disciplines.

One of the ways how to improve LCMS Moodle in the educational process is providing a lot of opportunities to enhance your abilities and skills. The main problem is to learn using it. It is up to a person to use as many tools and capabilities of LCMS Moodle as possible.

3   Conclusions

The majority of respondents (75%) claim that using LCMS Moodle in Kryvyi Rih State Pedagogical University educational process is at an appropriate level now. However, the following steps to improve efficiency should be taken in such areas as:

— involving new educators in using LCMS Moodle;
— promoting using LCMS Moodle regardless of class types;
— facilitating using different types of e-learning resources and more LCMS Moodle resources by teachers.

The lecturers have defined the main steps to reach this purpose:

1. increasing the IT competencies of both teachers and students – planned long-term courses "IT in full-time (blended) learning"; seminars, consultations, (group and individual forms) both on general issues, and according to the specificity of the specialties; methodological developments, recommendations, etc.;
2. improving logistical support – ensuring constant access to the Internet, updating and equipping computer classrooms (it should be noted that at the time of writing the article several computer classrooms were completed at the university);
3. internal and external expert evaluating of the course quality, both in content and in submission; creating of transparent, predictable and attractive regulatory framework for authors' content.

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