

ЗАГАЛЬНА ПЕДАГОГІКА ТА ІСТОРІЯ ПЕДАГОГІКИ

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EXPERIENCE IN USING DISTANCE LEARNING SYSTEMS
AT UNIVERSITIES OF UKRAINE AND MEXICO

ДОСВІД ВИКОРИСТАННЯ СИСТЕМ ДИСТАНЦІЙНОГО
НАВЧАННЯ В УНІВЕРСИТЕТАХ УКРАЇНИ ТА МЕКСИКИ

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ABSTRACT

The basic didactic principles of distance and traditional forms of education are considered. The use of learning management systems (Learning Management System) is relevant in the context of the COVID-19 pandemic. In the process of transition of educational institutions to distance work and learning during quarantine, there was an expansion of the range of tools used and the expansion of the functionality of existing new tools. The main functional modules of modern learning management systems like Moodle, Google Classroom, Microsoft Office 365 and their implementation in distance learning are analyzed. The main functional modules of modern distance learning management systems are identified, they include such modules as system administration, access to educational materials, means to ensure communication between participants in the distance learning process, etc.

Distance education is based on the principles and features of traditional forms of learning, in addition, new features are added, which are the use of Internet technologies for access to educational materials, online interaction between students and more. The peculiarities of implementation of the principles of distance and traditional forms of education on the example of higher education institutions of Ukraine (Berdiansk State Pedagogical University, National University of Life and Environmental Sciences of Ukraine) and Mexico (Autonomous Honored University of Puebla) are considered in the article.

Based on the results of the study, general recommendations were developed for the simultaneous use of several platforms, which allows you to work from any device; under modern pandemic conditions, you can also use the mobile Internet, which increases the convenience and productivity; at any time you can view the necessary documents, perform tasks, responds to changes in the workflow, which allows you to learn quickly about innovations and change ways to solve problems.

Thanks to the obtained results, teachers will be able to develop more effectively online learning environment.

Keywords: *distance learning, didactic principles, distance learning management system.*

Problem formulation. With the development of information technology, society has faced an important problem, which is to create a promising new education system that should prepare society for life in the new conditions of civilization. This explains the emergence of a new form of education – distance education, with the forms already known and traditional – full-time education, external form of education, etc. (Kalenichenko, 2020; Ovsyannikov & Aliksieieva, 2019; Serbova & Tsybuliak, 2019).

For the effective implementation of the distance learning system, it is necessary to create an appropriate infrastructure of educational institutions, train teachers, develop curricula (Danysko, 2018; Strutynska & Umryk, 2021; Tsybulko, 2020; Tsinko & Holub, 2020; Gorbatiuk & Rozumna, 2019; Chupryna, 2023).

Studies of M. Bukharkina, A. Kay, V. Kukharenko, E. Mashbyts, R. Maison, S. Nipper, E. Polat, O. Rybalka, N. Sirotyнка are devoted to the implementation of distance learning. Scientific works of D. Verduin, T. Clark, A. McGress, V. Oliynyk, O. Sobaeva, P. Stefanenko, R. Howard are of great practical importance for the organization and implementation of distance education. Of particular interest are studies relating to the comparison of traditional and distance educational models (A. Kay, N. Mulina, G. Ramble,

P. Serdyukov), the comparison of different models of distance learning (G. Ramble, D. Sewart).

However, the problem of systematic implementation of distance learning within the educational institution using centralized learning management systems (Learning Management System), which are designed to develop, manage and disseminate learning materials online with the provision of shared access by many users are actualized in the conditions of the COVID-19 pandemic (Kravchenko & Gorbatyuk, 2018; Pavlenko, & Pavlenko, 2021; Ostenda, Nestorenko & Ostenda, 2018).

The purpose of this article: based on the analysis of the functionality of learning management systems and the experience of their application in higher education institutions of Ukraine and Mexico to form general recommendations for the choice of distance learning support.

Analysis of basic research and publications. Before the COVID-19 pandemic, many universities around the world used learning support systems mainly as centralized platforms for the delivery of educational content in the blended learning process, in particular the application of inverted class models (Kuzminska, 2016; Rybalko, 2020). The appearance of the COVID-19 has changed the situation. Thus, the analysis of online tools to support learning (Yuzyk, 2020; Shchetytnina & Gorbatyuk, 2020) shows that 2020 was a year of video platforms, when educational institutions tried to support distance work and learning during quarantine; in 2021 there is an expansion of the range of tools used, but learning management systems still hold high positions: Google Classroom ranks 9th out of 150 tools, LMS Moodle has 22nd position. At the same time, according to the survey of teachers and students of higher education institutions of Ukraine, which was conducted as a part of the study (Kuzminskaya & Barna, 2021) to support e-learning, Google Classroom is used in 9.3% of higher education institutions, Microsoft Sharepoint in 2.1% (Glazunova & Korolchuk, 2017), LMS Moodle is used in 64.4%. The latter is confirmed by the research of B. Seren and R. Mohammed (Seren & Mohammed, 2020) and is the basis for the assumption that among the various learning management systems on the market, LMS Moodle is the most popular in the implementation of distance and blended learning in higher education institutions. It should also be noted that the popularity of this learning management system has a certain historical basis (Costa & Teixeira, 2012; Glazunova & Voloshina, 2015). According to the official website the most widespread use of LMS Moodle was in Spain (14,359 registered sites), the United States (13,785 sites), Germany (10,082 sites) and Mexico (10,942 sites). On the other hand, higher education institutions, which by 2020 actively implemented distance learning support systems in the educational process, are making efforts to enrich institutional educational environments with new tools and methods of involving students and teachers in active online interaction (Tosun, 2021). V. Starosta, studying the use of LMS Moodle in higher education institutions of Ukraine before and during the pandemic, confirms the limited use of this system (25% by undergraduate and 30% by graduate) and an increase to

84% and 88% respectively during quarantine restrictions caused by the COVID-19 (Starosta, 2021; Belozubov & Nikolaev, 2007).

Thus, an objective need to study the functionality of distance learning systems, insufficient theoretical and practical elaboration of the problem (there is only a small number of special studies on this issue) and the current experience of higher education institutions in Ukraine and Mexico have led to the choice of our research.

Presenting main material. Consider the features of the basic didactic principles of traditional and distance learning processes.

It is clear that distance education is based on the principles and features of traditional forms of learning, in addition, new features have been added, which are the use of Internet technologies for access to educational materials, interactive interaction between students and more.

Thus, the principle of directing education to solve problems of education and general development of students in traditional education means that teacher must pay attention not only to solving problems and skills, but also to the effectiveness of the system of educational activities in this topic (Demchenko, 2016). In the distance learning system, this principle has received the following interpretation: the principle of creativity of the nature of cognitive activity (Danisko, 2018).

The principle of scientificity, which is based on the connection between science and subject in distance learning, has corresponded to the fundamental nature of learning to the cognitive needs of the learner (Kuzminskyi, 2005; Rybalko, 2020).

Continuation of the content of this principle is the principle of free choice of information obtained through certain activities: there is no single ideal source of information, so the focus of learning is not directly information, but ways to transform and process it, through participation in discussions, teleconferences, etc.

The principle of systematicity and consistency, which requires that the knowledge presented is organized, classified, logically related to other material. The ability to choose independently learning goals, form and pace of learning leads to improved learning outcomes in distance learning.

The principle of clarity has become a principle of virtualization of learning (multimedia publications, videos, illustrations, video conferences, etc.) (Lavrik & Poblano, 2014).

In addition to the principles described above, there is also a group of principles of distance learning, the creation of which is the result of active development and use of information technology (Glazunova & Korolchuk, 2017).

Thus, the principle of identification is important in distance learning because there are more opportunities for falsification of learning than in the traditional full-time form of learning. You can control the independence of control measures by using technical means, such as video communication. Information technologies should provide the possibility of control by the teacher of the educational process, the ability to make changes in the curriculum, make available not only contact between teacher and student, but also to ensure the

possibility of contact between students as this is the principle of interactivity (Abramova & Khrinenko, 2019). The principle of basic knowledge is important for effective distance learning, which is that the user of the distance learning course must have computer skills, have access to the Internet, online skills and the necessary technical support for full-fledged learning. An important pedagogical principle is the principle of pedagogical expediency of using information technology (Aliexsieieva, 2015). Each step of designing and organizing the process of distance learning requires pedagogical evaluation and evaluation of the feasibility of using the latest information technologies that have a direct impact on the components of learning – its content, purpose, means and so on (Kovalova & Babiichuk, 2021).

Note that the structure of the above pedagogical principles is not stable, with time real changes and innovations associated with the further development and implementation of distance learning will appear.

However, these principles are actually decisive in the construction of distance learning systems. These systems make up a large number of interconnected modules. At the same time, the main functionalities that modern distance learning systems (ITEnergy Corporate Projects) should provide are highlighted: access to educational content. It is necessary to provide the possibility of user authorization, management of user rights, control of access to educational materials; providing convenient means of administration. A typical set of functionalities is user registration, user group management, management of distance courses and control measures, providing means of communication between course users.

Today, there are many opportunities to communicate, the main ones being video and audio conferencing, forums, chats, blogs, e-mail. Based on the built models, the system creates appropriate curricula for each user and reporting. It is important to be able to generate reports at the request of the user; integration of the system with various information systems (the system should not be isolated from other information systems) with which it is in a common environment; formation of complex distributed systems. It is necessary to simplify user access to training courses by building a distance learning system with several nodes. It is important to have an autonomous client who will provide access to materials in the absence of permanent access to the training system (Byrka & Chubrey, 2019).

Taking into account these didactic principles and the necessary functionality of distance learning systems, we can synthesize the following modules of the system: module of system administration; module of organization and support of the educational process; test development and support module; module of development and presentation of all types of educational materials in the system; module of export-import of educational materials of various formats; module of interactive interaction of course users: lecturer-students, students-students, students-lecturer; user activity register module.

Today, a wide range of distance learning and distance learning management systems is widely used, both open source (shareware) and paid, widely used and narrowly oriented. We compare the availability and

implementation of modules in distance learning support systems, which have become most common in higher education institutions (Table 1).

Table 1

Implementation of the main functional modules of modern distance learning management systems Moodle, Google Classroom, Microsoft Teams

Platform / module	<i>Moodle</i>	<i>Google Classroom</i>	<i>Microsoft Teams</i>
1	2	3	4
Module for developing and presenting educational information in the system	Module «Lesson» for the presentation of educational material The Glossary module adds comments to definitions and automatically links words in lectures to the definition of a glossary	The main menu of the teacher's console contains tabbed courses, calendar, selected materials for review, archived courses, settings. The development of lessons in the selected course is carried out in the environment of the tab «Tasks». The lesson contains a title, instructions for the task or tasks, the purpose of the topic, category, differentiation «for all students of the course» or «selected students (students)», as well as «for selected courses». The lesson can contain tasks, tasks with the test, materials, questions. When creating and assigning tasks, you can sync Google Classroom with Google Calendar, Google Meet for online live meetings with 200 participants in one session indefinitely. Simultaneously with the creation of the Course, a folder on Google Drive is automatically created in the automatic structuring files (Google Docs, Google Spreadsheets, Google Presentations, Google Forms) for each lesson separately. Each student is also assigned a copy of the assignments for the lesson, provided they are placed on Google Drive, automatically with the «Copy to each student» setting.	OneDrive allows you to organize the presentation of educational information. A variety of file content can be used: Word text documents, Excel spreadsheets, PowerPoint presentations, OneNote video castes, MS Stream), links to various resources.

<p>Test development module</p>	<p>The activity «Test» in the Moodle system allows you to create a test with the following parameters: the choice of time frame for testing, limiting the time of the test, the number of test attempts, the number of questions per page; mixing answers in questions.</p>	<p>For feedback, there is a variety of tasks «Questions» and «Tasks with test». The test is developed in the Google Forms environment.</p>	<p>Microsoft Forms, as part of Office 365 services Education, allows you to create questionnaires, tests, analyze the results of knowledge control.</p>
<p>Control of lecture material</p>	<p>Journal of registration of activity of users (students) in the block «Management». Possible log filtering parameters are day, course name, group, participant, completed task.</p>	<p>The activity of students is determined by the fixation of the student in the lesson independently – «Marked as performed» after listening to / viewing the lecture material. Login and logout are controlled only by selected groups of administrators.</p>	<p>Creating «Tasks» for students in teams «Class» Microsoft Teams allows you to monitor the performance of tasks.</p>
<p>Individual work</p>	<p>Module «Tasks». The teacher creates a description of the task, the setting for its implementation and indicates the place where the student is obliged to upload the results. The student can download the results in the form of abstracts, videos, presentations,</p>	<p>The flow of tasks is structured by topics and categories. The teacher creates a description of the content of the task, attaches a file from Google Drive or provides a link to a third-party resource. The student console provides independent creation and attachment of works in the form of Google Docs, Google Spreadsheets, Google Presentations and / or other materials in the form of links. The student has the opportunity to create their own survey and assignments in the course. In his own console,</p>	<p>The teacher creates a description of the content of the task, attaches a file or provides a link to the resource. The teacher can assign an individual task, add instructions, choose the time of execution and enter the task in the calendar.</p>

	tables, etc. The Module «Workbook» differs from the module «Tasks», in it the tasks consist of <i>Answers in the form of text</i> that can be edited by the student.	the student has the opportunity to add a comment to the course or a private comment for the teacher (the teacher has the opportunity to limit the course in the settings and stop the comments of students).	
Interaction			
Student-student interaction	Forum Chat Messaging	Students can post messages on the course page with the possibility of their moderation by the teacher	Chat video conferencing
Teacher-student interaction	Forum Chat Messaging	The teacher can post messages to all students or personal messages in a feed or e-mail, which can be commented on by students, providing feedback between the teacher and students, as well as leaving comments on assignments and tests.	Chat video conferencing
Students-teacher interaction	Chat Messaging	The student can leave comments on the completed tasks, as well as publish comments (questions, clarifications) on the tasks of the course and send messages to the teacher by e-mail	Chat video conferencing

Thus, each of the above learning management systems (Table 1) satisfies the requirements for modern forms of distance learning. However, different educational institutions usually choose one as a basic one. Let's investigate the factors influencing the choice of learning management systems on the example of individual institutions of higher education.

Our study examined the experience of the Autonomous Honored University of Puebla in Mexico, where Anna Alekseeva (Candidate of Pedagogical Sciences, Associate Professor of the Department of Computer Technology in Management and Education and Informatics of Berdyansk State Pedagogical University) had the international internship. Mexican universities use various technologies for distance learning: the corporate platform Microsoft Teams, learning management systems Blackboard Learn and Moodle, video conferencing service Zoom. At the beginning of the pandemic, courses were created on all these platforms. The Special

Department DGCyTIC (Dirección General de Cómputo y Tecnologías de la Información y Comunicaciones) decides on the choice of learning platform, creates courses on these platforms, fills them with teaching materials provided by teachers, registers applicants for courses. Teachers are responsible for the quality of teaching materials and classes.

For example, the Autonomous Honored University of Puebla uses the Microsoft Teams platform (Fig. 1) for distance learning because the virtual server is securely encrypted, which ensures the safety and confidentiality of information. That is, data security directs more resources to achieve goals and training efficiency, you can reduce the financial cost of expensive equipment and pay for relevant specialists, you do not need to create storage space for servers and their maintenance.

We have identified temporary difficulties in implementing a distance learning system: insufficient computer skills for teachers and students, lack of distance learning experience; a small number of methodological materials for the preparation and conduct of distance learning; insufficient development of information and communication infrastructure; the problem of personnel search (distance learning requires highly qualified staff, specialists in the subject area); insufficient interactivity of distance learning materials. The main content of the courses is now lectures, which combine text materials and simple graphic objects (photographs, drawings, etc.).

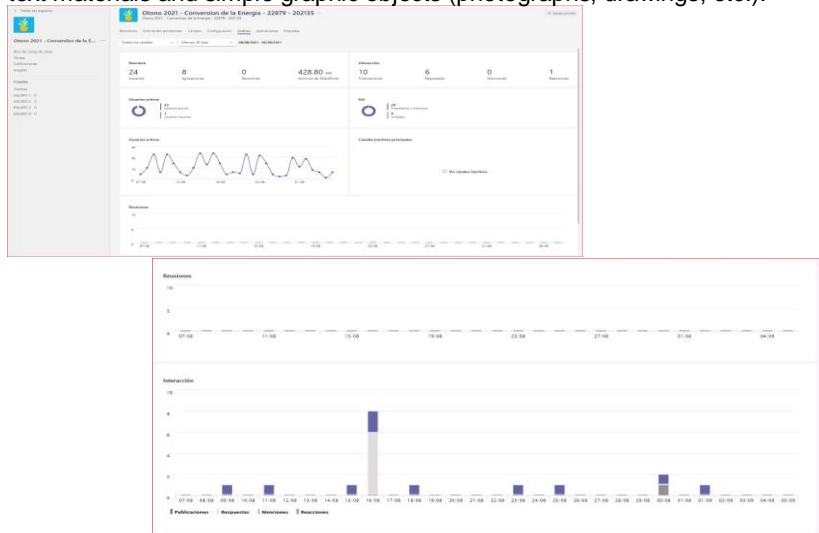


Fig. 1. An example of using the Teams platform at the Autonomous Honored University of Puebla

Berdiansk State Pedagogical University uses various platforms: Moodle (Fig. 2), Google Classroom, Microsoft Office 365, but preference is given to the e-learning system Moodle, as a specialized environment for

placement and organization of e-learning materials, best suited to implement these recommendations and requirements.

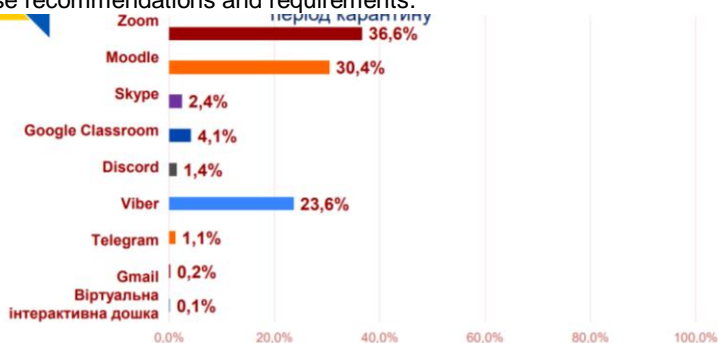


Fig. 2. Remote technologies used in BSPU

As the National University of Life and Environmental Sciences of Ukraine has created an institutional educational environment based on open source software, a single authorization system for all users has been set up (the user accounting system is maintained through the openLDAP database in which student credentials are converted from the state database EDEBO) and at the beginning of quarantine restrictions based on the Moodle learning management system a powerful database of e-learning courses to support full-time, blended and distance learning was created, this system is the basis for teachers and students' use.

Moodle (Modular Object-Oriented Dynamic Learning Environment) is an open source modular software package (GNU GPL license) designed to create distance learning courses and web sites. This distance learning management program focuses on teacher-student interaction and is also used to support face-to-face courses. Moodle can be installed on any computer that supports PHP and MySQL, PostgreSQL, Microsoft SQL Server; the software is cross-platform.

However, the use of the standard Learning Tools Interoperability allows you to create a distributed learning environment for sharing different virtual environments that interact with the user and with each other. Integration of educational and scientific subsystems into a single information and educational environment (based on open source software). Such environments include Google Workspace for education (in particular, the Google Classroom learning management system, which is used mainly for the initial internships of students, which involve not only teachers and students of National University of Life and Environmental Sciences of Ukraine, but also business representatives and other stakeholders) and Microsoft Office 365, including Microsoft Teams for organizing the work of project teams. The Center for Distance Learning Technologies provides support and advisory assistance to teachers and students on the use of environmental resources, monitors the effectiveness of the use of e-learning courses and the activity of distance learning participants (Fig. 3).

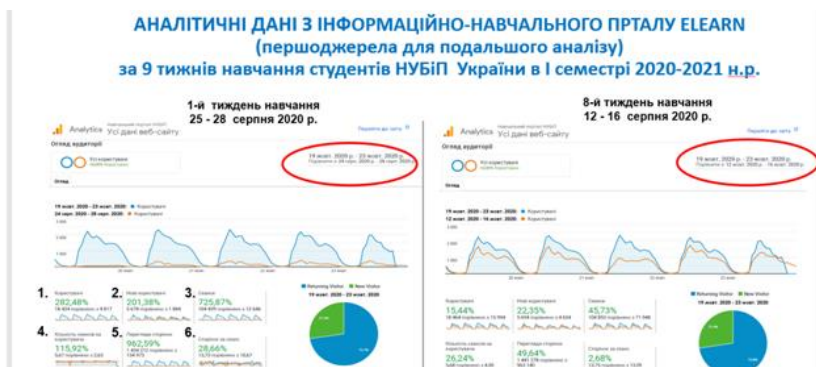


Fig. 3. Example of static reports on the effectiveness of the Moodle learning management system at the National University of Life and Environmental Sciences of Ukraine

Conclusions from this study and prospects for further exploration in this direction. The main didactic principles of distance and traditional forms of learning are considered, the main functional modules of modern distance learning management systems are derived, which include system administration, access to educational materials, means to ensure communication between participants in the distance learning process and more. In accordance with the formulated modules, a review and comparison of the availability and implementation of modules in distance learning systems Moodle, Google Classroom, Microsoft Office 365, using the experience of higher education institutions in Ukraine and Mexico are conducted.

Thus, higher education institutions in Mexico uses mainly Microsoft Office 365, which requires less training for teachers, because with the pandemic they began to use cloud servers, which are light and mobile.

Ukrainian higher education institutions mainly use Moodle, because this platform was chosen long ago for distance learning of students. From the Mexican experience, we recommend using several platforms at the same time, which will allow you to work from any device – smartphone, tablet, laptop, PC (the device does not matter, the virtual office is available always and everywhere where there is an Internet connection). Under the current conditions of the pandemic, you can also use mobile Internet, because now all operators provide customers with sufficient resources and speed, which increases the convenience and productivity, at any time you can view the necessary documents, files, perform tasks, responds to changes in the workflow, which allows you to learn quickly about innovations and change ways to solve problems.

The information provided in the paper contains information on the capabilities of existing distance learning management systems and is relevant today for the development of these systems.

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АНОТАЦІЯ

Розглянуто основні дидактичні принципи дистанційної та традиційної форм навчання. Використання систем управління навчанням (Learning Management System) актуалізується саме в умовах пандемії COVID-19. У процесі переходу освітніх закладів на дистанційну роботу та навчання під час карантину спостерігалось розширення спектру використовуваних інструментів та функціоналу новими інструментами. Проаналізовано основні функціональні модулі сучасних систем управління навчанням Moodle, Google Classroom, Microsoft Office 365 та їх реалізацію в умовах дистанційного навчання. Визначено основні функціональні модулі сучасних систем управління дистанційним навчанням, які містять забезпечення адміністрування системи, доступ до навчальних матеріалів, засоби для забезпечення комунікації між учасниками процесу дистанційного навчання тощо.

В основі дистанційної освіти закладені принципи та особливості традиційних форм навчання, окрім того, додані нові особливості, які полягають у використанні інтернет-технологій для доступу до навчальних матеріалів, інтерактивної взаємодії між студентами тощо. Розглянуто особливості реалізації принципів дистанційної та традиційної форм навчання на прикладі закладів вищої освіти України (Бердянський державний педагогічний університет, Національний університет біоресурсів і природовикористання України) та Мексики (Автономний Заслужений університет Пуебла). В статті розглянуто досвід використання систем дистанційного навчання.

За результатами дослідження було розроблено загальні рекомендації щодо одночасного використання декількох платформ, що дає змогу працювати з будь-якого девайса; за сучасних умов пандемії можна також використовувати мобільний інтернет, за рахунок чого в разі збільшується зручність і продуктивність роботи; у будь-який час можна переглянути необхідні документи, файли і виконати завдання; прискорюється реагування на зміни в робочому процесі, що дає змогу швидко дізнаватися про нововведення і змінювати способи вирішення завдань на необхідні.

Завдяки отриманим результатам викладачі зможуть ефективніше розвивати середовище онлайн-навчання.

Ключові слова: дистанційне навчання, дидактичні принципи, система дистанційного управління навчанням.