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5.3 Modern tools for the implementation of distance learning

The COVID-19 pandemic has made radical adjustments to the organization of the educational process in higher education institutions. Most governments around the world, including Ukraine [231], have transferred higher education students to distance learning under quarantine restrictions in an attempt to curb the spread of the pandemic. These nationwide events affect almost 70% of the world's student population. Quarantine is not a vacation, but a new learning environment that requires the creation of modern forms of activity, where the main factors of success are the responsibility and self-organization of students and teachers.

Distance learning is a form of open learning system that provides interactive interaction of teachers and students at different stages of learning and independent work of students with the materials of the information network using modern information and communication technologies. "Distance learning in a higher education institution is a new, independent, progressive form of learning that has greater potential" [232]. Distance learning involves the creation and use of a single information and educational environment, which contains various electronic sources of information, namely: distance learning courses; electronic textbooks located on educational servers; virtual libraries; databases of educational resources; web-quests designed to achieve learning objectives; virtual environments of educational and practical activity (laboratory works, workshops); electronic simulators; electronic systems for monitoring and measuring the effectiveness of training [233].

The Moodle (Modular Object-Oriented Dynamic Learning Environment) learning platform was chosen as the only information and educational environment [234, 235]. The Moodle platform meets all the requirements of the organization of lifelong learning in order to obtain professional competencies and includes the following interrelated stages: diagnosis, planning, training, management of the educational process, assessment, communication of results [236]. Moodle learning environment allows to provide asynchronous independent work of students of higher education institution, aimed at solving the system of educational tasks and tasks in the process of time-

distributed interactive interaction with the developing elements of this electronic learning environment [237]. This platform contains a large number of different learning elements (so-called "modules"), which provide dialogue and cooperation between teacher and students. With the help of the platform, the teacher can choose any of the modules, place it on the site, edit, and update, and use to inform, teach and evaluate students. To provide students with material for theoretical training in each discipline, a full-fledged course was created, which included lecture material, lesson plans, electronic resources, materials for independent work, test tasks. The use of multimedia video and audio materials, drawings significantly increases the effectiveness of teaching and students' interest in learning new material. Certain modules, such as Task Activities, allow the teacher to assign tasks, collect papers, evaluate them, and leave feedback on those papers. Students can send any digital content (files), such as text documents, spreadsheets, and pictures, audio and video files. In addition, you can allow students to enter the answer directly on the site. The platform allows you to monitor student activity, contains a user-friendly electronic journal of grades. The "Test" module is used to assess the student's work. This module gives the teacher the opportunity to use Bloom's taxonomy tests, which may contain questions of different types: multiple choice; essay; drag and drop in the text; short answer; numerical answer; conformity; "right and wrong." The "Test" module allows the teacher to quickly check the results of many students at once, as their answers are checked automatically and immediately entered into the journal of grades.

One of the strengths of Moodle is the wide range of communication opportunities (glossaries, blogs, forums), which are focused on the joint work of teacher and student. In forums it is possible to carry out discussions on groups, to estimate messages, to attach to them files of any formats. In personal messages and comments there is an opportunity to discuss a specific problem with the teacher in person. In the chat, the discussion takes place in real time.

Given that most of the disciplines studied in higher education are practice-oriented, teachers face an extraordinary task – to create conditions not only for the acquisition of theoretical knowledge, but also for the development of skills and

practical skills. In addition, the teacher is primarily a speaker who needs feedback. There are many resources on the Internet with training programs that would help make distance learning as productive as possible. Based on own experience of participating in educational online webinars, it was decided to provide visual contact between teacher and student to use the ZOOM service to the distance learning platform. It is one of the leading tools for online meetings and video or audio conferences. Zoom service has a number of advantages: it is very simple and easy to use; it can be used on any gadget – phone, tablet, computer or laptop. During the broadcast, the teacher explains the task or demonstrates the practical skills that students must complete. The teacher can also demonstrate presentations with information material and videos. The teacher also has the opportunity to explain to students how and for what forms of work it is better to use the materials contained in the distance learning platform, which should be given special attention. In turn, students can also use the "screen demonstration" function to perform the tasks of the teacher. Students can ask the teacher questions or leave comments in the chat, and the teacher can answer them immediately during a lecture or practical session. An important role is played by the "video conference recording" function, which allows students who could not join the video conference to view the recording in time later. All videos can be stored on a computer or in the Zoom cloud storage. The Zoom service is available to the largest possible audience of students because it is free. Free conferences last up to 40 minutes, which is almost equivalent to an academic hour and does not require the teacher to significantly review the methodological material for lectures, practical or seminar classes.

But there are some problems when using the ZOOM service. First of all, it provides both teachers and students with powerful gadgets and high-speed Internet to support high-quality video conferencing. It should be understood that distance learning is not a tracing of full-time learning in the classroom and requires some change in the structure of the organization of the classroom - at least because attention and fatigue at the computer work completely differently. But it is no less obvious that modern distance education has emerged, formed and developed on the basis of a concept known as the "inverted class" [238, 239]. That is, when a student masters the material before

the lesson and during the practical lesson together with the teacher clarifies complex issues, says what is not clear, and corrects mistakes, if any. Such a system implements the student's ability to learn independently.

Certain difficulties may arise with the identification of distance students. But both the Moodle platform and the ZOOM service require certain logins and passwords to use, which allows you to in some way ensure the identification of the student who is present at the practical lesson or lecture.

Mandatory requirements for the organization of the process of distance learning will be first of all: technical conditions, which will include computer equipment, software with sufficient characteristics, access to the Internet, as well as staffing requirements. Availability of trained teachers of the appropriate level (tutors), engineers and laboratory assistants. Attention should be paid to the need to train teachers (tutors) to use educational resources. Before the active introduction of distance learning, tutors were trained to work with the educational platform Moodle [240]. Open online courses and methodological developments were usually used to train in the ZOOM service [241].

The combination of theoretical material presented on the Moodle distance learning platform, interesting interactive tasks and video communication with the help of ZOOM service during lectures and practical classes should be a good basis for students to receive quality theoretical and practical training even in quarantine competencies inherent in the curriculum in each discipline.