

## COMPUTER TECHNOLOGIES AND TEACHING AIDS FOR DISTANCE LEARNING IN EDUCATIONAL INSTITUTIONS UNDER QUARANTINE

### *TECNOLOGIAS INFORMÁTICAS E SUPORTE ENSINO PARA APRENDIZAGEM A DISTÂNCIA EM INSTITUIÇÕES DE EDUCAÇÃO EM QUARENTENA*

### *TECNOLOGÍAS INFORMÁTICAS Y AYUDAS DIDÁCTICAS PARA EL APRENDIZAJE A DISTANCIA EN INSTITUCIONES EDUCATIVAS BAJO CUARENTENA*

Tatyana PAKHOMOVA<sup>1</sup>  
Den KAN<sup>2</sup>  
Victoriia URIADOVA<sup>3</sup>  
Volodymyr VASYLCHUK<sup>4</sup>  
Liudmyla VASYLCHUK<sup>5</sup>

**ABSTRACT:** The global spread of coronavirus infection has paralyzed the work of many areas of economic, business, and, of course, educational activities of almost all countries on the planet. Unfortunately, Ukraine is no exception, and a quarantine regime has been introduced in this country. The way out of the current situation in education in Ukraine was the introduction of distance learning in all educational institutions, which created new challenges for both teachers and students. The purpose of the paper was to study information technologies, tools and methods of learning that can be used for distance learning in educational institutions under quarantine. As a result, authors analyzed world practices in ensuring the educational process within the framework of distance learning. The advantages and disadvantages of distance learning technologies for both higher education institutions and higher education seekers were identified.

**KEYWORDS:** Distance learning. Information technology. Internet technology. Educational institutions.

**RESUMO:** A disseminação global da infecção por coronavírus paralisou o trabalho de muitas áreas econômicas, de negócios e, é claro, das atividades educacionais de quase todos os países do planeta. Infelizmente, a Ucrânia não é exceção e um regime de quarentena foi introduzido neste país. A saída para a situação atual da educação na Ucrânia foi a

<sup>1</sup> Zaporizhzhia National University (ZNU), Zaporizhzhia – Ukraine. Department of English Philology. Full Doctor in Pedagogy. ORCID: <https://orcid.org/0000-0002-1427-1536>. E-mail: [t.pakhomova@ust-hk.com.cn](mailto:t.pakhomova@ust-hk.com.cn)

<sup>2</sup> Kyiv National Linguistic University (KNLU), Kyiv – Ukraine. Department of Korean Philology. Full Doctor in Political Sciences. ORCID: <https://orcid.org/0000-0002-2191-4210>. E-mail: [ds.kan@nuos.pro](mailto:ds.kan@nuos.pro)

<sup>3</sup> Kyiv National Linguistic University (KNLU), Kyiv – Ukraine. Department of Korean Philology. PhD in Philology. ORCID: <https://orcid.org/0000-0002-1349-2695>. E-mail: [vuriadova@tanu.pro](mailto:vuriadova@tanu.pro)

<sup>4</sup> Kyiv National Linguistic University (KNLU), Kyiv – Ukraine. Department of History of Ukraine, Regional Studies and Tourism Studies. Full Doctor in History. ORCID: <https://orcid.org/0000-0003-4853-8101>. E-mail: [vvasylchuk@ust-hk.com.cn](mailto:vvasylchuk@ust-hk.com.cn)

<sup>5</sup> Kyiv National Linguistic University (KNLU), Kyiv – Ukraine. Department of Foreign Languages. PhD in Philology. ORCID: <https://orcid.org/0000-0002-6798-8389>. E-mail: [vasylchuk-1@tanu.pro](mailto:vasylchuk-1@tanu.pro)

*introdução do ensino a distância em todas as instituições de ensino, o que criou novos desafios para professores e alunos. O objetivo do artigo foi estudar tecnologias de informação, ferramentas e métodos de aprendizagem que podem ser usados para ensino a distância em instituições de ensino em quarentena. Como resultado, os autores analisaram as práticas mundiais na garantia do processo educacional no âmbito da educação a distância. Foram identificadas as vantagens e desvantagens das tecnologias de ensino a distância para instituições de ensino superior e candidatos a ensino superior.*

**PALAVRAS-CHAVE:** *Ensino a distância. Tecnologia da informação. Tecnologia da internet. Instituições educacionais.*

**RESUMEN:** *La propagación mundial de la infección por coronavirus ha paralizado el trabajo de muchas áreas de las actividades económicas, comerciales y, por supuesto, educativas de casi todos los países del planeta. Lamentablemente, Ucrania no es una excepción y se ha introducido un régimen de cuarentena en este país. La salida a la situación actual de la educación en Ucrania fue la introducción del aprendizaje a distancia en todas las instituciones educativas, lo que generó nuevos desafíos tanto para los profesores como para los estudiantes. El propósito del trabajo fue estudiar tecnologías de la información, herramientas y métodos de aprendizaje que se puedan utilizar para el aprendizaje a distancia en instituciones educativas en cuarentena. Como resultado, los autores analizaron las prácticas mundiales para asegurar el proceso educativo en el marco de la educación a distancia. Se identificaron las ventajas y desventajas de las tecnologías de educación a distancia tanto para las instituciones de educación superior como para los solicitantes de educación superior.*

**PALABRAS CLAVE:** *Educación a distancia. Tecnología de la información. Tecnología de internet. Instituciones educativas.*

## Introduction

In connection with the spread of the COVID-19 pandemic, on 11 March 2020, the Cabinet of Ministers of Ukraine decided to impose quarantine for all types of educational institutions. In pursuance of the Resolution of the Cabinet of Ministers of Ukraine No. 211 of 11.03.2020 (On prevention of the spread..., 2020), on 12 March 2020, all higher education institutions switched to the distance learning regime, which many higher education institutions seem to have declared in recent years. The new challenge has become an unbearable burden for some and an opportunity for development for others. Teachers of educational institutions, where distance learning technologies existed before, found themselves in better positions as many of them have already tried online courses out. Furthermore, social networks and various messengers were used to communicate with students. In addition, the best teachers have long begun to place their learning resources on

the Internet (KUDABAYEVA *et al.*, 2018; NAZARTSEVA *et al.*, 2019; DOLAKOVA *et al.*, 2018).

The fundamental criterion for the evaluation and implementation of a particular educational technology (forms, methods) of teaching in the education system is its effectiveness. A comparison of the effectiveness of distance learning with classrooms, conducted in the United States based on a survey of teachers of higher education institutions, showed that 57% of teachers consider the results of distance learning comparable or even superior to traditional classes, and 33% of teachers believe that in the coming years distance learning results will be capable of surpassing those of the classroom learning (Advantages and disadvantages of distance learning..., 2020).

The distance learning system has the following features: individual learning, freedom and flexibility of time management, accessibility for all, social equality, creativity, low emotional stress. On the contrary, the conventional education system has other features – live communication between students and teachers, there is stress on exams and seminars, a strongly expressed methodological and ideological orientation of classes (ALLALYEV, 2019; PORTNOVA, 2019; BUROVA; USATENKO, 2020).

It is noteworthy that the online mode is well suited for lectures and less so for practical classes, and this format is almost impossible for conducting "classic" laboratory classes. It is not possible to automatically transpose seminars to this format. It is necessary to seriously change the form of work to involve all students. But in general, the university education system, where in recent years there has been a strong emphasis on independent work of students, more or less coped with this load, at least during lectures. All this is an important aspect when considering the issue of information and other technologies in distance learning, especially under quarantine restrictions, when distance learning is the only possible form of educational process.

Among the scholars involved in the development of scientific and academic research approaches to the development of distance learning, it is worth noting Yu.V. Sakulina (2018), L. Shahmoradi *et al.* (2018), V. Donets *et al.* (2018), P. Khanna (2016), Y.I. Nikolaev (2019), L. Gavrilova and Yu. Katasonova (2017), and others.

The main purpose of the application of information technology (IT) in free economic education should be to provide students and applicants with knowledge, skills, and abilities necessary for effective interaction with modern computer technology and new IT in the educational process and future professional activities. Considering the future specialty of

students and applicants for higher education, in the classes, if possible, it is necessary to link the terms of IT with the concepts of their future subject area.

Among the technologies used in distance learning, the most widespread are as follows (BORONENKO *et al.*, 2018; LIU *et al.*, 2020):

- case technology – a form of distance learning based on providing students with informational educational resources in the form of specialized sets of educational and methodological complexes with the use of different types of media (cases);
- Internet technology – a method of remote transmission of information based on the use of global and local computer networks to ensure access of students to information educational resources and to form a set of methodological, organizational, technical, and software tools for implementing and managing the learning process regardless of location of its subjects;
- telecommunication technology – a technology based mainly on the use of satellite data transmission and broadcasting, as well as global and local networks to ensure student interaction with the teacher and with each other and students' access to informational educational resources in the form of digital libraries, video lectures, and other means of teaching.

It is also worth addressing the advantages and disadvantages of distance learning technologies for both higher education institutions and for higher education seekers, i.e., students. This list of advantages and disadvantages is presented in Table 1.

**Table 1** – Advantages and Disadvantages of Distance Learning Technologies for Both Higher Education Institution and Higher Education Seeker

<b>Advantages of educational technologies</b>	
<b>for higher education institution</b>	<b>for higher education seeker</b>
Ease of communication with students	Opportunity to study at any time
Wider opportunities to work with educational materials	Opportunity to study anywhere
A larger percentage of working time is used to improve the learning process	Opportunity to study at a comfortable pace
	Opportunity to study in a quiet environment
Unification of the learning process in all structures of the higher education institutions	Opportunity to study without leaving the main field of activity
Documentation of the learning process	Access to teachers
Variety of ways of studying the material, individualization of the learning process, creative approach to learning	
Ability to provide knowledge of higher quality	
Increase in the number of students	
<b>Disadvantages of distance learning technologies</b>	
<b>for higher education institution</b>	<b>for higher education seeker</b>
Lack of control	Insufficient motivation
Theorization of learning	Insufficient computer literacy
Dependence of the educational process on information technology	
Not suitable for the development of communication skills and teamwork skills	

---

Not suitable for the development of practical skills

---

Source: Prepared by the authors

When referring to "distance technology in education", authors mean specific platforms and tools (e.g., Moodle, Google Classroom, Zoom, Skype, Google Suite/Docs etc.) that allow students and teachers to communicate, perform, and assess tasks, control attendance, organize semester control, certification etc. Such technologies, depending on the country, university and discipline studied, can be integrated at any stage of the course. Here the initiative of the teacher on introduction of such technologies, readiness of students to use them and technical possibility of both parties to apply these technologies are important (BORONENKO *et al.*, 2018; THISTOLL, YATES, 2016; PORTNOVA, PORTNOVA, 2019).

Google Suite for Education allows to quickly organize the educational process with Classroom and Hangouts Meet. Google has created a distributed system of support and training for users of its services. Furthermore, close integration of Google services with the LMS Moodle distance learning management system is ensured.

Nowadays, Google Suite for Education offers a full range of available services for free. The list of the most popular includes Google Drive, Calendar, Docs, Sheets, Slides, Mail, Search, YouTube. Full integration of services creates a unique ecosystem and a single repository of documents and files, without restrictions. Moodle functionality allows to organize adaptive learning. It can be used for self-training, for distance learning, certification and retraining of specialists, for the organization of lifelong learning and during the course the teacher can observe not only the success of students, but also their progress with competences (AL-RAHMI *et al.*, 2018; BEKETOVA *et al.*, 2020; VINICHENKO *et al.*, 2018a).

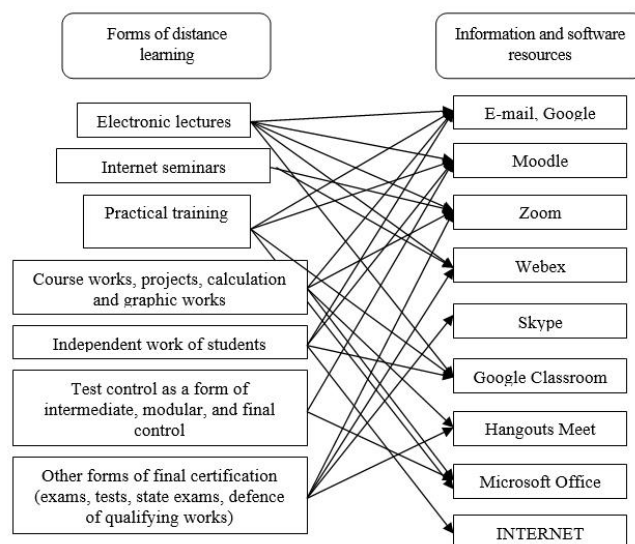
Each distance technology has its own features of use, and therefore it is important, especially for the implementation of the educational process in quarantine, to understand the general mechanisms of use of software packages and distance learning technologies. The research algorithm was presented in the form of systemic interrelations between the form of distance learning and information and software resources. The main features of such remote technologies as Moodle, Google Classroom, and video communication systems Zoom and Hangouts Meet were analyzed. Therefore, the purpose of the paper was to investigate information technology, tools and methods of learning that can be used for distance learning in educational institutions under quarantine.

## Methodology

Authors applied theoretical research methods in the paper, namely the analysis of literary sources where the principles of construction of the remote form of educational process are considered. The methodological framework of the study are the basic ideas of system, technological, and activity approaches. Distance learning technologies are closely related to the most common teaching methods. In terms of distance learning, there are the following: illustrative, reproductive, problem-based, research, and heuristic.

An illustrative method of teaching allows students to acquire knowledge in lectures, from educational and methodical literature, from an on-screen textbook. Perceiving and comprehending the facts, students' conclusions remain within the framework of reproduction of thinking. The reproductive method of teaching contributes to the comprehension of educational material by students according to rules similar to the shown patterns or situations. The method of problem statement in teaching is applied with the use of various sources and tools. Before teaching the material, the teacher formulates a cognitive task, and then, comparing opinions and different approaches, shows how to solve the problem. In this method, students are participants in scientific research.

**Figure 1** – Algorithm of Research as a Form of System Interrelations Between the Form of Conducting a Remote Lesson and Information and Software Resources



Source: Prepared by the authors

The research method of teaching is used after the analysis of educational material, setting tasks, oral or written instruction of the teacher. This method allows students to independently study the literature, sources and perform search actions. The heuristic method of teaching helps to solve the tasks either under the guidance of the teacher or by the students themselves based on working with electronic textbooks and teaching materials (KOSTRUBA, 2019; BODROVA *et al.*, 2020).

The materials of the research were literary and information sources on the ways of using various software packages that are applied in classes in distance form. The algorithm of research can be presented in the form of system interrelations between the form of carrying out remote employment and the information and software resource which is used for its maintenance (Figure 1).

A separate category should include messengers, which are used to communicate with a particular student, and provide an opportunity to communicate with the entire group at once. These are: Viber, Telegram, WhatsApp etc.

## Results and discussion

Analysis of Figure 1 suggests that among the information and software resources that allow to conduct distance learning classes, it is possible to identify those with which both the student and the teacher encounter in everyday life. These are primarily the use of e-mail and electronic disks (for example, Google Drive), Skype – video technology, and Microsoft Office, which at present is studied by pupils as early as in elementary school. The Internet does not require additional descriptions and comments, as it is used by almost 95% of the population of countries where it is available from the technical and economic aspects of development. In contrast, Webex is just beginning to conquer the market for video services in Ukraine, and therefore this study will not describe this software (SULTANOV *et al.*, 2020; KHUSANOV; RIKHSIEVA, 2019).

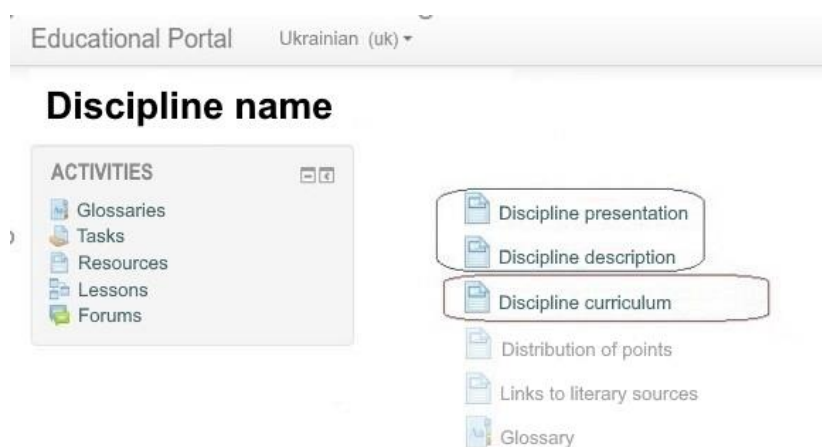
At the same time, distance learning technologies such as Moodle and Google Classroom are specific technologies for the general public, and video systems such as Zoom and Hangouts Meet, albeit well-known, were almost non-existent prior to the introduction of quarantine restrictions in the educational process. Therefore, further research will cover a more detailed analysis of these 4 information and software resources of distance learning (ZARIPOV *et al.*, 2020; UKHOV *et al.*, 2020).

The functionality of each of these applications is quite wide, therefore authors will address the main features that will reveal the main technical possibilities of using these information and software resources and for which forms of distance learning classes can be used. Moodle distance learning platform (Modular Object-Oriented Dynamic Learning Environment) (VINICHENKO *et al.*, 2018b; VINICHENKO *et al.*, 2018c).

The Moodle distance learning resource is a modular object-oriented dynamic learning environment, also called a learning management system (LMS), a course management system (CMS), a virtual learning environment (VLE), or simply a learning platform that provides teachers, students, and administrators with a very developed set of tools for computer-based learning, including distance learning. Moodle can be used in student education, professional development, business education, both in computer classes of the institution, and for independent work at home (MOODLE, 2018).

The platform can contain a curriculum of study of the relevant subject, lecture material and material for practical classes, control questions to test knowledge, furthermore, video and audio materials can be placed on the platform, as well as presentations, many interactive materials and detailed 3D-models. The system is filled according to template forms and tools. Figure 2 demonstrates a general presentation of the discipline (subject) on the Moodle platform. The most important information according to the teacher who is engaged in development and filling of system for remote studying of any subject is specified (BUROVA *et al.*, 2020; AKHYADOV *et al.*, 2020).

**Figure 2** – General Presentation of the Discipline Within the Remote Platform Moodle with the Selection of Basic Structural Elements



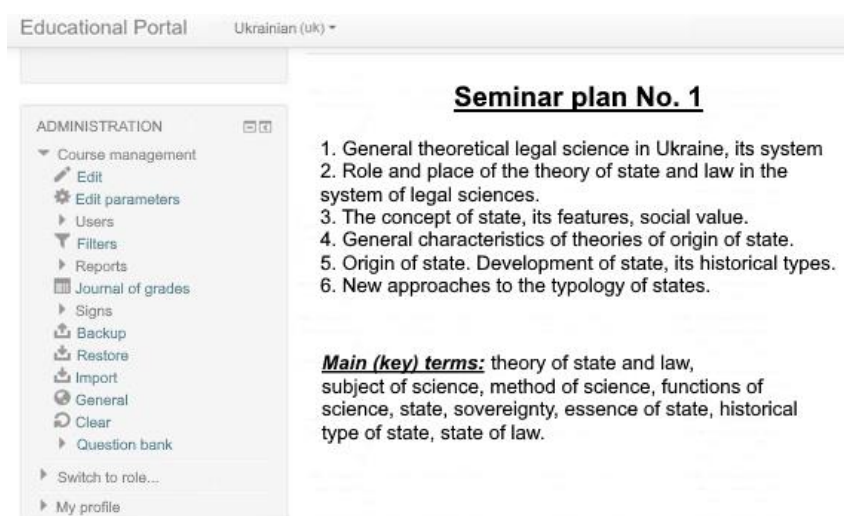
Source: Prepared by the authors



The next stage is to fill the system of topics and lecture materials that will be studied by the student within the framework of the discipline learning. As an example, authors provide the discipline "Theory of State and Law". Furthermore, Figure 3 presents the material that is displayed when working on a seminar. In the Moodle distance learning system, it is also possible to use various forms of control to supervise the acquisition of knowledge by students. The Google Classroom cloud-centric platform combines useful Google services organized specifically for learning. The following tasks are possible on its basis:

- create a separate class (course);
- organize the enrolment of students in the course;
- provide students with access to the necessary study material;
- provide tasks to perform;
- evaluate tasks;
- organize communication between all participants.

**Figure 3** – Presentation of Seminars in the Moodle System



Source: Prepared by the authors

Next, authors consider the algorithm in Google Classroom in more detail. To get started, one needs to log in to corporate mail. Google Classroom is located in Google applications where it can be selected for further work. After signing up in the application, it will be necessary to select a role – a student or a teacher. Once opened, the user will be taken to Google Classroom where they can start creating their own course. Training courses that have been accessed by other users will also be found. It is possible to join an existing class or

create a new one. Authors provide an example of creating a new one. To do this, click on "+" in the upper right corner and select "Create class". Then fill in the form in accordance with the names of the fields (BUROVA, 2020).

In the future it is possible to set the frame of the course and create messages for students. When creating and organizing the course, the main tabs will be available: Tasks, People, and Grades. The Tasks tab allows to add learning materials to the course and distribute the tasks by topic and in the required sequence. When creating a Task, the user should follow the prompts of the system and carefully fill in all the fields, because the interface is intuitive (BOEVA-OMELECHKO *et al.*, 2019).

The People tab will list the students who have joined the course. Users who have not yet confirmed the invitation in the system have a pale icon and are inactive. The user can send individual notifications to all authorized users via corporate mail (click on the icon and select the command "Send a letter to the student"). In the Grades tab, the teacher can check the tasks, give grades, comment on the answers. In the Grades tab, 2 modes for work are available:

1. View all works of a specific user (student).
2. Check the works directly in the general window.

If necessary, the teacher has the opportunity to leave comments on the work. Returning to the Tasks tab, statistics are available for each type of work. Furthermore, most of the functionality is for student work, but it is difficult to cover it in great detail within the framework of a scientific article on the basic technologies of distance learning. Summarizing the description of the features of work in Google Classroom, it should be stated that this resource is best suited for practical classes and independent work of students in the format of distance learning (YUDAEV *et al.*, 2018).

Zoom combines cloud video conferencing, simple Internet conferencing, group chat in conference rooms based on the platform. After registering or logging in, click Organize a conference – the desktop application will be downloaded automatically. Alternatively, a user can click on the download link in the footer <https://zoom.us> or download directly at <https://zoom.us/support/download>. To log in, the user needs to visit <https://zoom.us> and click "Sign in". Google, Facebook, or Zoom accounts are available for logging in.

If a user has no Zoom account, they can click "Sign Up, It's Free" button to create a new Zoom account. Next, the interface of the personal account should be explored, and account settings and conference settings need to be adjusted. The Personal Meeting ID (PMI)

is automatically assigned to the user as a permanent personal meeting room. The user can run it at any time or schedule it for future use.

The user's PMI is part of the personal meeting URL, for example, <https://zoom.us/j/5551112222>. If the user is on a paid subscription and has a Pro license, it is possible to set a 10-digit PMI, otherwise changes are not possible. Conferences:

1. Start: Click “Start” to start a pre-scheduled conference included in the list of upcoming conferences.

2. Edit: Edit or update the scheduled conference in the “Personal Meeting Room” tab.

3. Delete: Click “Delete” to permanently delete the scheduled conference.

The user must select “Meeting” to view, start, edit, and delete scheduled conferences, conference entries, and personal conference ID. To start creating a meeting, one needs to click on the system button "Schedule a New Meeting". To edit a conference, the user must go to the "Personal Meeting Room" tab, view the meeting details and click on the system button. In addition, this tab can be used to duplicate the meeting in cloud-oriented applications such as Google Calendar, Outlook Calendar, Yahoo Calendar. It is also important to consider the functionality, which is located at the bottom of the video conferencing

- Mute: Mute or unmute the microphone.
- Start Video: show video from the camera or install a screen saver from the account.
- Invite: view and manage participants (if the user is the organizer).
- Manage Participants: opens a window with a list of users.
- Share Screen: allows to upload photos and images to show to the participants, show the desktop of the user's computer.
- Reaction: allows to add an emotional reaction to the report.
- More: button for selection of additional parameters.

To end the meeting, click on “End Meeting” in the system window and select the method of ending the meeting (only for the user who created the conference or for all participants). During the meeting, users can invite people to join the conference by clicking on the Invite tab.

After clicking the invitation, users can select the option "Invite by e-mail", "Invite in chat", and "Invite by phone" (requires a subscription to the audio conference plan) or invite a number system (requires a subscription for connection to the cloud). Users must select “Copy URL” or “Copy Invitation” to send instant meeting information to another location. Copying the URL will copy the join link and Copy Invitation will copy the full text of the invitation. It

can further be pasted using Ctrl + V on PC, Command + V on Mac, or by right-clicking and selecting Paste.

To invite from the Zoom web portal, users need to go to the Meeting menu in the account and select the meeting to which they want to invite others. Then users need to go to the tab "Personal Meeting Room" and click "Copy the invitation". The meeting invitation will be copied and this information will be available for pasting into an email or other location where users want to send it (BUROVA; KABAKOV, 2020).

Thus, the main functionality of the information and software resource Zoom, which is created for video conferencing in distance learning, was considered. It remains to consider the latest resource of this study, namely Hangouts Meet. To organize a video lesson via Google Calendar with the use of Hangouts Meet, users need to:

- In the browser window, open the link: <https://gmail.com/>. Enter your corporate email address, click "Next" and add a password.
- Classes should be scheduled in advance for a specific day and time. To do this, sign in to Google Calendar. Then select the specified day and time in the calendar, add the name of the event and click "Other settings".
- Add lecture time and select "Hangouts Meet".

All students are added to the meeting with the help of "Add guests" by typing their names. Then a link to a video call can be selected and shared in other available ways (in the ENC e-learning system, social networks etc.). After adjusting all the settings, click "Save". The system will ask to send invitations to participants whose addresses the user has specified. The Lecturer, who organizes the lecture, has to start the lecture at the appointed time. This can be done with the use of the calendar.

Participants can join by following the link in their e-mail inbox. Pre-invited guests can announce their participation. The page of the remote lecture or seminar will open in a separate tab. After selecting "Join now" the user must wait for other participants. In the video lecture window, the number of those who joined can be seen, also users can open a chat and exchange text messages (DAUS; YUDAIEV, 2017; OSTENDA *et al.*, 2018).

Hangouts Meet allows to ask participants to turn off the microphones when the teacher provides the information; to visualize the lecture, it is possible to present one's desktop or a certain window, for example with a presentation; users can choose a convenient version of the presentation in window or full-screen mode by selecting the window and clicking "send".

Students can also share their screen with the completed task etc. To do this, they must click "Start presentation now". The teacher and all other students will see a screen

demonstration. To stop, click "Stop presentation". Or select the "Do not share again" option if you are not in the appointment tab. To end the lecture, click "End call". To create a remote lesson for the same group, simply create a copy of the event and edit it.

## **Conclusion**

Thus, in modern conditions of quarantine restrictions, teaching requires the widespread use of various distance learning technologies. It is safe to say that the use of distance learning technologies in the implementation of educational curricula for students on a systematic basis and based on modern international platform Moodle, as well as with the use of technologies such as Google Classroom, and video systems Zoom and Hangouts Meet allow to organize the educational process according to modern requirements, and also to support an appropriate level of quality of forming competences of future experts in the conditions of difficult educational processes under quarantine.

Furthermore, special attention should be paid to retraining of teachers to master modern knowledge of information technology, because distance education will develop after the completion of quarantine restrictions, because, of course, the distance learning technologies are the future of world education. Further development of the study is seen in scientific articles on each separate information and software resource for the educational process within the framework of distance learning.

## **REFERENCES**

**Advantages and disadvantages of distance learning.** Information site "Education: ways to success", 2020. Available in: <http://ru.osvita.ua/vnz/reports/adv/46958/>.

AKHYADOV, E.S.-M.; GONCHAROV, V.V.; MAKUSHKIN, S.A. Video marketing in education: attracting applicants using the YouTube service. **Revista Inclusiones**, v. 7, pp. 387-396, 2020.

ALLALYEV, R.M. Religious origins of the rule of law conception in the United States. **Amazonia Investiga**, v. 7, n. 14, pp. 212-217, 2019.

AL-RAHMI, W.M.; ALIAS, N.; OTHMAN, M.S.; ALZAHIRANI, A.I.; ALFARRAJ, O.; ALI SAGED, A.; RAHMAN, N.S.A. Use of e-learning by university students in Malaysian higher educational institutions: a case in Universiti Teknologi Malaysia. **IEEE Access**, n. 6, pp. 14268-14276, 2018.

- BEKETOVA, E.; LEONTYEVA, I.; ZUBANOVA, S.; GRYAZNUKHIN, A.; MOVCHUN, V. Creating an optimal environment for distance learning in higher education: discovering leadership issues. **Palgrave Communications**, v. 6, n. 1, pp. 66, 2020.
- BODROVA, T.; ZUBANOVA, S.; KRUCHKOVICH, S. Texts of various genres as the methodological basis of the subtest "reading" of the first certification level of the RSL exam. **Revista Inclusiones**, v. 7, pp. 124-136, 2020.
- BOEVA-OMELECHKO, N.B.; POSTERNYAK, K.P.; ZHELTUKHINA, M.R.; PONOMARENKO, E.B.; TALYBINA, E.V.; KALLIOPIN, A.K.; OVSYANNIKOVA, M.N. Two images of Russia in the British political mass media discourse of 1991 - 1993 and 2013 - 2019: pragmatylistic aspect. **Online Journal of Communication and Media Technologies**, v. 9, n. 4, e201926, 2019.
- BORONENKO, T.; KAISINA, A.; FEDOTOVA, V. Organizing educational institutions networking cooperation through distance learning technologies within regional education system. **Turkish Online Journal of Distance Education**, v. 2, n. 19, pp. 86-100, 2018.
- BUROVA, A.YU. Digital signal processing without performing arithmetic multiplication operations. **Amazonia Investiga**, v. 9, n. 25, pp. 200-205, 2020.
- BUROVA, A.YU.; KABAKOV, V.V. "Unerroric" of multistage discrete Fourier transform of digital signal without arithmetic operations of multiplication. **Amazonia Investiga**, v. 9, n. 25, pp. 429-437, 2020.
- BUROVA, A.YU.; RYAPUKHIN, A.V.; MUNTYAN, A.R. Reduced hardware costs with software and hardware implementation of digital methods multistage discrete Fourier transform on programmable logic devices. **Amazonia Investiga**, v. 9, n. 27, pp. 227-233, 2020.
- BUROVA, A.YU.; USATENKO, T.O. Digital algorithms for the discrete frequency selection of signals that do not use algorithmic multiplication operations. **TEM Journal-Technology Education Management Informatics**, v. 9, n. 2, pp. 501-506, 2020.
- DATSENKO, G.; SUZANSKA, Z. Distance learning as a means of promoting self-education. **Distance learning as a modern educational technology. Materials of the interuniversity webinar**. Vinnytsia: Vinnytsia Institute of Trade and Economics of Kyiv National University of Trade and Economics, pp. 17-20, 2017.
- DAUS, YU.; YUDAIEV, I. Estimation of solar energy potential under conditions of urban development. **Proceedings of the International Conference Actual Issues of Mechanical Engineering 2017 (AIME 2017)**, v. 133, pp. 156-161, 2017.
- DOLAKOVA, M.I.; ZUBANOVA, S.G.; PASHENTSEV, D.A. The legal basis for the implementation of the financial policy of the state in the Russian Empire of the second half of the 19th century. **Vestnik of Saint Petersburg University-Law-Vestnik Sankt-Peterburgskogo Universiteta-Pravo**, v. 9, n. 4, pp. 452-466, 2018.

DONETS, V.; KUCHUK, N.; SHMATKOV, S. Development of software of e-learning information system synthesis modeling process. **Advanced Information Systems**, n. 2, pp. 117-121, 2018.

GAVRILOVA, L.; KATASONOVA, J. Theoretical aspects of implementing distance learning in Ukraine. **Educational Discourse**, n. 1-2, pp. 168-182, 2017.

KHANNA, P. A conceptual framework for achieving good governance at open and distance learning institutions. **The Journal of Open, Distance and e-Learning**, v. 1, n. 32, pp. 21-35, 2016.

KHUSANOV, B.; RIKHSIEVA, B. Thickness dimensions of the contact layer of soil-rigid body interaction. **E3S Web of Conferences**, v. 97, pp. 1-7, 2019.

KOSTRUBA, A.V. Termination of contractual obligations in the civil code of Ukraine. **Ius Humani-Revista de Derecho**, v. 8, pp. 123-142, 2019.

KUDABAYEVA, KH.I.; BATYROVA, G.A.; BAZARGALIYEV, Y.SH.; BASPAKOVA, A.M.; SAKHANOVA, S.K. Hair trace element composition in 6- to 12-year-old children with goiter in West Kazakhstan, a province of the Republic of Kazakhstan. **Journal of Elementology**, v. 23, n. 2, pp. 647-657, 2018.

LIU, Z.-YU.; SPITSYNA, N.; ZUBANOVA, S.; VEKILOVA, A. Using internet resources for remote language learning. **International Journal of Emerging Technologies in Learning**, v. 15, n. 13, pp. 22-33, 2020.

**Moodle**, 2018. Available in: <https://moodle.org/mod/page/view.php?id=8174>.

NAZARTSEVA, E.A.; MORYA, L.A.; ZUBANOVA, S.G. Teaching foreign students the vocation-related language. **Amazonia Investiga**, v. 8, n. 22, pp. 338-343, 2019.

NIKOLAEV, YU. Distance learning as an individual approach to English. **Distance Learning**, v. 3, n. 28, pp. 179-182, 2019.

**On prevention of the spread of acute respiratory disease COVID-19 caused by coronavirus SARS-CoV-2 on the territory of Ukraine.** Resolution of the Cabinet of Ministers of Ukraine No. 211 of 11.03.2020. Available in: <https://zakon.rada.gov.ua/laws/show/211-2020-П#Text>.

OSTENDA, A.; NESTORENKO, T.; ZHYHIR, A. What do students think of the education curriculum? Case of katowice school of technology. **International Relations 2018: Current Issues of World Economy and Politics**, v. 1, pp. 582-589, 2018.

PORTNOVA, I.; PORTNOVA, T. Stylistic features of European architecture of XX – beginning of XXI century in the light of current trends of the time. **Journal of Mathematics and Computer Science**, v. 1, pp. 51-60, 2019.

PORTNOVA, T.V. Composite – image organization of the dramaturgy of dance based paintings. **Amazonia Investiga**, v. 8, n. 20, pp. 415-421, 2019.

SAKULINA, YU. Use of information and communication technologies in the implementation of distance education. **Science and Education Bulletin**, v. 3, n. 39, pp. 45-48, 2018.

SHAHMORADI, L.; CHANGIZI, V.; MEHRAEEN, E.; BASHIRI, A.; JANNAT, B.; HOSSEINI, M. The challenges of E-learning system: Higher educational institutions perspective. **Journal of Education and Health Promotion**, n. 7, pp. 116-124, 2018.

SULTANOV, K.S.; KHUSANOV, B.E.; RIKHSIEVA, B.B. Longitudinal waves in a cylinder with active external friction in a limited area. **IV International Scientific and Technical Conference Mechanical Science and Technology Update (mstu-2020)**, v. 1546, 012140, 2020.

THISTOLL, T.; YATES, A. Improving course completions in distance education: an institutional case study. **Distance Education**, n. 37, pp. 180-195, 2016.

UKHOV, P.A.; RYAPUKHIN, A.V.; BIRIUKOVA, N.A.; BIRYUKOVA, A.K.; DMITROCHENKO, B.A. Problems of distance learning in the LMS moodle environment through the eyes of students of Moscow aviation institute during quarantine (self-isolation). **Revista Inclusiones**, v. 7, n. 3, pp. 412-426, 2020.

VINICHENKO, M.V.; CHULANOVA, O.L.; KARACSONY, P.; BOGDAN, E.S.; MELNICHUK, A.V.; MAKUSHKIN, S.A. Model of competences of graduates of high schools of engineering directions: research of stakeholders. **Modern Journal of Language Teaching Methods**, v. 8, n. 3, pp. 369-380, 2018.

VINICHENKO, M.V.; CHULANOVA, O.L.; OSEEV, A.A.; BOGDAN, E.S.; MAKUSHKIN, S.A.; GRISHAN, M.A. Interaction of the higher education and key employer for the formation of the actual profile of the competences of graduates of engineering directions. **Modern Journal of Language Teaching Methods**, v. 8, n. 5, pp. 394-404, 2018.

VINICHENKO, M.V.; KARACSONY, P.; KIRILLOV, A.V.; OSEEV, A.A.; CHULANOVA, O.L.; MAKUSHKIN, S.A.; SHALASHNIKOVA, V.J. Influence of time management on the state of health of students and the quality of their life. **Modern Journal of Language Teaching Methods**, v. 8, n. 5, pp. 166-184, 2018.

YUDAEV, I.V.; DAUS, YU.V.; GAMAGA, V.V.; GRACHEV, S.E.; KULIGIN, V.S. Plant tissue sensitivity to electrical impulse. **Research Journal of Pharmaceutical Biological and Chemical Sciences**, v. 9, n. 4, pp. 734-739, 2018.

ZARIPOV, R.N.; MURAKAEV, I.M.; RYAPUKHIN, A.V. Industrial enterprise risk management mechanisms aggregation and integrated visualization of risk assessment results. **Revista Inclusiones**, v. 7, pp. 32-41, 2020.



### **How to reference this article**

PAKHOMOVA, T.; KAN, D.; URIADOVA, V.; VASYLCHUK, V.; VASYLCHUK, L. Computer technologies and teaching aids for distance learning in educational institutions under quarantine. **Revista on line de Política e Gestão Educacional**, Araraquara, v. 25, n. esp. 3, p. 1664-1680, Sep. 2021. e-ISSN: 1519-9029. DOI: <https://doi.org/10.22633/rpge.v25iesp.3.15584>

**Submitted:** 20/03/2021

**Required revisions:** 05/06/2021

**Approved:** 12/07/2021

**Published:** 01/08/2021