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ANALYZING ONLINE LEARNING TOOLS TO IMPLEMENT DISTANCE LEARNING: PRE-COVID AND COVID TIMES

Introduction. Distance learning has been worldwide implemented in various educational institutions. In the fast-changing society, the requirements to the education system are facing changes, too. Today, distance learning can be used not only for adult learners, but for younger students as well. In the pandemic, all students from primary school to universities were shifted to distance learning due to the necessity of minimizing social interaction and avoiding the fast-spreading virus.

Digitization of various materials and a large number of open educational resources (OER) make it possible to diversify studying online. Moreover, learning management systems (LMS) aka virtual/managed learning environments (VLE/ MLE) makes it possible to unify studying as all the materials are gathered in the same place: easy for students to track and send assignments and for teachers to post and grade tasks, share main or extra resources, etc. Thus, the purpose of the article is to analyze online learning tools.

Methods. The general scientific, chronological, comparative, retrospective and interpretational methods were used in the research paper.

Results. Software for conducting online classes is analyzed. Despite a wide variety available in the Internet with different options of payment, duration and number of participants, in Ukraine Zoom, Google Meet and Microsoft Teams are mainly utilized. Due to the coronavirus outbreak, there was a huge surge in teleconference software popularity as it was used for educational, work and socializing purposes.

Originality. During the quarantine Moodle and Google Classroom were most often used. However, in the US almost all the universities have their own LMSs, while in Ukraine only half offer the option. Next, conference software for holding online classes is analyzed. Despite the fact that there is a wide variety of apps available, in Ukraine it was Zoom, Google Meet, and Microsoft Teams that were widely used. Even with a 40-minute limit, Zoom is chosen to be number one. Nevertheless, the time limit of free versions was quite bothersome for some academic staff and students stimulating a shift to Google Meet. Microsoft Teams were less used due to limited access to corporate accounts.

Conclusion. The pandemic outbreak stressed the necessity of improving distance learning in Ukraine which can be used either independently or in blended learning.

***Keywords**: distance learning; online learning tool; online learning platform; learning management systems (LMS); quarantine; Covid.*

Introduction. Distance learning is a promising type of training that orients teachers to implement innovative methods and technologies, such as online lectures, online consultations, video conferences, webinars, etc. The introduction of distance learning in general education is the next step in developing the education system in Ukraine and the evolution of society as a whole. Our society has moved to constant dialogue and continuous communication. Access to computers, mobile gadgets and electronics comes natural for every student nowadays.

Statement of the problem. Recently, the problem of using the latest technologies of distance learning has received much attention in the scientific literature. The distance learning system is in the center of attention of scientific circles, and current trends indicate a further intensification of research in this area. In particular, such scientists as V. Kukharenko, S. Vitvytska, V. Yasulaitis, E. Polat, A. Petrov, O. Tyshchenko and many others dealt with theoretical and methodological problems of distance learning. Today, there are many approaches to identifying problems and benefits in the use of distance learning.

This question has been studied by such scientists as M. Thompson, M. Moore, A. Clark, D. Keegan. Each of these authors emphasized a particular aspect of this method [1]. Analyzing the experience of foreign scientists and Ukrainian teachers, we will supplement and summarize the list of students' characteristics in terms of their ability to perceive distance learning methods: 1) constant readiness for communication; 2) propensity for teamwork; 3) use of technology; 4) the need for tactile contact; 5) learning through the game; 6) use of real and virtual world at the same time.

Types of communication flow from one to another. Collectivist skills develop in this single reality; 7) speed of learning (in particular, technology); 8) use of new teaching aids; 9) use of knowledge based on their own experience; 10) modern students are better educated than any generation before them [2, p. 12].

The purpose of the article is to analyze online learning tools for distance learning implementation.

Presentation of the main research materials. Taking into account the peculiarities of the development of Z-generation students, it is necessary to reconsider approaches to distance learning, develop new methods, use new teaching aids and expand the competencies of teachers who need to work with students. The teacher ceases to be the bearer of knowledge that tries to pass on to the student. The main task is to motivate students to show initiative and independence. The teacher becomes an organizer of independent activities, where everyone can realize their own abilities and interests, i.e. creates conditions, an environment in which it is possible to develop personality, acquire knowledge and skills necessary for life in the information society. All the above mentioned features of students and changes in society affect the organization of the educational process. In the conditions of informatizing society and digitizing education, the issue of using ICT is acute, starting from primary school. The introduction of early learning of ICT in the educational process is due to the requirements of the new state educational standard of primary general education [1]. There are the following current trends in education, caused by the spread of distance learning: 1) there is a change in communications due to the rapid development of modern technology; 2) information is placed not only on paper and in people's memory, but also on social networks. Among the main factors influencing the quality of distance education there are the following: ability to make strategic decisions in situations of uncertainty, to find information needed to properly assess the situation, skills to process it, decision-making skills and communicate this decision to the learner. It is possible to implement this at the right speed in today's society with the use of distance learning technologies. In addition, such technologies are designed to close the gap between the social and economic situation of different segments of the population and countries with different levels of economic development.

Therefore, distance learning technologies should be used under such conditions: providing opportunities for success for everyone; maintaining the model of effective development; achieving equality in the dissemination of information. The development and popularity of non-formal education is, in particular, the uneven use of technology in the education of different generations. The teacher should take into account the changes taking place in modern education. In particular, the pedagogue must be aware of modern distance learning features, compared to traditional. During distance learning, teachers work with students to help them develop learning and assessment strategies, provide comprehensive support, and act as a mentor, tutor.

The basis of distance learning is the Internet, mass digitization of various materials and a large number of open educational resources (OER). An example of a successful system of remote interaction is Peer 2 Peer University (P2PU) [3], which operates with the support of the Chicago Public Library and aims to optimize interaction in the professional pedagogical field. The additional advantages of distance learning are the following [4]: adaptability of educational organizations, professionals to changing conditions, rapid response to the changes in market conditions and new market requirements, increasing compliance with socio-economic, socio-cultural, educational needs of society; concentration of activity of participants of network interaction on the key professional, academic competences, unique processes occurring in the field of education; elimination of duplication of a number of functions by participants of network interaction; involvement in the implementation of joint academic, professional activities of competent participants in the educational process who have the necessary resource potential; improving the efficiency of information exchange mechanisms between participants of informal networking, replication of the best innovative practices; implementation of partnership relations in the process of achieving the certain results; lack of spatial and temporal constraints; increasing the level of competitiveness of distance learning participants; increasing the pace of efficiency, generation and translation of specialized knowledge; increasing innovation activity, readiness for change in accordance with the requirements of the changing world, increasing requirements for the level of the teacher's professionalism.

Distance learning poses new challenges for teachers. Educators must be ready to choose high-quality technologies for remote interaction. Therefore, the aim of the research paper is to study a wide range of tools most used to implement distance learning.

The general scientific, chronological, comparative, retrospective and interpretational methods were implemented in the research paper.

First of all, software for conducting online classes is analyzed. Despite the fact that there is a wide variety available in the Internet with different options of payment, duration and number of participants, in Ukraine Zoom, Google Meet and Microsoft Teams are mainly utilized.

When the coronavirus outbreak hit the world, there was a huge surge in teleconference software popularity as it was used for educational, work and socializing purposes. In the UK only, from January 2020 to November 2020 Zoom boasted a surge from about 50 thousand to roughly 1.7 million [5]. However, it's not only Zoom software that enjoyed a teleconferencing app boom but Microsoft Teams, too. They reported that the number of daily active users have doubled since April 2020 (75 million) till 145 million in April 2021 [6]. However, in Ukraine limited access to corporate accounts explained the low popularity of MS Teams [7].

Naturally, Google wasn't either left behind. Initially, Google Hangouts were widely used but along the pandemic outbreak Google Meet was updated and made free to make a smooth transition of Google users from Hangouts to Meet. In May 2020, the Google Meet app reported a thirty-fold increase in usage since January 2020, with more than 60 thousand daily active users in the UK and over 100 million in the world [8].

B. Wiyono et al. surveyed 82 students who singled out such major issues as signal problems and internet quotas when having online classes with Zoom and Google Meet. Therefore, the authors offered the solution of increasing internet capacity, improving ICT (information and communications technology) mastery, communicating with lecturers and university leaders [9].

According to the survey of Ukrainian lecturers, Zoom was specified as number one software with about 40% frequency rate [10]. It should be mentioned that according to the authors' experiences, the similarities and differences are as follows (table 1):

Table 1

Similarities and differences of Zoom and Google Meet

	Zoom	Google Meet
Duration of a basic free conference (with over 2 participants)	40 minutes	1 hour (N.B. not personal google.com accounts, but business ones which should be used for education purposes)
Monthly price	$15-$20 per license	$6-$18 per user
Number of participants	Up to 500 (up to 1,000 with Large Meetings add-on)	Up to 250
Common features	– Windows, Mac, Android, iOS – screen sharing (when allowed by the organizer only) – chat	– Windows, Mac, Android, iOS – screen sharing (for every participant) – chat
Special features	chat rooms (when set at account settings)	

Shevchenko et al. pointed out that a lecture in Ukraine normally lasts 80 minutes which doesn't align with a 40-minute session limit in Zoom. Therefore, there were suggestions to make "online classes 40 minutes long as most suitable, less tiring, and focus retaining" [7]. As a result, "professor-tutors experimented with the segmentation of topics into subtopics 40 minutes each, with simple and understandable tasks". The authors also claimed that Google Meet was eventually chosen as an alternative.

To conclude the analysis of video conferencing software used for simultaneous classes, it is Zoom software that got most of research attention. Zoom is reported to have had twice as many downloads as Google Meet [11]. Moreover, the authors compared the number of active users of online meeting applications concentrating on Zoom, Skype, Google Hangout, Cisco Webex Meeting and GoToMeeting over a month from February 2020 till March 2020 and made a conclusion that the boom was as high as from 8 to 258 thousand users.

Another point of interest in this research is online learning environments. Nowadays, a lot of universities in Ukraine offer various classroom management platforms, also known as learning management systems (LMSs), virtual/managed learning environments (VLEs or MLEs). Generally, they consist of a build of integrated or collected applications that enable the student and teacher to both handle information (in the form of, for example, news and alert items, access to resources in different formats, and links to pertinent materials or web-sites) and to communicate (through discussion forums, chatrooms and linked email) [12].

Successful e-learning is preceded by an understanding of each participant's need for learning, their own ability to learn and willingness to cooperate in online learning environments. The goals of the learning process should be clear and understandable to potential participants, as well as linked to their professional interests and the challenges they face today. The task of distance learning organizers is to make it active, comfortable, flexible, emotionally positive, so that each participant has the opportunity to effectively and efficiently achieve the educational goals set by the program.

In the US, LMS became a standard feature in postsecondary education. One of the advantages is a higher level of transparency of the learning process. Dahlstrom et al. (2014) point out almost an absolute adoption rate of LMS equaling 99% among US universities and colleges [13]. They are convenient both for teaching and studying because they comprise a great many features, for example setting, checking and assessing daily assignments [14].

It should be noted that according to Bakhmat et al, the one most often used (27%) in Ukraine is Google Classroom. It is followed by Moodle (5%), which is an acronym of Modular Object Oriented Developmental Learning Environment [10]. However, when the pandemic hit Ukraine many students used to send their assignments via emails or even communication tools (Viber, Telegram, Skype). Shevchenko et al. mentioned that 34% of the universities utilize Moodle and Google Classroom as the most popular distance learning tools. The authors also analyzed availability and implementation of online learning tools. In total, there were 50 Ukrainian universities surveyed and half of them had none. Moodle is mandatory at 25% of the universities, Google Classroom – at 18.2%, while about 7% have their own collaboration software platforms [7].

The following advantages of applying Google Classroom have been highlighted in several research papers: easy to use, materials of theoretical and practical issues, integration with problem-based learning, improvement of technology and computer skills, etc. [15].

It is worth pointing out that several research papers have been published on using Google Classroom in Ukrainian universities. To begin with, Stavytskyi and Urazgaliyeva studied the use of Google Classroom tools in teaching students of economic specialities. They drew a conclusion that there were positive changes in the levels of economic competence of the experimental group when compared with the control group. At the same time, the former students showed higher level of motivation to "study Econometrics; they understand the importance of applying theoretical knowledge in practice" [16]. Next, Gurevych analyzed the following additional educational (communication) platforms used by teachers during distance learning. According to the results, Google Classroom was most often chosen (23.5%), closely followed by Email (22.4%), Zoom got 20.3%; Messengers – 17.4% and Skype – 13.6%. After that, the students were asked to consider the effectiveness of the used platforms. LMSs (or in the study they are referred to as VLEs) were chosen by 816 students as the most effective (35%). Almost 590 answers were in favor of video conferencing effectiveness (26%). Over 100 fewer got messengers (20%). Almost 300 students rated emails effective. However, there were 140 answers that none of the distance learning tools were considered effective [15].

According to the official site of Moodle statistics, there are 1340 sites registered in total as of January 2022. However, 925 are private [18]. To name a few in Kharkiv, there are such universities that offer Moodle LMSs as V. N. Karazin Kharkiv National University, Kharkiv State Railway University, Kharkiv Petro Vasylenko National Technical University of Agriculture, Kharkiv State Zooveterinary Academy and others [17]. Unfortunately, no statistics of setting Moodle LMS in Ukrainian universities have been found. With an exception that in 2018 there were 56% universities (in total there were 657 registered) with Moodle sites. However, in 2014 only 15.4% of universities had Moodle sites.

Among the 28 EU member states, Spain, Portugal and Austria have the highest rate of utilizing Moodle. With Moodle as a proxy, Ukraine is "currently at a level of technical standards in education that is uncompetitive with its immediate EU neighbors and incompatible with its EU aspirations" [14].

Naturally, the number of distance learning courses has increased greatly with the pandemic outbreak. To be exact, the Department of AI at Kharkiv National University of Radio Electronics posted an update stating that over 40 courses were created during the national quarantine in the academic year 2019-2020. It was also added that "teachers of the department use various platforms and tools for distance learning… using the Moodle course management system, Google Classroom, Hangouts Meet" [19].

It should be also noted that during the quarantine in spring 2020, many universities encouraged students to take courses at online learning platforms. Prometheus and Coursera were mostly recommended with

students enrolling at the rate 54% and 33.5% respectively [7]. Despite the fact that Coursera courses are not free, they were offered for free for students and many university communities welcomed the chance.

Conclusions and prospects for further research. Distance learning is deeply rooted in today's realm. Designed to navigate numerous learning opportunities, it can be used totally independently or as an effective complement to conventional education. In particular, distance learning provides an opportunity both flexible in time and highly professional in content; to study various subjects; to develop skills and abilities, etc.

Analyzing distance learning in Ukraine, it should be noted that there are numerous opportunities to improve quality and availability. To be exact, academic staff and students with a lack of technical skills should take training courses. At the same time, a unified LMS is a necessary component nowadays for each and every university. So far, there has been a growth of universities utilizing distance learning platforms. Taking into account the first quarantine of spring 2020, academic staff have greatly improved technical competence.

The research paper mainly focuses on 1) theoretical fundamentals of distance learning and 2) online learning tools (mainly conferencing apps) and platforms implemented during the quarantine in spring 2020. However, engaging game-based learning tools should be thoroughly studied which are used during distance learning.

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АНАЛІЗ ОНЛАЙН-ІНСТРУМЕНТІВ ДИСТАНЦІЙНОГО НАВЧАННЯ ДО ТА ПІД ЧАС ПАНДЕМІЇ COVID-19

Вступ. Дистанційне навчання впроваджено у всьому світі в різних навчальних закладах. У суспільстві, що швидко розвивається, змінюються й вимоги до системи освіти. Сьогодні дистанційне навчання можна використовувати не тільки для дорослих, а й для молодших школярів. Під час пандемії всі учні, починаючи з початкової школи до університетів були переведені на дистанційне навчання через необхідність мінімізації соціальної взаємодії та уникнення швидкого поширення вірусу.

Діджиталізація різноманітних матеріалів та велика кількість відкритих освітніх ресурсів (ВОР) дають змогу урізноманітнити навчання онлайн. Більше того, системи керування навчанням (СКН), або віртуальні/керовані навчальні середовища (ВНС/КНС), дають змогу уніфікувати навчання, оскільки всі матеріали зібрані в одному місці: студентам легко відстежувати й надсилати завдання, а вчителям публікувати та оцінювати їх, ділитися основними чи додатковими ресурсами тощо. Таким чином, метою статті є аналіз онлайн-засобів навчання.

Методи. У роботі використано загальнонауковий, хронологічний, порівняльний, ретроспективний та інтерпретаційний методи.

Результати. Проаналізовано програмне забезпечення для проведення онлайн-занять. Незважаючи на широку різноманітність доступних в Інтернеті різних варіантів оплати, тривалості та кількості учасників, в Україні переважно використовуються Zoom, Google Meet та Microsoft Teams. Через спалах коронавірусу відбувся величезний сплеск популярності програмного забезпечення для проведення телеконференцій, оскільки воно використовується для навчання, роботи та спілкування.

Оригінальність. Під час карантину найчастіше використовували Moodle і Google Classroom. Однак у США майже всі університети мають власні КНС, тоді як в Україні лише половина пропонує таку можливість. Далі аналізується програмне забезпечення конференції для проведення онлайн-занять. Незважаючи на те, що існує велика різноманітність програм, в Україні широко використовувалися Zoom, Google Meet та Microsoft Teams. Навіть з обмеженням у 40 хвилин, перевагу було надано Zoom. Однак, обмеження часу в безкоштовній версії Zoom було досить неприємним для деяких викладачів і студентів, що стимулювало їх перейти на Google Meet. Команди Microsoft менше використовувалися через обмежений доступ до корпоративних облікових записів.

Висновок. Спалах пандемії підкреслив необхідність удосконалення дистанційного навчання в Україні, яке можна використовувати як самостійно, так і в змішаному навчанні.

Ключові слова: *дистанційне навчання; онлайн-засіб навчання; платформа навчання онлайн; керовані навчальні середовища (КНС); карантин; Covid.*

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