

## COMPARATIVE CHARACTERISTICS OF PROGRAMS FOR ORGANIZING VIDEO CONFERENCING IN THE PROCESS OF E-LEARNING OF STUDENTS



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**Abstract.** Due to the rapid development of information technology, e-learning is becoming widely used. Therefore, the problem of solving the remoteness of participants in the learning process needs a balanced solution. In the world's leading countries, the use of video conferencing is one of the ways to effectively teach students.

In the realities of the modern world, since the beginning of the pandemic, in a large number of universities training sessions, consultations, tests and exams are conducted online by videoconference. There are many tools for e-learning, in particular, the IT industry provides the opportunity to use some modern online services: Microsoft Teams, Zoom, Skype and others. The objectives of the article are to analyze the possibilities of video conferencing in the process of e-learning, identify the advantages and disadvantages of e-learning.

**Keywords:** *e-learning, video conferencing, online technology, educational process, IT technology, software products.*

### Introduction

The implementation of online technologies in the educational process shows the positive consequences of changing the traditional format of the organization of the educational process of higher education institutions in the modern conditions of reorganization of the information environment of society.

Every year, students are more IT-educated as they evolve in today's digital society. Today, IT companies have created a large number of modern software products for teaching the new generation. In particular, the following online services (e-tools) have appeared: visualization tools, tests and surveys, video conferencing, mind maps, online learning platforms, etc. They can help to diversify e-learning, that is online learning of the material, by using animated presentations, novel scripts, various storylines and more.

Currently, the need among teachers for online video conferencing for e-learning of students of universities in Ukraine has increased. This is conditioned by the rapid development of technology, the availability of free programs and educational services. In Ukrainian higher education institutions, lectures, seminars, laboratory works, practical classes, colloquiums, testing and consultations are held by videoconferences using external platforms such as: Microsoft Teams, Zoom, Skype, Google Meet, WebEx by cisco etc.

The purpose of the article is to review the features of the online service "video conferencing" during e-learning of higher education students.

**Literature review.** The analysis of this problem indicates that modern scientists seek to create a single educational space with an e-learning system, that is a universal form of learning, directed, in which the specialist will be able to continuously develop throughout his career (Hart, 2021, Morse, Spivak, 2017, Prikhodko, 2015). The introduction of e-learning in education is covered in the works of many foreign and domestic researchers, including V. Bykov, B. Holmberg, R. Deling, J. Koumi, B. Shunevych and others (Shunevych, 2009, Chrást, 2020). However, insufficient attention is paid to the peculiarities of the use of video conferencing in the process of organizing e-learning. Analysis of the relevance and significance of these issues began in research (Rusina, 2011, Romanenko, Rusina, 2020).

**Research methodology.** The role of video conferencing services in the process of e-learning and scientific approaches in the modern system of higher education, issues of analysis, advantages and disadvantages of research are considered.

**Research results.** The use of video conferencing in the e-learning process requires methodological understanding and aims to improve the quality of the learning process.

E-learning is a learning system built using information and telecommunication technologies that are used in the modern world by both students and teachers (E-learning, 2017). The e-learning system allows to provide effective studying of academic disciplines, obtaining information and consultations by teachers for students regardless of time and location.

Let's focus briefly on the advantages and disadvantages of e-learning.

So, in our opinion, the benefits of e-learning are:

- mobility;
- accessibility (any place);
- independence from the audience, both teacher and student (relevant during a pandemic, martial law, economic difficulties, etc.);
- unlimited use of modern teaching aids and methods;
- the possibility of documenting classes with their further analysis and refinement;
- non-attachment to classes in classrooms;
- Simultaneous processing of students' sources of educational information.
- use of specialized forms of control (testing and assessment of students' knowledge);

In our opinion, we can highlight the main drawbacks of e-learning:

- the complexity of "live communication in the form of dialogue" with the student audience (students are accustomed to working only in classrooms, in person to ask questions to the teacher);
- Lack of guarantee of concentration of students' attention exclusively on the educational process (the student can join the conference and do their business with the video camera turned OFF);
- the difficulty of controlling the actual attendance of classes (in the process of recording the presence of students in class, etc.);
- technical issues (such as unstable internet connection; operating system, hardware preventing you from connecting to the online platform or limited access to video calling, etc.).

Video conferencing is one of the ways to acquire and share knowledge without hindrance.

Video conferencing is a method of exchanging video images, sound and data between two or more points, which are equipped with the appropriate hardware and software systems. Its participants can see and hear each other in real time, as well as share data and process it together (Shunevych, 2009).

The results of the survey PCMag on the best video conferencing software are presented in Figure 1 (The Best Video). Next, we will consider some of them and others that are better suited for use in the learning process.

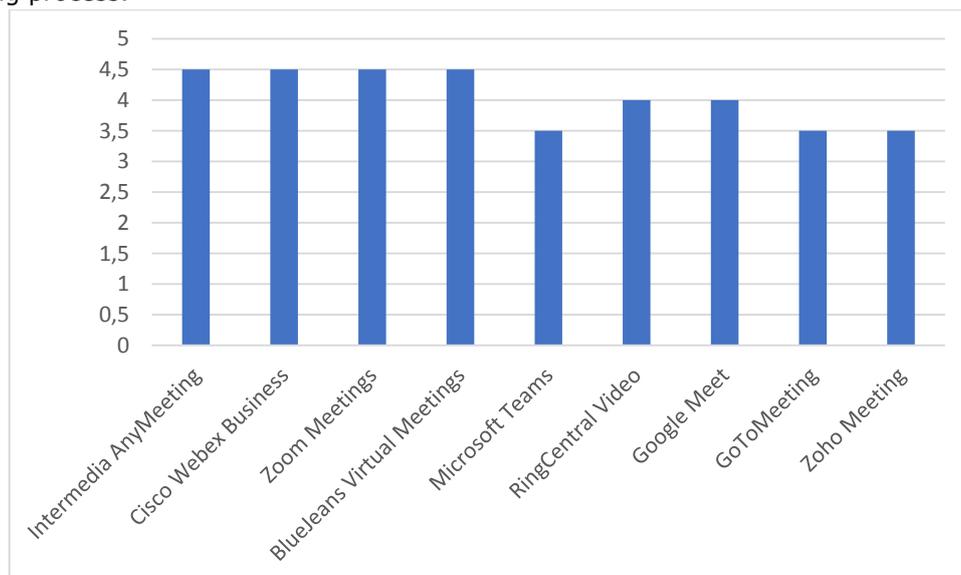


Figure 1. The Best Video Conferencing Software

Video conferencing is available for use from a variety of technical devices and any location (classroom, transport, home, dorm room, etc.).

Given the need to use video conferencing, teachers need to improve their skills and knowledge of IT tools and the ability to use them properly.

We have analyzed common services for conducting classes in the process of e-learning students. In the modern system of higher education, the most common online services for video meetings of teachers with students are: Zoom, Microsoft Teams, Skype, Google Meet, My Own Conference, WebEx by cisco and others. Table 1 presents a comparative description of the use of online services on different criteria of opportunity - "video conferencing" for e-learning students.

Table 1.

**Comparative characteristics of the use of online services**

Features Name	Number of participants (max.)	Free use	Duration (minutes)	Waiting room	Chat – individual (messages to each particip.)
Zoom	100	Yes	40	Yes	Yes
Microsoft Teams	100	Limited (only if having corporal e-mail of educational institution)	60	No	Yes
Skype	50	Yes	No limits	No	No
Google Meet	100	Yes	No limits	Yes	No
My Own Conference	20	Yes	20	No	No
BigBlueButton	5	Limited (demo)	15	No	Yes
GoToMeeting	25	Limited (14 days after registration)	No limits	No	No
ooVoo	8	Yes	No limits	No	No
WebEx by cisco	100	Yes	No limits	Yes	Yes

Table 2 presents the highlighted capabilities of our online services software.

Table 2.

**Some features of online services software**

Features Name	Additional opportunities
Zoom	Graphic tools, polls, the ability to make a video call from the selected phone contact, create My Apps. When conducting individual meetings, consultations, time is unlimited.
Microsoft Teams	Office 365, video call attendance report.
Skype	Phone book.
Google Meet	Reaction to the speech, recording of the conference, apply visual effects, use the JamBoard.
My Own Conference	Presentation of information from three cameras simultaneously.
BigBlueButton	Voting.
GoToMeeting	Screen sharing, drawing tools, meeting transcripts, remote access to materials, collaboration with graphic and text documents are supported.
ooVoo	Supports seamless video calling, even on LTE, allows you to upload a video to YouTube in one click? There is a possibility to synchronize with the list of personal contacts on Facebook, to create a video chat room with adaptive design.
WebEx by cisco	Personal room, command messages, file and content exchange, document sharing, ability to record and save to meeting server, integration with Outlook, participants can signal to join the discussion and request remote access to the document.

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However, there are some limitations when joining a video call. These include:

- in Microsoft Teams for Android OS it is impossible to join without installing a mobile app;
- in Google Meet not all participants of the conference are visible, if there are more than 20 of them;
- Zoom under Ubuntu does not always allow you to join the conference;
- Skype restricts access to the meeting only within the registered group;
- in Free Conference (My Own Conference) there is no possibility to record the meeting.

**Discussion of research results.** Carrying out a comparative description of the used programs of services for organizing video conferences indicates that the update of information tools for improving the organization of the educational process in educational institutions should be constant. Teachers and students, using a variety of software products, must constantly engage in self-improvement of their knowledge and skills. Despite the disadvantages of e-learning, the use of video conferences is one of the effective tools for organizing the educational process in higher education institutions. Video conferencing participants are aware of the benefits of video communication. In particular, it is possible to work in the following learning formats:

- individually with each student – to see their reactions;
- in small groups – to give a group, project task for discussion or implementation;
- several groups at the same time – invite to participate in the discussion of a topic or educational or scientific problem.

Undoubtedly, the advantage is that everything happens regardless of the geographical distance of each participant in the video conference.

## Conclusions

Having analyzed the services for video conferencing during classes in the process of e-learning students on different criteria of opportunities, it should be noted that in each of our studied programs and online platforms (Zoom, Microsoft Teams, Skype, Google Meet, My Own Conference, BigBlueButton, GoToMeeting, ooVoo, WebEx by cisco) are the advantages and disadvantages with which participants face during the educational process. In the conditions of rapid development of digital society, challenges of today, the use of online technologies is one of the effective formats of higher education.

Further research is planned to create guidelines for the use of reporting documentation of video conferences to analyze the effectiveness of the learning process by teachers of educational institutions.

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