Teaching in the Internet Environment Against the Background of COVID-19: Integration of Video Content into E-Learning

Tetiana Bilushchak[a] and Ivan Bratus[b]

[a] *Lviv Polytechnic National University, 12, S. Bandery str., Lviv, 79013, Ukraine*
[b] *Borys Grinchenko Kyiv University, 18/2, Bulvarno-Kudriavska str., Kyiv, 04053, Ukraine*

Abstract

The creation or use of educational video content in e-learning, which would improve the quality of learning, motivation of students' learning activities due to the quarantine restrictions caused by the COVID-19 pandemic is becoming a major issue for many universities. The typology of educational video content has been outlined. The expediency of integrating video content into e-learning against the background of COVID-19 has been determined with the help of an empirical study conducted on the basis of two universities. The comparative analysis of the received results has been carried out.

Keywords1

Integration, video content, Internet environment, e-learning, Moodle, YouTube, COVID-19.

1. Introduction

The world academia faced a global challenge in 2020 due to a pandemic caused by the spread of the coronavirus SARS-CoV-2. To counter the spread of COVID-19, educational institutions were temporarily closed almost all over the world. Educational institutions were also temporarily closed in Ukraine following the practice of foreign countries, and the academic year 2019-2020 was completed in the remote mode. As the pandemic caused by the spread of COVID-19 does not subside, teachers face new challenges related to motivating students to study due to quarantine restrictions caused by the need to prevent the spread of acute respiratory disease COVID-19 in Ukraine, caused by coronavirus SARS-CoV-2. The events of 2020 drew the attention of the whole society to the distance learning technologies. The COVID-19 pandemic made face-to-face learning impossible for several months, and distance learning became the only available form in the education system.

The relevance of the research topic is that radical changes are taking place in the field of education: e-learning is actively used, distance learning technologies are being developed, so the use of state-of-the-art video resources and integration of video content into e-learning will improve the quality of learning, motivation for learning activities due to quarantine restrictions caused by the need to prevent the spread of acute respiratory disease COVID- 19 caused by coronavirus SARS-CoV-2.

The purpose of this study is to determine the feasibility of integrating video content into e-learning against the background of COVID-19.

To achieve this purpose one must perform the following tasks:

- analyze current studies of international and Ukrainian scientists;
- determine the typology of video content and the typology of examples of educational video content;
- determine the feasibility of integrating video content into e-learning against the background of COVID-19 through empirical research;

COLINS-2021: 5th International Conference on Computational Linguistics and Intelligent Systems, April 22–23, 2021, Kharkiv, Ukraine
EMAIL: tetiana.m.bilushchak@lpnu.ua (T. Bilushchak); kulturolog@gmail.com (I. Bratus)
ORCID: 0000-0001-5308-1674 (T. Bilushchak); 0000-0002-8747-2611 (I. Bratus)

- build a scheme for choosing the type of educational video content when working on the units of the selected topic of the class.

The research methodology has been carried out using a sociological method, namely a survey using an interactive form of questionnaires, which will make it possible to identify the level of interest in the integration of video content into e-learning. To solve the tasks set in the paper, a theoretical analysis of the scientific literature has been conducted and comparative and review-analytical monitoring of the state of integration of video content into e-learning has been used. System-typological and classification methods have been used to organize educational video content according to certain criteria. In addition, the methods of analysis and synthesis have been used to generalize and draw conclusions.

2. Related Works

P. Edelson, V. Pitman and other researchers consider e-learning as online learning [1]. B. Khan defined e-learning as "…the use of new information technologies, multimedia technologies and the Internet in the learning process." [2]. P. Sanderson and M. Rosenberg they say of e-Learning as the use of Internet technologies to provide a wide range of solutions that ensure increasing knowledge and productivity. According to him, e-learning is based on such principles as: work is carried online, the delivery of educational content to the end user is carried out with the help of a computer using standard Internet technologies [3]. K. Chorianopoulos made a thorough work on the study of the taxonomy of video lecture styles [4]. The team of authors [5] investigated the impact of interactive video on learning performance and student satisfaction in the e-learning environment. V. Vember, D. Buchynska analyzed the multimedia content used by teachers in preparation for different types of educational activities and reviewed the features of different types of educational videos [6]. The issues of integration of digital content of different types into e-learning were considered by N. Morze, O. Glazunova [7]. Research papers [8, 9, 10, 11] are exploring the possibility of using videos on the YouTube platform in the educational process. It is noted that YouTube is an important tool in the learning process because it attracts students' attention and develops their creativity. Authors of scientific works [12, 13, 14, 15] consider video content as not just a video, but a specially prepared educational product that contains the necessary elements to increase the perception of the initial material and maintain interest in the discipline. The use of educational multimedia content on the Internet in the context of other topics was considered by such scientists as [16, 17].

3. Typology of educational video content in e-learning

E-learning is defined as learning and teaching on the Internet using network technologies. E-learning is divided into synchronous and asynchronous forms. Synchronous and asynchronous e-learning is an online learning environment where a student is actively involved in his/her own learning, and where learning activities and expectations are similar to those found in a traditional classroom. Synchronous distance learning mode is characterized by the fact that each participant is near his/her means of communication connected to the global network Internet, using the appropriate software or web application. To connect to the broadcast of the online lecture, they need simply enter the URL (web-site address) using a web browser. Asynchronous learning takes place through online channels without real-time interaction.

The integration of video content into e-learning should evoke the effect of the student's presence, be interactive, encourage dialogue and motivate further learning. After analyzing scientific papers and video content that is available on the Internet, we are going to distinguish the following types of video content for e-learning. Here are the typology and the examples of educational video content (Table 1).

Based on the analyzed and proposed above-mentioned types of educational video content that the teacher can use and integrate into e-learning, we have proposed a scheme for choosing the type of educational video content when working on the units of the selected topic (Fig. 1).

Table 1
Typology and examples of educational video content

Type of video content	Example
video presentation of the course	video recording of the introductory word of a teacher to the discipline;
video review of educational materials	which are presented in the system of distance education for a particular discipline. Answers to the questions: "How to sign up?", "How to view your own achievements and current tasks?", "How to connect to the webinar?", "How to find and download the necessary educational materials?";
video recording of a "live" lecture	video lectures are given directly during lecture classes, they can create the effect of presence for students who watch video lectures;
interactive video lecture	contains tasks for independent work and interactive visual elements (hyperlinks, windows with material, etc.); This type of video lecture is combined with texts, maps or even surveys;
multimedia video lecture	shot in the studio and contains complex special effects: cutting out background, use of 2D and 3D animation, animated slides, screencasts, infographics (diagrams, graphs and histograms);
video demonstration of educational materials	This video contains a demonstration of the experiment, laboratory work, operation of the equipment, software, assembly and disassembly of the equipment. Video can be created from photos of process stages (repair, assembly-disassembly, process of creation of the drawing, figure, etc.) or on the basis of objective video shooting (recording of technological processes);

Type of video content	Example
studio short video lesson	which reveals a very narrow topic (issue);
video lecture-presentation	created as a sequence of slides with audio accompaniment of the material, or a video lecture, which is a direct presentation of the material by the teacher;
video lecture-instruction	video lecture, which aims to provide clear and step-by-step instructions by the teacher for practical, laboratory works or the implementation of certain educational activities;
video lecture-interview	video lecture, in which the material is presented through an interview of the teacher with invited scientists and specialists on specific educational issues
video scribing	a method of narration or explanation, accompanied by a graphic illustration of the main content of what is said. The main purpose of scribing is to help better master the content and remember the meaning of new information by involving visualization. Video scribing can be divided into professional, semi-professional and amateur;
video infographics	graphic visual presentation of data or knowledge designed to quickly and clearly display complex material. The video format of the infographics increases the impact on a person through the use of graphics in motion, as well as by adding music and sound effects. Creating the effect of augmented reality, video infographics is especially used to present a large amount of data with the involvement of the user in active research in obtaining the necessary material;
screencasts	digital video recording of

Type of video content	Example
	information displayed on a computer screen. Often accompanied by voice comments. Screencasting is actively used in educational processes, it is widely used by pupils/students and teachers of schools, higher educational institutions. Due to the ease of creating such videos, screencasts have acquired various forms of implementation and presentation of the material: picture in picture, only the presented material, "Dumb" screencasts, accelerated screencasts, screencasts as a reference, screencasts with elements of video scribing, etc.

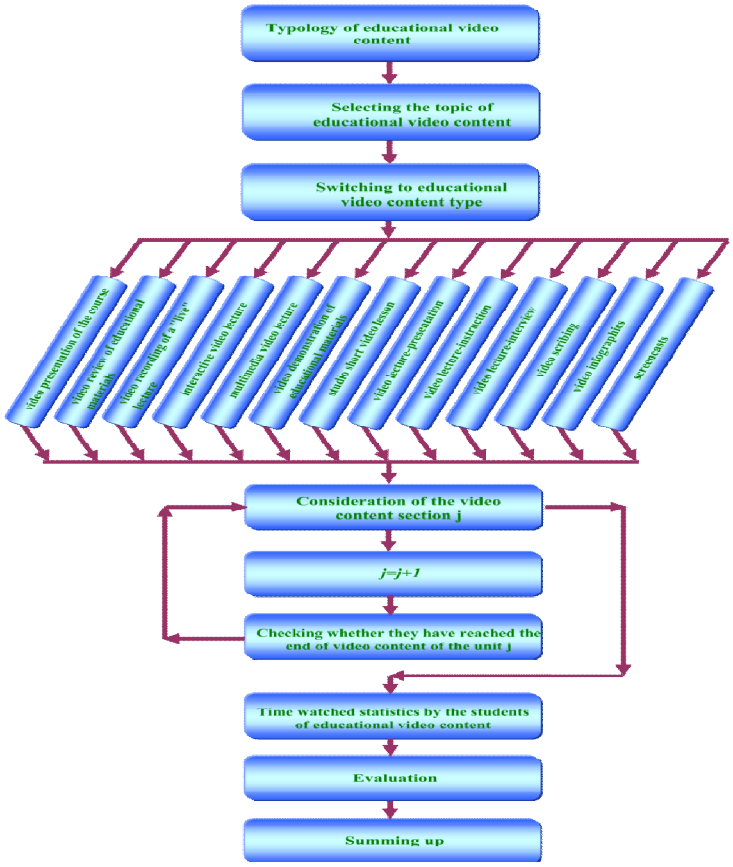

Figure 1: Scheme for choosing the type of educational video content when working on units of the selected topic of the class

Figure 1 shows on what principle the distribution by typologies of educational video content is done, i.e. after choosing the educational video we move on to choosing its type, and then cyclically and consistently consider video content of the educational material unit by unit. After that, we can estimate the times watched by students, evaluate students and sum up.

4. Integration of YouTube video content into the Moodle e-learning environment

Let us assume that the integration of video content into e-learning has already been recognized as a "challenge of time" and the pedagogical and scientific-pedagogical staff is faced with the task of only implementing this new concept in a quality manner. That is, the question is in the scaling of different forms of video product in specific e-courses. At the same time, we immediately reject the integration of video content into the e-course only for the sake of its "updating" – this often only delays the inability of the erroneously constructed e-course to "reach" the studying youth (and, frankly speaking, discredits the very "progressive idea" by a clumsy implementation). We are now in a "search period", indeed, so we should hardly expect "ready-made solutions" and "demand" perfect content from teachers. The only thing that remains important is the understanding of the principles of integration and the individual selection of appropriate ways to implement the educational plan.

Let us consider the rapid changes in the field of video content – its quantity and quality significantly increase (we are talking primarily about video resolution and associated technical capabilities) and priorities are changing. The events of 2020 related to the COVID-19 pandemic have shifted educational video content towards the screencast. Additional opportunities and at the same time problems are the diversity of the very e-learning platforms, as well as programs and services of video content.

It is important to note that the quarantine did not cause, but just revealed a similar diversity in the use of video content services. Those educational institutions that did not conduct systematic work in the field of information and communication technologies found themselves in difficult circumstances – teachers often had to independently combine the existing scarce skills for at least some work with pupils and students. It was especially difficult to create video content for teachers who did not have sufficient preparation to create it.

However, even "experienced" educators have difficulty integrating video content into e-learning. These problems are multicomponent, because they are caused by technical, psychological, pedagogical and other factors. The younger generation has long known the "nicknames" of video bloggers – by an individual selection of videos by the podcasters that they easily determine the preferences of the interlocutor. In fact, video culture has become an integral part of the consciousness of the young generation, reproducing and shaping their preferences.

Nevertheless, integrating "fashionable" content into e-learning causes many problems. This is primarily an ethical component - for example, video bloggers rarely use the word "error" – more often we hear "bug", "screw-up", "crap", "glitch", "slip-up", " typo ", etc. in their lexicon. A kind of "gap" is formed between the official position of the educational institution and the preferences of pupils/students. This problem is beyond the scope of our study and we point to its relevance because it is particularly acute in video form.

It is also important to note that popular bloggers spend hundreds of thousands of dollars to create quality video content. Cover is often the most expensive, which certainly affects the quality of the visuals and sound design. A determining specificity of the author's video content is "attention to details" – interior solutions, color range, hairstyles and thousands of details that "enliven the picture", hold the attention of adolescent and young audiences. Words and phenomena that are relevant today are often "played upon", "hype" is welcomed (however, they always say that "this video is not for hype") and all this takes place in a tense atmosphere of constant cognitive dissonance ("You all know that matches are dangerous and you should not damage school property? Therefore, today we will damage school property and we will get away with it!" etc.).

Accordingly, educators mostly abandon the most popular and "vivis" content in their e-learning. There is still a significant amount of highly professional video by BBC, Netflix, Discovery, etc. However, their integration into the electronic environment may raise copyright concerns. For

example, when a video lecture is broadcast live on YouTube, it may be "interrupted" if it uses a copyrighted piece of feature, documentary, or animated film (Figure 2).

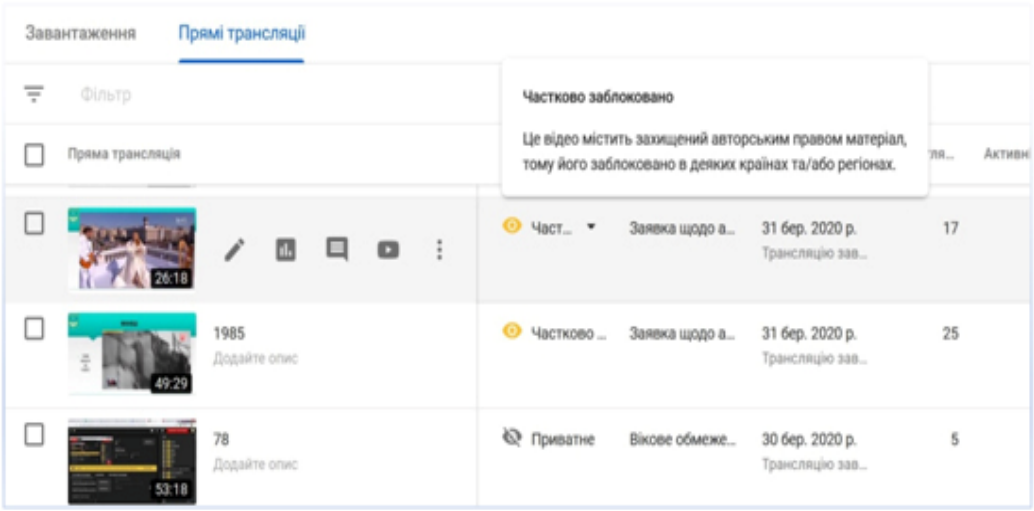

Figure 2: Blocking videos on YouTube

Of course, an educational institution can host videos in a cloud environment or on its own servers. Nevertheless, the cost of maintaining such resources with terabytes of information can be disgruntling. Some people deliberately "bypass" "copyright protection" – remove the authentic soundtrack from the video and degrades and distorts visuals. In this way, it is sometimes possible to "cheat" the artificial intelligence system responsible for blocking. However, for ethical reasons, such steps can discredit teachers and their effectiveness is declining every year.

However, the creativity of teachers is still embodied in high-quality video content, which can be integrated into an appropriate electronic educational platform. We can single out several video services and e-learning platform (Fig. 3).

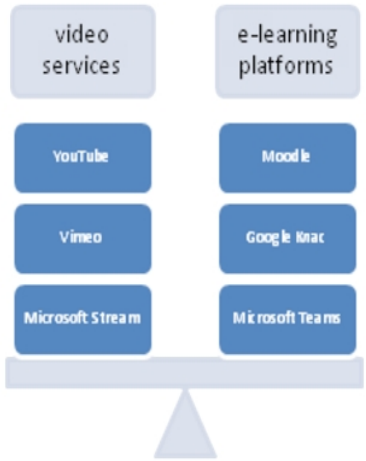

Figure 3: Several video services and e-learning platforms

A combination of different services can be strictly prescribed by the educational institution or remain free to choose. YouTube + Moodle "couple" is more typical for higher educational institutions, YouTube + Google Class – for secondary school. Why does YouTube confidently take first place? Undoubtedly, this service is the most recognizable among others. YouTube can be used with or without authorization. This significantly increases the audience coverage. Playing video on the maximum number of fundamentally different devices is especially important in e-learning, because this kind of learning is mostly done remotely (everyone uses their own "gadgets").

We have already considered in part the active and passive methods of using the YouTube service: “YouTube video hosting is characterized by the agile concept, which provides extreme flexibility in development and implementation. YouTube's basic agile approaches prioritize responding to change. In addition, personality is placed above the processes and tools, and the working software is declared more important than the documentation. That is, the concept of YouTube functioning provides a focus on building a channel that meets the expectations of end users to the same extent as the ideas of the channel "creators". Indeed, such effective practices should be based on an organic combination of profound technical, technological and psychological features of YouTube" [14]. We see that YouTube is a flexible tool for implementing various projects, including educational ones.

Among various platforms available for the distribution of open access video content, we consider the integration of YouTube into an e-learning platform organized on the basis of the Moodle distance learning platform. Moreover, in order to create a network between teachers of the university department, we consider creating a common channel for communication of all teachers on YouTube video hosting. The student's invitation takes place within a set of educational materials and with the involvement of the relevant teacher of the discipline with the provision of possible access parameters such as: "Open access", "Access by link" or "Restricted access". If the topic of the discipline has several subtopics/sections, you can create playlists, as well as embed video content on Moodle resources with an option to start a video lecture from YouTube in a certain period of time.

This application provides users with a flexible, high-quality tool for distance education using state-of-the-art and reliable, time-tested and effective distance learning environment Moodle. YouTube-Moodle integration provides an effective tool for organizing e-learning, will allow us to create interactive training courses that will be convenient and accessible to individual users and large groups based on the Moodle system:

- full integration – the student uses a single tool - switching from Moodle course to video content is carried out on YouTube conveniently and effortlessly;
- easy access system – the user only needs to log in to one environment and he/she gets access to all video content;
- personal reminders for watching video content – every teacher has can configure group reminders in his/her Moodle calendar in a certain period and set the time of access to video content of the course.

4. Comparative analysis of data as a result of the survey

A survey of respondents from two universities – Lviv Polytechnic National University and Borys Grinchenko Kyiv University – has been conducted. 129 respondents took part in the research. Table 2 shows the data obtained by processing two compared conditions for the surveyed data of video content watching intervals, namely by article and the desired time for video content watching where the surveys were conducted for such time intervals as $\Delta T = 10$ min, 20 min, 30 min, 40 min. (two videos 20 minutes each) and 45 minutes (full time of one academic hour).

Table 2

Data after processing of two comparative conditions of data about intervals of video content watching by surveyed male and female respondents

The best time frame for mastering the educational topic in the time of the quarantine during COVID-19 pandemic		
Time intervals	Females	Males
up to 10 minutes	5	2
up to 20 minutes	28	8
up to 30 minutes	34	3
45 minutes	16	2
Two video content of the same material, split 20 minutes each	19	5

Table 2 shows that females participated more in the survey and accounted for a significant proportion of respondents, namely 82,95%, which is almost 5 times more than males.

Figure 4 illustrates in the form of a histogram the results obtained after processing two comparative conditions for surveyed data intervals of video content watching.

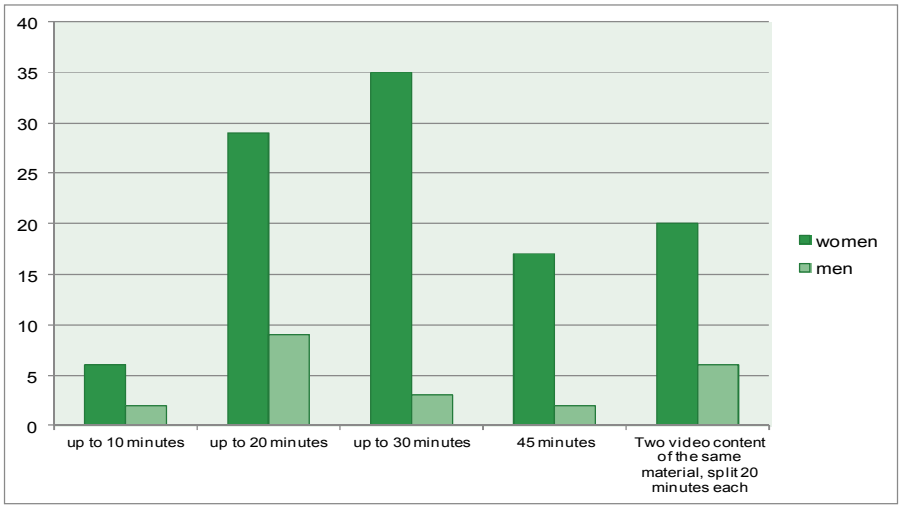

Figure 4: The results obtained after processing two comparative conditions for the surveyed data intervals of video content watching

When we analyze the data shown in the figure 4 we can see that 30-minute long videos are preferred by females almost 12 times more often than males in relation to the total number of the interviewed female respondents. To study the possible time intervals and preferences in watching videos that were not in the survey, we will construct two approximation functions based on the data obtained as a result of the survey separately for men and women.

Having a set of the most optimal time intervals of video content watching obtained as a result of the survey for mastering the educational topic in the period of the quarantine during the COVID-19 pandemic, we construct 5th degree approximation polynomials using a least-squares approach [18] with $n = 5$ – answer options.

$$f_{sex}(A_1,\ldots,A_5) = \sum_{i=1}^{n}\left[\Phi(x_i) - \sum_{l=0}^{5} A_l x^{5-k}\right]^2 \xrightarrow[\{A_l\}\in R]{} \min, \tag{1}$$

where ΔT_i – time interval, $\Phi(\Delta T_i)$ – value for a certain consecutive interval, A_l – coefficients of the 5th degree polynomial from the set of real numbers.

Based on formula (1) we get a general form of the approximation function:

$$f_{sex}(\Delta T) = A_0(\Delta T)^5 + A_1(\Delta T)^4 + A_2(\Delta T)^3 + A_3(\Delta T)^2 + A_4(\Delta T) + A_5. \tag{2}$$

We construct approximation functions using (2) for specific values that we received as a result of processing data obtained from people:

- **female**

$$f_W(\Delta T) = 1.8359\cdot 10^{-6}(\Delta T)^5 - 5.85979\cdot 10^{-5}(\Delta T)^4 - 6.75979\cdot 10^{-5}(\Delta T)^3 + \\ + 3.00701\cdot 10^{-1}(\Delta T)^2 - 1.6927(\Delta T) - 3.3085\cdot 10^{-12}, \tag{3}$$

- **male**

$$f_M(\Delta T) = -7.2037\cdot 10^{-6}(\Delta T)^5 + 0.00085787(\Delta T)^4 - 0.035963(\Delta T)^3 + \\ + 0.606435(\Delta T)^2 - 3.05389(\Delta T) + 3.41938\cdot 10^{-12}. \tag{4}$$

Table 3 shows the data on the surveyed male and female respondents approximated by functions $f_W(\Delta T)$ and $f_M(\Delta T)$, according to formulas (3), (4), respectively (4).

Table 3
Approximated data on the surveyed respondents

ΔT	Women	Men
10	**6**	**2**
11	8,230974	3,578461
12	10,58234	5,026496
13	13,01206	6,299904
14	15,47937	7,367161
15	17,94494	8,208333
16	20,37111	8,813995
17	22,72215	9,18414
18	24,96441	9,327104
19	27,0666	9,258472
20	**29**	**9**
21	30,73865	8,578528
22	32,25959	8,024896
23	33,5431	7,37286
24	34,57289	6,658005
25	35,33631	5,916667
26	35,82463	5,184839
27	36,03319	4,497096
28	35,96166	3,885504
29	35,61428	3,378539
30	**35**	**3**
31	34,1328	2,767928
32	33,03183	2,693518
33	31,7217	2,780037
34	30,23262	3,021739
35	28,60069	3,402778
36	26,86811	3,896128
37	25,08334	4,462496
38	23,3014	5,049237
39	21,58404	5,589272
40	**20**	**6**
41	18,62517	6,182217
42	17,54287	6,019029
43	16,84404	5,374771
44	16,62746	4,093916
45	**17**	**2**

Figure 5 shows functions $f_W(\Delta T)$ and $f_M(\Delta T)$ constructed based on the results of the 5th degree approximation polynomials according to formulas (3), (4).

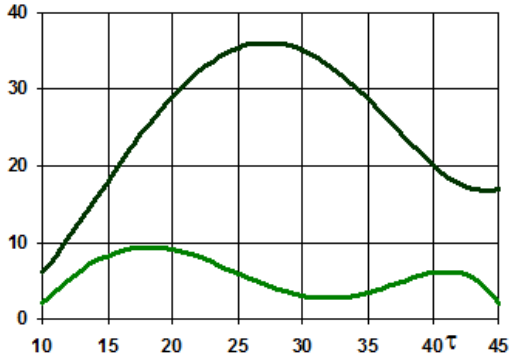

Figure 5: Approximation functions $f_W(\Delta T)$ and $f_M(\Delta T)$

According to the constructed function curves $f_W(\Delta T)$ and $f_M(\Delta T)$ in Fig. 5 we can see, which time intervals are preferred by both male and female users. Male users prefer shorter video watching intervals and the most optimal for the majority are videos from 15 minutes up to 20 minutes (curve $f_M(\Delta T)$, Fig. 5). While most female users watch longer video content from 25 min up to 30 min (curve $f_W(\Delta T)$, Fig. 5).

In particular, the respondents answered the question "Which social platform do you prefer as additional training in the use of video content during the restrictions related to COVID-19 in Ukraine" as follows 83,7% – YouTube, 43,4% – Instagram, 13,2% – Facebook. All other percentages were distributed in such responses as Twitter, TikTok, Telegram, Zoom, Edera, Prometheus and Microsoft Teams. Thus, according to the results of the online survey, the most popular among respondents is the use of video content on YouTube video hosting.

To the open question "Was studying of disciplines during the distance learning caused by Covid-19 accompanied by materials with video content posted on the Moodle platform" the answers were obtained with such results as: "yes" – 36,4%, "no" – 50,4% and 13,2% of respondents confirmed the need to accompany the materials with video content. (Fig.6).

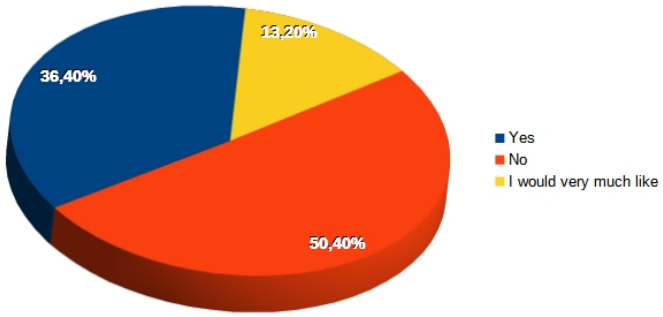

Figure 6: Priority of studying the disciplines as accompanied with materials with video content posted on the Moodle platform during distance learning caused by Covid-19

What is more, in the framework of our research, students of different courses majoring in "Information, Library and Archival Science" of Lviv Polytechnic National University and "Graphic Design" of Borys Grinchenko Kyiv University were asked the question "Would you like your teacher to create video content for studying the topic", where the results of the survey were distributed in this way – the majority of 72,1% of students confirmed and expressed their interest; there is no need to make additional video content on the disciplines they study, as for 24,8% of respondents online class is enough to understand the topic, and 3,1% of students confirmed that they already have video content on studying the discipline topics in their e-learning (Fig. 7).

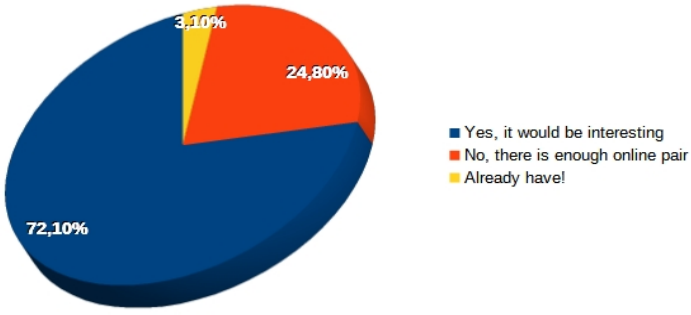

Figure 7: Priority of studying topics with the help of video content created by the teacher of the discipline

The results of the survey confirm the great interest in studying topics with the help of video content created by the teacher of the discipline.

The results of the answers to the clarifying question "In which style would you like to receive information in video content" were distributed as follows: 66,7% – Video scribing * (the process of visualizing a complex meaning with simple images, where images are drawn in the process of explanation); 50,4% – Video lecture; 31,8% – Video instruction and 24,8% – The presence of pop-up questions during the video material (Fig. 8).

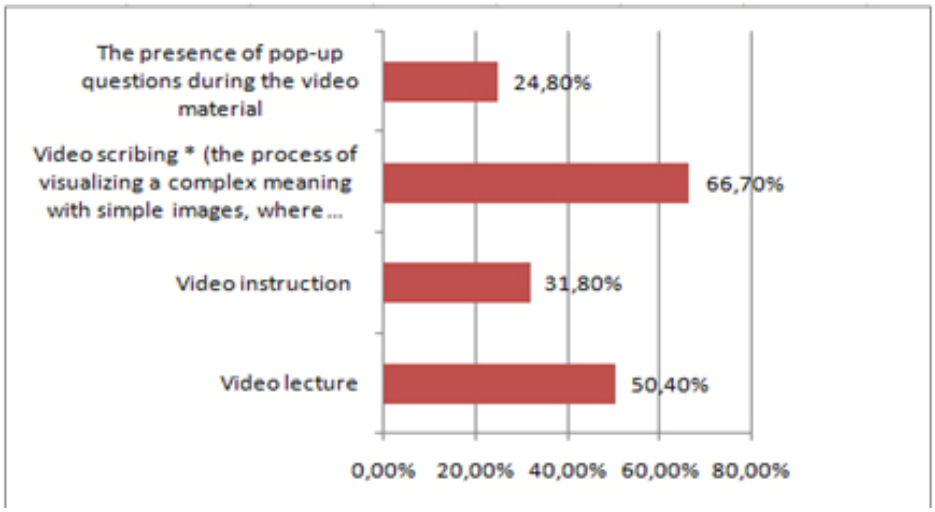

Figure 8: Priority of receiving information in video content of a certain type

In our study, the question "Would you prefer educational video content where the teacher" and the answer options, which received such results as: "Uses a touch of humor in explaining the material" received the most affirmative answer – 82,2%; "Quickly and enthusiastically explains" – 35,7%; "Slowly and focused" – 17,1% and among their answers, respondents, in particular, highlighted "In moderate pace and perhaps with humor" and "use of examples to the topic".

Respondents were also asked – "What do you think are the advantages of educational video content compared to textual content added to disciplines" and "What do you think are the disadvantages of educational video content compared to textual content added to disciplines". Among the answers to the question "What do you think are the advantages of educational video content compared to textual content added to disciplines" respondents answered as follows: Information is easier to perceive – 66,7%, Information is remembered faster – 47,3%; video format better conveys an action or process – 60,5%; An option to stop the lecture/laboratory work to comprehend the information obtained – 72,1%; Using the "go back" function to listen to the material again – 79,8%.

In particular, the answers to the questions "What do you think are the disadvantages of educational video content compared to the textual content added to disciplines" were distributed as follows: background sound can interfere – 20,2%; Video content requires high quality Internet – 49,6%.

5. Conclusions

Thus, the pandemic caused by the spread of COVID-19 has intensified the use of new teaching aids using different types of educational video content. In order to diversify learning activities, improve the quality of learning, motivation of learning activities and meet the needs of Generation Z, there is a need to integrate video content into e-learning. Based on the analyzed scientific papers and video content available on the Internet, the types of video content for use in e-learning have been identified and a scheme for choosing the type of educational video content while working on the units of the selected topic has been suggested. Among the variety of platforms available for the distribution of open access video content, we consider the integration of YouTube into an e-learning platform organized on the basis of the Moodle distance learning platform. What is more, in order to create a

network between teachers of the university department, we consider creating a common channel for communication of all teachers on YouTube video hosting. The student's invitation takes place within a set of educational materials and with the involvement of the relevant teacher of the discipline with the provision of possible access parameters such as: "Open access", "Access by link" or "Restricted access". If the topic of the discipline has several subtopics/sections, you can create playlists, as well as embed video content on Moodle resources with an option to start a video lecture from YouTube in a certain period of time. Thus, the student will use the only means – switching from Moodle to video content is carried out on YouTube conveniently and effortlessly; every teacher can customize group reminder in his/her Moodle calendar for a specific period and set access time to the discipline's video content.

To understand the quality of integration of video content into e-learning against the background of COVID-19 in academic disciplines by students, we have conducted an empirical study based on various courses in "Information, Library and Archival Science" at the Lviv Polytechnic National University and "Graphic Design" at the Borys Grinchenko Kyiv University. The sample is 129 respondents. The results of the study showed that there is quite a large number of students (72,1%) who expressed a desire to study the topics of the disciplines using video content created by the teacher and only a small number (3,1%) said that they already have the video format of studying topics on the disciplines created by the teacher, and some students (24,8%) found that online class is enough to study the topic during the pandemic. During the analysis of respondents' answers it was also found that 36,4% of students confirmed that during distance learning caused by Covid-19, studying disciplines was accompanied by materials with video content, which are posted on the Moodle platform, and 50,4% of respondents answered that during distance learning on the Moodle platform studying disciplines was not accompanied by materials with video content. In particular, 13,2% of respondents expressed a desire to obtain information through video content posted on the Moodle platform when studying materials on disciplines.

Among the advantages of using video content during the study of the discipline, respondents indicated an option to stop the lecture/laboratory work to comprehend the information obtained (72,1%); Use the "go back" function to listen to the material again 79,8%. Within the research we have also obtained data from the development of two comparative conditions for the surveyed data of video content watching intervals, namely by article and the desired time for video content watching. According to the approximation functions, it has been determined which time intervals male and female respondents may prefer.

6. References

[1] P. Edelson, V. Pittman, E-Learning in the United States: New Directions and Opportunities for University Continuing Education. Global E-Journal of Open, Flexible & Distance Education 1 (2001) 71-83.

[2] B. Khan, A framework for e-Learning, 2000.

[3] P. Sanderson, M. Rosenberg, Book review: e-Learning: strategies for delivering knowledge in the digital age, 2002. URL: http://www.qou.edu/arabic/researchProgram/eLearning-Researchs/eLearningStrateg iesDelivering.pdf.

[4] K.Chorianopoulos, A Taxonomy of Asynchronous Instructional Video Styles. The International Review of Research in Open and Distributed Learning, 2018. URL: http://dx.doi.org/10.19173/irrodl.v19i1.2920.

[5] D. Zhang, L. Zhou, R. Briggs, J. Nunamaker, Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. Information & Management. 43 (2006) 15-27.

[6] V. Vember, D. Nastas, Modern types of educational videos and peculiarities of their use in the educational process. Educational discourse. 1:13 (2016) 19-29. doi: 10.28925/2312-5829.2016.1.1929.

[7] N. Morse, E. Glazunova, Methods of integrating digital content in an e-learning course. Educational technology and society, 17:1 (2014) 537-544.

[8] N. F. Abbas, T. A. Qassim, Investigating the Effectiveness of YouTube as a Learning Tool among EFL Students at Baghdad University. Arab World English Journal (AWEJ) Special Issue on CALL, 6 (2020). doi: https://dx.doi.org/10.24093/awej/call6.23.
[9] R. Goloshchuk, O. Dovbush, Using Moodle and Adobe software for e-learning. Bulletin of the National University "Lviv Polytechnic": Information systems and networks, 673 (2010) 249-258.
[10] I. Bratus, Z. Sverdlyk, Own YouTube channel: aspects of monitoring. Ukrainian Journal of Library Science and Information Sciences, 2 (2018) 78-88. doi: https://doi.org/10.31866/2616-7654.2.2018.152784.
[11] Ł.Wiechetek, Improving knowledge and skills with video-sharing websites. Framework of e-learning video course for students of logistics. In: Proceedings of the 12th International Technology, Education and Development Conference, Valencia, Spain, 5-7 March, 2018, pp. 2069-2080. URL: http://dx.doi.org/10.21125/inted.2018.0388.
[12] O.Vural, The Impact of a Question-Embedded Video-based Learning Tool on E-learning. Educational Sciences: Theory and Practice, 13:2 (2013) 1315-1323.
[13] K. Bugaychuk, Distance and e-learning: essence, features, relationships. Bulletin of postgraduate education, 10 (2014) 17-27.
[14] G. Dzhevaga, Creating a video lecture for distance learning. Bulletin of Chernihiv National Pedagogical University. Series: Pedagogical sciences, 137 (2016) 19-23. doi:https://doi.org/10.31499/2307-4914.15.2017.163188.
[15] J.Costley, C. Lange, Video lectures in e-learning: Effects of viewership and media diversity on learning, satisfaction, engagement, interest, and future behavioral intention. Interactive Technology and Smart Education, 14:1 (2017) 14-30.
[16] T. Bilushchak, O. Radkovets, Y. Syerov, Internet Marketing Strategy Promotion of a Book in Social Media. International Workshop on Control, Optimisation and Analytical Processing of Social Networks. In: Proceedings of the 2st International Workshop on Control, Optimisation and Analytical Processing of Social Networks (COAPSN-2020). Lviv, Ukraine, May 21, 2020 , CEUR Workshop Proceedings, vol. 2616, 2020, pp. 260-272. URL: http://ceur-ws.org/Vol-2616/paper22.pdf.
[17] N. Shakhovska, O. Peleshyshyn, Zh. Myna, T. Bilushchak, Online community information model for use in marketing activities. In: Proceedings of the 1st International Workshop on Control, Optimisation and Analytical Processing of Social Networks (COAPSN-2019), Lviv, Ukraine, May 16-17, 2019, CEUR Workshop Proceedings, vol. 2392, 2019, pp. 263–272. URL: http://ceur-ws.org/Vol-2392/paper20.pdf.
[18] G. Milovanovic, Numerical Methods and Approximation theory. Yugoslavia: Faculty of Electronic Engineering, 1984.