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Technological features of video content creation and editing for students specialty «Construction and civil engineering»

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The article defines the concept of "video content" which is one of the main and effective components of the multimedia content of the educational process. The possibilities of using multimedia technologies at the stage of creating video lectures for students of higher educational institutions of the specialty "Construction and civil engineering" are considered. The possibilities of using multimedia technologies at the stage of creating video lectures for students of higher educational institutions of the specialty "Construction and civil engineering" are considered. The article presents statistical data on determining the role of video content in the strategy of delivering information to the user. The latest technologies for the development and editing of video content are analyzed

Keywords: video content, construction and civil engineering, multimedia system

Технологічні особливості створення та редагування відеоконтенту для студентів спеціальності «Будівництво та цивільна інженерія»

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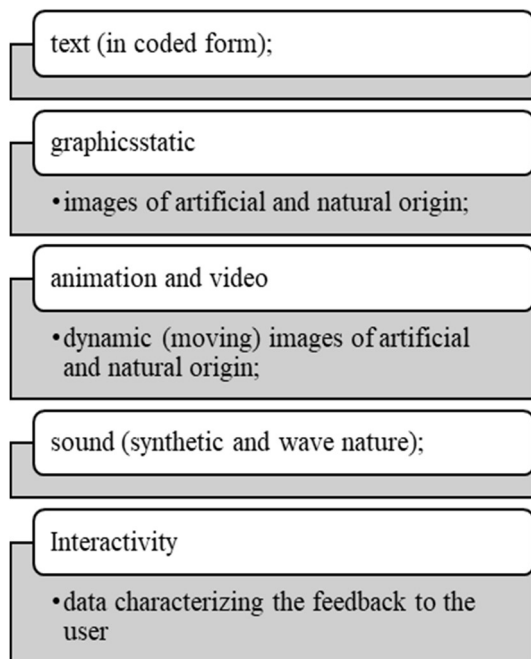*Адреса для листування E–mail: dmitr_tat@ukr.net

В статті визначено поняття «видеоконтент» якій є одним із основних та ефективних компонентів мультимедійного контенту освітнього процесу . Розглянуті можливості застосування мультимедійних технологій при створені відеолекцій для студентів закладів вищої освіти спеціальності «Будівництво та цивільна інженерія». Представлені статистичні дані визначення ролі відеоконтенту в стратегії донесення інформації до користувача. Проаналізовані новітні технології для розробки та редагування відеоконтенту. Розглянуто переваги застосування відеоматеріалів в освітній діяльності закладів вищої освіти, особливо для студентів інженерних спеціальностей. Охарактеризовані складові мультимедійної системи, які дозволяють інтенсифікувати навчальний процес. Надано пропозиції для ефективного впровадження відеокурсів в навчальний процес, які дозволять організувати повноцінну навчальну взаємодію відносин «викладач-студент». Представлено алгоритм розробки лекційного відеокурсу по дисципліні «Дерев'яні конструкції для студентів спеціальності «Будівництво та цивільна інженерія». Алгоритм представлено у вигляді покрокових дій створення відеоконтенту з детальним описом кожного етапу (кроку). Досліджено використання різноманітних відеоформатів та надано пропозицію використання збереження форматі MPEG 4 для можливості читання файла в будь-якому програмному забезпеченні для перегляду медіа файлів. Особливу увагу приділено підготовці сценарію, вибору технічного оснащення для проведення зйомок, та постановки освітлення. Представлено аналіз існуючих програмних продуктів у для створення навчальних роликів. Наведено функціональні особливості сучасного програмного забезпечення для обробки та редагування відеоконтенту, проведено порівняльний аналіз програм для обробки та редагування відеоконтенту. Представлено процес редагування та обробки навчального відеоконтенту

Ключові слова: відеоконтент, будівництво та цивільна інженерія, мультимедійні системи

Introduction

The following types of data are traditionally referred to the multimedia data (MMD):

- text (in coded form);

- graphicsstatic
  - images of artificial and natural origin;

- animation and video
  - dynamic (moving) images of artificial and natural origin;

- sound (synthetic and wave nature);

- Interactivity
  - data characterizing the feedback to the user

In this paper, such a part of multimedia data as video was considered.

Video is powerful storytelling content. It also leads the way in connecting people and building more satisfying and deeper relationships between a person and his target audience.

Video plays an important role in the strategy of delivering information to the user. According to the statistics:

- In 2019, video content was supposed to make up 80% of all consumer internet traffic.
- Social media videos generate 1200% more shares compared to images and text.
- 87% of internet marketing specialists use video content.
- The consumption of mobile video is growing by 100% annually.

In the educational process, video resources are more frequently used to increase the effectiveness of teaching new theoretical or practical material.

Review of the research sources and publications

Many scientists are engaged in the introduction of new technologies in the video content form into the educational process, in particular, the works of Semenyuk S. [1], Kasparinsky, F.O. [2], Brame C.J. [3], Subudhi B.N., Veerakumar T., Esakkirajan S., Chaudhury S. [4], Ohnishi Y., Yamaguchi S., Shimoikura Y., Nishino K., Kondo H., Hayashi A. [5], Hung I., Kinshuk, Chen N. [6], Madariaga L., Nussbaum M., Gutiérrez I., Barahona C., Meneses A. [7], Lyons A., Reysen S., Pierce L. [8], Gallardo D. [9], Mohammed A.M. Alhefnawi [10]. Scott and others are devoted to this problem. But not enough information is published on the use of video content tools for engineering students in higher education institutions.

Definition of unsolved aspects of the problem

Successful assimilation of training courses by students of engineering specialties is one of the important tasks of higher educational institutions (HEIs). In connection with the implementation of distance education in Ukraine, an important role is assigned to the material presentation in the form of video content, a variety of video materials. Video content is posted on the Internet - on the official website of the HEIs, on pages in social networks of the institution and its structural units simultaneously [11]. It gives the ability to provide maximum convenience for students' information perception.

Problem statement

Analyze the introduction of video content into the educational process for engineering specialties students. To develop a video lecture course on the discipline "Wooden structures" for students of the specialty "Industrial and civil engineering".

Basic material and results

For effective video courses implementation in the educational process, it is necessary to pay more attention to the video. To do this, you can use the following options:

1. Develop a simple video SEO strategy.
   Search engine optimization isn't just about posts.
   To work effectively, you need to use some standard elements:
   - Headlines are the best way to grab people's attention. It should be informative and concise.
   - Add keywords to the video description and include a link to your site.

2. Make it clear what is at stake.
   To get more views of your video lecture, it is necessary to provide students with enough information so that they can decide whether they want to watch it or not.

3. Use social proof.
   Using social proof is a good way to not only increase conversions, but also build trust between teacher and student.
   50% of video content users find testimonial videos helpful.

4. Optimize video conversions.
   Once the teacher encourages students to watch the video lecture, it's time to get the most out of them and focus on conversions. All it takes is properly optimize them with a focus on conversions.

5. Select distribution points.
   To reach even more, you need to find the right distribution channels and deliver your content to your audience.

6. Increase the reach and impact of the video for the audience.
   To develop a video lecture course on the discipline "Wooden structures" for students of the specialty "Construction and civil engineering", the following algorithm was used:

Step 1. Determine the target audience.

Even if you are not filming a video lesson for a general audience, but, for instance, for students or sales staff, it is important to determine the target audience. This will help you better "aim" your material and make the video as useful as possible.

Step 2. Prepare the script.

It will help: [12]

- Structure your presentation, think over theses and tips that will make the lesson more advanced and valuable.

- Avoid unnecessary pauses and exclamations. There will always be work at hand if you suddenly get lost and lose your train of thought.

The presentation of educational material should begin with the most interesting facts or briefly present information about what the lecture will be about. Based on the script, you can storyboard an instructional video. A storyboard is a series of thumbnails that show you what key scenes will look like.

You don't have to paint every scene in detail. Just a freehand sketch will do - the main thing is to visually show the main actions.

To understand how long the video will turn out, watch the script through the Honomer service - by the amount of text, it determines the duration of the upcoming video.

Step 3. Pick up a camera and microphone.

First of all, you need to know that microphones are dynamic and condenser:

- Dynamic microphones allow better echo and background noise suppression.

Condenser microphones are more susceptible to background noise and lesser sounds. But they can be used to achieve excellent sound during recording in complete silence.

Three types of microphones are suitable for video tutorials:

Lapel microphone or lavalier

The microphone headset (or it is also called the "head") is a budget option, it is a conventional headphone with a headset.

Web camera with microphone or "gun" - a device that is attached to a video- or camera.

Step 4. Choose a filming location.

The popularity of a video highly depends on the image. The background plays an important role here. Perfectly, the shooting location should be 100% suitable for the video tutorial topic.

Any location can become the background. The background sets the topic.

Step 5. Set up the lighting.

"Work light" is a very bright light (500 to 1000 W). For the clear picture, It's necessary to set up at least three lamps to reach a clear picture. The image quality depends on how you arrange these items.

Step 6. Think over the teacher's character and image.

Looking at the presenter, the viewer makes a decision in the first minute: to continue watching or look for another video.

Step 7. Record video in parts.

Before the final video recording, read the text aloud, select the optimal volume and rate of your speech. Moreover, it's necessary to check the microphone.

It is not a good idea to record the entire lecture in one shot. Divide the performance into short takes. Changing the angle will significantly diversify the video sequence.

Step 8. Select a program for creating tutorial videos and edit these video content.

After filming, editing is the next step. Better to start working with simple programs, gradually moving on to more advanced ones.

Windows Movie Maker

The most convenient application for capturing videos from Skype, YouTube and IGTV. The platform has a clear interface, especially users praise the quality and speed of rendering (getting an image from a model). During operation, the app does not conflict with other applications.

The editor supports almost all video formats: HD Video, MPEG, OGV, QuickTime, RM, WebM, MXF, WMV, 3GPP. The program is able to process more than a dozen audio files simultaneously and read about 15 graphic image formats.

Avid Media Composer

This editor was chosen for the official training program at the famous New York Film Academy. At first glance, the app may seem complicated, however, having mastered it, you can make any video in one window and without the help of specialists.

AMC belongs to the professional software category and was released back in 1989. The films, nominated for last year's Oscars for Best Film and Best Editing, were created using this tool.

An ordinary user can make up a video shot with several cameras, overlay several audio tracks, graphics and titles. The program allows you to make high-precision corrections and reads any media format, and also works with any resolution (even 4K). You can add motion effects, animations, 2D and 3D compositions, and even correct focus and camera shake issues.

Bolide Movie Creator

Professional, but at the same time so intuitive software, even a child can understand it. By the way, the interface is completely in Russian, it stands out strongly against the background of others. To make the process even more accessible, the developers have posted detailed instructions on their official website.

The editor allows you to create picture-in-picture and freeze frames, set transparency from 10 to 100%, add voice to video.

You can also improve the sound quality if you weren't using the best microphone. The program works with formats MP4, AVI, MPEG, MOV, WMV, MKV, VOB, DVD, 3GP.

Interactive Platform

The platform allows you to create interactive videos where the user can control the plot, which means the video has several options for development. Through depths of engagement, these videos are much more

memorable than any ad or educational film. According to Ion Interactive, 88% of marketers believe interactive content sets them apart from the competition.

The platform is presented as an online editor. Nowadays you can create interactive films with a choice of 2 to 6 actions there. All actions must be filmed in advance and arranged in the correct order according to the script. The created project can be monetized through advertising, in-app purchases (paid premium branches), or you can make the project completely paid. Creating an interactive movie consists of 5 steps: loading content, organizing a non-linear structure, overlaying gamification, choosing a monetization model, and publishing on the marketplace.

Prezi

This app was first released for creating presentations. However, from a certain point in the application there was a function to prepare videos. The program is very flexible: you can import projects there in ppt format and convert them to video. In addition, Hungarian startup's product allows for incredibly dynamic presentations with customized elements. For many users, the program has become one of the main tools in their work.

You can use several control mechanics in your project. The most common and familiar type of control is one where the user needs to choose one of the options for the development of events.

Premiere Pro

With Premiere Pro video editor, you can edit content in any format - from 8K to virtual reality. Built-in file support, easy-to-use proxy workflows, and faster ProRes HDR performance make it easy to work with multimedia even on mobile workstations.

However, if you want to make a simple video tutorial without complex special effects, you can use other software that is easier to use.

At its core, a video file is a collection of static images that replace each other at a certain frequency.

To create a video lecture, parts of the lecture were filmed in accordance with the requirements discussed bove (Fig. 1).

Videos were combined with slides to create a more engaging curriculum, resulting in a broader presentation of the material (Figure 2).

Each still image is a separate video frame [13]. This is true if we are talking about compressed video. However, no one stores films in this format. The point is that uncompressed video takes up a lot of disk space. The video is saved in video files, in which various information compression algorithms are applied. Thanks to these technologies, a video file can be compressed tens and hundreds of times with virtually no loss of picture and sound quality. Video formats are: PAL, NTSC, SECAM, VHS, DV (Digital Video), AVCHD, HD, MPEG, AVI (Audio-Video Interleaved), WMV (Windows Media Video), MOV, MKV, 3gp, FLV (Flash Video), SWF (Shockwave Flash), RM, RA, RAM VOB (Versioned Object Base), m2v, m2p.
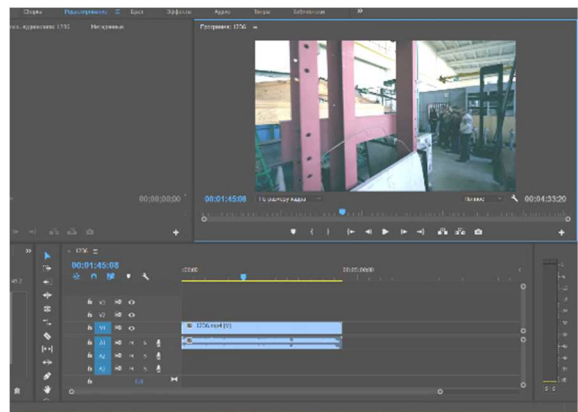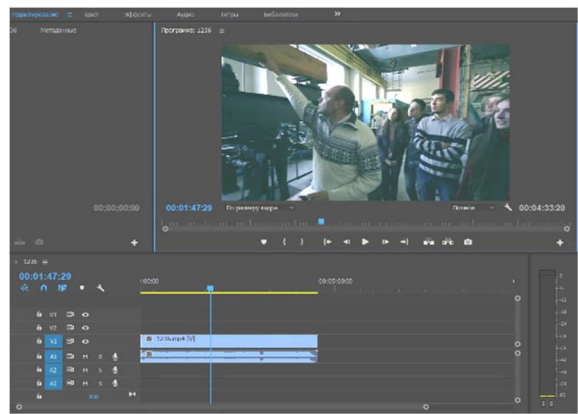
Figure 1 – Processing and editing video content
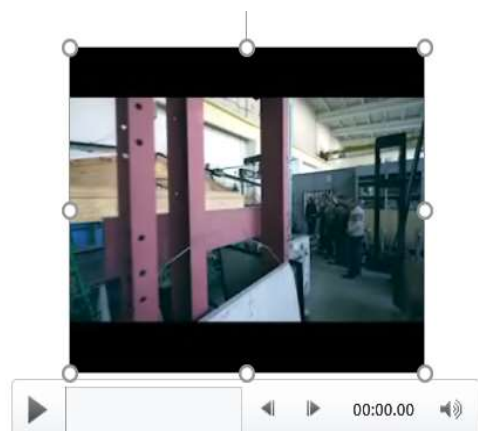
Figure 2 – Merging video with slides

The created lecture in the form of a presentation, in Microsoft PowerPoint, can be exported to the wmv video format. This is the easiest way to create video from presentations. herefore during creating one of the video lecture topics, slides are made and converted into a video clip. The created video lecture can be uploaded to the video hosting.

Slide-to-video export function supports soundtrack, animation, transition effects and time intervals set for all effects used in the presentation.

To convert a presentation into a video, we also used such software products as:

iSpring Suite (Fig. 3) which converts ready-made ppt presentations not only into video files, but html5, scorm for publication on the Internet and educational platforms;
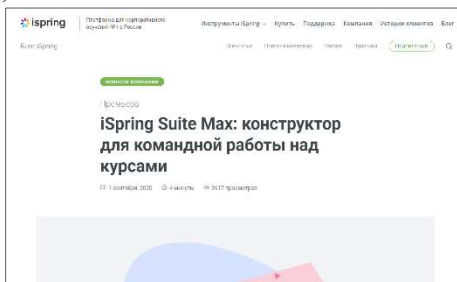

Figure 3 - The iSpring Suite program interface

Vyond (formerly GoAnimate) (Fig. 4) has a rich library of ready-made templates for video presentations and allows you to create animated videos;
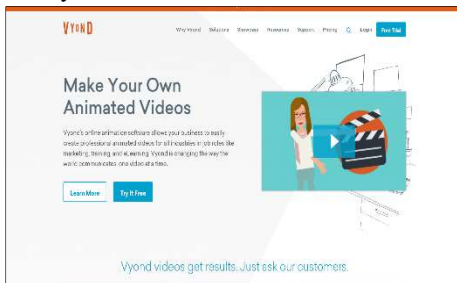

Figure 4 – The Vyond program interface

Moovly (Fig. 5) allows you to create not only video presentations, but also animated banners and infographics. In the demo version, video download is available;
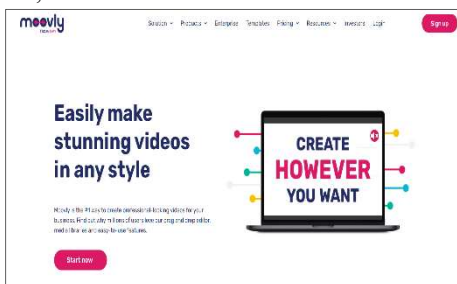

Figure 5 – The Moovly program interface

SparkolPro (Fig. 6) the program allows you to create a doodle video, in which the drawing unfolds right on the screen;
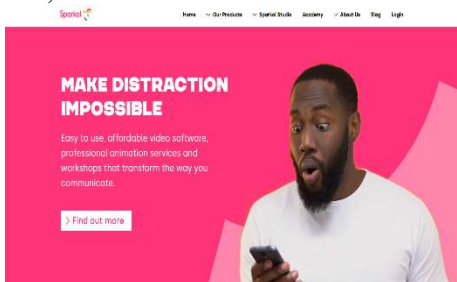

Figure 6 – The SparkolPro program interface

Wideo (Fig. 7) has ready-made templates for creating presentation videos about products and services;
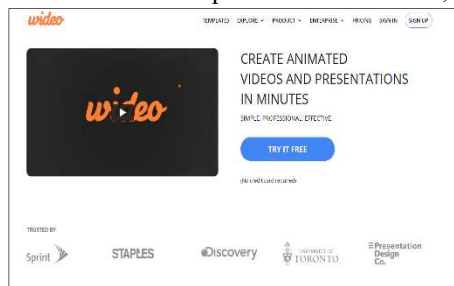

Figure 7 – The Wideo program interface

Kingsoft WPS Office (Fig. 8) has all the functionality of MS Office, allows you to convert a movie to pdf, there is a function to protect files from copying and changing;

Figure 8 – The kingsoft WPS Office program interface

ProShow Producer is designed to create videos from photos and images. Videos can be saved in 40 different formats - which allows you to play the presentation on all types of devices.
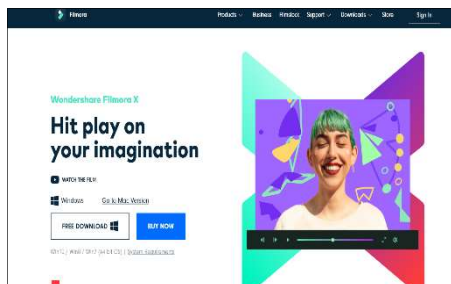

Figure 9 – The ProShow Producer program interface

Conclusions

The use of trending tools to provide educational material for students of the specialty "Construction and civil engineering" will make it possible to provide educational services more efficiently. Therefore, each teacher of the HEIs of the construction direction needs to study ways to effectively develop and implement video lectures. To create an interesting video, you need to determine in advance what you need to achieve. Choosing a video format, you need to proceed from the goals and objectives. In addition, one of the main and priority tasks is to study the target audience. However, it should be remembered that for the video to work, the concept must take into account the characteristics and desires of the target audience of the educational institution.

After analyzing the introduction of video content for students of engineering specialties into the educational process, a lecture video course on the discipline "Wooden structures" for students of the specialty "Construction and civil engineering" was developed. Processing and editing of video content has been completed.

The video was saved in MPEG 4 format so the file can be read in any software for viewing media files.

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