ВИДАВНИЦТВО
«МОНОЛІТ»

DIGITAL EDUCATIONAL ENVIRONMENT IN INSTITUTIONS OF HIGHER EDUCATION

DIGITAL EDUCATIONAL ENVIRONMENT
IN INSTITUTIONS OF HIGHER EDUCATION

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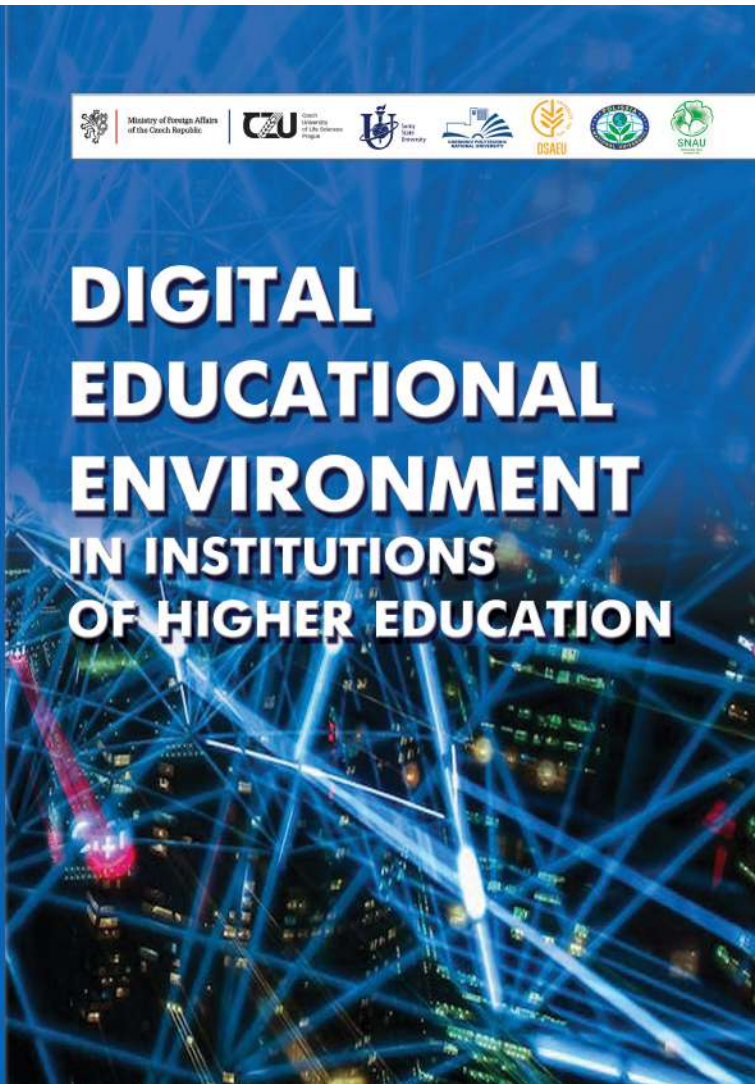
DIGITAL EDUCATIONAL ENVIRONMENT IN INSTITUTIONS OF HIGHER EDUCATION

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The monograph presents modern educational technologies that can be used in the educational process of a higher educational institution. The monograph is aimed mainly at students of various study specialties, teachers. The monograph collects the opinions of scientists and teachers regarding the possible use of information technologies in the learning process, considers the main services and tools for evaluating written works, conducting an oral survey, and organizing online testing.

CONTENTS

2. Marchuk, N.A. Mushenyk, I.M. (2021). E-learning – perspektyvna model' navchannya v informatsiynomu suspil'stvi [E-learning – a promising model of learning in the information society] Proceedings of the Informatsiyni tekhnolohiyi i avtomatyzatsiya: materials of the XIV International. Science and practice conference (Ukraine, Odesa, October 21–22. 2021). pp 145-156 (in Ukrainian)

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3.3. Online visualization tools for organizing activities and evaluating the achievements of applicants

In the conditions of distance learning (E-learning), teachers and students encountered certain limitations of available learning methods and complications in the perception of educational information. To increase the effectiveness of the available resources and platforms for presenting educational information, it is expedient and important to use online visualization as a method of presenting information by visualizing information, creating conditions for visual (with the naked eye or using an optical device) observation using various techniques and online tools.

The purpose of this publication is to improve the level of practical skills in using online visualization tools for organizing educational activities and evaluating the achievements of learners in the conditions of distance learning.

According to its content, information is a collection of data or information about some objects and phenomena, presented in various forms, it has always played an extremely important role in human life and today is an integral part of the world around us and our consciousness. According to the Law of Ukraine "On Information" dated October 2, 1992 No. 2657-XII, information is "any information and/or data that can be stored on physical media or displayed in electronic form" [1].

With the transition of civilization to the era of digital technologies, the procedure for exercising and ensuring everyone's right to access information held by subjects of authority, other managers of public information, and information used in education is becoming more and more important. Information, regardless of its purpose, must meet the following key criteria [2]:

– the reliability of information means that it corresponds to reality (at least until science proves otherwise), that it does not contain errors and distortions;

– completeness of information (obtaining the amount of information necessary and sufficient to achieve the goal of the analysis);

– timeliness (relevance, relevance) of information means that it is exactly what is needed at the moment, essential, important at this time, such that corresponds to modern scientific developments;

– comprehensibility means that the information must be clear, designed to be understood by its users, provided that they do not even have sufficient knowledge, but are interested in perceiving this information.

In education, information is a tool with which, in the course of training, theoretical ideas about the subject of study are formed and opportunities for developing practical skills are opened. Therefore, information, especially in education, has real value when it is clear, easy to understand. We believe that the value of educational information is "measured" by the level of ease of perception and interpretation and memorability.

Based on this, the role of information is important at all stages of its perception: when choosing and specifying the subject of study, studying the evolution of the issue, creating analogies, examples, extrapolations, etc. Depending on the choice of methods of providing information, its interpretation and perception by the student depends. This dependence of

the "presentation-perception method" is extremely intensified when using digital teaching methods, E-learning, which have significantly reduced (not to say eliminated) the possibilities of active "live" communication between the teacher and students. During distance learning, the maximum share of information comes to the student through its visualization.

Regarding the visual perception of information, psychologist Richard Gregory believed that human visual perception is based on top-down processing [3]. Top-down processing, also known as conceptual processing, occurs when we form our perceptions starting with the big picture. We make assumptions about what we see based on expectations that precede knowledge and past experience.

To the commonly used channels of information perception (mostly depending on the personal characteristics of a person), scientists include the visual channel (visually perceptive people), the auditory channel (hearing-perceptual people) and the motor channel (motor-perceptual people).

Thus, "the visual channel of perception (about 30%) is the cognitive ability to perceive new information mainly with the help of vision" [4]. To increase our chances of conveying more information to students in the online mode of education, we also have "the auditory channel of perception – this is the cognitive ability to perceive and process new information, primarily relying on hearing" [4]. Unfortunately, the motor channel of perception (kinesthetics), which occupies about 40% of the perception of information and is the most widespread among the population of the earth in the conditions of online learning, is practically unattainable for us.

At the same time, the difficulty of presenting information in the conditions of distance learning is that almost 90% of the information that comes through the eyes, that is, perceived visually, does not reach the brain. The brain uses previous experience or existing knowledge to construct reality, so the presentation of visual information in e-classes should be as vivid, vivid (or vice versa, simple), sometimes contradictory, but it still needs to be supplemented with other forms of perception.

Based on the need for a variety of information presentation to enhance its perception, we compiled a list of available tools for online visualization of educational information, which we plan to consider here (Fig. 3.10).

Yes, this is a list of simple, well-known tools that we have been using for a long time and quite quickly, so we will dwell on the individual nuances of
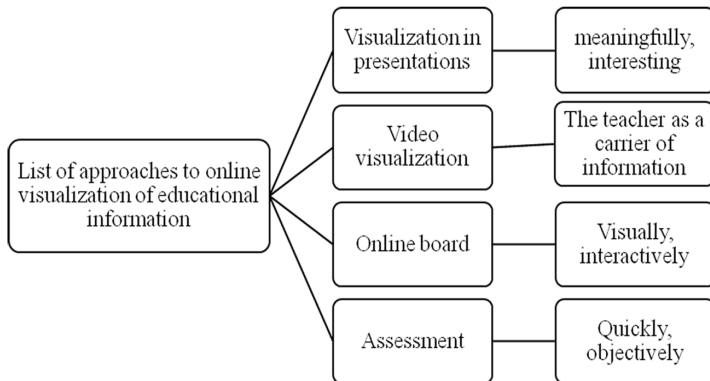
Fig. 3.10. Tools for online visualization of educational information

using these tools, but first of all, we will determine the key learning result of improving the skills of presenting visual information and, as a result, the proper perception of information by students and quality education. We also built a "map" of products that we create in the course of using these tools (Fig. 3.11).
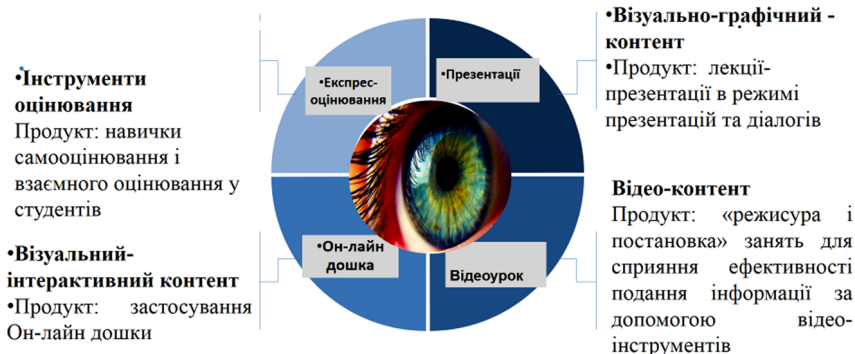
Fig. 3.11. Learning outcomes and products of online visualization tools

The most common and familiar visualization tool for us information – visualization of educational information in presentations, which is actually

the creation of visual graphic content. A presentation (from the English "рресептатиоп" – presentation, performance) is a set of pictures-slides on a certain topic, which are stored in a file in a special format.

The main features of programs that allow you to create a presentation:
– creating a sequence of slides;
– text formatting;
– inserting hyperlinks;
– insertion of control buttons;
– sorting of slides;
– creation of animation effects and 3D slide transitions;
– presentation demonstration, etc.

When creating a presentation, we must follow several important rules. First of all, the rules regarding meaningful filling of slides as primary pieces of information. We remember that the presentation is a concise presentation of the material, the maximum informativeness of the text (6–8 words, 6–8 lines), so the slides should not be overloaded with text for several reasons. First, it is difficult to perceive. Secondly, students will start reading information from the slide and will not hear you. Thirdly, large text arrays can be perceived from the outside as a "cheat sheet" for the teacher. And although it is partially true, you should not give an excuse for gossip. In those cases when there is a need for extensive comments on the slide, which are difficult to remember even for the teacher, it is advisable to use the "Notes to slides" service, they can be read to the lecturer and are invisible to students.

Related to this rule is the requirement that there is no accumulation of information, instead there should be a clear order in everything, all information should be carefully structured.

Another important rule concerns the use of words and abbreviations. These should be either already familiar abbreviations/abbreviations for students, or their explanations should be provided immediately. And we will add a few remarks purely about the design of the slides, because the presentation is a visual and graphic content, it should be well designed, but not overloaded. The general rules here will be the presence of short and concise titles, bulleted and numbered lists, and the color scheme should be the same for all slides.

Before finally choosing a design (it can be chosen from those offered in the corresponding tool), we must remember the purpose of creating a presentation and its perception. So, if we create a presentation for a public

speech, participation in a competition or another communicative event (especially when the speech lasts several minutes), a bright color scheme, illustrative pictures, the presence of multiplier effects and video inclusions can and should be the most creative, bright, that will attract attention. If the presentation is purely educational and it is expected that the students will watch it during the lecture (1 hour and 20 minutes), we should not burden the perception and overwork the eyes of the students, and ours as well. That's why we use classic, floral compounds that are the most gentle on the eyes.

Yes, the best combinations of font and background colors are:

– white on dark blue,

– black on white,

– yellow on blue.

Below we present the most common services that can be used for visualization of educational information and presentation in e-classes and their short, far from exhaustive description of their properties, but first of all, these are quite simple services and free of charge (Fig. 3.12).
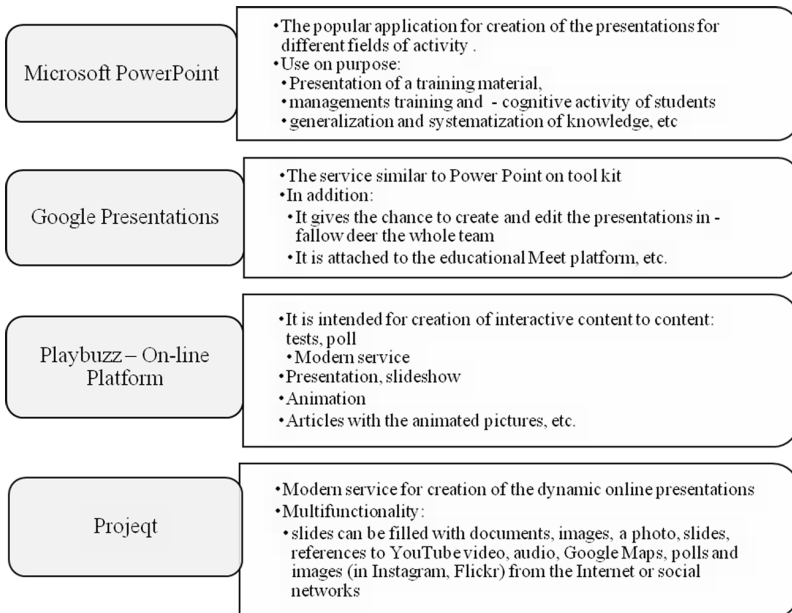

Fig. 3.12. The most common services for creating presentations

The main difficulties associated with clarifying questions about the phenomenon of attention. assimilation of the material and the process of managing this mental phenomenon are caused by the impossibility of separating it into an independent form of mental activity [5].

Therefore, summarizing the material about presentations, we note that any information, if it is presented monotonously, loses interest after 15 minutes of presentation.

Usually in the classroom, the teacher focuses attention on the slides, then on the explanation, then on the display of the material on the board, then offers the students a discussion or a mini-discussion. With online training, we are somewhat limited, but we must remember the psychological requirement of changing the presentation of information. Therefore, even with the most interesting information, it is worth periodically interrupting the demonstration of your screen, going "on the air" in person, engaging students in a conversation.

In the end, we came to the analysis of video techniques that can be used in e-education, which we consider to be an extremely important element, we consider the volumes in the context of "directing and production" of video content. First of all, let's remember what picture we see in front of our eyes during e-classes, especially when the Internet connection is weak, and in conditions of war it is always weak here. So, if during off-line classes we were met in the classroom by smiling students ready to communicate, then in the online classroom it is at best photos, so-called "avatars" of students, or black rectangles with surnames. Students see us in the same way, and this is unacceptable for the perception of information.

Therefore, we usually turn on the camera. The frame that we will present to students must be carefully thought out and correctly displayed. This is important for several reasons, but first of all, the teacher is a carrier and "retranslator" of educational information, which he must convey professionally both in terms of content and form. Our main considerations regarding the importance of video content for teachers are shown in fig. 3.13.

Let's move on to the video content. This is not only about videos, video content is also visualization of the teacher in online conferences, chats, lectures, etc. In this case, the product itself is not important, it is about the form of information presentation, and it has its own characteristics,
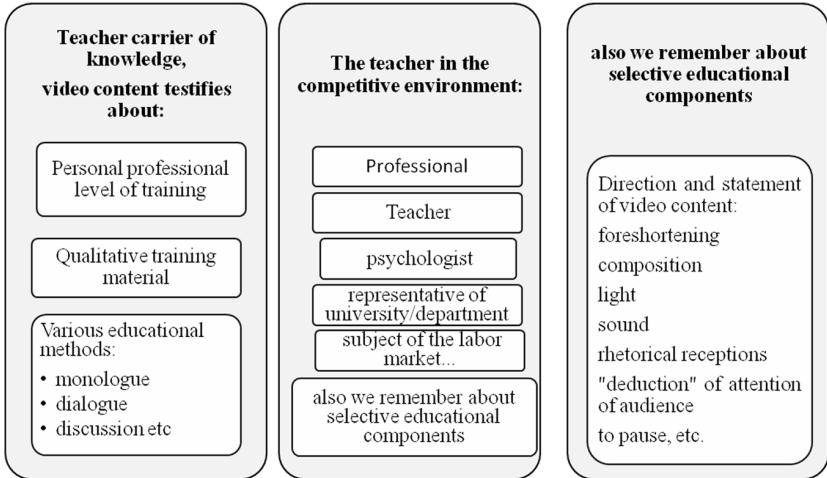
Fig. 3.13. Motivation for teachers regarding the expediency of creating high-quality video content

because not everyone is "loved" by the camera, and therefore it is important for us to take measures so as not to harm ourselves in the camera.

We are not talking about such simple things as setting the camera from a mobile device. Of course, if we broadcast with the mobile phone vertical, then in the end we will have a picture with black edges cut off, so, contrary to habit, we place it horizontally.

We will talk about the basic things that are used by directors and professional cinematographers, but do not always receive attention from teachers, professional professionals and amateurs of video shooting (presented in descending order of importance).

Light. The light must be strong and its direction is important: the light must be frontal. The main errors in the arrangement of light during video broadcasts or video shooting are shown in fig. 3.14.

A simple experiment on yourself will help here: you should take the camera and change the position until you like the picture you see. It is advisable to arrange the workplace in front of the window, and additionally take care of the lighting equipment. Round professional lamps are very helpful.

Aspect. In our case, we call the placement of the "model" relative to the camera, more precisely, keeping the eye-camera horizontal. Hanging

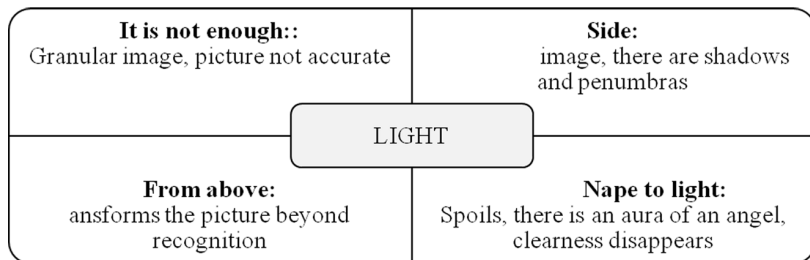| It is not enough:: Granular image, picture not accurate	Side: image, there are shadows and penumbras
	LIGHT
From above: ansforms the picture beyond recognition	Nape to light: Spoils, there is an aura of an angel, clearness disappears

Fig. 3.14. Basic mistakes in lighting

over the screen is unacceptable, which is worse than poor lighting. Nor will it add to us the image of shooting from below, when a chandelier shines above the head, and the nostrils look at the screen. For shooting, the camera must be at eye level, this does not coincide with the position of our device (for example, a laptop) during normal work on it, that is, on a table. In order to get the perfect angle, we have to raise our device on a stand about 30-40 cm high. Usually, teachers do not have a professional stand, but here books will come in handy, which are always in abundance.

Composition. By composition in our case, we mean how many of us are in the frame, or how close/far the camera should be from the model/teacher. For reference, you can use the basic settings of the phone "Grid", which divides the screen into 9 squares. It is necessary to avoid "effects" "talking head" or, on the contrary, "lost silhouette". Approximate eye level is located in the upper third of the frame, there should be some space above the head.

And a simple but obvious thing here is that the tone of the clothes should contrast with the background, like the text in the slides: light on dark, or dark on light. Here we add several services for creating video content (Fig. 3.15).

Note that ZOOM, MEET, TEAMS are completely comparable and competitive with each other, but the latter is perhaps more demanding of the level of computer software.

We should also emphasize that most modern educational platforms allow recording of broadcasts of online classes, but video recording as a product does not suit everyone, because we can make mistakes, take pauses, rush, etc. If offline it is practically not noticeable, then on the video it looks embarrassing for the author. Professional filming of video films is carried out in several takes and is not just a whim of the director, it is a path to
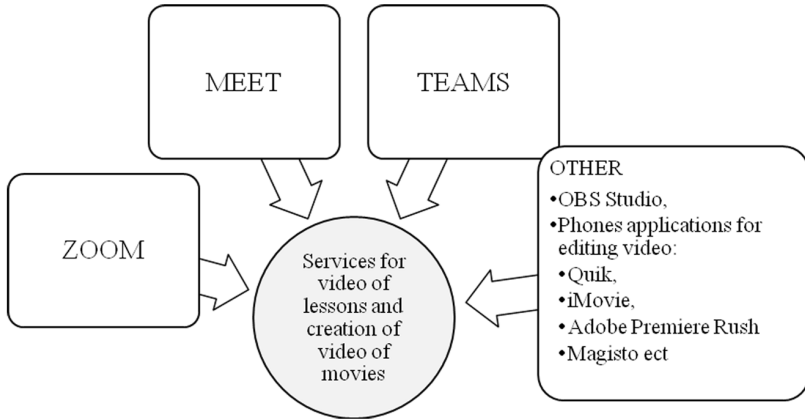
Fig. 3.15. Services for video lessons and creating video films

perfection, therefore we offer services for both online broadcasts and high-quality filming of video films. In this context, we should pay attention to the OBS Studio program, which allows you to make high-quality educational films, apply additional special effects to them, etc. Yes, the program requires certain application skills, but as a product – you will get a quality film, it is worth it. As far as video editing phone apps go, they are pretty simple to use but allow you to edit and edit videos. that's why we list them here.

There is one more very important aspect of online visualization for the organization of educational activities, with the help of which we livened up the explanation in offline mode and without which the author of this material would personally be very sad. It's about the board. Its online version is used as a tool for visual enhancement of information perception and/or creation of visual interactive content. A teacher has many opportunities to use an online blackboard: here is the change in the type of activity, which we talked about above, and the increase in the visibility of the explanation, and the involvement of the audience in the educational activity.

First of all, let's choose a tool (Fig. 3.16). These three tools are similar, the teacher should choose the most suitable one for him. Of course, if you conduct classes on the ZOOM platform, it is appropriate to create this board, but it is not necessary, especially since Miro and Twiddla provide, in our opinion, somewhat wider opportunities.
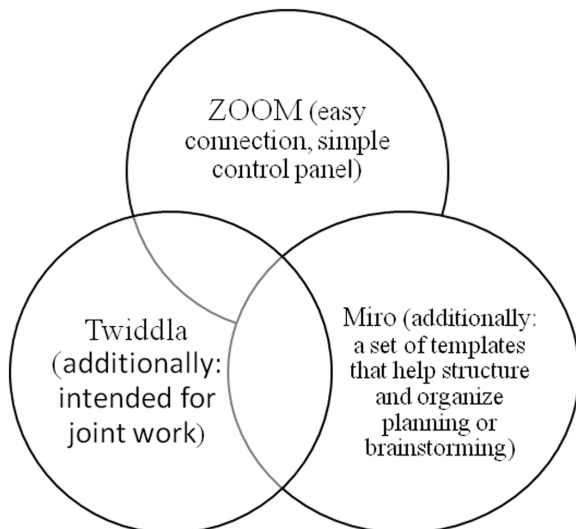
Fig. 3.16. Online boards for organizing educational activities

In any case, the teacher gets a tool where you can do what we usually did with chalk (a felt-tip pen) on the blackboard – explain some educational material using simple pictures or diagrams, write a formula, build a relationship. And there is another thing why these boards are important in the educational process – it is teamwork, which is usually supported by students very willingly. Here, to revive attention, the effect of the power and unexpectedness of a certain stimulus to attract students' attention is also important: a loud sound, a bright flash of light, and a bright formula is written, a picture prepared in advance is added, etc.

Finally, about the assessment of students' work and the practice of peer-assessment (it is about the practice of self-assessment and mutual assessment), which is important for perception and assimilation and is taken into account during university accreditation. Given that a separate section is devoted to services for formal assessment of knowledge, we will focus here on express methods of assessment and the assessment itself. That is, on an informal assessment. If there is a need for express assessment, quick voting, discussion support in conditions of limited resources, or simply to revive the activity of the audience, we recommend using the chat of the

service where the class is held. Questions that "presuppose the answers "yes"/"no" or "t+"/"-". This will give a quick and effective effect.

There are also a number of strategies for informal assessment of knowledge, such as creative mini-projects that are generated by students and presented for assessment during class when working in small groups. The strategy is valuable for "mature" learners, such as masters and PhD students, as it reveals understanding, not just rote memory, and encourages students to think when creating a project.

Regarding self-evaluation, we note that "the ability to conduct self-evaluation, reflection, evaluate others, create evaluation tools, work in a team belongs to the skills of the 21st century, since a modern person in society ... of knowledge must learn to independently evaluate his activities, draw appropriate conclusions and change, and not to wait for the reaction of other people for control and evaluation" [6].

Among the tools for quick current assessment and the assessment itself, we can cite the Quizziz mobile application. It is convenient for creating favorable conditions for activity.

As a conclusion, we note that online visualization is a powerful tool both for organizing activities and evaluating the achievements of students, and for assimilating educational information. Perception of educational information strongly depends not only on professionalism, but also on the teacher's charisma. The advantages of online training are the ease of presenting presentations and videos, the automation of official evaluation, and the ease of online ongoing testing. There are, of course, disadvantages: purely technical – problems with communication and fundamental – lack of contact between the teacher and the students. And although online education is a forced form, which we resorted to initially due to the COVID-19 pandemic, and from February 22, 2022 due to the beginning of the hot stage of the war between Russia and Ukraine, education is new resources, new tools, and ultimately, new opportunities . We hope this became a transition to a new qualitative breakthrough in national education.

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