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# PEDAGOGICAL SCIENCES

UDC 378.4: 004

*Yarovyi Anatoliy Mykhailovych,*
*Candidate of philosophical sciences, associate professor*
*Vinnytsia National Agrarian University*
*Yarovyi Andriy Anatoliyovych,*
*Doctor of science, professor, head of the computer science department,*
*Vinnytsia National Technical University*
*Belkin Igor Vladimirovich*
*candidate of pedagogical sciences, doctor of philosophy, senior lecturer*
*Vinnytsia National Agrarian University*
*Vinnytsia, Ukraine*

## VISUALIZATION AS THE LATEST PEDAGOGICAL TECHNOLOGY: CONTENT AND PROSPECTS OF DEVELOPMENT

*Abstract.*
*The article outlines the role of new technologies in the educational space, considers the possibilities of their use and their impact on the creative activity of the future specialist.*

*Keywords: Methods of active learning, visualization, pedagogical technology, epistemological tendency, multidimensionality.*

**Formulation of the problem.** In modern conditions of science development, methods of active learning become very important. Because they are the ones who use the life and professional experience of students wisely. They are based on experimentally established facts that a person's memory reflects (other things being equal) up to 90% of what he does, up to 50% of what he sees, and only 10% of what he hears. Thus, the most effective ways of learning should be based on the active involvement of most or all of the "analyzers" of students in appropriate actions.

Among the modern tools and methods of teaching, scientists distinguish intellectual, business, psychological and economic training, coaching training, business games to acquire skills and qualities, brainstorming, games for modeling non-standard, critical and conflict situations, team cohesion, etc. All these latest pedagogical technologies are used both for students in training and for staff already working. [1]

**Highlighting aspects of the problem.** The rapid penetration of information and communication technologies into human life and the overload of information flows require modern education to adopt new technologies, change teaching methods, ways of presenting educational information and introduce new learning technologies that would be effective in today's conditions. The information richness of the modern world requires special preparation and some adaptation of educational material before it is presented to students in order to provide students with basic or necessary information that will be understandable, easily accessible and easily assimilated in a visually accessible form. The expediency of using the visualization of educational information is due to the need to take into account the cognitive characteristics of the current generation of students, as well as the need for a compact presentation of educational material in the form most convenient for perception, understanding, assimilation and memorization.

**Analysis of scientific research.** The theoretical foundations of visualization of educational information are reflected in the works of O.G. Asmolov, F.CH. Bartlett, A.O. Verbytskoho, V.V. Davydov, P.M., Erdnieva, Z.I. Kalmykova and others. Features of the application of visualization in the educational process were studied by S.V. Aryutkin, G.V. Bryantsev, S.A. Gerasimova, V.V. Koibichuk, V.P. Kuzovleva, E.O. Makarova, N.M. Manko, I.L. Margolina, N.O. Neudakhina, E.V. Polyakova, A.F. Pukhov, A.G. Raputo, O.S. Rohde, S. Selemenev, S.I. Sergeev, V.V. Chetin, D.M. Shekhovtsova and others. The creation of original methods of computer visualization of educational material, the development of new methods of its application in the teaching of specific disciplines are devoted to the work of L.I. Bilousova, N.V. Zhyteneva, O.M. Mansurova, A.L. Soboleva, B.E. Starichenko, S.V. Shushkevich. Peculiarities of digital generation thinking are reflected in the works of J. Coates, G. Soldatova, O. Strykun, D.I. Feldstein and others.

**The purpose of the article**. In this article, we focused our attention on technological trends used in modern education, revealed the possibilities of their application for visual presentation of information.

**Presenting main material**. In the system of modern education (as well as in other spheres of social life) there are cardinal transformations connected with introduction of the newest information technologies of training. And if earlier these processes acquired a fragmentary character, nowadays (and especially in the last two years) we observe the comprehensive introduction of online learning technologies. Moreover, in the temporal dimension, the transition exclusively to distance learning, acquires an extreme-total nature. And the reason is obvious and understandable - global social challenges and threats associated with the emergence and spread of viral danger. Modern humanity (all countries of the world) suddenly and unexpectedly faced the problem of protecting the health of its citizens and the problem of survival of human civilization as a whole. It is in such

socially tense conditions that the task of minimizing direct social contact between people and their self-isolation is set. Such objective social conditions have made radical changes to the implementation of the educational process itself, which before these social events was largely provided by direct educational contact "teacher-student" in the classroom.At present in Ukraine (as well as in other countries of the world), depending on the real state of morbidity of people (as evidenced by statistics), we find a completely opposite trend, which shows not only the dominance but the full transition of all educational institutions (secondary system). and higher education) on the distance form of education, one of the leading forms of which is visualization as the latest pedagogical technology. [7]

In fairness, the problem of visualization is not far-fetched, but becomes very relevant, especially if we consider it in terms of radical paradigm transformations that cover not only the education system, but extend to the whole system of modern science, philosophy and social practice. .

At the moment, there is a sufficient number of educational technologies that facilitate the perception and assimilation of educational material, allow experimentation, promote the development of critical thinking, the ability to solve problems. However, in educational environments that inspire innovation through science, technology, mathematics, revealing the potential of the child, promote the development of his imagination, creativity, ability to analyze the situation, apply theoretical knowledge to solve real world problems, today there is a shortage. The most promising way in this direction is the use in the learning process of such an educational techno-trend as **robotics**, which allows children to get acquainted with science in a playful way. Robotics is an effective method for studying important areas of science, technology, design and is part of a new international paradigm: STEM education (Science, Technology, Engineering, Mathematics). The use of such pedagogical technology encourages children to fantasize about what the future robot will look like, what it will do, how it will react to different processes. Such fantasies are the first steps to the development of students' imagination, to forecasting, designing and analyzing events, encourage students to technical creativity, contribute to the skills of design, modeling and programming. The use of robotics allows you to visualize complex processes, for example, when learning programming languages, children often do not understand the program codes and can not imagine what happens in the process of downloading written programs. For them, program code is just a set of letters and numbers, and what lies behind them is just a mystery. But, using robotics, when a student designs his own robot and writes a program for it, he sees step by step what is happening and is able to observe at what stage the mistake was made. Such manipulations immediately visually show the effect of program codes and allow them to very effectively promote their memorization, understanding and motivate for further study of the discipline and self-education.

On the basis of cardinal reassessments of the phenomenon of rationality the transformation towards irrational (irrational) structures is carried out. Such (alternative to the rational) form of the irrational is the figurative component of thinking. The paradigm of figurative architectures of thinking is gaining special importance and is becoming more and more relevant. Evidence of this is that the problem of the figurative in some specific sciences has long arisen and is studied not only on a theoretical but also on a practical level. And in the field of practical implementations significant results have been achieved in the use of the latest information technologies.

Summing up, we come to this conclusion. At the present stage of development of science and social practice, cardinal paradigm transformations are carried out, which, on the basis of reassessments of the phenomenon of rationality, actualize and give dominance to irrational structures (figurative component of thinking). This is what will determine the content of the latest pedagogical technologies and pedagogical science in general in the near future. .

The essence of visualization as the latest pedagogical technology in the sensory-image representation of educational information, carried out using modern information technology (artificial intelligence). Of course, this or that training material can be provided in sensory forms and without the use of computer systems (so to speak, manually). In this case, we also use visualization technology, because its content is still a sensory-image provision of educational content. Hence the dual understanding of the visualization itself, firstly, without the use of information technology, and secondly, in its direct use (so to speak, in automated mode). And in order to avoid epistemological confusion, it is advisable to use such a pedagogical approach as visualization in a broad sense, emphasizing that this is a simple and exclusively sensory-image provision of relevant educational information, without paying attention to what way (by what means) it is provided. And the second, visualization, in the narrow sense, where a special condition (and this is emphasized) indicates that the provided sensory-image representation of educational information is provided by means of artificial intelligence. In further scientific analysis, we will proceed from the understanding of the second (narrow) understanding of visualization as the latest pedagogical technology. [5]

However, these are external (substantive prerequisites), which are also (important) and which need to be pointed out. In the future, we will focus on more significant substantive points that would, ultimately, reveal the inner nature of visualization as a modern pedagogical technology.Therefore, analyzing the visualization, the emphasis is on (and we have previously stated) that this is a pedagogical technology that is based (and this is its main essence) on the factor of automated sensory-image provision of educational information. The question arises: what, in fact, is the very essence of sensory representation (image) of educational information and what is its mechanism, what is its fundamental difference from other (and what exactly) forms of educational information? In answering these questions, it is

necessary to proceed to the analysis of more voluminous philosophical problems that are already outside the scope of pedagogical science. It is a question of necessity of the philosophical analysis of the general problems concerning features of human knowledge and epistemological means of its maintenance.The main thing to point out here is that the inner spiritual world of man (its information base) is formed and functions as a result of the epistemological phenomenon-virtualization, as a process of inner creation of man's own spiritual (subjective) world.Virtualization, in turn, is differentiated into two components - symbolization and visualization. This classification is not contrived, but stems from the basic knowledge of the complex of sciences of the human psyche (psychology) and the sciences of the human brain (the functioning of its left and right hemispheres). It is the left hemisphere of the human brain that generates and provides the perception and processing of information in the form of symbolic structures (letter, word, number). And this, in fact, is the process of symbolization. Whereas the right hemisphere functions and is responsible for figurative forms of information representation (visualization). These two epistemological processes, which are ensured by the functioning of the hemispheres of the brain (and they interact and complement each other) are closely interrelated.

It should be noted that these two epistemological tendencies (symbolization and visualization) are realized both in the process of cognition as a whole and in the process of learning, as one of its varieties. Symbolization is represented and functions through certain rational structures of thinking (concepts, judgments, inferences). And since rational structures of thought are closely connected with the structures of language, symbolization acquires its formalized expression through linguistic (symbolic) forms, which are its basic components. In contrast to symbolization, the basic components of visualization, its, so to speak, primary elements are sensory images. That is why the process of visualization acquires the character of generating a corresponding series (space) of figurative structures (figurative picture of the world).

It is also important to note that these two epistemological tendencies (symbolization and visualization) are not identical, but have fundamental differences that relate not only to differences in the primary basic elements (concept - image), but also, in general, general forms of representation (conceptual system - figurative picture of the world). There are deeper substantive differences. And if symbolization (rational structures) as an epistemological tendency in modern epistemology (epistemology) is sufficiently studied, then much remains to be explored regarding visualization. And all this at the level of the problem of the general theory of cognition (epistemology), and what to speak of questions of more partial character, consideration of a ratio of symbolization and visualization in pedagogical science. Actually, in the system of modern pedagogy (by and large) this is not the problem. Modern pedagogy is completely monopolized by a rational pedagogical paradigm. The latest figurative pedagogical technologies

are not fully perceived, and some of them (the same eidetics) are considered as a certain pedagogical "nonsense".Therefore, visualization as a modern pedagogical technology is considered in a certain limited form, while as a certain insignificant addition (supplement) to modern rational pedagogical technologies, ie in secondary roles.

In modern pedagogical classifications of educational forms, visualization is presented and associated with visual forms of learning, which in the pedagogical process is also given a certain role, but not primary, but secondary. The main role, of course, is given to the component of rational (symbolic). The most symbolic (rational) is dominant and determining. And the cognitive purpose of the pedagogical process is precisely the rational and is limited, and it is in the rational that the whole pedagogical meaning and motive is seen. And visual forms of learning (visualization) are needed as a certain pedagogical application, as a certain pedagogical form of confirmation and proof that the rational corresponds to and ensures the achievement of a true educational result. A typical example of such an approach to assessment in the pedagogical process of visualization is its modern form and specific pedagogical form (which is now actively used in the pedagogical process) as a presentation. The main thing that the main intellectual efforts of the teacher (whether in lectures or practical classes) is to build a rational pedagogical structure in terms of a particular discipline (or its separate topic) according to the curriculum. And as soon as such a rational construction is generated by the teacher, the next step is to bring under the theoretical provisions of such a rational structure of the relevant visual educational material, which acquires the character of visualization technology in the form of presentation material.Our opponent may ask, and what, in fact, is wrong here and what in this pedagogical scheme may cause some doubts? Such pedagogical techniques are a common thing of every teacher. And all this is generally accepted as the norm in the organization of the pedagogical process. [9]

Yes, indeed, our opponent is right, such a pedagogical scheme is classic. Rational structure is crucial, and visualization (presentation) is secondary (complementary). So, what else is required? What's wrong here?

However, the author (questioning the sufficient effectiveness of this pedagogical scheme) asks: "Can the presentation itself (visualization) without prior presentation of a rational educational algorithm (symbolization) provide more effective ways of learning material by students"?

Moreover, the assessment and place in the pedagogical process, which is given to the visualization of traditional approaches to pedagogical science is very similar in general in the system of philosophical science (section epistemology) situation to determine (in a broader context) the relationship between figurative and rational components of thinking. And this is complicated by the fact that the "figurative" in epistemological terms is not clearly defined, and therefore (and this is often observed) is its substantive confusion and even

substitution and identification with the symbolic (rational) [2].

That's when we came out again, but in general philosophical terms to pose the problem, which (in part) we tracked and formulated in the system of pedagogical science in terms of analysis of visualization as a pedagogical technology (exploring its modern form - presentation). Indeed, if considered in general philosophical terms, it is possible not to translate figurative forms into symbolic structures, but on the contrary, the transformation of the symbolic into figurative types of cognition will provide more effective ways of cognition.

Accordingly, in a partial case, in pedagogical science not bringing (adaptation) of visualization (in the form of presentation as its kind) to the corresponding symbolic structures (symbolization) but, on the contrary, bringing in accordance with the forms of visualization (presentation) and derivation of certain rational structures , which will give more effective pedagogical results. Of course, such a statement of the question destroys traditional approaches, formed pedagogical stereotypes and creates a certain pedagogical discomfort. After all, it is easiest to follow the established pedagogical path, the trampled pedagogical path. But, ultimately, it's not about what's comfortable and what's not. The criterion for evaluating pedagogical activity is its level of efficiency.

Continuing the analysis of these problems, we point to one important circumstance that radically depicts the nature of the relationship between symbolic and figurative, namely the ability of "figurative" independently (even in partial insufficiency or lack of "symbolic" in general) to achieve cognitive results. What, exactly, turns out and about what (the above testifies)? And this unequivocally testifies to the self-sufficiency of the "figurative" and its ability to function independently (and even in the absence) of the "symbolic" (rational), pointing to its powerful heuristic capabilities, which far exceed the intellectual capabilities of the "symbolic" (rational).

We support the position of VP Hrytsenko, that in itself the sensory image (visualization) of the studied object without the component of "rational" is sufficient to represent it, even in the absence (or lack) of logical ( rational) validity, to make a transition (as the author claims) from "one link of deduction to another in the presence of logical omissions" and so on. [3]. In other words (and we are sure of it) it is legitimate to claim that the figurative type of cognition (visualization) is more information-intensive and more heuristically powerful than rational (symbolization). And this level is achieved "figuratively" due to its unique ability to represent the object in all its multidimensionality (invariance).

The given general philosophical analysis of the ratio of "rational" and "figurative" provides a certain methodological basis for solving more partial problems of modern pedagogical science, namely when considering the features of visualization as the latest pedagogical technology. This means that all of the above about the figurative type of cognition (features and priorities)

applies equally to visualization, with the only difference that in the first case we are talking about the abilities of the natural human brain, while in the second, characterized by abilities artificial intelligence.

And the main thing that is achieved by visualization is a change in the understanding of the essence and priorities of the most intellectual human activity and its strategic criteria. Accordingly, this applies to the functioning of the most artificial intellectual information systems. And the main of these priorities - access to the level of multidimensionality, modeling of artificial intelligence system on the principle of "sooner or later", and, accordingly, access to the ability to the basic intellectual operation - forecasting and prediction. Actually, such abilities should be shown by visualization in the system of pedagogical sciences functioning as the newest pedagogical technology. How this can be achieved in the real practice of pedagogical activity, considering (as an example) the presentation as a kind of pedagogical technology of visualization. Earlier, we have already solved the problem and shifted the emphasis, translating it into the plane of the fact that the presentation (selection and presentation of presentation material) must precede the development of a logical structure (algorithm). On the contrary, the logical construction is developed as a result, as a result, one of those infinite "one-dimensions", while the provided sensory-image material about the studied object (all presentation material) in its entirety depicts this object in all its infinite multidimensionality.Therefore, the student has the opportunity to track and separate one link "one-dimensional", which is represented in the existing (already existing) at the time logical constructions. At the same time, to carry out a more constructive intellectual operation, namely, choosing from the "multidimensional" other parts of the "one-dimensional", which at that time were not yet provided with logical structures, assessing all this in terms of socially appropriate. This creative approach provides the student with more constructive pedagogical results. Actually, there is something that the author Gritsenko V.P. pointed out, characterizing the ability of the "figurative" to make "… methodological transitions from one link of deduction to another…" and indeed, even, "in the presence of logical gaps", ie, in the absence of such logical structures [3] actually others (previously unknown and not developed at that time) logical structures the student will be able to model and predict in general, correlating all this with the needs of social practice.

It is clear that by providing the appropriate sensory image material (presentation material) in the aspect of the researched problem the student is not able (and this is not required of him) to present it in full. This, in fact, is determined by the level of research of the educational problem or object. If possible, the student can work independently, or supplement with other, already existing latest educational material. The question arises, and how much in general it is necessary to provide presentation material (sensory image data) that further will allow to allocate at least approximately that multidimensionality on the basis of which to carry out development of new logical structures. In each case, the learning pro-

cess will develop its own specific pedagogical situation. However, the main thing (and this should be emphasized) that needs to be done is to build the provided presentation material (sensory data about the object) in the sequence required by the "logic" of the object (tracking its main stages of emergence, formation and development). And, accordingly, the very objective logic of the studied object (educational problem) will give this invariance (multidimensionality) of its study and will determine those logical structures that already exist and that need new development. And here the determining criterion is the component of socially appropriate. And, thus, in the process of learning, thanks to visualization (presentation as its kind) a higher level of intelligence is achieved - the ability and ability of the learner to model and predict.

And here we would like to focus on another extremely important issue, regarding the ability of the learner to implement (as we claim) a higher intellectual function - modeling and forecasting. In fact, it is such an objective basis that allows it to be implemented and provided. After all, such intellectual abilities do not arise out of nowhere. There must be certain objective factors on the basis of which such an intelligent function works. Such objective factors are provided by visualization, according to the results of which the student from the very beginning of the learning process deals not with certain logical (rational) structures and assimilates them (this is a traditional teaching method), but, on the contrary, and helps the teacher) develops and masters the relevant empirical material (sensory data) in relation to the studied educational problem. At the same time, he tries to assimilate the empirical material to the greatest extent, which, in the end, will allow him to reflect this (as we said) the most "objective" logic of the subject (educational problem) by building these sensory data into a certain series. It is due to the achievement of such a level and supplementing it with a social criterion for evaluating the subject itself (the problem under study) and will be presented in all its invariance (multidimensionality).In fact, such multidimensionality is formed and provided not arbitrarily, but is a reflection of the infinite multifacetedness of the direct sensory-image content of the object itself (educational problem). Therefore, the essential expression of the functions of modeling and forecasting (as higher intellectual functions) is the alternate analysis (and the sampling is carried out according to the criterion of social) of one aspect of the provided sensory-subjective content and its deployment in the appropriate logical structure (ie rational processing). And as we pointed out earlier, the learner can track even which of the links of that objective multidimensionality is currently provided with properly developed logical structures (and how), and which links of that invariance need a new rationale, especially according to the needs of modern practice. That is, without even providing a new rationale, but simply stating the need to develop a new logical structure (pointing to the objective needs of practice), this is also an extremely important factor in the learning process.

Of course, these intellectual operations are carried out to a greater extent at the level of purely scientific research, where the deployment of new logical structures, the results of research on new parts of the invariance of sensory content is provided, ultimately, the development of new scientific concepts (theories). But also in the process of learning with the use of such methods more effective pedagogical results are achieved. And all this through the active introduction of visualization as the latest pedagogical technology.

Thus, summarizing all the above, we state the powerful creative possibilities provided by visualization (in the sense as we presented it) with its active use in the pedagogical process. We followed this on the example of one of the types of visualization as a presentation. Similar pedagogical results can be obtained by using other pedagogical forms.

Summing up the general results of this scientific article, we point out that the system of higher education in Ukraine, setting as the main task the training of highly qualified specialists, considers among the main competencies that the applicant for higher education must acquire for the entire period of study, it is the ability to creative, critical analysis and solving professional problems. Therefore, the introduction of the latest visualization technology in the educational process allows to achieve and ensure such pedagogical results.

**Conclusions.** Today, children come to higher education institutions, whose psychological features have been formed in the new information environment, created as a result of the widespread use of mobile technologies and the Internet, which have become available to almost every child. Without these changes, it is impossible to organize effective student learning. "Clip" thinking of the modern digital generation, focused on the fragmentary perception of visual information, on the one hand, and on the other - new educational techno-trends and increased opportunities for information and communication technologies encourage teachers to use visualization in subject teaching.

**Prospects for further research**. The study does not cover the full depth of the problem of using visualization technologies and, in our opinion, a promising area of further research is to prepare future teachers for the effective use of new visualization technologies in their own teaching activities.

**Literature**

1. Belkin I.V. Coaching - an innovative method of teaching. Modern information technologies and innovative teaching methods in training: methodology, theory, experience, problems // Coll. Science. Pr .. - Issue 47 / editor. - Kyiv-Vinnytsia: LLC firm "Planer", 2016. P. 119-123.

2. Vlasov A.I. Hardware implementation of neurocomputing control systems. Instruments and control systems. 1999. № 2. p. 62.

3. Gates B. Business with the speed of thought: Exmopress. Moscow, 2001.

4. . V.P. Kozhemyako, A.M. Yarovy, A.A. Yarovy, "Visualization as a unique information and intellectual technology: the need for a new methodology and a new logical basis", Optoelectronic information and energy technologies, Volume 28, № 2, p. 5–16, Feb. 2015

5.  Lukyanets V., Sobol O. Rationality - "custom-despot"? Sententiae. 2004. Special issue № 1. p. 18.

6.  Luger JF Artificial intelligence: strategies and methods for solving complex problems. M. Williams Publishing House. 2005. p. 778.

7.  Yarovy A.M. On the epistemological nature of the figurative type of cognition. Multiverse: Philosophical Almanac. 2006. № 56.

8.  Yarovy A.M. Modern information and image technologies. Philosophical thought. 2007. № 4. p.145.

9.  Visualization in the context of implementation of innovative pedagogical technologies / A.M. Spring, A.A. Spring, A.D. Slobodyanik. - Abstracts of the International scientific-practical conference "Innovative technologies in the process of training". - Vinnytsia, VNTU, 2021. - [Electronic resource. https://conferences.vntu.edu.ua/index.php/itpf/2021/paper/view/12903/10840

*Ivanova L.A.,*
*PhD, Professor of Department of Pediatrics and Children Infectious Diseases of Bukovinian State Medical University, Teatralna Sq., 2, Chernivtsi, Ukraine, 58002*
*Horbatiuk I. B.,*
*PhD, Assistant of Department of Pediatrics and Children Infectious Diseases of Bukovinian State Medical University, Teatralna Sq., 2, Chernivtsi, Ukraine, 58002*
*Horbatiuk Ir.B.*
*PhD, Assistant of Department of Internal Medicine, Clinical Pharmacology and Occupational Diseases of Bukovinian State Medical University, Teatralna Sq., 2, Chernivtsi, Ukraine, 58002*
DOI: 10.24412/2520-6990-2021-996-47-49

## EVALUATION OF THE DISTANCE LEARNING RESULTS FOR THE DISCIPLINE "CHILDREN'S INFECTIOUS DISEASES" BY THE 6TH YEAR STUDENTS OF THE BUKOVINIAN STATE MEDICAL UNIVERSITY DURING THE COVID-19 PANDEMIC

*Abstract.*
*The research was conducted with using the author's questionnaire "Student Survey on Online Learning", developed on the basis of the Google form and aimed at improving the educational process. This form of education was accompanied with an ambiguous attitude of all participants in the learning process, as it depended on the conditions and features of learning.*

*Keywords: distance learning, students .*

In 2020, due to the spread of Covid-19 coronavirus infection all around the world and the announcement by the World Health Organization of a coronavirus pandemic, universities in all countries were forced to go to an online learning format. The forced transition to distance learning, associated with the pandemic, has led to changes in the system of organization of the learning process. There is a need for rapid reformatting from contact/traditional form of distance learning to ensure the continuity of the educational process in partial or complete isolation.

Distance learning is an independent form of learning [1], where the interaction between a teacher and students is carried out at a distance, ie online, which reflects all the components inherent in the educational process (goals, content, methods, organizational forms, teaching aids) and implemented by specific means the Internet technologies or other means that provide interactivity [2]. Distance learning can be carried out in synchronous and asynchronous modes. Synchronous format means real-time collaboration. Its advantage is that it is possible to involve participants instantly and at a certain time. Asynchronous learning allows students to work at their own pace and at a convenient time.

In the first decade of the XXI century there was a significant shift of educational systems towards online education [3]. Over the last 30 years, distance education is gaining momentum and maintains its position in the field of education. As a type of formal learning, distance learning is an important aspect in different educational institutions through the use of different technological applications that connect students with their teachers [4-5]. Currently, computer technology allow you to implement meaningful learning processes at any distance within the structure of the student-teacher system [6].

Distance learning has many positive qualities. First of all, students are given the opportunity to study at home [7]. Moreover, there are many educational tasks that allow students to adapt their curriculum without following a structured schedule. Thus, distance learning programs provide students with flexibility in choosing a course of study, without wasting time, as students can participate in the learning process from home [8]. In addition, for those who want to improve their professional and academic skills without leaving their jobs, distance education is often the only one alternative [9]. Of course, there are disadvantages of this method of training, but in the situation that occured in 2020 - the period of the COVID-19 pandemic, it proved to be the most effective [10].

In this regard, we assume that the results of the study will identify the positive aspects and existing problems of distance learning and will have practical importance for its further improvement.