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DIGITAL PEDAGOGY

Textbook



**MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF
KAZAKHSTAN
M.Kh. DULATY TARAZ REGIONAL UNIVERSITY**

**K.D.Buzaubakova, A.S.Amirova,
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The textbook «Digital Pedagogy» is intended for future teachers studying in all pedagogical specialties, including future teachers studying under the educational program 6B01301 – «Pedagogy and methods of primary education» for an elective course.

The textbook «Digital Pedagogy» was prepared within the framework of the grant project AR09259497 «Improving the system of pedagogical education in Kazakhstan in new conditions: technological and methodological aspects of the formation of digital competencies of future teachers in the conditions of distance learning in the Republic of Kazakhstan» and funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan.

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INTRODUCTION

Since the XXI century is the information age, digital technologies are one of the pedagogical technologies that radically change the learning process in universities. Digital technologies require the development of new approaches to the innovative education of future teachers. This will be associated with an increase in the access of educational organizations of the country to electronic resources and will serve as a basis for the development of digital skills of future specialists in obtaining digital education in the active, differentiated development of educational materials from educational funds using electronic resources.

The main goal of digitalization of education is to improve the quality of education, to train competitive future specialists within the framework of various international-level research programs, including in the field of creating «artificial intelligence» and «big data».

The use of electronic resources for the formation of personality, intellectual culture, technological competencies of a future specialist in the conditions of Digital Kazakhstan informatics is important for his survival in the information society, the training of a professional specialist who will correctly navigate the flow of information and find effective solutions.

In solving such important tasks, there is a need to teach the subject of «Digital Pedagogy» in pedagogical universities.

The purpose of the discipline «Digital Pedagogy» is the independent development of new knowledge by future specialists at the request of the information society, conducting research of an innovative orientation, the implementation of scientific projects, the full use of Internet access in obtaining new knowledge: video recordings, digital educational content (lecture materials, electronic textbooks), an universal educational library of prepared educational funds etc.

The discipline «Digital Pedagogy» sets before the teacher the task of targeting the student to a specific and effective goal-ensuring the quality of education. This is, of course, due to the teacher's ability to use digital literacy in the use of information, communication and digital technologies, identifying information transmitted from educational funds in order to improve education.

The partnership between the teacher and the student, providing for the development of advanced forms of digital educational learning technologies, is aimed at using new forms of digital content of educational material: video lectures, Internet libraries, information resources, etc.

Digital technologies allow students to integrate into the global educational space. When discussing topical issues related to the improvement of education using digital technologies, you can exchange opinions at targeted webinars, online seminars, online forums, consider effective ways to solve them and introduce them into world practice. Digital technologies allow future specialists to get acquainted with scientific achievements and innovative practices of the international level.

Chapter 1 «The digital transformation of education in the XXI century» of the textbook «Digital Pedagogy» reveals the essence of the educational environment,

trends, patterns, principles, methods and technologies for the development of digital education. A new characteristic of trends, patterns and didactic principles of the development of the digital educational process is given, didactic patterns, digital transformation of the principles of vocational education, the creation of a digital educational process are studied, in the conditions of digitalization of society, the principles of organizing the educational process, increasing the student's academic independence, digitalization of the basic process and didactic principles in digital education are considered more deeply. The origin of cyberpedagogy is given, its basic concepts. The didactic digest of technologies and methods of cyber pedagogy is analyzed.

The 2nd chapter «Development and prospects of digital pedagogy» of the textbook «Digital Pedagogy» reveals the content of the development and formation of personality in the context of digital pedagogy, defining the role of teachers and students in the digital environment, as well as the essence of the characteristics of the digital generation.

The role of a smart teacher in a digital society and the digital educational process is considered from a modern point of view. Priority is given to the role of the smart educator in society, conditioned by the demands of society, the competencies of the smart educator of the digital society are revealed.

Chapter 3 «Digital learning technologies: digital educational platforms and tools» of the textbook «Digital Pedagogy» reveals the requirements for digital learning tools, features of digital learning tools, reveals the didactic capabilities of digital educational platforms: Skype, Zoom, Microsoft Teams, Google Meet, Google Classroom, Nearpod, Learning Apps, Quizizz, Kahoot, «Kundelik», BilimLand, Online Mektep, etc.

Digital educational platforms are considered as the main component of the e-learning system. The characteristics of existing digital educational platforms in the world practice are given: edmodo, Socrates, project, thinglink, TED-Bas, cK-12, ClassDojo, educlipper, etc. The WizIQ virtual laboratory and its capabilities are determined.

Also, the textbook «Digital Pedagogy» reveals the structure, types, main functions of an electronic portfolio and the necessary documents for completing an electronic portfolio; as the principles of the features of distance learning, technologies and methods of distance learning in the higher education system, the characteristics of information and communication technologies, distance learning technologies, educational technologies, case technologies, telecommunication technologies, network technologies are given. Distance learning is one of the forms of organization of the educational process.

Mobile learning (M-learning), new approaches to access to educational content via mobile devices are analyzed. Examples of mobile learning in corporate education, the structure of mobile learning, the quality of service at the level of cellular network infrastructure are considered, mainly the resources and capabilities of the network.

The advantages and disadvantages of mobile technologies are revealed, the possibilities of mobile technologies are differentiated.

The advantages and disadvantages of STEAM education, its goals, significance, development paths, and 4C skills are revealed.

Also in the textbook «Digital Pedagogy» there are questions-tasks, test tasks, a glossary for checking and evaluating students' knowledge.

The purpose of the textbook is to form digital competencies of future teachers.

The textbook «Digital Pedagogy» is intended for students of all specialties of a pedagogical university, including future teachers studying under the educational program 6B01301 – «Pedagogy and methods of primary education».

1. DIGITAL TRANSFORMATION OF EDUCATION IN THE XXI CENTURY

1.1 Factors of formation and development of the digital educational process

The digital educational process is carried out in the information environment during the production of information. The XXI century, as an information age, is characterized by the need for a digital educational environment. This process, which is being implemented in world practice, is being considered in connection with the adoption of the state program «Digital Kazakhstan» in the country for entering the information society, forming its own direction in the education system of Kazakhstan.

The State program «Digital Kazakhstan» states: in the field of higher and postgraduate education, standard curricula and programs will be updated taking into account the introduction of the discipline «Information and communication technologies» in all specialties in accordance with the requirements of professional standards and the labor market».

The main goal of this program is the creation of an innovation ecosystem—the mass dissemination of innovative activities in the Republic of Kazakhstan. As you know, this is a guiding document in the formation of the digital educational process in the country.

Factors influencing the formation of the digital educational process in the field of vocational education and training:

- 1) new requirements for professional personnel in the digital economy;
- 2) new digital technologies that form the digital environment and develop in this environment;
- 3) a new generation of students with special socio-psychological characteristics – the digital generation (Figure 1).

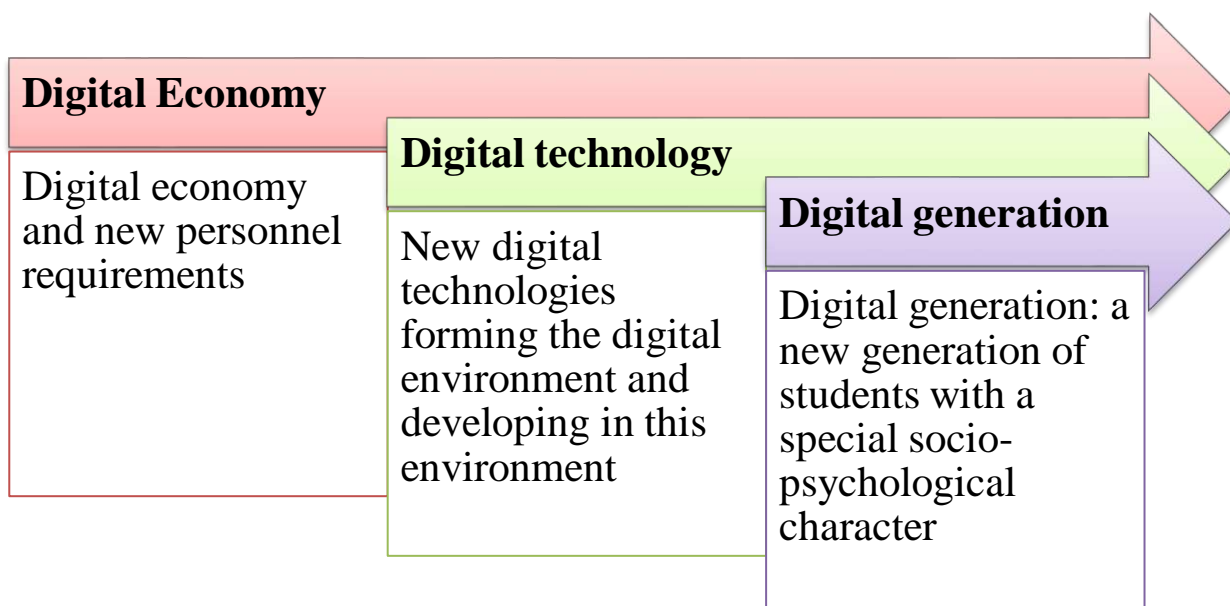


Figure –1. Factors influencing the formation of digital

The features of the digital generation (perception, attention, thinking, motivation, behavior patterns, lifestyle, worldview) determine the psychological and pedagogical aspects of goal-setting, principles, approaches to the formation of content, form, methods of digital didactics.

The digital generation as an «advanced» personality is a new type of students with a high ability to self-education, focused on obtaining and developing knowledge, forming their own direction of knowledge where possible, combining in some cases training, work and personal development.

In general, the digital generation should be a person capable of making important and significant changes that will form the basis for the formation of a new digital educational process.

Digital technologies («advanced», «clever», «SMART») form the core of the modern stage of technological development and play a leading role in the future. At the present stage, there is an active transition to a digital system – an in-depth interface of digital technologies with material and socio-humanitarian technologies and practices, including educational technologies, i.e. convergence.

Most representatives of the digital generation should focus mainly on modern digital technologies from the point of view of cognitive development and social development (Fig.2).

Among the important digital technologies in education are: telecommunication technologies, including technologies that ensure the connection of communication networks and create a new generation of networks; technologies for processing large amounts of data (Big Data); artificial intelligence; distributed registry technologies (including blockchain); electronic identification and authentication technologies; Internet of things; and also virtual and augmented reality, digital analogy technology, etc.

A wide range of digital production technologies is used to create and design an effective educational and production process of vocational education and training, including industrial Internet, additive technologies, automated production technologies.

Digital technologies provide new opportunities for building the educational process and solving a wide range of educational tasks, as well as new tasks that have not been solved «forever» by traditional means of education.

Digitalization of the economic sphere significantly changes educational orders, focusing on the need to master new complex digital competencies regardless of the profession or specialty being acquired. In addition to IT competencies that ensure the readiness of the individual to use computer and digital technologies and form the core of modern professional information literacy of any specialist, educational results include a wide range of other competencies (professional and universal) that change significantly under the influence of digitalization of new content.

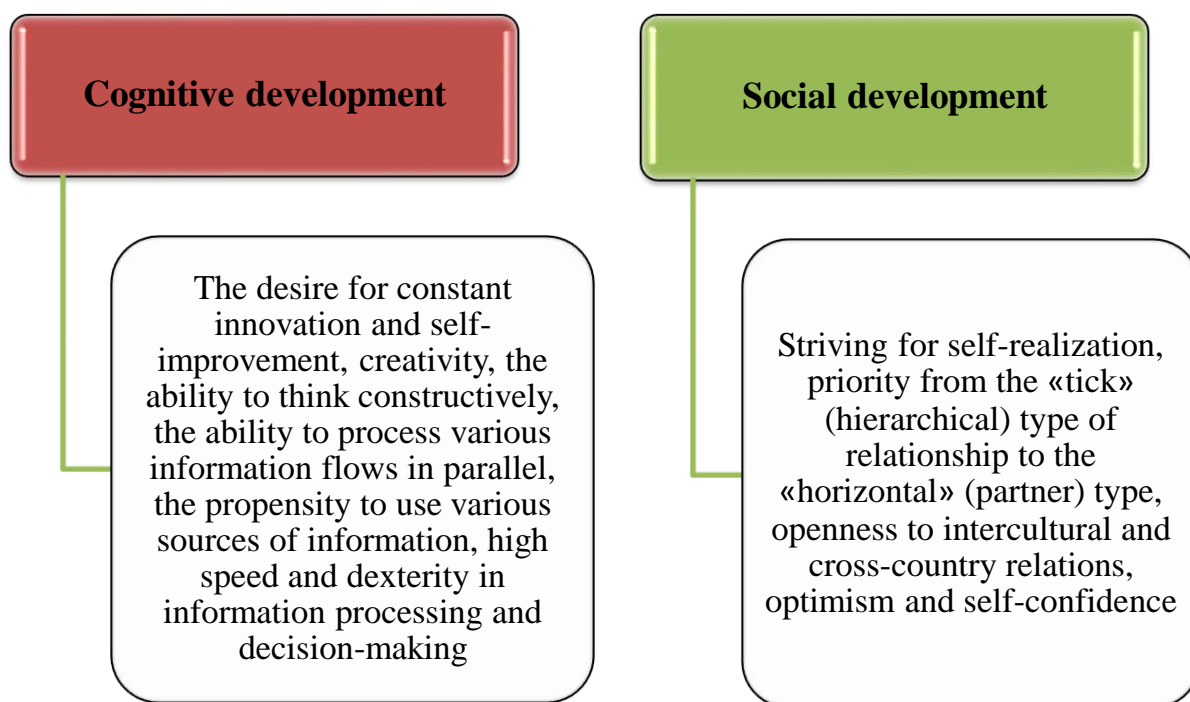


Figure – 2. Directions of development of the digital generation representatives

Digital technologies acquire an important quality in education: freedom; hypertext; multimedia (polymodality); subculturality; interactivity; independence (Fig.3).

The process of «narrowing of time and space» caused by the spread of digital telecommunications, globalization, the emergence of new models of labor organization (coworking, library), remote knowledge improvement organizations, distributed project teams, etc.), increasing the independence and responsibility of future specialists, willingness to work in conditions of uncertainty, constant self-development requires.

Types of digital technologies:

1) the use of **artificial intelligence** will become the basis of an adapted learning system and self-forming electronic consultants, automatically adapted to services, individual learning strategies and other features of the student, providing the design of individual educational routes and the organization of training according to an individual curriculum;

2) **virtual reality technologies** allow you to design digital and on-screen models of objects (visual, including spatial), providing the formation of competencies, skills and opportunities to create a motivational game and a real environment at the stages of mastering, securing and controlling educational materials, conducting research and conducting virtual experiments;

3) **chat-bot technology** is widely used for operational feedback with students in the learning process;

4) the use of **digital analogy, digital footprint and Big Data** will create a system of personal control of the dynamics of development and success of the student in education;

5) **augmented reality technology** ensures the implementation of complex principles of digital didactics (practical orientation, interactivity) in the process of forming professional skills and abilities in the conditions of a real production process (during production practice);

6) **the technology of electronic identification and authentication** (face recognition, voice recognition) is used to check the student during the remote examination in the conditions of distance learning;

7) **blockchain technology** is necessary to create a unified information educational environment in educational networks that ensures the effective implementation of network educational programs and projects;

8) **digital technologies for specialized educational purposes - edtech (educational technologies)** - as a rule, uses one or more of the above digital technologies.

The researcher A.Yu. Uvarov reveals the factors of development of the digital educational process in the macro-characteristics and macro-model of the process of informatization of education. The author divides the driving force of the spread of digital technologies in education into two parts: external factors characterized by an external impact on the education system, and internal factors directly related to education itself.

External and internal factors of informatization of education:

1) external factors reflecting the conditions of the functioning of the education system and its requirements;

2) internal factors determining the readiness and ability of the education system to accept the achievements of technological progress and apply them to solving their own problems.

External factors have a direct impact on the process of informatization of the education system and depend on the processes that develop outside the education system. Teachers cannot exercise direct control over them. These factors will depend on the achieved level of development of the information industry, the spread of the use of digital technologies in all spheres of society.

Freedom	<ul style="list-style-type: none"> • Freedom to search for information in the global information network
Hypertext	<ul style="list-style-type: none"> • Freedom of movement through the text, the modality of the text and the non-necessity of reading it as a whole, the reference nature of information, reduction-increase of information, the use of cross-references
Multimedia (polymodality)	<ul style="list-style-type: none"> • The ability to comprehensively involve various channels of perception (auditory, visual, motor) in the educational process
Subculture	<ul style="list-style-type: none"> • Compliance with the world traditions familiar to the digital generation, popularity, thereby the student's entry into the digital environment familiar to him
Interactivity	<ul style="list-style-type: none"> • The ability to provide multi-personality in the process of educational communication and educational activities
Autonomy	<ul style="list-style-type: none"> • The choice of the method of presentation of the material, the level of complexity, the pace of work, the nature of the partner, the game environment, the availability of unlimited opportunities for individual adaptation to the needs and characteristics of each student

Figure –3. Didactic qualitative features of digital technologies

External factors determine:

- meeting the requirements for the effectiveness of the education system as socially necessary;
- ensuring the required level of training and information literacy and information culture of graduates;
- ensuring the availability and quality of applied digital technologies and digital educational resources;
- the possible level of solving the problems of digital transformation in education at a specific stage.

External factors not only stimulate innovations, but also open up opportunities for knowledge, development and application of restrictions imposed on the pace and characteristics of providing the educational process with digital technologies.

The digital transformation in education is influenced by such external factors as political, economic, technological and socio-cultural.

Political factors. The decision to computerize education was made by the country's politicians at a very high level. Computerization was considered as an integral part of the program to strengthen the development of the country. The decision on the digital transformation of education is also an integral part of the political program for the transition to the digital economy, which is reflected in such national projects as «education» and «Digital economy». Therefore, the political factor is taken as an external factor of the digital educational process.

Economic factors. At the global level, the use of information technologies that led to the informatization of education has become very simple. As a result, the idea of how many and what types of computing equipment will be required to ensure the educational process has changed. At one time, Professor N. Negroponte was the first to evaluate the equipment of educational organizations with information and communication technologies, the number of computer classes and the number of students using one computer. His MediaLab MIT program "One Laptop per Child" seemed too fantastic. Today, the presence of each student and each teacher of an individual mobile digital tool, constantly connected to the Internet, is perceived as a common picture and widespread practice in education.

Technological factors. The development of a technological base that creates conditions for the informatization of education in the country is one of the external priority factors at the present time. Speaking about the history of informatization in their educational organizations, teachers, as a rule, begin by describing the changes in the digital educational environment that have become available to them. Today, equipped multimedia classrooms and virtual laboratories, electronic libraries, etc. can be called as a developing environment for digital education.

Sociocultural factors. An important role is played by the society's understanding of digital transformation in education:

- contributes to the development of a country, region or municipality;
- affects the daily life of children;
- helps to solve problems of social inequality.

Sociocultural factors are associated with the use of digital technologies in schools as a real factor determining the prospects for economic development of the region from the head of the country to the municipality. This is done not only in our country, but also in many foreign countries. Thus, many experts call one of the factors of the Irish economic miracle a large-scale program of informatization of education, which allows modern enterprises to prepare high-quality labor at all levels of necessary qualifications. The heads of Intel and Dell corporations assessed it as an important factor that influenced the decision to locate the enterprises and research centers of these companies in Ireland. Studies have shown that schools guarantee the return of funds spent to students within ten years in connection with the achievement of the goal "creating the best general education system in the world".

Informatization of schools at the world level is considered not only as a tool for training students and economic development, but also as an important mechanism for solving problems of social inequality between residents of different regions of the country, children from low-income and high-income families.

According to F. Molnar, experiments show that informatization of education helps to reduce inequality in obtaining quality education (Fig.4).

Today, the pace of the influence of external and internal factors on additions in education has changed. The reason for this was the increased influence of developing digital technologies on the change of internal factors, namely:

- updating the goals, content, form and methods of educational work;

- the use of digital technologies to «replenish» the traditional content of educational projects;
- the emergence of a personalized model (system) of the organization of educational work, result-oriented, etc.

All this has become possible primarily due to a significant increase in the characteristics and availability of digital technologies.

Thus, despite the growing influence of internal factors, the role of external factors as a whole remains decisive.

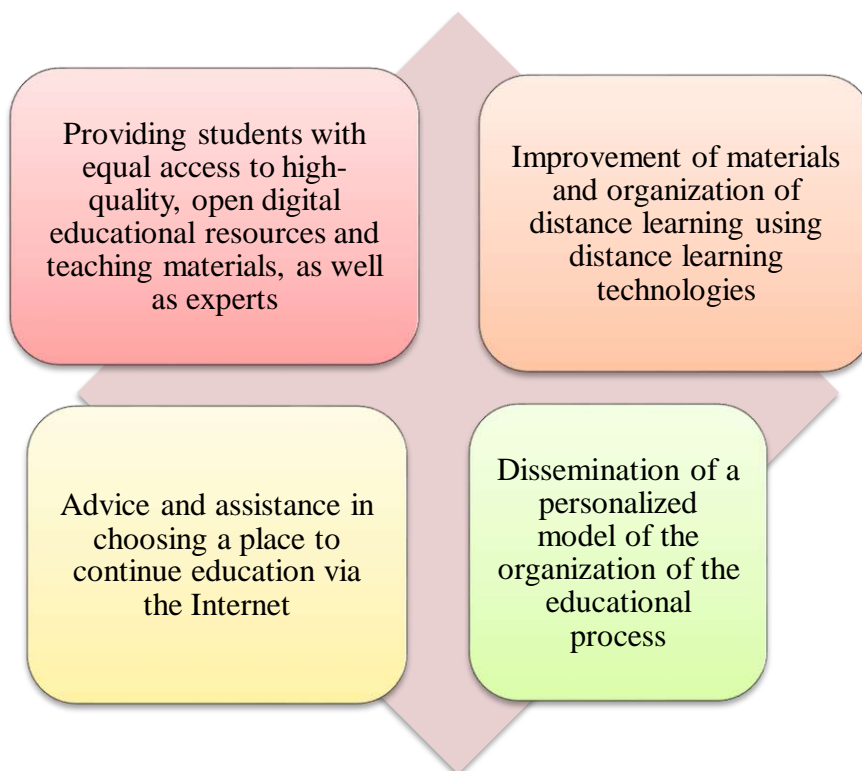


Figure –4. Prerequisites contributing to the reduction of inequality in obtaining quality education in the informatization of education

Technical capabilities of the equipment (network, servers and their software; information security; personal account of users; reliability of work; types of digital educational resources) have become the real needs of educational organizations. Based on external factors (including the actions of leaders), it is planned to direct teachers to actively discuss the internal factors of the digital transformation process in their educational organizations and search for the most effective ways to develop it. If 10-15 years ago the need for digital technologies was not obvious, now it is impossible to imagine education without it, so it begins to look for and use ways of timely and productive use.

External factors have a direct impact on the dynamics of internal factors, manifested by the emergence of new pedagogical solutions based on the use of digital technologies (for example, computer simulators, educational process management information systems, electronic textbooks, etc.).

External factors influence the development of new educational standards and the content of textbooks. They contribute to the emergence of new highly effective methodological guidelines and pedagogical experience, ways of organizing the educational process using digital technologies. They also have a direct impact on the preparers of educational material, teachers, researchers and other categories of educational workers who are directly mastered in the development of the content, organizational forms and methods of teaching. Mastering new information tools in education, finding new methodological solutions, he helps to navigate the education system from the inside.

Internal factors largely depend on the processes that develop within the education system. They are associated with pressing problems within the education system, with the processes of adopting and mastering new tools for working with information to solve new and previous educational tasks, without neglecting the changing expectations and demands of society as a whole (Fig. 5).

The standardized control carried out on the basis of the methodology of the national unified testing (UNT), used to solve educational problems, as a means of automating the educational process in distance learning and standardized control systems, can be called the basis of open education.

It is possible to single out the basics of open education as a means of automating the educational process in distance learning systems and standardized control based on the method of the Unified National Test Exam (UNT) used in solving educational problems. A striking example of the internal factor of informatization of education will be the activity of adherents of the idea of automation of educational work, which has been going on for several decades.

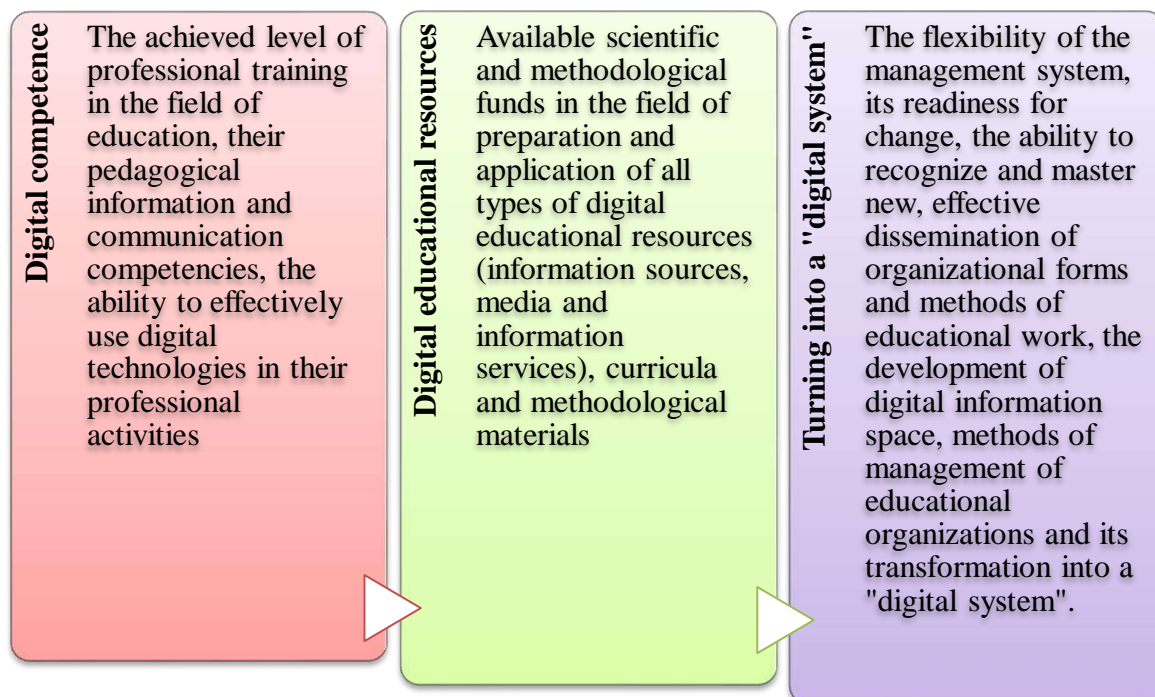


Figure – 5. Internal factors of informatization of education

Another internal factor was the development of an activity-based approach to teaching and spreading the ideas of pedagogical constructivism. The research of one of the developers of this approach, S. Papert (1980), gave a significant impetus to the pedagogical development of digital technologies, S. Papert put on a new path the problems of changing the content of education, methods and forms of educational work. His research was the basis for the first digital learning environments (Logos) and a number of subsequent developments («Living Geometry», etc.).

Another factor that gave a pedagogical impetus to the application and development of digital technologies can be called digital measuring instruments and computer laboratories. A digital conductor (sensor) for measuring environmental parameters (temperature, pressure, distance, speed, etc.), automatic instantaneous processing of collected data, qualitatively changes the volume and level of observations conducted by students. Automation tools for scientific research coming to the field of education from research laboratories are a mandatory element of equipping educational laboratories, and their use is an internal motivation for the introduction of digital technologies. The continuation of this process can also include updating the content of the technological course, which includes discussion and development of devices (programmable) (various automatic, robotic devices and robots).

We can also say about other internal factors – the replacement of the traditional technical form of education with digitalization. Electronic designer and interactive whiteboard have become the main tool for equipping classrooms. Mastering the means of presentation graphics, streaming video, the Internet and digital educational resources, digital technologies are actively used by teachers as visual aids. In order to meet the new standards of information transmission to a modern teacher, it is important to have technological equipment and launch the Internet system in all educational institutions: electronic diaries in schools, electronic textbooks, as well as the ability to work with their Internet platforms and servers, record video lectures, upload practical work using the necessary servers, etc.

The spread of communication in various Internet networks, as well as the development of specialized Internet services, will allow us to move to new forms of communication between a teacher and a student, a teacher and parents. This is another factor that will help digital technologies enter the field of education.

In the professional training of future specialists, digital didactics is of great importance in the educational process.

Contradictions affecting the factors of development of digital didactics:

1) between the generality of education and the increase in quality requirements and the abilities of students;

2) between an increase in the degree of uncertainty of the future and the implementation of the student's life and professional self-determination in the pedagogical process;

3) between the requirements of the digital society and the digital economy for the socialization and professionalization of a graduate of the vocational education

system and the tendency to close representatives of the ordinary digital generation within the virtual (social network, game) world;

4) between the rapidly and constantly increasing changing nature of the requirements of the economy for the graduate of the vocational education system and the delayed nature of the ordering the educational process in accordance with these requirements;

5) contradictions between the demand of the economy and society for digital education and the desire of the state to monitor the goals, content and results of education in its sector as much as possible.

Finally, the process of digital transformation of the education system still needs to be improved. In the educational process, several attempts are being made to develop issues of changing the goals and content of education, methods and forms of educational work that require the introduction of digital technologies. This is evidenced by the implementation of the distance education system, the increase in the possibility of using digital technologies and information and communication technologies. In addition, access to the development of world experience is now being opened through the organization of all online courses and webinars on various topics at the international level, acquaintance with priority areas of modernization of the education sector and improvement of knowledge.

With the availability of digital technologies, teachers will increasingly use it to solve subject problems. In solving such tasks, teachers use digital technologies to record video lectures, videos, interactive whiteboards and electronic textbooks.

It is increasing the pace of using computer testing tools for the use of digital technologies in the educational process and training. Every year, the types of test tasks used in the country's universities at the present stage are improved and put into practice. Depending on the specifics of the types of tests, test tasks are also different, which are compiled taking into account the complexity of the content of the discipline. For example: an open test, a closed test, a complementary test, etc. And each of them must correspond to a percentage indicator.

There are two types of open-type test tasks: replenishment tasks and free presentation tasks. Their peculiarity is that in order to complete them, the student must write one or more words himself (numbers, letters, possibly phrases or even sentences). In this type of task, there are no distractions and options for correct answers.

Closed-type tasks include five types of tasks: alternative answers, several options with one correct answer, several options with several correct answers, matching and sequence restoration tasks. Closed-type test tasks represent various answers to the task. For example, choosing one or more correct answer options from the suggested range of options, choosing the correct list items, setting the correct sequence, etc. These are always exercises with set tasks, and the correct answer presupposes a number of options for pre-designed answers.

In the educational process, priority should be given to the use of network resources, the integration of advanced pedagogical forms and teaching methods into

digital information and telecommunication technologies, and skills in working with Internet technologies.

In recent years, digital technologies have become increasingly in demand in foreign countries due to the growing interest in the development of a new model of educational institutions. And in our country, this interest increases the readiness of educational management organizations to change, to recognize new ones, to support and disseminate effective organizational forms and methods of the learning process.

Thus, the factors of formation and development of the digital educational process are characterized by its implementation at all levels of education in the country. Intensive introduction of digital technologies into all spheres of modern society will contribute to increasing the need for their use in the education system and will form the basic basis of digital education.

Currently, a new form, such as online training, is being introduced in higher educational institutions of the country to train personnel in some educational programs, which will contribute to the development of the digital educational process. Of course, as a result of fundamental and applied research and their implementation into practice, this will give a new impetus to the training of specialists with digital education, who will become the basis of the future of the New Kazakhstan.

Questions for assessment and verification of knowledge

1. Describe the formation of the digital educational process.
2. Reveal the factors of development of the digital educational process.
3. Prove the external factors of informatization of education with your own vision.
4. Prove by giving examples of internal factors of informatization of education.
5. Determine the essence of the digitalization policy in the country's universities from the point of view of your educational institution and prove it by examples.
6. Conduct a comparative SWOT analysis of the state of the digital educational process development in the country.

Recommended literature

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1.2 Trends, patterns and principles of digital education development

A number of broad trends in the development of vocational education and training can be considered as the main laws defining the features of the principle of digital education, including:

1) dissemination and implementation in practice of various corporate forms of digital professional education e-learning, we-learning. At the same time, the development of integrated network programs of vocational education and training, offering the «construction» of independent educational directions from modules and short programs implemented by educational organizations;

2) presentation of new requirements regarding the practice-oriented content of education, increasing the role of the content of education in terms of access to important information in education;

3) horizontal and vertical convergence of vocational education programs; ensures continuity of cooperation between general, secondary and vocational and higher educational institutions. What becomes important is not a document on education of a certain type and profile, but a portfolio of professional knowledge that records the totality of educational programs and competencies mastered by a person and his «digital footprint».

In the context of digital transformation of the principle of vocational education, the following individual (didactic) patterns are reflected:

1. Increasing the role of the teaching principle and the student's academic independence.

Digital technologies make it possible to create an environment saturated with a variety of educational resources, almost unlimited in content structure. At the same time, the student is studying independently (possibly when calling teachers, tutors, etc. or adaptive learning systems) solves a number of important educational tasks. The first of them is the understanding and formulation of an individual educational request and the formation of an individual educational route on this basis. In the future, he must make a decision on whether his educational direction is correctly built or not, in the case of remote development of online courses, the student is required to be able to independently organize his educational activities at all stages of the educational principle.

Thus, the digital educational environment is an open complex of resources, conditions and opportunities for learning, development, and socialization of the individual. The activity of the student and his academic independence depend on how much the pedagogical potential of this environment is in demand. In this regard, digital vocational education and training are associated with the formation of educational independence of a secondary school graduate and offer a fundamentally new demand, readiness for independent organization and stimulation of the principle of learning with active and effective use of the resources of the digital educational environment (Fig.6).

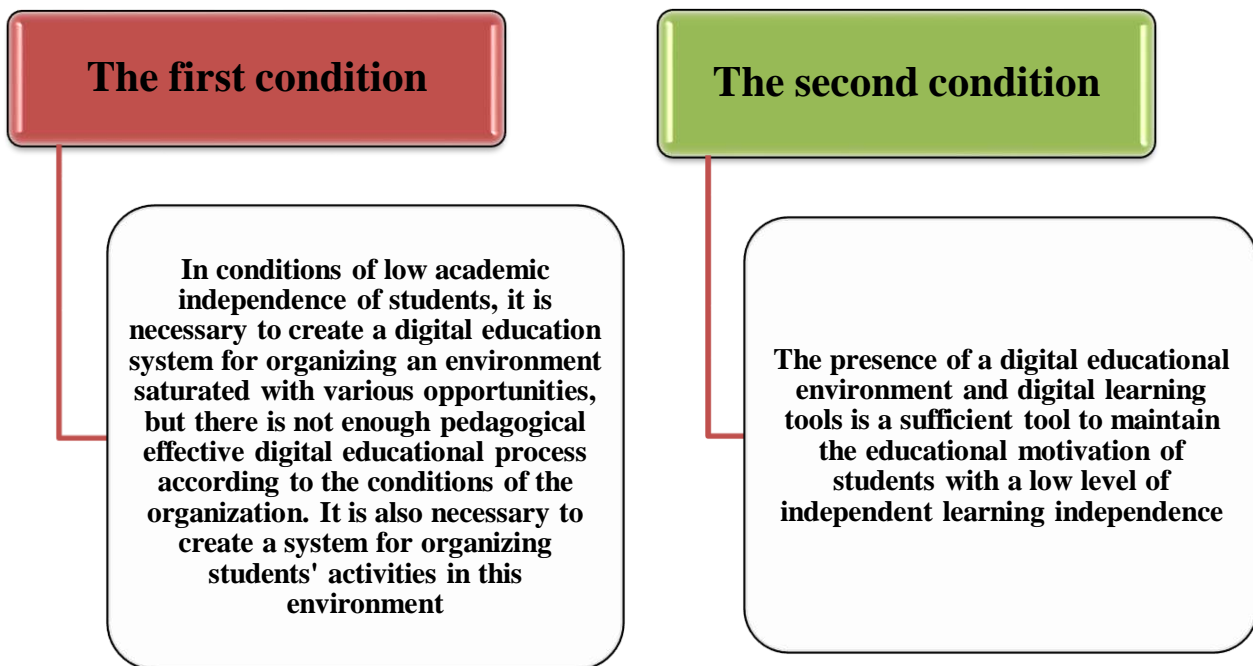


Figure – 6. Conditions for creating a digital educational environment

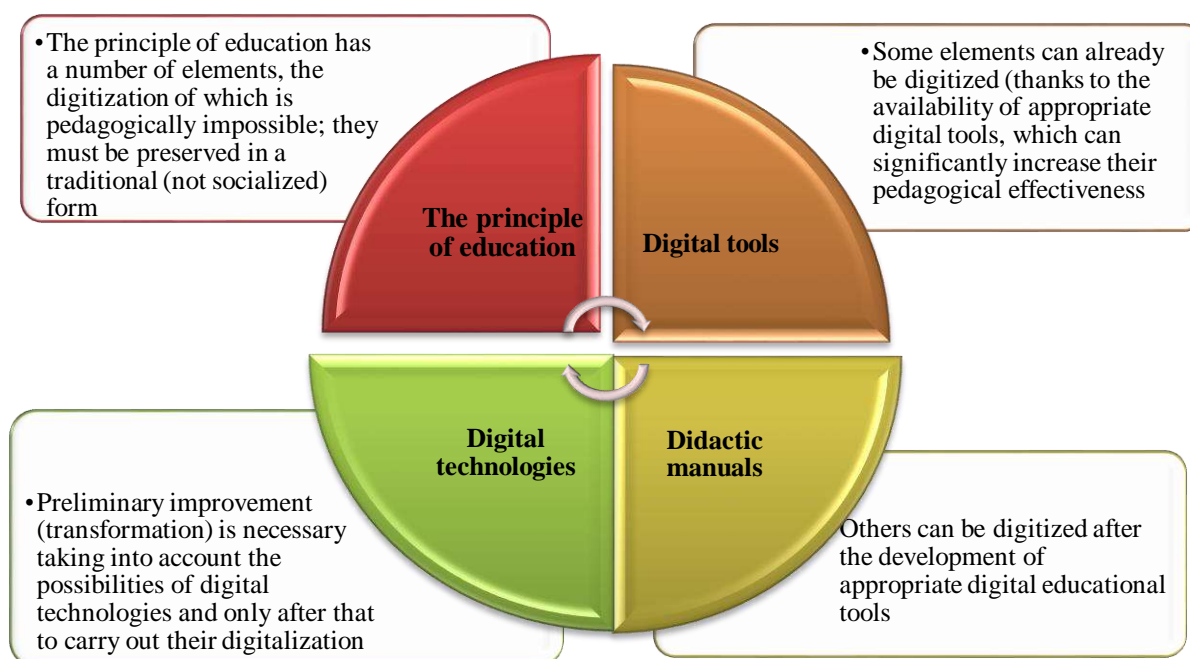
2. The results of digitalization of the basic process depend on its effectiveness.

In the 60s of the last century, a pattern was established that «automation of efficient processes makes them even more efficient, since automation of inefficient processes makes them more efficient». Therefore, in the process of digitalization, it is necessary to approach with caution the choice of elements of the educational principle.

It is necessary to use a set of management tools provided by educational motivation, including digital technologies:

- the state of success based on the full assimilation of these learning outcomes, which significantly reduces the role of fear as the dominant factor of educational motivation in traditional pre-university education;
- prompt feedback when performing training tasks;
- the use of a wide range of social and emotional methods of managing educational motivation, including the use of a gaming environment (gamification), interaction with partners in the network, the creation of study groups, etc.

Figure 7 reveals the elements of education in the process of upbringing.



Figure–7. Elements of education in the process of digitalization

3. In the context of digitalization of the principle of education, the role of active and interactive forms of learning is increasing.

The principle of digitalization new, high-quality opportunities, such as the provision of educational material and the guidance of didactic principles, generate new types of activities that are real in the conditions of socialization of a digital society. In these conditions, the differentiation of various technologies increases in terms of didactic potential. A lecture, which is a homogeneous, long-term, passive form of educational work. On the contrary, the role of pedagogical technologies, which are based on the independent individual activity of students, interactive communication, group work, group and individual reflection, which has a certain internal scenario and a complex structure, namely the project activity of students, in all its variants, game learning technology, case study, group discussion and discussion, etc. All of these technologies also form a set of social competencies for students that are necessary for a digital society.

4. The transformation of the principle of education in the process of digitalization is aimed at increasing the degree of construction of the principle of learning: methods and complex forms of learning are carried out in accordance with the complexity of the learning tools used in the principle of education. Various forms of educational activity organization are significantly increasing in the digital educational environment, they acquire a dynamic character (a changeable structure of groups, large-scale determination of study groups, a rapid transition of various scenarios from group activity to individual and vice versa). This significantly increases the result of pedagogical activity in the principle of learning.

As a result, in the conditions of digitalization of the principle of education, the general change in the activity of a teacher occurs not in his facilitation, but in increasing the level of his intelligence and creative abilities, including through

automation of complex operations (structuring of curricula, designing the scenario of the principle of education, choosing the content and materials of training depending on the topic, checking the work of students, etc.).

5. In the principle of digital education, technologies and teaching methods are chosen depending on the content of the training. This creates conditions for the development of the idea of active learning content, according to which the main source of content is professional, communicative, organizational, self-education is characterized by the use of innovative learning technologies and interactive methods.

Such innovative technologies become key elements of the content of education that contribute to the development of personality, while it is necessary to master the use of technologies and teaching methods to understand what creativity, critical thinking, communication, teamwork or "project" is.

The main prerequisite for the formation of universal, general professional competencies is the organized activity of students to master the official content of vocational education and training. Digital technologies make it possible to significantly accelerate the principle of mastering the content of education in the process of teaching and learning, to make it technologically and pedagogically effective, to increase motivation for their development through prompt diagnostic feedback, individual recommendations and other means.

6. Visual-imaginative and visual-logical thinking of the global digitalization process. The process of digitalization and the formation of a global information environment will become compact and convenient for quick perception and use, giving rise to new ways of «collecting» educationally significant information. These approaches are mastered by representatives of the digital generation at the early stages of childhood, as a result of which the style of thinking of students also changes. He stops narration (which requires a verbal «explanation of new material» and is associated with the independent development of voluminous texts) and proceeds to infographic, visual-logical thinking based on the joint work of the two hemispheres of the brain.

The difference between infographics and narration allows you to use more complex logic (nonlinear, multidimensional, linear); it better reflects the essence of an interdisciplinary, integrated approach to learning. Compactness and relative autonomy of infographic forms materials («diagram», «slide», etc.), unlike text forms, correspond to the modular, molecular format of modern competencies, differently integrated into different professions. The use of mainly infographic, visual-logical type of thinking allows you to quickly, approximately solve complex, complex, multi-system tasks in conditions of incompleteness of information, which is extremely necessary in a dynamic and uncertain world. In fact, we are talking about the creative, intuitive, probabilistic thinking of a modern person, the need for which increases significantly with the automation of everyday operations on any production principle.

7. Digitalization of vocational education and training contributes to reducing the duration of training courses. The higher the degree of individualization of the teaching principle and the possibility of choosing educational

programs, the shorter these programs should be in duration and content. The modularization of the teaching principle will continue on micromodules, which in the conditions of digital transformation will become the main didactic units of educational (professional) modules. In the conditions of vocational training and additional vocational education, they acquire a self-sufficient character; in the conditions of secondary vocational education, the role of elective courses is assigned, and in the future, variability for the core of general vocational education is an option.

The factors that determine the need to build the principle of digital education in education and training distinguish three areas that characterize the formation of a digital society: Digital economy; digital environment; digital generation (Fig.8).

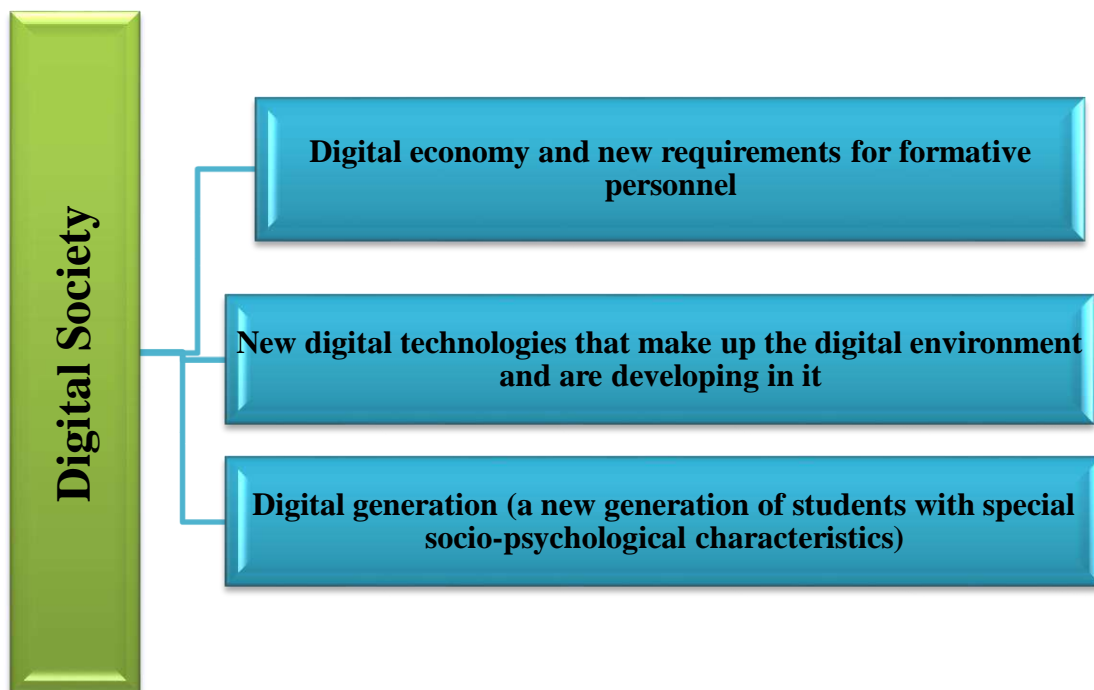


Figure – 8. Characteristics of the formation of a digital society

1. The digital economy is the main source of educational goals for vocational education and training. The spheres of digitalization of the economy are significantly changing the educational order, moving to the need to form a complex of new digital competencies, regardless of the specialty received. The analysis of the «promising NTP (National Technology Initiative) markets» reveals the essence of our ownership of digital production technologies. In addition, professional education is required for graduates of various fields who previously had only a level of computer skills, depending on the principle of digitalization.

For example: Foodnet (FoodNet) – production, storage and processing of products of the digital market; FashionNet (FashionNet) – the market of products of the fashion industry; Edunet (EduNet) – digital education, SafeNet (SafeNet) – information security related to the digital services market, etc.

In addition to IT competencies, the new complex, which ensures the use of computer and digital technologies by a person and forms the core of modern functional literacy of any specialist, includes the expected educational results from the content of a set of other competencies (professional, general professional, universal), changing under the influence of digitalization.

The growth of the digital economy depends on the skills of the most significant changes caused by life. The introduction of digital technologies leads to the unification (in various combinations) of new opportunities – work, education, hobbies and recreation.

In recent years, the centers of digital development of the industry, digital centers and venture studios of universities have been particularly noticeable. The centers of digital development of the industry unite enterprises, organize practical events and implement educational programs for managers of enterprises and industries.

University venture studios are a space and groups for the development of startups in educational organizations. Each startup team strives to solve a real problem of society, economy, region. Such specific tasks and problems of the university team are solved in the venture studios of universities together with the teams of venture funds and corporations.

2. Digital «advanced», «clever», «SMART» technologies form the core of the modern stage of the technological process and play a priority role in the future. Currently, digitalization as an important process is actively undergoing an in-depth convergence of digital technologies with material and socio-humanitarian technologies and practices, including understanding the place and role of digital technologies in any modern field of professional activity in education.

From the point of view of the business sphere, the most successful companies will be those who understand that digital technologies are created by «smart» people. The main corporate capital is the company's culture, which forms the talents of specialists who change effective methods of manufacturing products, services and analysis. These are not Information technologies, robots or computers, but human relations. This is the main tool for developing the company's digital capabilities. Many digital technologies have didactic (educational) potential.

Figure 9 shows a didactic description of digital technologies.

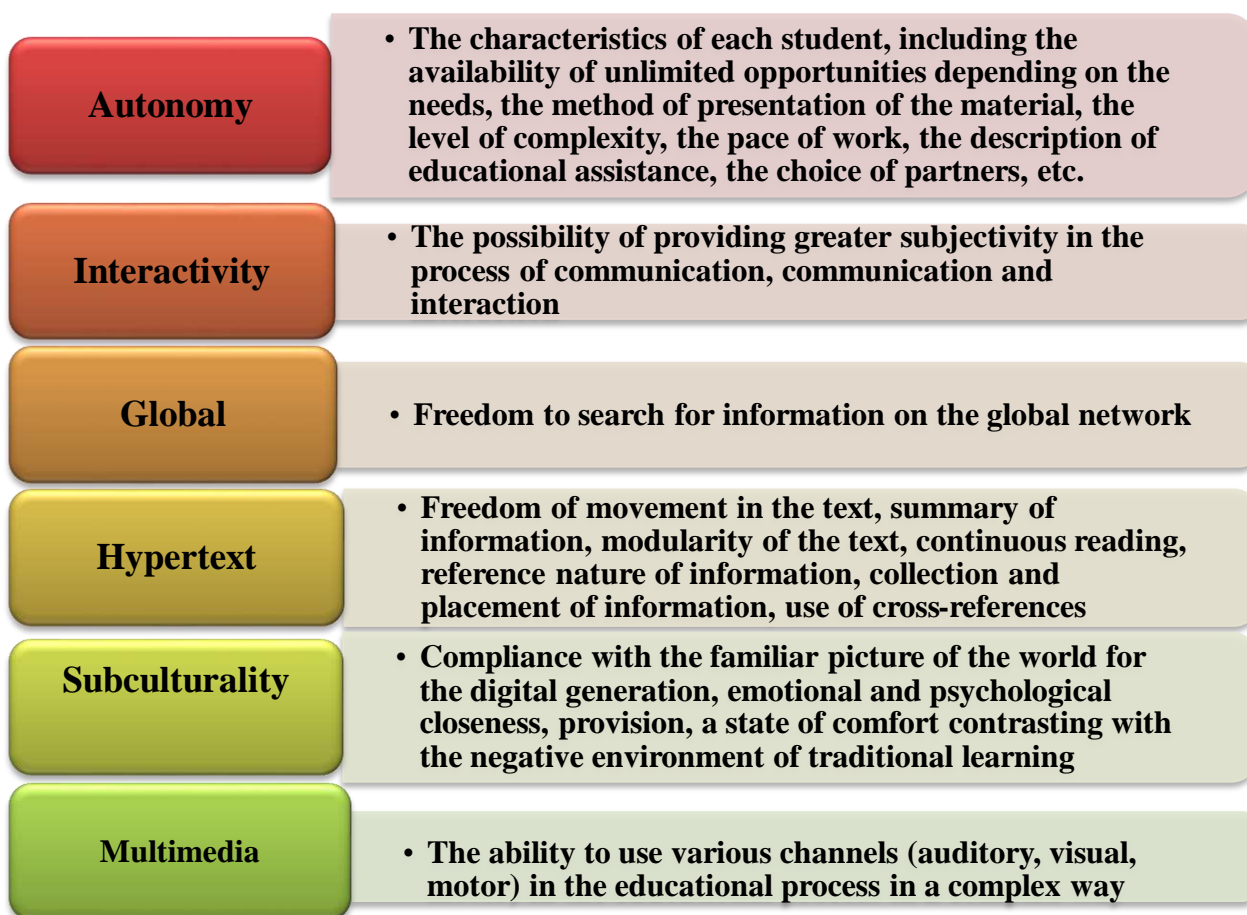


Figure – 9. Didactic characteristics of digital technologies

As a rule, several digital technologies can be used.

Telecommunication technologies. In a narrow sense, telecommunication technologies are understood as a set of software and hardware that allow communication without the use of wires and transmit information packets, including audio and video information.

A digital footprint is a set of data created by a user while in a digital space. In a close context, the term «digital shadow» is also used - information that a person leaves, even if he does not understand the digital space.

Artificial intelligence (machine intelligence, AI) is a technology that allows a computer to learn from its own experience, adapt to set parameters. To describe various artificial intelligence training technologies, the terms «machine learning» and «deep learning» are used, which are not related to human knowledge and qualifications. It is used as the basis of facial recognition technology, as oral speech, text, as expert systems, etc.

Figure 10 shows the digital technologies used in education.

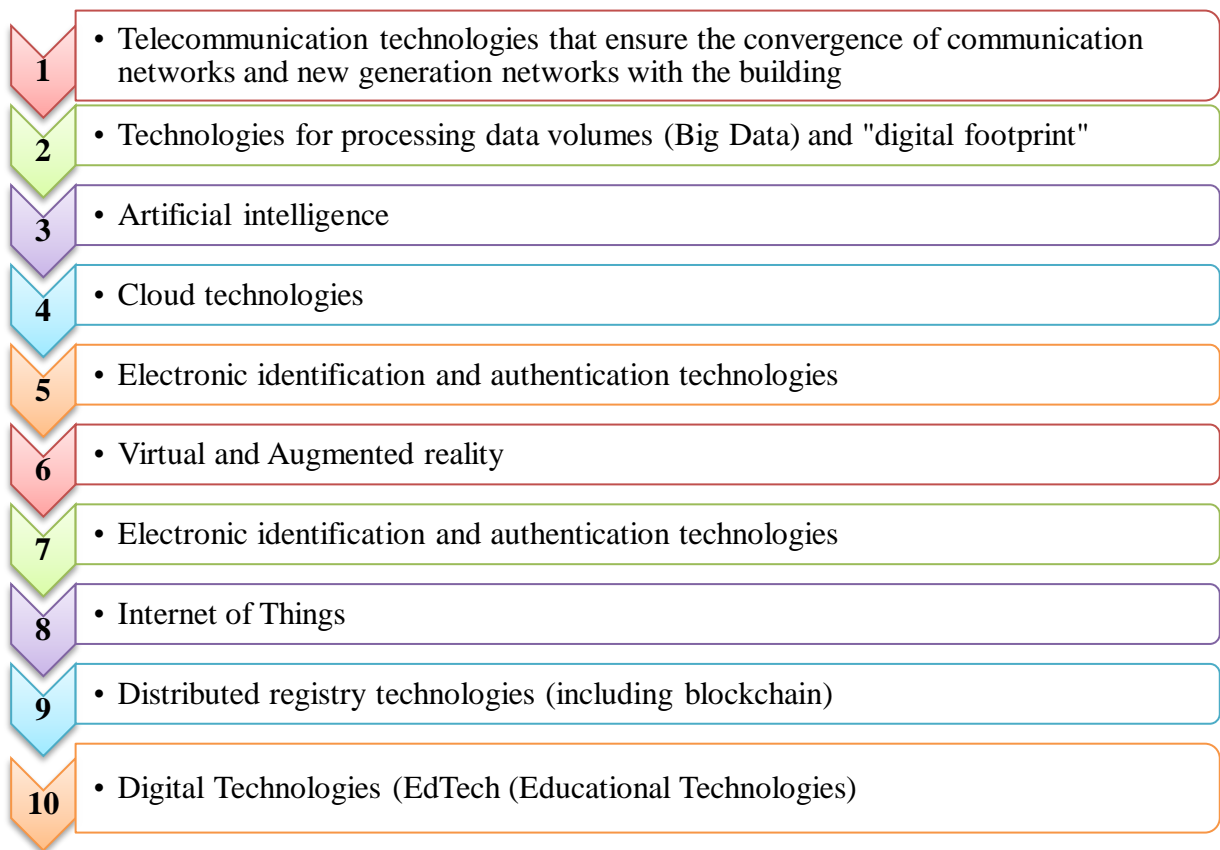


Figure –10. Digital technologies used in education

Electronic identification. In the last decade, the direction of electronic identification has been rapidly developing, in which information is accumulated with minimal human participation. After all, the operator can make a mistake with the computer keyboard when entering data. The fact is that finding and correcting errors in large datasets can take too much time. The main thing in the automation system is the reliability of information. Automatic identification technologies maximally meet the requirements of computer systems and control systems, which require clear recognition of objects in real time.

Authentication is a procedure for verifying the identity of a claimed user, process, or device. This control allows you to check with confidence whether the user (process or device) is exactly this user or not. During authentication, the believing party is convinced of the authenticity of the verified party, while the verified party actively participates in the information exchange process. As a rule, the user confirms his identity by entering unique information about himself (for example, a password or certificate) that other users do not know about.

Cloud technologies are the provision of remote access to data processing or storage and it is considered to be one of the most modern information technologies. In cloud technologies, there is no need to install any special programs on the computer, you only need to have Internet access. And all processing, loading and storage operations are carried out via the Internet, that is, cloud technologies are considered as a whole branch of computer technology.

Blockchain is a digital analogue of an independent notary, the role of which is to register certain events, preserve the authenticity of these events, which guarantees the correct identification of events and their slides. When a new record (correction) is made, information about all previous records (corrections) is saved. The use of technology significantly complicates the possibility of falsifying historical data through the use of encryption mechanisms and distributed (decentralized) information storage. In addition, any attempt to distort the record faces the need to rewrite not a specific historical record, but all the records preceding it in reverse chronological order and in all distributed repositories.

Digital technology is a technology based on the display of signals in discrete bands of analog levels, and not in the form of a continuous spectrum.

In addition, to build an effective educational and production principle of vocational education and training, a wide range of digital production technologies is needed, including industrial Internet technologies, additive technologies, automated production and design technologies, etc.

The use of digital technologies creates new opportunities for building an educational principle and solving a wide range of "eternal" and fundamentally new educational tasks that cannot be solved by traditional means of education.

Digital didactics of vocational education and training is based on a system of traditional didactic principles of teaching, turns them into conditions of the principle of digital education, and is also guided by a number of new principles:

1. The principle of personalization is the basic principle of digital didactics. The principle of personalization consists in setting the learning goals of the student (taking into account the degree of his maturity and independence), designing an individual educational route, determining the pace and level of mastering certain elements of the educational program, effective technologies, forms and methods of teaching, the composition of the study group, determining his educational needs, individual inclinations and preferences, ethno-cultural and others it also implies freedom of choice, taking into account the specifics. Thus, the use of "digital footprint" technology allows you to act in accordance with the norm of the principle of education in the accumulation mode, controlling the indicators of personal development of the student and the learning outcomes established in the implemented evaluation principle.

Application possibilities in education: creation of multi-level monitoring of the effectiveness of the educational process as a management decision support system, in predicting the success of training students are guided by personalized recommendations.

2. The principle of dominance of the learning principle associated with the didactic principles of education and development implies the attention of the student to his educational activities in the digital educational environment. The activity of a teacher is considered as the organization of the principle of teaching and learning and it is auxiliary, supportive in relation to this process. The main role of the learning principle determines the importance of the student's learning independence,

his subjectivity in the principle of self-education and learning, the need to stimulate development and reliance on it from the teacher.

3. The principles of expediency require the differentiated application of digital technologies and learning tools that ensure the achievement of the goals of the principle of education, in combination with its principles. The principles of purposefulness contribute to the digitalization of ineffective pedagogical technologies, as well as the achievement of educational goals with the use of digital tools.

4. Principles of flexibility and adaptation – develops the idea of an individual approach in teaching to the conditions of the principle of digital education. Adaptive digital educational process includes individual learning styles and strategies and other psychological and pedagogical features, as well as the order, method and pace of providing educational material to each individual student as a result of an integrated diagnostic system of the current psychophysiological state of students; the level and nature of pedagogical support, including in the form of individual recommendations, the number of repetitions, the level of complexity of tasks, etc., automatically performs flexible adjustment.

5. The principle of success in learning requires ensuring the full assimilation of knowledge, skills, competencies that ensure the mastery of the specified results of vocational education (training) – the required qualification or work function, consistently developing the didactic principle of strength. The application of this principle in the context of digital education is ensured by the dominant role of the approval stage in the didactic chain «explanation-approval-control».

To consolidate the principle of education, the following approaches can be used: bringing the stage of interpretation of new material into the space of electronic educational resources (technology «inverted learning»); allocation to the stage of consolidation of the maximum number of classroom hours involving face-to-face interaction between the teacher and students; search for the optimal ratio of team and individual forms of consolidation, independent work and work under the guidance of a teacher, computerized reinforcement training and moments of reflexive self-assessment.

Digital learning tools make it possible to free the principle of consolidation for both the student and the teacher from the «impact of monotony», daily, laboriously and with minimal time. To do this, depending on the type of educational program and the characteristics of students, a game or realistic environment is used, means of rhythmization (individual pace and rhythm of work, pause, music), the choice of the level of complexity of training tasks with the possibility of choosing any of them or with automatic transition from level to level, an individual approach to training tasks depending on the features of the student, his inclinations or specialization choice, immediate availability of grades, etc. In vocational education and training, metacircular technologies – simulators, imitation, augmented reality tools - can be used to form and consolidate professional skills, master typical algorithms of professional activity.

6. The principles of learning (principles of interactivity) in cooperation and interaction can be to some extent related to the traditional didactic principles of consciousness and activity. Its main feature is the active multi-sided communication carried out in various forms (real, virtual-network) between students, teachers and other subjects involved in the educational principle of vocational education and training (the employer organization, customers and users of the results of students' project activities, external experts and consultants, etc.) building the principle of learning based on process.

The application of this principle presupposes the priority application of team forms of organization of educational work based on social learning mechanisms – communication, cooperation, competition, mutual learning and mutual evaluation. In this case, the level of structural complexity of the forms of training used should increase as students' progress through the stages of the learning principle. The implementation of this principle at the organizational level presupposes the social openness of the educational environment of the organization of vocational education, the active use of mechanisms of network cooperation and public and private partnership in the professional sphere.

7. Interaction of teaching with traditional didactic principles of connection with life practice orientation requires adaptation of the principle to the current and prospective requirements of the economy, labor market, used and promising production technologies with the goals, content, technologies, methods and means of vocational education and training. In the context of a practice-oriented educational process, the idea of the fundamental core of education is changing, «fundamental» and «practice-oriented» are synthesized: the basis of fundamental training is not scientific knowledge, but a broad meta-subject, general professional and life complex of skills combined with the experience of their application in a social context.

The continuity of learning with traditional didactic principles of connection with life presupposes the formation of personally significant practical experience among students (Fig. 11).

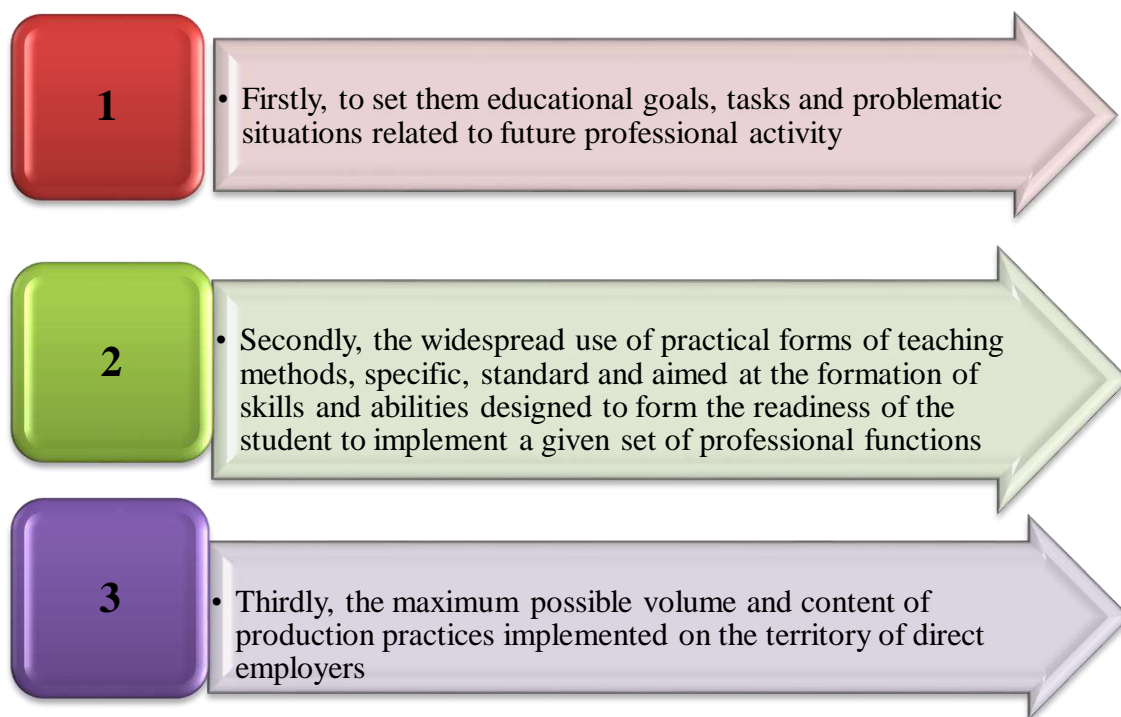


Figure –11.Features of the continuity of learning with traditional didactic principles of connection with life

In the context of digitalization of the principle of education, another requirement of the principle of practice orientation is the formation of a unified digital environment of the organization of vocational education and the employer enterprise (in the future, the digital ecosystem of the cluster of vocational education).

8. The principles of increasing complexity, which can be associated with the traditional didactic principles of accessibility and consistency, include forms and methods of learning that allow you to switch (Fig. 12). The use of digital tools allows not only to ensure the design and use of a variety of necessary forms and methods of learning, but also to automate the level and rate of growth of complexity depending on the educational results achieved by the student.

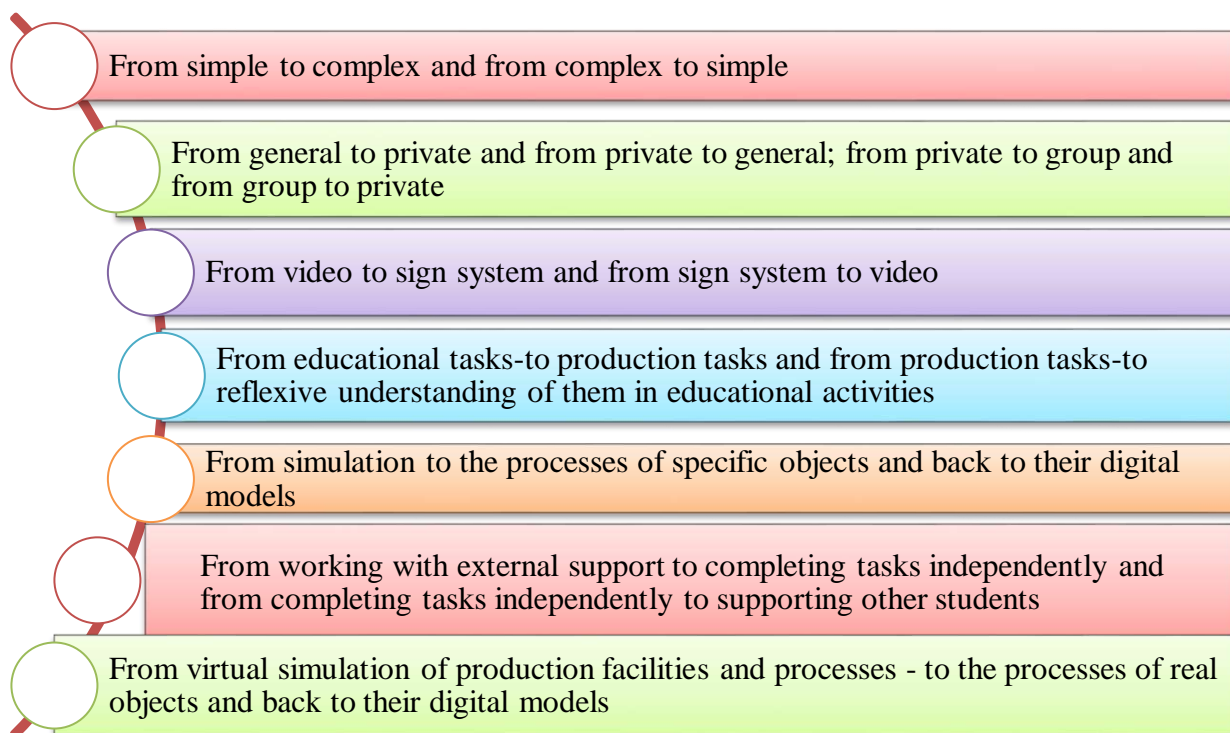


Figure –12. The essence of the traditional didactic principles of accessibility and consistency

9. The principle of priority of the educational environment requires providing students with an excessive resource opportunity to build an individual educational route, select content elements and the level of their development. Such a resource reserve can be implemented on the basis of a network educational resource and a unified information educational environment.

10. The polymodal (multimedia) principle implies the development of didactic principles of visibility in relation to the conditions of the principle of digital education. The possibilities of traditional visibility are significantly expanded due to infographics, including through self-generated by students in the process of mastering new material, during the development of educational projects, individual and team independent work, etc. In addition, the principles of polymodality require the use of not only the visual and auditory, but also the motor (kinesthetic) channel of perception in the principle of learning. In the educational principle of vocational education and training, it provides for the use of not only a keyboard and mouse, but also a variety of manipulators, joysticks, pedals and other means of manual and foot control of educational and professional equipment (simulators, devices and machines equipped with sensors and effectors, etc.). A more complete and comprehensive account of the principles of polymodality, interactivity and practical orientation is provided by the use of augmented reality tools in the educational principle.

11. The implemented assessment principle requires the transformation of a control (ascertaining) assessment into a continuous, personalized diagnostic and formative assessment of educational achievement, carried out directly on the principle of performing educational tasks. Digital technologies provide prompt

feedback with informing the student, the teacher (in some cases, and other stakeholders) about the progress and results of the assignment, strengths and weaknesses, the presence of gaps in the previous material, providing personalized recommendations to eliminate the identified problems, setting and adjusting the immediate goals of educational work and scenarios for further development provides communication. At the same time, the stages of consolidation and control (current assessment) of learning outcomes are integrated into a single process, ensuring the successful solution of the «full mastering» task.

The use of digital technologies in combination with the pedagogical technology of criterion-level assessment ensures the objectivity and transparency of assessment, as well as immediate assessment forms a stable educational motivation.

The construction of evaluation as a diagnostic and formative process requires the rejection of the repressive evaluation function. The student has the right to make a mistake and correct it, including by any necessary number of repetitions. In the educational principle of vocational education and training, a significant part of the principle of the formation of professional skills and abilities can be fully automated using the implemented assessment

At the same time, to assess the protection of a given set of professional and general procedures, an expert assessment is required, carried out by specialists with certain qualifications, without the supply of only computerized assessment forms. Big data technology allows monitoring the educational principle, summarizing the data obtained during the implemented assessment: on the one hand, at the level of a group, course, department, educational organization, educational network; on the other hand, an educational module, an educational program, a certain type or level of educational programs on the subject of the region, etc.

In the absence of didactic principles of digital vocational education and training, this language is open and needs to be supplemented as the theory and practice of digital education develop.

Questions for assessment and verification of knowledge

1. Describe the patterns of development of the principle of digital education.
2. Prove with concrete evidence the factors that cause the need to build the principle of digital education.
3. Specify three directions characterizing the formation of a digital society in education and training and reveal the essence
4. Typical disclosure of the didactic (educational) potential of digital technologies.
5. Analysis of the features of the digital generation.
6. List the advantages and disadvantages of the factors of development of digital didactics.
7. Requirements for didactic principles in digital education - stories.
8. Describe the principle of personalization (taking into account the peculiarities of certain elements of the educational program when designing an

individual educational program). To show the importance of the student's academic independence on the didactic principle of education and development.

9. Prove the effectiveness of the target principles by concrete examples.

10. Give a description of the principle of flexibility and adaptation (development of the idea of an individual approach in teaching regarding the position of the principle of digital education).

11. Analyze the principle of success in learning (ensuring the full assimilation of knowledge, skills, documents that ensure the assimilation of knowledge or work function).

12. Use a concrete example to explain the proposals used in the nomination for approval of the principle of education.

13. The principle of active multilateral communication training based on the principles of learning (interactive principles) in Solidarity and interaction has been created.

14. Draw up a technological scheme of forms and methods of training, in which the principles of increasing complexity allow you to switch.

15. Analysis of the principles underlying the educational center.

16. Explain your opinion on the example of the Polymodal (multimedia) principle.

17. Give a description of the features of the educational achievement carried out directly on the implemented evaluation principle.

Recommended literature

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2. Slinkin S. V. Didactics of modern higher professional education: a textbook for institutes and faculties of advanced training/S.V.Slinkin. –Tobolsk: D.I. Mendeleev TSSP, 2014. – P. 315.

3. Khutorskoy A.V. Modern didactics. Study guide. 2nd edition/A.V. Khutorsky. – M.: Higher School, 2007. – P. 639.

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1.3 Didactic digest of technologies and methods of Cyberpedagogy: Digital Didactics and Cyberpedagogy

Digital didactics is a branch of pedagogy, a scientific discipline about the organization of the educational process in a digital society. Digital didactics consistently uses the basic concepts and principles of traditional (pre-digital) didactics as a science of learning, addition and transformation, depending on the conditions of the digital environment.

The factors that determine the need to create a digital educational process in education and training are considered to be the three components of a digital society:

- 1) the digital generation (a new generation of students with special socio-psychological characteristics);
- 2) new digital technologies that form and develop the digital environment;
- 3) the digital economy and new requirements for the personnel formed by it.

Digital didactics is a branch, a scientific direction of pedagogy, the subject of which is the digital transformation of the educational process, the organization of the learning process in the transition to a digital economy and a network society.

The concept of «digital didactics» first appeared in Kazakhstani scientific publications in the late 2010s. The term «digital didactics» was introduced in the 2000s in order to replace the term «informatization of education», reflecting the first stage of the digital transformation of the educational process based on the use of publicly available information and communication technologies (ICT) by teachers.

The subject of digital didactics is the organization of the student's activities in a digital educational environment.

The key factor in the formation of digital didactics is the transition of human civilization to a new stage of development - to an information society that represents a complex of profound changes in all aspects of human life and activity: the development of digital technologies and the network environment as a «new human habitat»; the development of the digital economy and new requirements for general and professional human competencies; the achievement of generation dominance «digital aborigines» appearance.

The basic concepts of digital didactics are digital educational technologies and digital educational products, resources and services (EdTech), which should be understood not as strictly scientific terms, but as markers denoting new phenomena of educational reality. From the point of view of digital didactics, the process of active development of EdTech is a complex process of contrasting transformation of digital and pedagogical technologies. The goal of the transformation of the educational process is to create a flexible and adaptive education system that meets the needs of the digital economy, the interests of all participants in educational relations and ensures the fullest use of the didactic potential of digital technologies.

The purpose of the transformation of digital technologies is their adaptation for the most effective solution of the set pedagogical tasks. A feature of the digital educational process is the convergence or full integration of pedagogical and digital technologies.

Figure 13 shows digital pedagogical technologies and teaching methods.

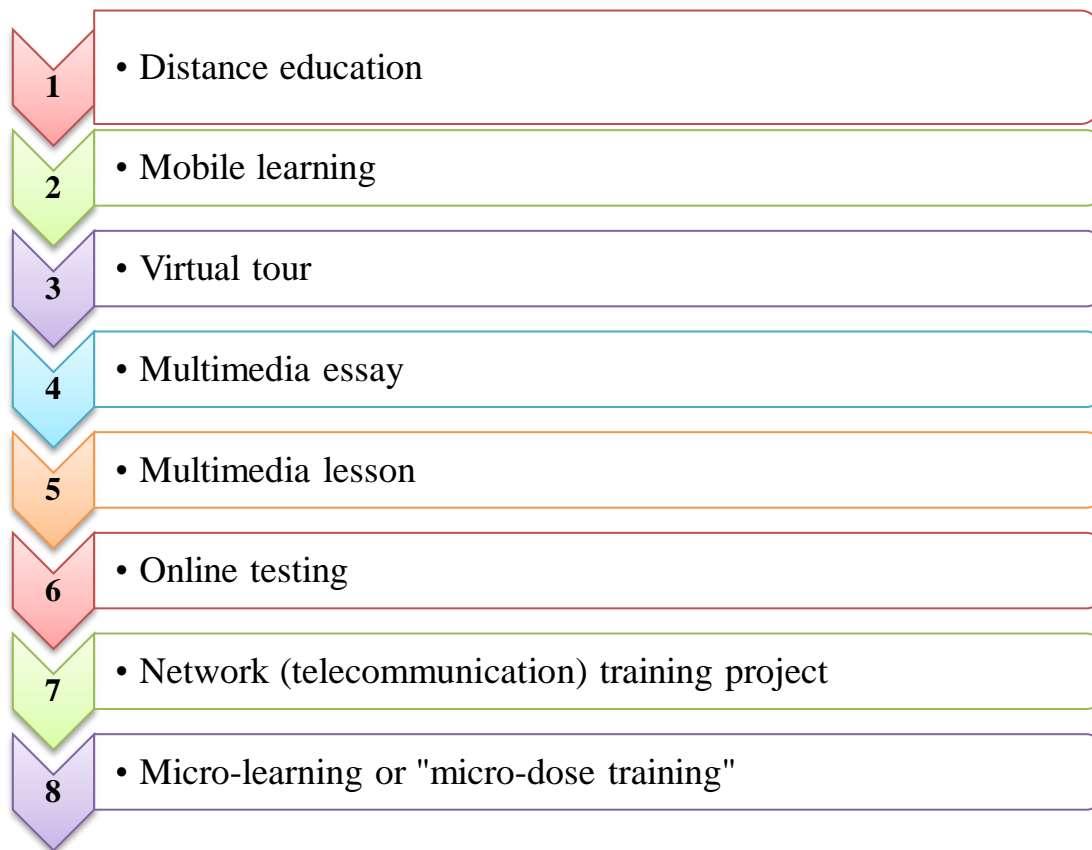


Figure –13. Digital pedagogical technologies and teaching methods

Digital didactics is a branch of pedagogy aimed at organizing the educational process in the conditions of digitalization of society. This scientific discipline uses the principles and basic concepts traditional for didactics, but changes and supplements them, adapting them to modern reality. Digital didactics is the basis for building modern teaching methods and strategies. The principles of digital didactics, as a rule, consistently develop the principles and methods of traditional (pre-digital) didactics: the main role of the educational process (the principle of educational and developmental learning); personalization; purposefulness; flexibility and adaptability (individual approach to learning); inclusiveness; success in learning (strength of knowledge); interactivity – learning in cooperation and interaction (consciousness and activity in learning); practice orientation (connection of learning with life); increased complexity (accessibility and consistency); saturation of educational environments; polymodal and introduced assessment.

Figure 14 and Table 1 reveal the significance of the didactic principles of the digital educational process.

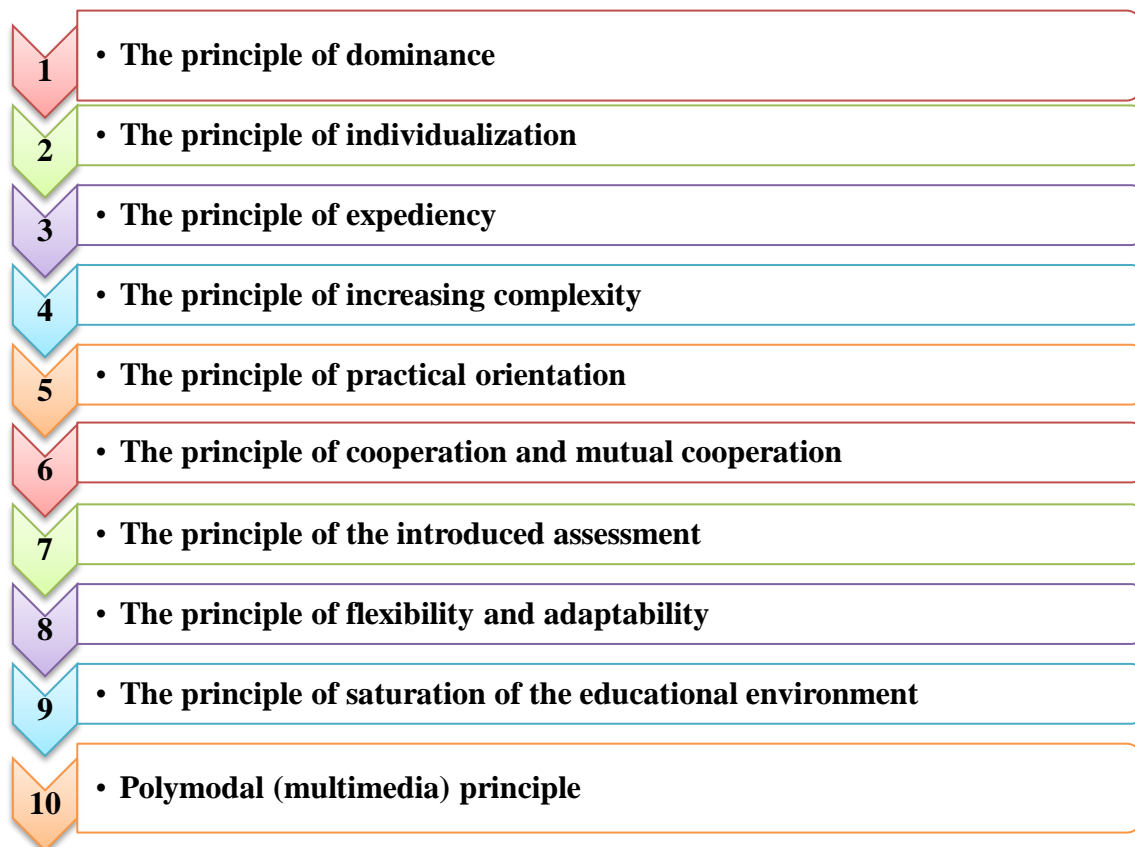


Figure –14. Didactic principles of the digital educational process

Creating a digital educational process is a complex task that requires scientific justification based on a new direction of pedagogical science – digital didactics. Digital didactics uses the basic concepts and principles of traditional (pre-digital) didactics as a science of learning, addition and transformation depending on the conditions of the digital environment. Digital didactics can be considered as a transfer-integrative field of scientific knowledge. Digital didactics is the basis for designing the activities and interaction of a student and a teacher in the process of mastering certain specialized areas, disciplines, modular courses.

The didactic principles of digital vocational education are transparent and, due to their novelty, need additions as the theoretical and practical possibilities of digital education develop.

The results of digitalization of education will be an effective autonomous education based on individual educational processes and continuous monitoring of the student's activities. Digitalization significantly expands the possibilities of using group and individual forms of classes, ensures full mastery of professional knowledge and skills, and also significantly contributes to the development of inclusive learning.

Table 1 – The essence of the didactic principles of the digital educational process

№	Didactic principle	
	name	meaning
1	The principle of dominance	It is focused on the independent educational activity of the student in the digital educational environment. The teacher should organize the educational process, support and help the student in the educational process.
2	The principle of individualization	Allows the student to independently determine the purpose of training, choose a strategy, pace and level of mastering the program of the educational process. This approach allows the teacher to track the student's personal development indicators and learning outcomes.
3	The principle of sustainability	The principle of expediency corresponds to the traditional didactic one: in the educational process it is necessary to use only digital technologies that ensure the achievement of the goals set by a particular student in the educational process
4	The principle of flexibility and adaptability	Allows you to develop an individual approach depending on the conditions of the educational process. The digital educational process allows you to automatically adapt the program to each student, taking into account such aspects as the order, method and pace of presentation of educational material. Also, this principle is guided by the level and nature of the teacher's support.
5	The principle of success in learning	It corresponds to the didactic principle of strength and requires achieving goals, as well as full mastery of knowledge and skills. In the digital educational process, this principle is the final element in the didactic chain «explanation-approval-control». To consolidate the material, additional study hours are allocated, face-to-face meetings of teachers and students are often organized. The teacher carefully monitors the optimal ratio of group and individual forms of consolidation. Digital tools significantly accelerate this process and contribute to its daily use.
6	The principle of learning in cooperation and interaction	It is an analogue of the didactic principle of interactivity: it requires the construction of a real and networked educational process based on an active multilateral relationship between the teacher and the student. This principle involves the use of group forms of network learning.

7	The principle of practical orientation	The principle of practical orientation, directly related to the traditional didactic principle of the connection of learning with life, requires a clear regulation of goals and specific results: defining goals, learning objectives and eliminating problematic situations; practical tasks; consolidating the knowledge gained in practice in the necessary conditions, i.e. in an existing project. The principle of increasing complexity, associated with the didactic principles of accessibility, consistency and consistency, involves a sequential transition.
8	The principle of increasing complexity	From simple to complex and from complex to simple; from general to particular and from particular to general; individual-individual and group; individual and other learning processes.
9	The principle of saturation of the educational environment	Building an individual learning strategy requires a large amount of information resources. Such a reserve can be implemented through a single information educational environment of a network educational resource.
10	Polymodal (multimedia) principle	It is a more detailed didactic principle of visibility and uses visual, auditory and motor (kinesthetic) methods of perception in the educational process. To do this, various devices are used, such as simulators, sensors, as well as augmented reality tools
11	The principle of increasing complexity	Requires continuous assessment of the student's achievements in the learning process. Digital technologies provide prompt feedback with continuous transmission to the teacher of the necessary data on the results of the task. Thanks to this, the teacher draws conclusions about the strengths and weaknesses of the student, which allows you to adjust the immediate learning goals in the educational process. Thus, digital technologies ensure the objectivity and transparency of the final assessment of the performance of a particular task

Cyberpedagogy. Recently, new terms related to the problem under consideration have been increasingly used in pedagogy and psychology. These are virtual pedagogy, communication pedagogy, interactive pedagogy, digital pedagogy, Internet pedagogy. So, at the present stage in the education system, the concept of «cyber pedagogy» can be found more and more often.

Cyber – (the English word «Cyber») is a global network root used to refer to various network resources, information objects and events, etc., related to computer

electronic and digital technologies. That is why the concept of «virtual reality technology» occupies an important place in the education system and the process of cybersocialization, cyber education and training, specially organized purposeful, planned activities [<https://chto-eto-takoe.ru/cyber>].

The existence of cyber pedagogy is not accidental, but a natural phenomenon in the history of pedagogical science and educational practice. It ultimately implies the entry of pedagogy into the era of unity of science and practice, which is a necessary condition for progressive evolution in any sphere of human activity.

According to Kazakhstani authors, Internet pedagogy – is a branch of pedagogy, a separate search engine that implements the principles of e-learning based on a single quick access to all electronic distance learning materials for students of all ages, categories, stakeholders. The foundations of Internet pedagogy, as well as traditional pedagogy, are universal values, values of the family and society, modern didactics focused on information and communication technologies. In fact, for the first time in the history of the development of society, information and scientific knowledge are not only means of its improvement, it is the main product of its socio-economic activity. In addition, information and education are the main assets and products of the information society, directly related to its further well-being and social development. It should be emphasized once again that information and communication, electronic, digital, computer and Internet technologies are an important component of this development. It creates an environment in which technology development is characterized by rapid and continuous changes. [Nurgalieva G.K., Suleev D.K., Tusubaeva Zh.M. Technology of distance learning organization. Monograph.-Almaty: Publishing house «RCIO», 2002.-150 p.]

If you look into the history of education, then there are reasons for the emergence and development of cyber pedagogy. Cultural, historical, socio-psychological and pedagogical foundations of human life in time were determined by information revolutions of a historical nature. For example, the middle of the XX century can be called the beginning of the formation of information technologies, the creation of computers and computer networks, databases. Since this period, new approaches and training systems have been used in the field of education. Among them: programmed learning; neural network pedagogy; the concept of cybernetic learning; cybernetic didactics, etc.

According to V. A. Pleshakov, the time that lasted from the middle of the XX century to the 90s of the XX century is the period of the fourth information revolution. The fifth information revolution, according to the scientist, began at the end of the XX century: «... it allowed modern humanity to move to a qualitatively new stage in the evolution of civilization – cyberevolution and became a catalyst for new radical changes in social structures around the world».

At the beginning of the XXI century, a wide path to new technologies and new concepts was opened in pedagogy and psychological science. A cyberontological concept based on theory began to develop. Great importance was attached to this problem by Russian scientists: V.A.Pleshakov, V.P.Bespalko, N.A.Obydenkova, N.A.Slyadneva, etc.

V.A. Pleshakov describes cyberontology as «human life and/or vital activity in a cyber threat determined by the level of development».

According to the cyberontological concept, a person's education is determined by the conditions of his existence. Therefore, the concept of a new environment of human life – cyberspace - arises. In the understanding of some scientists, "cyberspace is a global area of the information environment, including an interdependent set of information and technical infrastructure, including information and telecommunications networks and computer systems for storing, processing, converting and exchanging data.

According to a number of authors, the structure that creates a «virtual» reality for a person, the interconnection of technical, informational and social realities of the world. V.A.Pleshakov describes it as a «network information picture of the noosphere».

Cybervirtual space is a special world. In it, the effect of full participation in it, i.e. in a person, is realized and is actually a new alternative to the survival of humanity. Therefore, cyberspace is directly related to personality psychology. People often use cyberspace as a medium of self-expression that reflects their relationships and interests. From the point of view of psychoanalysis, cyberspace can be characterized as an environment that represents an intrapersonal space.

1. Today, cyberspace is an integral part of human life, complements and even replaces it (the latter is usually considered as cyber or Internet addiction). According to the degree of integration of the individual into cyberspace, we can talk about a new classification of so-called «emigrants» who have completely abandoned cyberspace, starting with the so-called «Mowgli», fully integrated into cyberspace. This classification is described in the works of V. A. Pleshakov. Thus, it is known that a person who has moved throughout history to an active life in cyberspace, mainly to the visual perception of information and the systematization of knowledge, is now in a very rapid process of changing his own psyche under the influence of new technologies. Along with the concept of cyberspace, the terms «digital environment», «digital educational environment», «digital educational space» are often used. According to the concepts of Russian scientists E. S. Larin and V. S. Ovchinsky: «digital environment – programs in the form of signals over networks and telecommunication channels for controlling various objects of the physical world by transmitting a variety of information technologies and cyberspace». [<https://russiancouncil.ru/common/upload/WP15Cybersecurity-Ru>].

According to the authors, it has infrastructure, structure and ultrastructure. Human life is inextricably linked with technology, which radically changes the nature of human relations. According to J.Palfrey, the children of the digital age will change market trends, as well as radically change many sectors of the economy, the education system and world politics. In this regard, as you know, there are many problems associated with the need to form a set of social norms, navigation skills in the digital world, a culture of using information and critical attitude to it. Another point is that every person, in addition to social and psycho-youthful status, ethnic and religious affiliation, marital status, property and material status, has a real potential

for socialization from birth to the end of life, as well as the possibilities of cyber-socialization. [https://vk.com/wall-105778016_65].

Scientist V.A.Pleshakov defines the process of cybersocialization as «the cybersocialization of a person as a socialization of personality – a process of qualitative changes in the structure of self-consciousness of a person, as well as as a need-motivational sphere of personality arising under the influence and as a result of the use of modern information and communication and computer technologies».

In the process of cyber-socialization, a person has a number of new, almost cyber-biological expectations and interests, motives and goals, needs and attitudes, as well as forms of psychological and social activity directly related to cyberspace. Based on the pyramid of needs created by A.Maslov, it can be assumed that Internet users find both satisfaction of their actual needs and quasi-satisfaction (imaginary, not real satisfaction). And such a process can lead to several difficulties. Because in the development of each personality, in its subconscious there are its own characteristics:

Firstly, the barriers between the levels of reality, between social and informational phenomena, between psychological and activity are violated. It can be said that a person immersed in a modern information system cannot fully distinguish classical reality from its virtual projection.

Secondly, the barriers between independent activity and future activity with personal experience are not disclosed. First of all, the perception of human interaction and displayed virtual events, phenomena as a virtual experiment.

In the process of interaction between a person and a virtual object, many subtle psychological reactions can occur in the system: individualization of these models, self-measurement, training, thought experiment, virtual learning and readiness for real actions. And the conclusions of such situations have not yet been psychologically fully studied. A new level of information literacy requires a transition to new psychological and pedagogical approaches. They should ensure the preservation of health, promote the mental activity of students, the formation of creative and mental abilities, the development of a holistic worldview and self-awareness of the individual, which will allow them to take a strong place in the information society. However, it would be a mistake to think that the use of new technologies in itself improves the quality of knowledge. In order to effectively use their capabilities, education specialists need to develop, study and actively apply knowledge of cyberpsychology and cyberpedagogy.

Despite the wide variety of information sources and educational technologies designed to transform information into education, it should always be remembered that there is only one way to transform knowledge into digital education: this change is carried out in the consciousness of a person. At the same time, it is necessary to take into account the very intensive human interaction with cyberspace. The reality of our life in the information society is that as a result of this interaction, individual minds, the minds of a person of the XXI century, arise and develop. In this context, the psychological directions of cyber pedagogy raise many questions and require scientific research.

Society is part of a cyber-virtual formation in which the processes taking place are not only controlled, but also controlled with the help of these technologies. First of all, covering such important areas as cyber-virtual education, history, sociology, psychology, pedagogy contributes to the formation of a new paradigm in cyber pedagogy.

Based on the opinion of scientists studying the problems of cyber pedagogy, the following main goals and objectives of cyber pedagogy can be distinguished: creating safe conditions for the formation of a culture of cyber sociality of an individual, optimal (depending on age, social status of a person, etc.) support of this process, providing timely assistance to a person in the process of his cyber sociality. It is known that the goal of continuing education is to fully meet the educational needs of a person, which is a manifestation of his desire for full self-realization and adaptation to the conditions of a rapidly changing world. In such a situation, a person himself becomes an active participant in the educational process.

The dynamic development of society and the depth of informatization of social institutions at the present stage, digitalization of all industries, and other factors require further informatization, transformation and modernization of education. These circumstances led to a change in social values and led to the network identification of a person. Today, a person needs not only new practical skills and theoretical knowledge, but also the possibility of continuous improvement of this knowledge and skills. In other words, humanity must comprehensively develop a culture of continuing education in the context of cyber-socialism throughout its life, as new technologies change the framework of the traditional educational process. Therefore, some positions in pedagogical science that have been developing over the centuries require changes. According to the conducted expertise, based on the opinion of scientists, in accordance with the new changes in the development of the system of continuing education, new concepts and terms are finding their place in pedagogy, psychological science: cyber ontology, cyberspace, cyber sociality, digital educational environment, etc.

It can be said that these concepts form the basis of cyber pedagogy as an innovative field in pedagogical science.

In the conditions of digitalization, the spread of telecommunication and network technologies and teaching aids, the content of the discipline of didactics is significantly expanding. This expansion is carried out in the following areas:

- 1) network and virtual learning;
- 2) self-education;
- 3) organization of the processes of designing, forming and mastering education (fig.15).

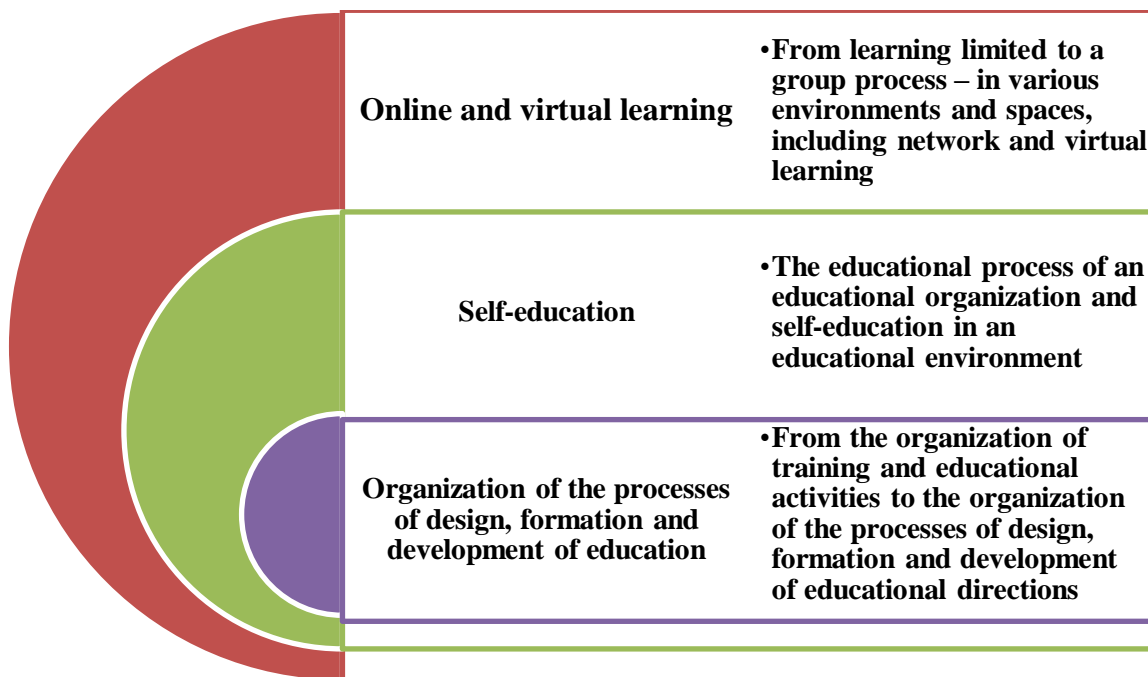


Figure – 15. Directions of cyberbullying technologies

The main means of digital didactics of education and training, ensuring the achievement of the set goal, are the personalized educational process: digital pedagogical technologies and metacyph educational complexes.

Personalized learning process. In the conditions of digitalization, the meaning of changes in the organization of the educational process is to increase its pedagogical effectiveness. This can be achieved, first of all, by individualizing learning – turning a holistic and general educational process for everyone into a set of individual educational directions created taking into account individual educational needs and requests.

Figure 16 reveals the pedagogical requirements for individualization of learning.

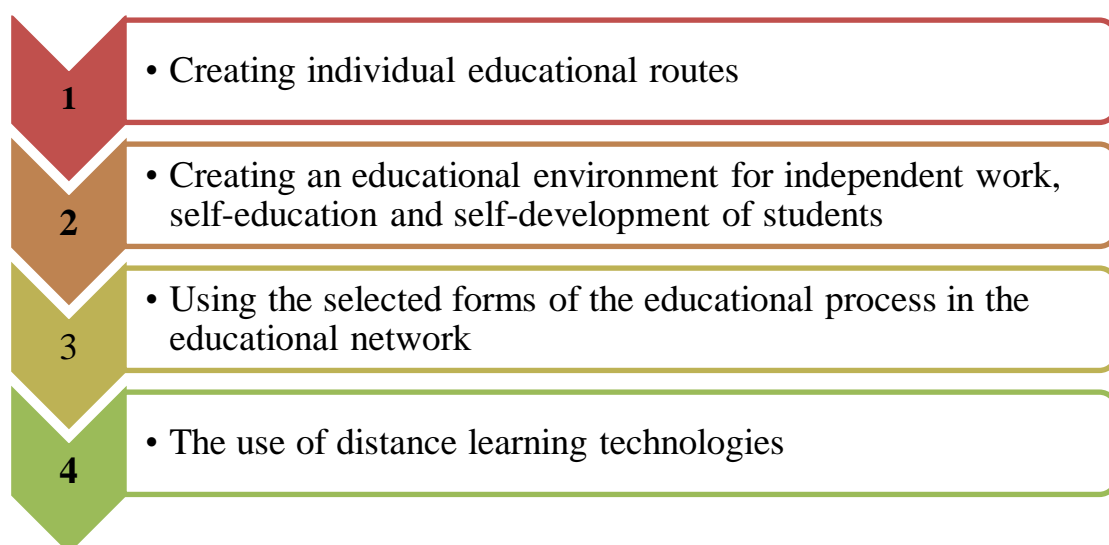
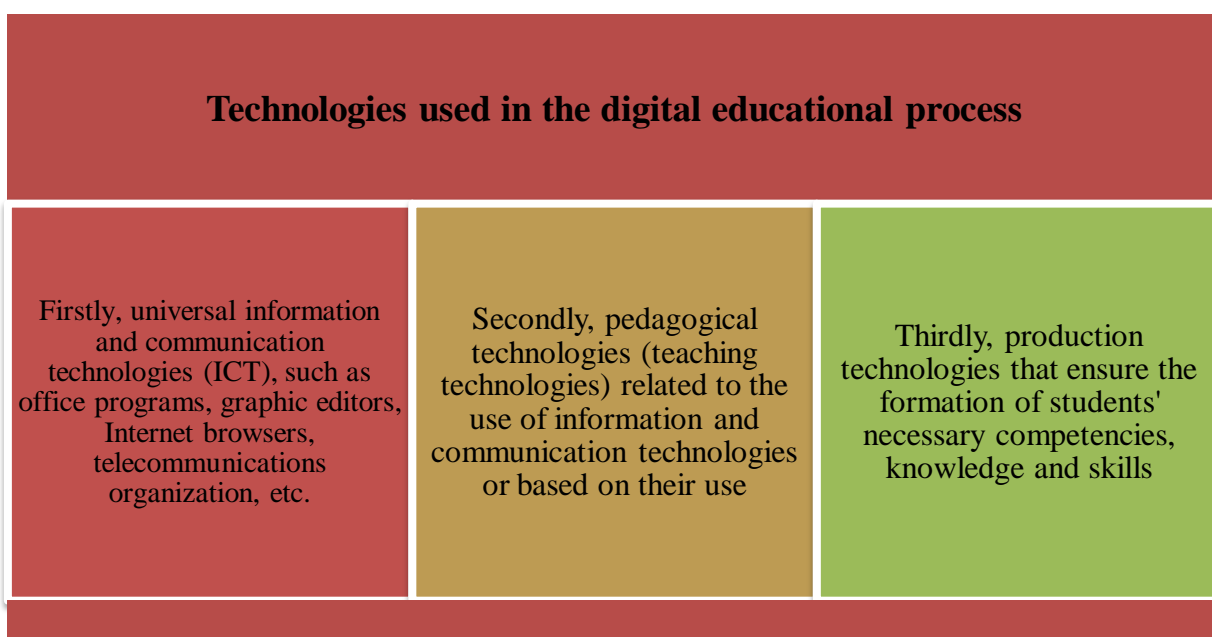


Figure –16. Pedagogical requirements for individualization of training

The general principle of choosing pedagogical technologies for digital vocational education and training is to choose such technological solutions that include the conditions and algorithms for the formation of universal and professional competencies demanded by the digital economy (Fig.17).

Pedagogical technologies necessary to create a digital educational process of education and training:

- 1) technology of distance (online) learning, including the use of adaptive learning systems;
- 2) «blended learning» technology, including «flipped learning»;
- 3) technology of organizing students' project activities, including telecommunication projects.



Figure–17. Technologies used in the digital educational process

Figure 18 reveals the leading functions of the teacher in the conditions of digitalization.

In addition, in the process of digital education, many traditional functions of a teacher lose their significance: «knowledge provider», Informant, interpreter, controller, accusation and «punishment» for non-compliance with requirements, etc.

It is impossible to imagine the modern educational process without a technological basis. It should be designed, calculated at all stages with specific educational, didactic and developmental goals, taking into account the individual psychological and pedagogical characteristics of a particular group and each student.

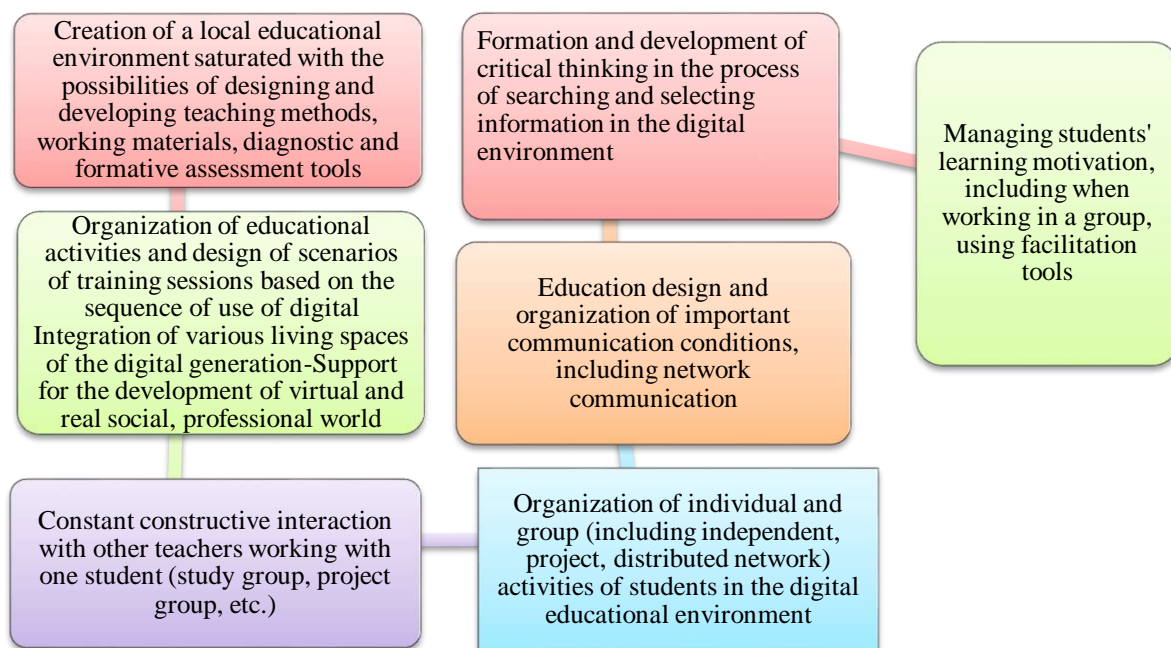


Figure –18. The leading functions of the teacher in the conditions of digitalization

At the present stage, it is impossible to imagine the educational process without information and communication technologies. This can be done by getting rid of the main principle of building information – the principle of «one window», as well as the «go home» control button.

A poster (in German – «plakat») is a type of visual drawing, graphics on a large sheet with a brief explanatory text, performed for propaganda, advertising, informational or educational purposes.

An interactive poster is an information presentation tool that can actively and differently respond to user actions. Interactivity is provided by the use of various interactive elements: links, navigation buttons, text or digital input areas, etc.

Compared with conventional printed analogues, interactive electronic posters are a modern multifunctional teaching tool and provide more opportunities for organizing the educational process.

According to V. E. Steinberg, this is a kind of extended didactic unit, a didactic multidimensional tool provides multi-level work with a certain amount of information at all stages: primary information transmission; processing; compression; management. Unlike a multimedia lesson, an interactive poster can be, for example, multi-level and multifunctional, providing both the study and consolidation of new material, quality control of feedback and assimilation of the information received. [<https://ecsoclab.hse.ru/announcements/551303183.html>].

P.M.Erdniev proposed a pedagogical technology called the extended didactic unit (EDU) for education, the transfer of new information. New knowledge in the use of the pedagogical technology of EDU is transmitted in the form of a system of concepts that form a single whole, combined and generalized on the basis of

semantic, logical connections (Fig. 19). [[https://studwood.net/1064752 /pedagogika /tehnologiya_ukrupneniya_didakticheskikh_edinits_erdniev](https://studwood.net/1064752/pedagogika/tehnologiya_ukrupneniya_didakticheskikh_edinits_erdniev)].

New knowledge in the use of the pedagogical technology of KDO is transmitted in the form of a system of concepts that form a single whole, combined and generalized on the basis of semantic, logical connections (Fig. 19).

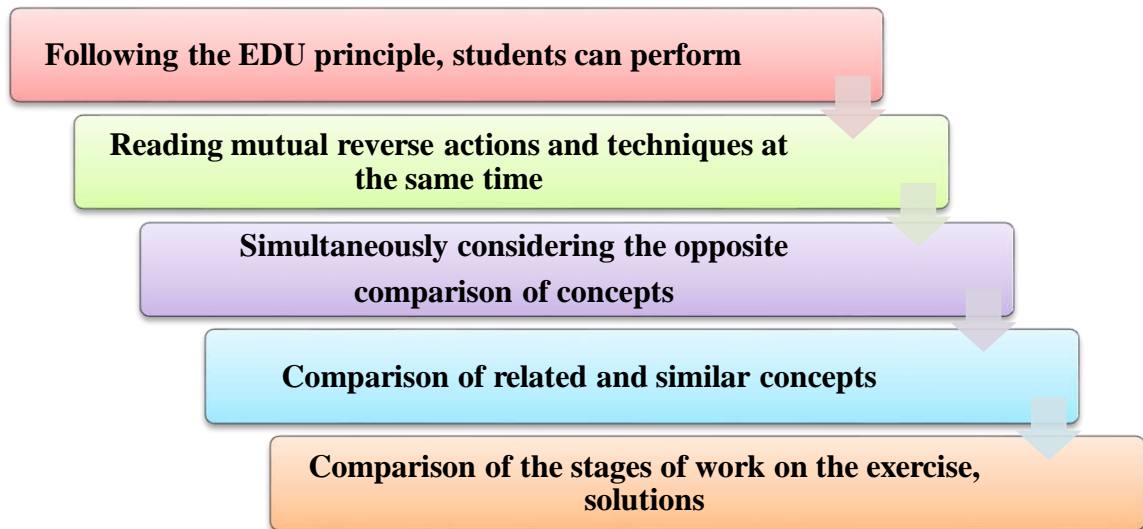


Figure –19. Stages of the pedagogical technology of EDU

Figure 20 shows the elements of an interactive poster.

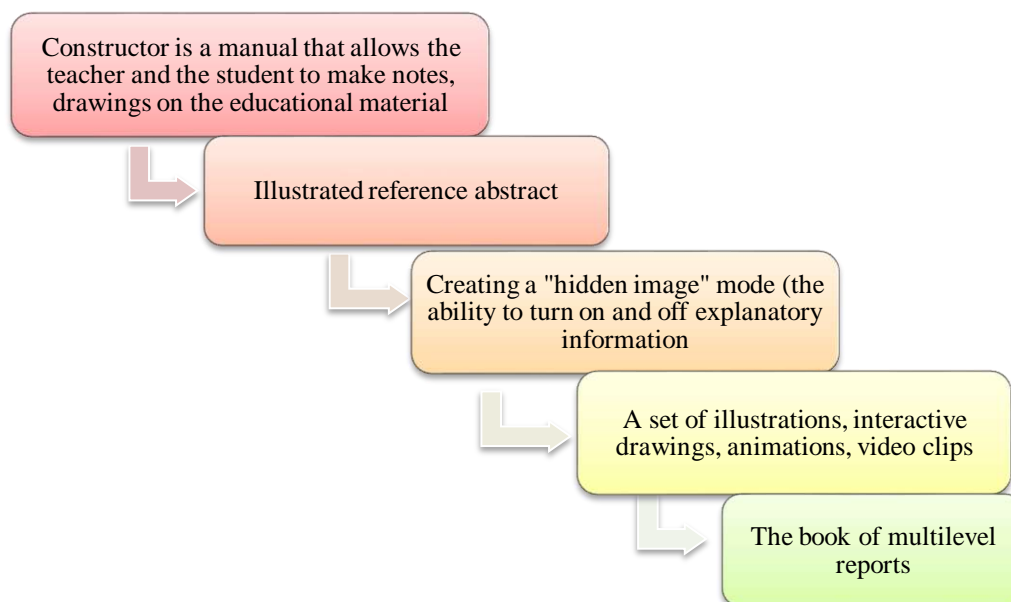


Figure –20. Elements of an interactive poster

The interactive poster can be used in several lessons. If it is necessary to carry out generalization, generalization, analysis, synthesis, classification, etc. operations

with students. The use of such a poster in a generalization lesson would be didactically justified (Fig. 21).

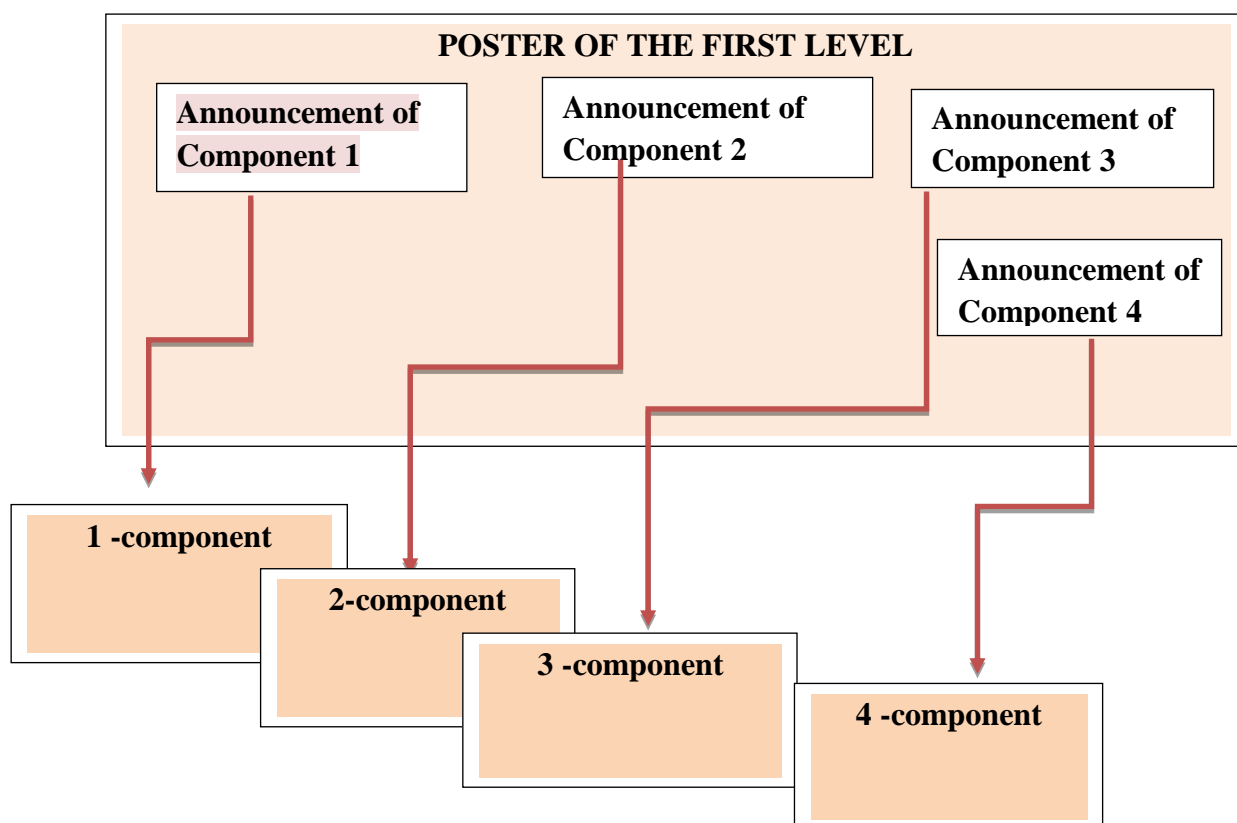


Figure – 21. Poster on the ground floor

An interactive poster such as EDU can provide us with an individual learning pace, a flexible response to the changed situation in the group and, more importantly, a systematic approach to learning.

A structured interactive poster consists of the previous poster and a number of scenes that are subordinate to it. This can be similar to a «menu», which is usually a structured interactive poster. This is the type of structure from which the general contours of a large object emerge. In addition, the individual components of the poster of the first level allow you to get an initial idea of the general content and meaning of a large information block (Fig.22).

An interactive table is several multi-level information blocks, thematically combined, arranged one after another on the slide.

The presentation of the material in large blocks contributes to a holistic and conscious perception of the material, makes it understandable for students to introduce and study a variety of mathematical facts, concepts, their properties, rules, theorems, etc., and also reveals their internal connection with the material.

When studying the topic, the student sees interactive reference posters and diagrams in front of him in the classroom and at home (using the possibility of transmitting information via the world wide web); repeatedly prepares for a written

answer, does homework, prepares for a theoretical test, independently performs one or another part of the task.

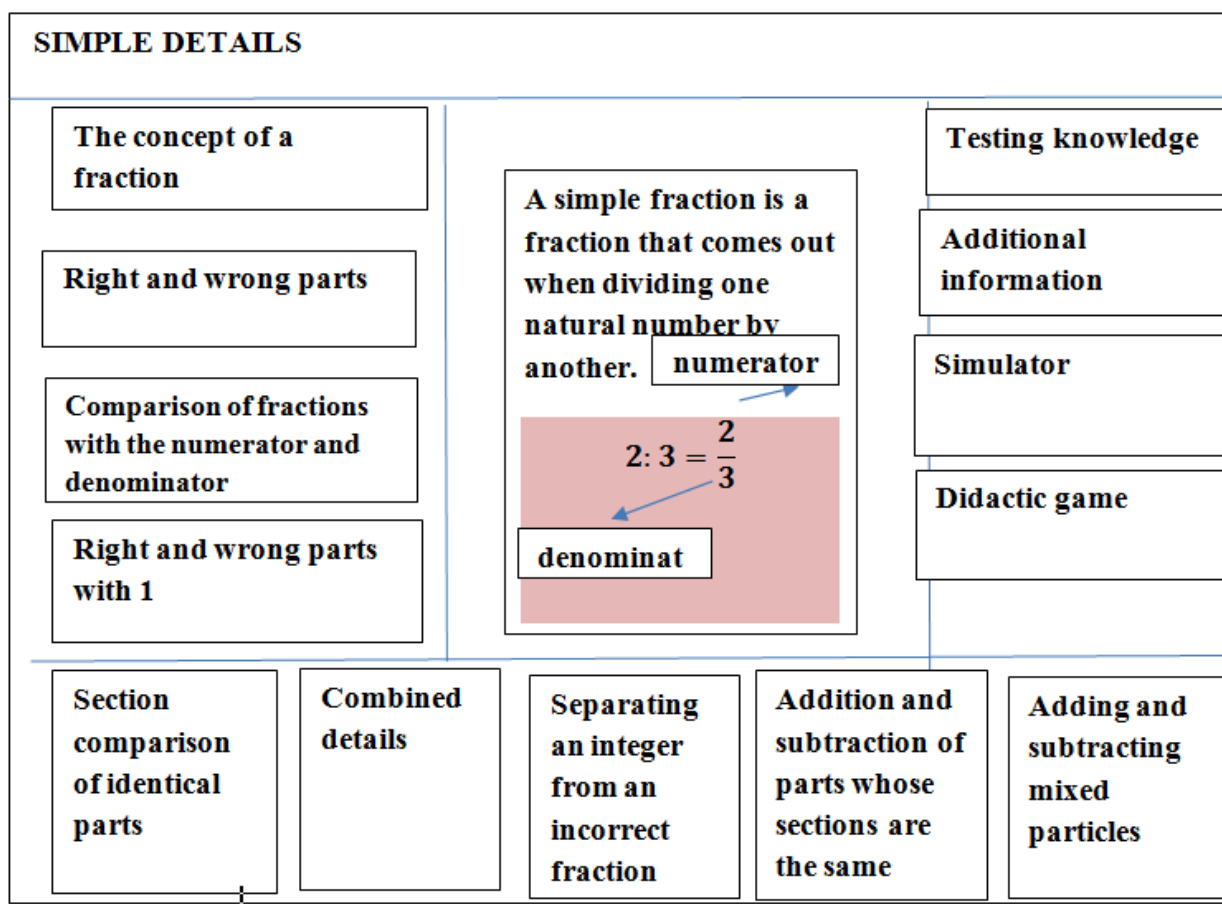


Figure –22. Structural interactive poster on the theme «simple details»

The student often hears how the teacher presents the material to other students, as well as pronounces it himself. Such an organization of the educational process, on the one hand, contributes to the development of all types of memory of the student. On the other hand, it is faster and better to memorize and understand each specific topic. In addition, the use of interactive reference schemes contributes to the formation of information and communication competence of students, supports an interactive mode of work in the classroom and at home, reduces the time for preparing answers, thereby helping to solve the problem of the educational load of students.

Interactive Help Notes - Microsoft Outlook features provide creation and storage of any number of necessary records. The recording mode is analogous to a regular notepad, in which some notes, reminders are created.

Multilevel didactic games are an active form of educational activities organized in the form of educational games that implement a number of principles of the game, active learning and differ in the presence of rules, a fixed structure of gaming activities and the presence of an assessment system.

Interactive infographics. Infographics are a graphical way of presenting information, data and knowledge. He appeared on the pages of foreign mass

periodicals more than 25 years ago. In case of information overload, it becomes necessary to display a large amount of data as briefly and quickly as possible. This is also facilitated by the emerging «screen» culture of modern man. They perceive visualization easier and better than printed text. Experts have noticed that more than five pages of text easily fit into one graphic drawing. A unique, unusual way of presenting information can attract attention faster.

An interactive wall (I-wall) is a vertical projection that has various multimedia properties and provides high image quality.

Interactive channel. There is an opportunity to see an example of an interactive channel at the link: https://drive.google.com/file/d/1aeg3-FI6hzs0i9_Uw4na__BoEWaLZg/view?usp=sharing and <https://time...graphics/ru/line/240152>.

Ready-made resources that are already available on the Internet can be used effectively. For example, a website is offered that you can access by clicking on the link: <https://www.liveworksheets.com/worksheets/ru/%D0%9C%D0%B0%D1%82%D0%B5%D0%BC%D0%B0%D1%82%D0%B8%D0%BA%D0%B0>.

The content of digital educational resources has new properties.

1) advantages of providing educational information and multimedia:

- taking into account the features of the student's admission;
- develop the skill of transferring information from one form to another;
- increased visual capabilities;
- realistic depiction of objects and phenomena;

2) interactivity of content:

- the possibility of nonlinear content study;
- the ability to manipulate objects, change their parameters and model.

3) main features:

- superiority, multilevelness and, as a result, variability of content;
- provision of information at the request of the student, manifestation of selectivity of information, implementation of an individual educational trajectory;
- the use of various combinations of interrelated fragments of content presented in various forms (text, graphic, audio, multimedia), in order to comprehensively cover the studied material;
- implementation of level differentiation of training;
- implementation of the principle of variability.

In modern society, the digitalization of education is in full swing. Interactive methods of digital didactics contribute to the establishment of emotional contact between students, teach them to work in a group, relieve the nervous load of students, increase the sense of security, help to achieve mutual understanding and independent success.

Questions for testing and evaluating knowledge:

1. Comment on the concept of digital didactics.
2. Describe the didactic principles of the digital educational process.

3. What are the main factors in the formation of digital didactics.
4. Classify and study digital pedagogical technologies and teaching methods.
5. To reveal the essence of digital didactics-the basics of building modern teaching methods and strategies.
6. A brief overview of the history of the emergence of Cyber Pedagogy.
7. Comment on the didactic digest of technologies and methods of Cyber Pedagogy.
8. Reveal the ways of using the interactive poster and give examples.

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2. DEVELOPMENT AND PROSPECTS OF DIGITAL PEDAGOGY

2.1 Digital society and the teacher's personality

In the context of the modern fourth industrial revolution, one of the main indicators determining the global competitiveness and economic growth of any state, any country, is the development of digital technologies.

The state program «Digital Kazakhstan», approved by the Decree of the Government of the Republic of Kazakhstan dated December 12, 2017 No. 827, defines the following strategic objectives:

1) digitalization of industry and electric power, transport and logistics, agriculture, internal activities of state bodies;

2) development of electronic commerce and financial technologies and cashless payments;

3) the state - to citizens, the state -to business; "smart" cities; expansion of communication networks and ICT infrastructure;

4) ensuring information security in the field of ICT;

5) improving digital literacy in secondary, technical, vocational, and higher education;

6) improving the digital literacy of the population (training, retraining);

7) development of technological entrepreneurship, startup culture and research competence;

8) attraction of "venture" financing, etc.

In addressing the relevance of the formation of demand for innovation, the leading role in ensuring the transition to the knowledge economy, carried out in connection with the development of human capital, is played by the personal development of teachers in a digital society.

The XXI century is the age of digital technologies, as the fast and information world is changing people. The task of the teacher at this moment is to master this speed, the skill of choosing the educational material that would be the most interesting and understandable to him. After all, child psychology can be different - someone is inclined to scientific research, someone to practical activity. Therefore, the teacher should now choose from the available information resources those educational resources that a particular student needs and interest them in independent learning.

V.I.Blinov, I.S.Sergeev, E.Y.Yesenin, guided by the need for a digital educational environment in the implementation of the concept of digital education in its development, propose a definition: «a digital educational environment is a set of conditions and opportunities for learning, development, socialization and upbringing of a person».

The amount of information in digital education is very large, and even students can access this information more than a teacher. Therefore, the role of the teacher should change not only in the direction of education, but also in a different way. The teacher must have a perfect command of the activities of the organizer, the conductor of the educational and learning process for each student. If so, he will make it clear

what each student needs, offer new formats of education, offer to choose textbooks, educational and methodological complexes, information resources. It is known that this applies, of course, to all educational organizations. In digital education, teachers should have a high ability to work with the evolving digital environment.

In recent years, much attention has been paid to the question of the role of the teacher in the educational process due to the change in technologies used in education. In addition, it is known that this problem is directly related to changes in the digital society. Computer or digital technologies can only be used as an additional tool in the hands of an experienced teacher. It is known that no technology works without a teacher.

Digital tools help to involve all students in the learning process, including those who are not confident in their abilities, usually do not show initiative. Online systems allow you to receive systematic feedback, including messages (opinions) from students about the availability of educational materials and assignments. Data analysis allows the teacher to easily and quickly identify the difficulties of each student and provide timely assistance, identify places where they compete, i.e. easily adjust the work of each student in the group.

Digital tools help educators achieve their educational goals. Today it is possible to access information quickly, every teacher should know his experience, his outlook on life, his priorities, responsibility for the result of his activities. A real teacher has qualities that distinguish him from other people. He sees the best in another person, he enlivens the students and gives them intelligence, kindness and love. A person who came into this world with one mission in this profession, which remains a role model, is a person who helps him find himself and his place in a rapidly changing world. From this point of view, the words "teacher", "student", «digital society» are always accompanied in consonance, since the mission that the teacher performs forms the personality of the student of the digital society.

The scientist E. Abylkassymova: «In the process of teaching a teacher, it will be customary to use widely various sources of information, including information educational resources of the Internet. Students get access to various information data in all corners of the world via the global Internet, can collaborate with students from other countries on topics of interest to them. This encourages them to look for additional information, evaluate the results they have obtained. The teacher becomes a leader, coordinator, consultant, who addresses him not by position, but as an authoritative source of information, an expert». [A.E.Abylkasymova Blinov V.I., Sergeev I.S., Yesenina E.Yu. The main ideas of the didactic concept of digital vocational education and training. – M.: Publishing House «Pero», 2019].

To date, the main goal of informatization of education in the Republic of Kazakhstan is to improve the quality of national education through the creation of a unified information environment based on the use of modern digital technologies. The implementation of digital literacy in a digital society will allow systematically developing digital competencies of the younger generation and implementing a digital economy strategy. Global Telecommunications help to develop critical thinking, logic, expressing a point of view. Therefore, in digital education, teachers

should be ready to use information from the Internet in a differentiated and effective way to develop students' logical thinking.

The work of every teacher in a digital educational environment requires the ability to use all information and communication technologies in everyday work, starting with e-mail and the Internet and ending with other electronic resources. This will greatly simplify the teacher's activities in the field of information retrieval, preparation of various documents, improve the educational process and will improve professional qualifications, self-education.

Today, in digital education, if you look at it in a meaningful way, digital literacy comes to the fore. Digital literacy is a set of knowledge and skills necessary for the safe and effective use of digital technologies and Internet resources. Thus, digital literacy is the use of Internet services when communicating with a pedagogical group for digital consumption, information retrieval and processing, evaluation, analysis and synthesis, as well as for making constructive pedagogical decisions (Fig. 23).

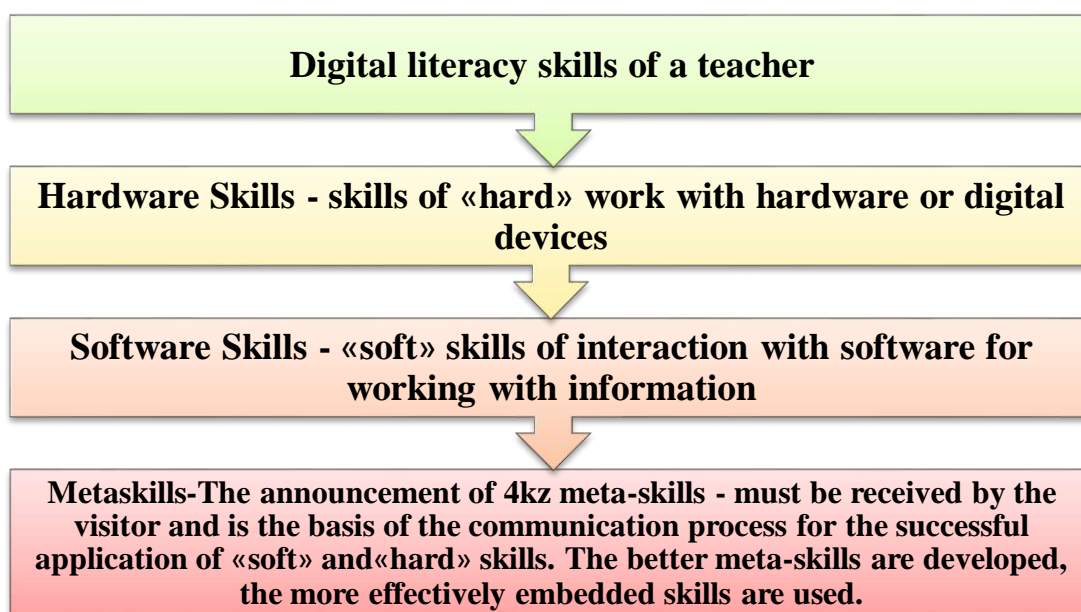


Figure – 23. Teacher's Digital Literacy Skills

Digital competence of a teacher is a set of skills for using information and communication technologies and digital media in the process of setting and solving tasks related to obtaining knowledge necessary for processing and working with information, learning, socialization and expanding available opportunities.

The digital education system will be conducted in three main areas: digitalization of the educational process; digital educational content; digitalization of education management.

Digitalization of secondary schools in Kazakhstan is one of the main trends in the process of its reform. The vision of the future schools is largely connected with the gradual transition of all subjects to the cloud education system. Here we are talking about online readings and virtual laboratories, open educational content, flexible and individual approach to each participant. Students can work together on

their homework online. School libraries have become information and computer centers.

The learning process will be linked to the ID of each student, which will allow forming grades and assessments (Fig.24).

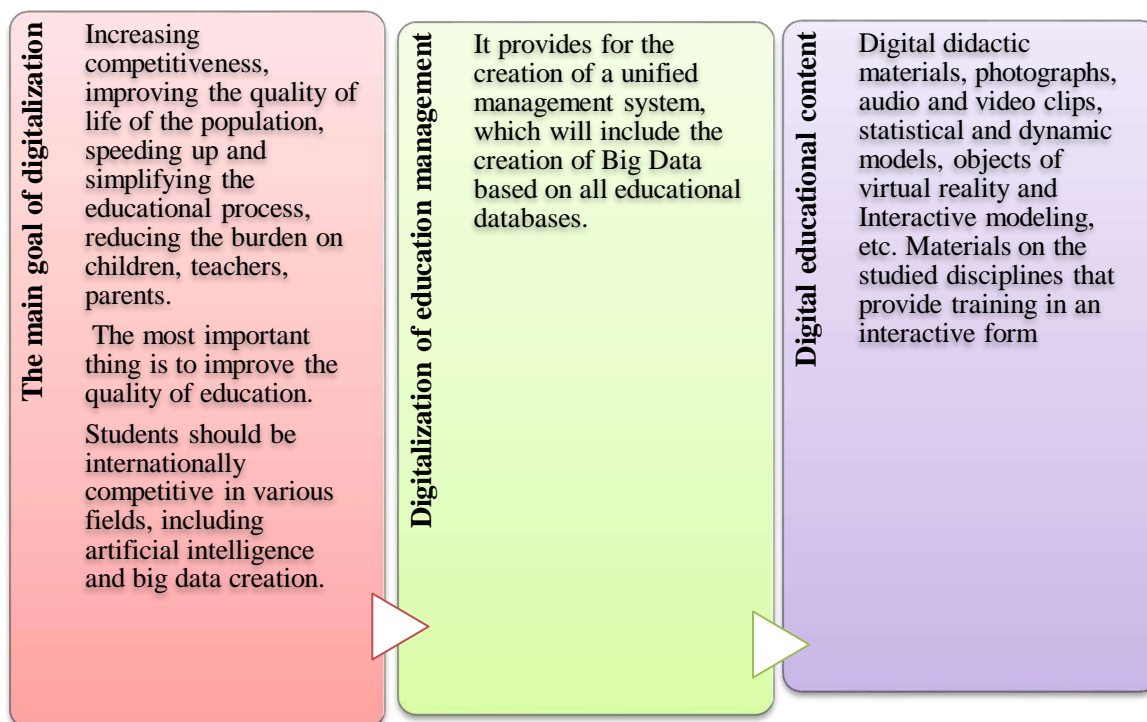


Figure – 24. Digitalization of education management

The information culture of the individual implies the transition to the fundamental operational foundations of thinking, where each student should not only be guided by information, modern information technologies, but also be able to use it effectively, use the Internet, the global information system.

Today, the problem of mixed education, i.e. the influence of the ratio of online and offline learning, is actively discussed in the field of education. Scientists note that «it is important not to replace offline education with online education, but a reasonable balance between classical dialogue and the possibilities of using modern digital technologies in the education system».

Therefore, teachers work with various online platforms: Microsoft Teams, Zoom, Miro, Choister, Googl dos, Wrike, Mash, Discord, Skype, etc.

According to N.Luhmann, it is important to promptly teach both teachers and students (in a certain sense, parents) new forms of interaction. In this regard, such moderator competencies as control of temporary formats of educational communication, implementation of the plan, schedule, coordination of meetings, distribution of flows, documentation will be in demand. The teacher should help students not only to orient themselves in the learning situation, but also to maintain the learning goal, to form results at control points.

Therefore, it is very important to create text educational channels for the moderator teacher (everyone reads, but only the teacher writes) and a free

communication channel (for informal communication). An important component of the work of a moderator teacher is the formation of communication rules, monitoring their implementation, encouraging students to evaluate their activities. Collective reflection of students in online groups is a mandatory procedure for correcting the educational process. This helps motivate students through feedback.

The formation of a «consulting environment for students» in the online mode is an important component of modern education. At the same time, it is obvious that formal group subject consultations need to be supplemented with individual study. Over time, reflection and individual consultations on subject areas become a common online learning procedure. In addition, it will be a teacher-facilitator who will be able to find gaps in the understanding of the subject, find contact with the student, sort out his problems, choose the pace of work. Of course, the digital environment and the means of interaction on the Internet are significantly changing the educational space: they contribute to its openness, excellence, accessibility, multiculturalism, expand the range of pedagogical impact. Therefore, the global educational space requires a lot of time and moral expenses from the teacher.

As O.L.Petrenko notes, such means can be open educational technologies, which, having a certain structure, pave the way for teacher variability. One or another role is used depending on the pedagogical task and organizational goal. The strength of the competence approach lies in the flexibility and variability of the use of roles. The teacher performs such roles as moderator, tutor, facilitator, coach with developed competencies.

Scientists Polat E.S., Bukharkina M.Yu., Moiseeva M.V., Petrov A.E. and others pay attention to the competencies and functional roles of the tutor, moderator. However, the modern needs of the educational process (online, distance learning) imply a revision of the set of competencies and, accordingly, the roles of teachers, the need for their further integration and expansion [Polat E.S., Bukharkina M.Yu., Moiseeva M.V., Petrov A.E. *New pedagogical and information technologies in the education system* / Ed. Polat E.S. - M.: Publishing Center «Academy», 2001. - 272 p.]

In accordance with the requirements of the new educational standards, a teacher should be able to build an educational process using all the possibilities of the digital educational environment. The digital educational environment of an educational organization is a complex of information educational resources, including digital educational resources, a set of technological means of information and communication technologies, a system of modern pedagogical technologies.

The teaching and learning process are organized by the teacher as a result of joint activities with students. It should be remembered that the choice of teaching and upbringing technology depends on many factors: the age of students, their capabilities, the readiness of the teacher, etc. the nature of the interaction of participants in training and the educational process is manifested in the principles of pedagogy of cooperation. The main thing: democracy (freedom of choice, equality); openness (freedom of criticism); alternative (abundance of ways of activity); dialogic; reflexivity (knowledge of goals, content, ways of activity).

The roles of the participants will be different: the teacher moves from an explanatory and illustrative teaching method to an activity where each student becomes an active participant in motivated conscious learning activities. The teacher acts as an organizer and coordinator of educational activities. One of the effective means of promoting cognitive motivation is the creation of problematic situations in the classroom, in which the student receives knowledge in the course of his independent work.

In order to form universal educational actions, the teacher uses innovative pedagogical technologies: information and communication technologies; technology of problem-based learning; modular technologies; multimedia technologies, digital technologies, technologies for the development of critical thinking, etc.

The task of the teacher is to give each student the opportunity to prove their point of view. In this regard, the teacher needs to use forms of work in the lesson that create an atmosphere of increased interest, emotional mood and effectively reveal the subjective experience of the student. The main means of achieving the goal is a lesson. It is part of the training and educational process, in which all the main issues of education, upbringing and personal development are implemented. Problematic issues, motives, discussions are the basis of activity in the lesson.

In the context of the educational process in the digital educational environment, such functions of a teacher as control, correction, and training in standard skills can be carried out by means of ICT, which significantly facilitates his professional activity. The use of digital technologies increases the interest of all participants in educational relations.

Computers, laptops, tablets and mobile devices may seem to exist always and everywhere: both at school and at home, the gap depending on socio-economic and geographical conditions still persists. Many rural families cannot install broadband at home or buy a smartphone. Learning platforms that will be in demand today are becoming available only to students with limited possibilities.

Finally, a digital school is not only the implementation of Internet technologies, mobile classrooms, interactive panels, whiteboards, projectors and other technological objects. First of all, it needs teachers who have knowledge in the field of digital and information and communication technologies, who are ready and able to apply new technologies in the classroom and in other aspects of their professional activities, who know the basics of working on the Internet on various platforms, ready for constant changes, training and self-education.

At the same time, the process of teaching and learning, organized through digital and information technologies, forms new thinking among students, pushes them to search for systemic connections and patterns, which ultimately contributes to the formation of their professional potential.

In the modern information society in the digital educational center, along with the search, accumulation, analysis, processing of information and electronic resources that contribute to the self-education of students, it is necessary to master the ways of using electronic platforms when performing collective, group tasks, the use of digital technologies.

Now the working population of the country is fully mastering information technologies in all spheres. As part of the implementation of the state program «Digital Kazakhstan», the stage of improving digital literacy of the population has started. Digitalization of education in Kazakhstan is one of the main trends in the process of its reform.

The phrases and concepts «Z generation», «digital generation», «network generation», «digital aborigine» (digital natives) are used today in everyday life to define the generation of children and youth socialized in the context of digital technologies in educational and professional activities. Questions arise about the extent to which this concept has been proven in the scientific field. As for the network or digital generation, there are intense discussions about their features, both public and professional.

In the context of the third modernization, it is necessary to provide a qualitatively new level of training of teaching staff adapted to the global competition in the field of knowledge. Adaptation to new conditions involves a process of constant change, within which the issue of digitalization of education is important.

In their work «The Era of «Greenfield» in education», D.Konanchuk, A. Volkov believe that the modern world is on the threshold of a new wave of innovations that can seriously change the existing «educational landscape» [Konanchuk D.,Volkov A. The era of «Greenfield in education». Access mode: [https:// www.skolkovo.ru /public/ media/ documents /research /education _ 10_10 _13.pdf/](https://www.skolkovo.ru/public/media/documents/research/education_10_10_13.pdf/)].

The era of internetization, which began in 1993, characterized by the process of transition of education from a centralized learning model to network interaction has radically changed the whole world. The educational system has become a flexible environment that allows students to build their own individual educational trajectory.

With the introduction of modern technologies in the learning process, the educational opportunities of institutions have significantly expanded, new learning formats have begun to appear. The so-called «digital generation» has appeared Today in modern schools and universities, a new generation of teenage children is being trained, who cannot imagine themselves without the Internet. The question arises, is it necessary to change the theories and teaching methods? What are the new training systems?

Now representatives of different generations live and work both in the world and in Kazakhstan. Scientist D.M. Dzhusubalieva notes the following generations:

- 1) generation (born 1900-1923);
- 2) the silent generation (born in 1923-1943);
- 3) the Baby Boomer generation (born in 1943-1963);
- 4) Generation X (born in 1963-1984);
- 5) Generation Millennium or Y (born 1984-2000);
- 6) generation Z (born in 2000), which is being trained and will be trained for the next 10-20 years. [Dzhusubalieva D.M. Transformation of education in a digital society//Materials of the International scientific and practical conference «Actual problems and prospects of modern pedagogical education» dedicated to the 70th

anniversary of the Doctor of Pedagogical Sciences, professor, academician of MANPO K.K.Zhampeisova.-Almaty: Ulagat, 2022.- p.36].

Therefore, teachers need to take into account the peculiarities of generation «Z».

According to the definition of the famous Kazakh scientist D.M. Dzhusubalieva, Generation «Z» (Generation Z, Generation M, Net Generation, Internet Generation) is a kind of transitional generation from the twentieth century to the 21st century, which is still influenced by the Millennium generation (Y), but at the same time it forms its own features; this is the generation of modern children who were born with a computer mouse in their hand [Dzhusubalieva D.M. Formation of digital competence of future teachers of foreign language education during university studies. Collection of materials of the Round table dedicated to the 150th anniversary of Akhmet Baitursynov and the Day of Education Workers «Modern language education: traditions and innovations», April 15, 2022, KazUMOiMYa named after Abylai Khan, Almaty, 2022, p. 10].

The development of digital technologies has made them a generation that grew up in a digital environment - they get almost all the information from the network. Unrestricted access to information gives them confidence in their views, although the correctness of some of them is questionable. They can stay online for days: play online games, communicate with each other online, talk about their lives in blogs, watch shows and movies. They prefer to communicate more in a virtual environment than in person. All this should be taken into account when preparing future teachers in the process of their studies at the university. In this regard, in order to meet the digital world, the digital economy and the needs of the market economy, new requirements are imposed on modern students - to be flexible, an innovator, a digitally competent specialist. Highlighting the pedagogical aspect of this problem, we can talk about the conditions for effective interaction between the teacher and students who are in the information and educational space of the university. One of such conditions for a teacher is knowledge of the characteristics of the younger generation and taking them into account when building the learning process.

A representative of the digital generation has socially and professionally significant competencies that are in demand in a digital society. Digital («advanced», «clever», «SMART"») technologies form the core of the stage of modern technological development and retain their dominant role in the foreseeable future. Currently, there is a deep convergence of digitalization – digital technologies with material and socio-humanitarian technologies and experience, including education. It is important to understand the place and role of digital technologies in any modern field of professional activity.

The didactic nature of many digital technologies (interactivity, multimedia, hypertext, personality, subculturality, etc.) allows you to build a purposeful teaching and learning process taking into account the peculiarities of digital society.

According to research by foreign scientists, the rapid transition to distance learning shows that learning is accompanied by requests on how to answer recipients for training and how to teach new material.

From these explanations it follows that personal development in a digital society is characterized comprehensively and, most importantly they realize that this type of personal competence is a necessary quality for every person living in the modern information society.

Pedagogical literacy can be understood as the fact that a teacher has certain knowledge related to this field, owns digital education content, owns digital educational resources, or can effectively use digital technology platforms within his specialty. In another way, it can be called digital competence.

With the development of society, theory and practice of education, the number of requirements for a teacher also increases. If twenty years ago such qualities as the diagnostic activity of a professional – search, creativity, innovation - were evaluated by a teacher, today the objective reality is the mastery of digital literacy by a modern teacher, knowledge of digital technologies, methodological techniques for introducing devices into the educational process, etc.

In accordance with the requirements of the new educational standard, a teacher should be able to build an educational process using all the possibilities of the digital educational environment.

The digital educational environment of the educational organization is a complex of information educational resources, including digital educational resources, a set of technological means of information and communication technologies, a system of modern pedagogical technologies.

The educational process in the digital educational environment has advantages over the traditional learning process:

- increasing the choice of means, forms and pace of learning of educational directions;
- providing access to various information;
- increasing the interest of students in the subjects studied through visibility, interactive presentation of educational material;
- increase motivation for independent learning, development of critical thinking;
- development of educational initiative, abilities and interests of students, etc.

The learning process is organized as a result of the joint activity of the teacher with the students. At the same time, it should be remembered that the choice of teaching and upbringing technology depends on many factors: the age characteristics of students, their capabilities, readiness, as well as the readiness of the teacher himself.

The nature of the interaction of participants in the educational process is manifested in the principles of pedagogy of cooperation. The main ones include:

- democracy (freedom of choice, equality);
- openness (freedom of criticism);
- alternativeness (multiplicity of ways of activity);
- dialogue;
- reflexivity (knowledge of goals, content, methods of activity).

The roles of the participants will also be different: the teacher moves from an explanatory and illustrative teaching method to an action-based method, where each child becomes an active subject of motivational-conscious educational activity. The teacher acts as an organizer and coordinator of educational activities.

Features of the digital generation. The significant gap between the digital generation of education needs to be taken into account in education. On the one hand, representatives of the digital generation of teachers find it difficult to integrate digital technologies into the principle of education; on the other hand, the unwillingness of the digital generation to integrate into the principle of digital education is manifested.

The features of the digital generation (perception, memory, thinking, motivation, behavior patterns, life expectancy, worldview) determine the psychological and pedagogical features, principles, ways of forming the content, forms and methods of digital didactics. It is important not only to understand the negative impact of digital technologies on the process of development, socialization and upbringing of «digital children», but also to know the high characteristics of the digital generation in order to rely on them on the educational principle of the digital generation (Fig.25).

At the same time, the importance of network socialization as a factor of personality formation is sharply increasing for all representatives of the digital generation. To give an opportunity to pedagogically manage the principle of network socialization, which at the present stage is spontaneous.

The root cause of the identified problems is the phenomenon of «digital street child», neglect, i.e. the transfer of the child from the first years of the parents' life to the «outsourcing» of digital gadgets (partially or completely), which creates the illusion of constant employment and satisfaction of the child. In these conditions, there is a «control takeover» based on the principle of socialization and upbringing of such children: in addition to the family and other traditional institutions, active (in many cases aggressive and antisocial) agents of the influence of the Internet environment move to the development of the child.

Some parents retain traditions of direct communication with their children, in addition, they have experience of sharing the resources of the digital environment, early acquaintance of children with digital gadgets does not greatly change their development.

The problems of education arising in this regard are primarily related to the need to adjust certain features of representatives of the digital generation. These features are not a lack of personal qualities, but complement the «gaps in social competence» with purposeful pedagogical activity («gaps in knowledge») (Fig.26).

Among the digital generation, the differentiation into «laggards» and «developed» is especially noticeable. Among the latter, a new type of students with university independence has appeared, focused on self-education, self-expression and self-development, where possible-independently forming an educational orientation, in some cases combining training, work and personal development.

Representatives of the digital generation («generation Z», «processor children», «tablet children», «baby chips», digital natives – «digital residents») are characterized by:

From the point of view of cognitive development-mosaic thinking («clipo»), lack of attention (according to data (can focus on one subject for no more than 8 seconds), inability to read and understand large texts, limited vocabulary, mixing of real and virtual space («changeable picture of the world»), poorly developed creative imagination, « reversibility of life»ghost

From the point of view of emotional and volitional development-impooverishment of sensory experience, simplified reflection of reality, perception of real life as «too uninteresting»and «too slow», impatience and the need for immediate reward, systematic disability

From the point of view of social development-infantilism (a balance between developed intellectual and social and personal development), individualism, belief in its uniqueness, the need for life decreases, sociability, unwillingness to cooperate, attention to one's inner world, hyperpragmatism and hedonism, vague and unstable moral and ethical ideas

In general, the leading role of network socialization in the process of personality formation; as a «reference group» at all stages of online growth, sets left-wing models and forms social trends

Figure – 25. Characteristics of representatives of the digital generation

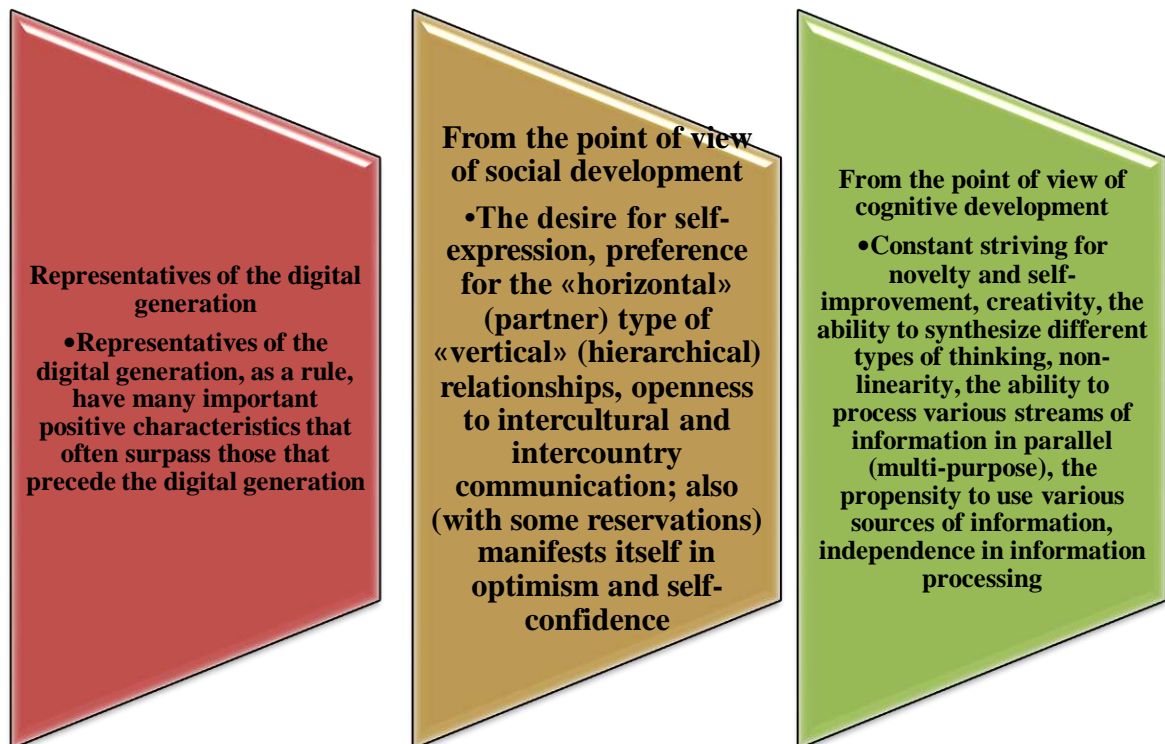


Figure – 26. Features of representatives of the digital generation

In general, the strategy of working with representatives of the digital generation should be based on the fact that it is almost impossible to integrate them into the traditional educational principle. Its essential transformation is necessary, the result of which is the creation of a new, digital educational principle. One of the socio-psychological barriers preventing the solution of this problem is that many teachers who have successfully passed the stage of adaptation to digital technologies and successfully use digital tools outside of professional activity retain their habitual belief that their professional and pedagogical activities should be of a traditional (digital) nature.

Questions for testing and evaluating knowledge:

1. Describe the role of the teacher in the digital world. Discover the face of a teacher in the digital world.
2. What is the role of the student in the digital world? Discover the student's appearance in the digital world.
3. Digital education system prove your opinion about three main directions: digitalization of the educational process, digital educational content, digitalization of education management.
4. Conduct a SWOT analysis of personal development and formation in the context of digital pedagogy.
5. Create a poster on the topic «Digital generation».
6. Write an essay on the topic «I am the digital generation!».

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2.2 SMART Education in the Information Society

Education is a strategic resource, intellectual capital, achieved and self-developing by the state. This is due to the fact that education is defined as one of the most important priorities of state policy, the purpose of which is «to achieve quality education in the field of education, in accordance with the requirements of the development of economic innovations, the needs of modern society and every citizen».

Smart - (Self-directed, Motivated, Adaptive, Resource free, Technology embedded) consists of the words: personality, motivation, adaptability, free access to resources, use of technologies based on oriented education. Smart education is self-directed, stimulating, flexible, technological learning based on self-learning, motivated, flexible, enriched with resources and based on technological learning methods. In accordance with the new educational paradigm, from the point of view and the ultimate goal of the Smart education strategy is to promote the development of creative, global human capital through a "class revolution", which includes the content of education, teaching and evaluation methods, and changing the educational environment.

The activity of teachers aimed at studying the content of the discipline and mastering ready-made methodological developments is associated with the established practical skills of working with teachers who have difficulties adapting to new conditions, mental and digital educational resources, electronic didactic materials, means of communication (social networks, chat, forum, E-mail, etc.).

According to V.P. Tikhomirov, «Smart is a society that needs a new development paradigm, new Internet capabilities and specially trained people who create new knowledge». The concept of Smart education: adaptive environment of continuous development and acquisition of knowledge, skills and abilities by students in the interests of society and the state. The main idea of smart education is new sources of knowledge and recognition of technologies that are used along with

traditional lectures, etc. [Tikhomirov V.P. The world on the way of Smart Education: new opportunities for development// Open education.-2011.-No.3.-pp.22-28].

Smart education is a creative educational environment that unites the efforts of professionals. Activation in the assimilation of world -class knowledge requires a teacher to modernize the education system and solve problems in the conditions of creating a modern new Kazakhstan.

Smart education is a direction that includes a complex relationship of all educational processes, as well as methods and technologies used in these processes. Knowledge sources require students to work not only in groups or in an electronic environment, but also at any time and anywhere in the world in the Internet space.

Smart education: the basic principles of the organization of the educational process.

Rapidly developing information and a sustainable society allow us to create new virtual relationships: new smart technologies (computer programs, intelligent educational applications, multimedia) based on the educational environment, as well as smart devices (smart board, smart screen), etc.

Smart technologies, smart devices, and Internet resources have virtually unlimited possibilities: an integrated intelligent virtual learning environment is created for each of its members. In many countries, Smart education is already a standard method of teaching in the education system, and in our country this approach to education is just beginning to appear.

The president of the International Consortium «Electronic University» V.P.Tikhomirov defined: «Smart education is standards, agreements and technologies according to which educational institutions and the teaching staff of the association carry out joint educational activities on the Internet on a common basis».

Modern ICT and Internet resources implemented with the help of Smart Learning are becoming more and more common information tools today. The educational process is focused on the student, is carried out continuously, including using the means of a professional in a professional environment. For continuous changes and development of motivation and requirements of students, it is necessary to master new knowledge. The modern smart society and its «lifelong learning» approach everywhere points to the need for education on the principle of «education in a place convenient for the listener», i.e. it is necessary to implement an important principle-education. Internet resources are characterized by the availability of a large amount of educational Internet content for an open user, an understanding of the need to obtain accessible information and improve knowledge. However, the training itself, as an electronic application, as a target process, requires educational materials, methodological complexes, smart-learning is provided by a social and information association and is carried out by students and teachers through information and communication technologies in an integrated information environment.

Smart-learning is based on five elements stemming from the abbreviation Smart:

- 1) «self-directed» – self-control;

- 2) «motivated» – motivated;
- 3) «adapted» – adapted;
- 4) «resource enriched » – enriched with resources;
- 5) «technology – embedded» - embedded in technology.

S. Jang describes these elements as follows:

1) Self-management «characterizes the change in the roles of students as learners and the transformation of teachers from distributors of knowledge into teaching assistants (mentors)». To do this, an online assessment system, performance assessment and self-study will also be introduced;

2) Smart-learning «argumentatively» emphasizes how it stimulates students to show interest in learning. Smart-learning pays special attention to teaching and learning methods that promote creative problem solving and process-oriented personal assessment. The educational practice of students goes from theoretical educational practice to practical educational practice;

3) Continuing education through an «adapted» individualized education system and an individual education and training system. Smart training increases the desire for career growth in the future. It also helps educational organizations to become a place that supports individual learning according to the levels and abilities of students;

4) Describes the support of various teaching and learning materials «enriched with resources». Smart-learning provides free access to a wide range of content created by public and private organizations and individuals in the field of education, expands the overall use of domestic and foreign educational resources and promotes collaborative learning through content distribution platforms;

5) The use of new information and communication technologies «embedded in technology». Smart-learning allows students to learn using information technology at any time and in any place. An educational environment is being created that encourages oriented learning of students and students are offered various teaching methods adapted to their chosen areas of interest. Smart education is considered the most progressive stage of changing education with the help of a new act. According to the researchers, intellectual education is undoubtedly an important prospect for the modernization of the education system, aimed at bringing education in line with the requirements of the modern world and creating an education system undergoing a technological revolution. Numerous studies confirm the effectiveness and attractiveness of smart learning.

This structure shows the three main elements of smart learning:

- 1) smart environment;
- 2) smart pedagogy;
- 3) smart-learner.

Smart learning focuses on the ideology of striving for a better education and, therefore, logically turns into smart education that meets the needs of smart pedagogy as a methodological problem and smart learning environment as a technological problem.

Smart pedagogy can have a significant impact on the environment. Smart pedagogy and smart environment contribute to the development of smart learners.

Studying the structure of Smart education, one can make sure that there are different interpretations of the concept of «Smart learning», but they have a lot in common: smart learning is defined as an independent, reasoned, adaptive model of the educational process, enriched with information resources and integrated into modern educational technologies. In addition, smart learning offers a paradigm shift in the ways students access knowledge. It is aimed at ensuring the educational process using modern smart technologies to fully prepare students and teaching staff for a rapidly changing world.

Using the Smart model, it is possible to describe how digital technologies affect learning and teaching.

The smart model consists of four stages (Fig. 27):

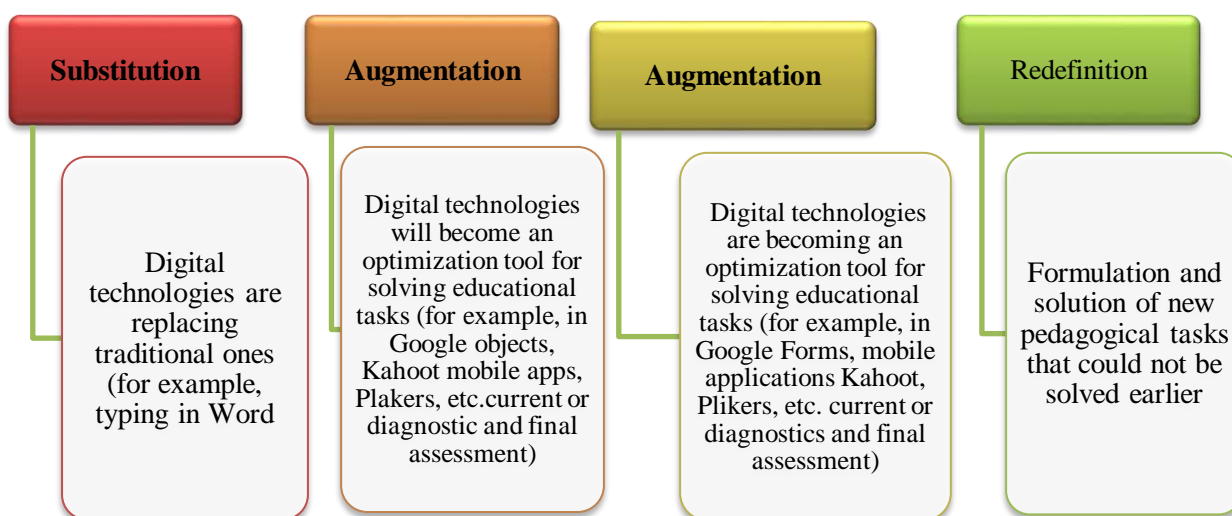


Figure –27. Stages of the SMART model

Smart in education is possible only through the sharing of content in the development of the concept of all universities. General development and operational («repositories» of information) educational content – «electronic twinning» is carried out on the basis of smart education through technology-based universities. The advantages of this approach are obvious: the university teacher does not need to study independently - the content of training from scratch-updating is required only when working with general material. For the effective use of smart educational technologies on the part of the employer, it is necessary to develop special training programs for university graduates, create seminars and master classes of innovative content.

For individualization and adaptation of learning based on smart technologies, learning contributes to the realization of internal potential through personal identification. With its results, the construction of an individual educational trajectory of the course being studied develops the intellectual abilities of the individual. The modern student promotes his individual trajectory: the choice of the optimal form and

pace of learning; the use of teaching methods corresponds to his individual characteristics; assessment and making adjustments to their activities.

When developing an individual educational trajectory, a student should evaluate their skills, abilities, prospects, interests, efforts, ready to learn. In this case, the teacher acts as a consultant who gives, evaluates and corrects the student's choice. The movement of the student along the educational trajectory, while special attention is paid to the personal interests, opportunities and goals of the student, the peculiarities of mastering the educational material, ways of working with it.

In the process of changing the technological paradigm of modern society. Smart society primarily ensures the development of smart technologies due to their impact on social processes in society. Smart society is a new stage in the development of civilization, providing qualitatively new opportunities: the possibility of developing new socio-economic processes for the development and discovery of humanity, namely: education is a new technological paradigm in the world, smart life and rapid adaptation to the conditions of the country as a whole.

At the present stage, the research potential in the development of professional competence of the individual, the description of phenomena and related approaches «information competence», «digital competence» and «smart competence of the individual» is increasing. This socialization follows from global processes that determine the change of approaches to the problems of forming a new generation, mastering and possessing competencies that take place in the conditions of changing formations.

Changing social formations leads to a change in the ontology of personal competencies associated with the transition of being into an informational, digital, virtual, smart space, where the virtual world becomes one of the problems of understanding being. The change of social formations has led to real changes in the social paradigm, a new strategy for the development of society and education as an institution for the development of key and professional competencies, one of which is the information, digital and smart competence of the individual. This is reflected in the works of scientists who have contributed to the development of the phenomena «information competence», «digital competence», «smart competence» (Table 2).

Information competence is an integral characteristic associated with the experience of activity in the information reality, ways of interacting with technology for the implementation of general and professional information needs of the individual. It should be noted that the information competence includes the authors of scientific research: knowledge of the basic methods and means of obtaining, storing, processing information; computer skills as a means of information management; ability to work with information in global computer networks; understanding the essence and significance of information in the development of modern information society.

Today, approaches to the phenomenon of «information competence of the individual» are changing and the phenomenon of «digital competence» is being investigated. It also includes other significant qualities characterized by the development of personality in a digital society. Scientists who have specially studied

the formation of information competence of a person: G.U.Soldatova, E.Y.Zotova, M.Lebeshev, V.Shlyapnikov, T.A.Nestik, E.I.Rasskazova, O.V.Kalimullina, I.V. Trotsenko, G. A.Afanasyeva, A.A.Zyabkov, etc.

Table 2 – Types of SMART competencies

Information competence	Digital competence	SMART competence
<ul style="list-style-type: none"> • S.V.Savelyev • L.M.Pazova • I.V.Shcherbashina • L.V.Astakhova • N.P.Tabachuk • T.N.Shamalo • N.V.Alexandrova 	<ul style="list-style-type: none"> • G.U.Soldatova • E.Y.Zotova • M.Lebesheva • V.Shlyapnikov • T.A.Nestik • E.I.Rasskazova • G.A. Afanasyeva • A.A.Zyabko in • M.A. Yuyudina • O.A.Maksimov • I. V. Trotsenko 	<ul style="list-style-type: none"> • V.P.Tikhomirov • N.V.Tikhomirova • K.D.Buzaubakova • A.M.Karmanov • N.V.Dneprovskaya • E.A. Yankovskaya • I.V.Shevtsova • N.V.Komleva • M.V.Karmanov

Scientists as G.U. Soldatova, E.Y.Zotova, M.Lebeshev, V.Shlyapnikova, T.A.Nestik, etc. have discovered digital competence in various spheres of human activity (working with content, communication, consumption, technosphere) in order to make a reliable, effective, critical and safe choice of information and communication technologies and the ability to apply, as well as his readiness for such activities.

The authors have identified four components in the structure of digital competence: knowledge; skills; motivation; responsibility (including security). Each of the components can be implemented to varying degrees in various fields of activity on the Internet.

The authors identified four types of digital competencies: information and media competence; communicative competence; technical competence; consumer competence (Fig.28).

According to O.V.Kalimullina, I.V.Trotsenko, digital competence is the knowledge and skills necessary for the use of technologies in the process of creating and processing new knowledge.

At the present stage, there is a transition from «digitalization» to «intellectualization» as a global process of influencing society. Smart technologies are defined by V.P.Tikhomirov, N.V.Tikhomirov, N.V.Dneprovskaya, M.V. Karmanov, A.M. Karmanov, N.V. Komleva, E.A.Yankovskaya, I.V. Shevtsova in the following categories: «smart society», «smart education», «smart technologies».

According to N.V.Tikhomirov, smart society is a new quality of society, the totality of people trained in it using technical means, services and the Internet leads to

qualitative changes in the interaction of subjects, which allows you to get new impressions – social, economic and other benefits for a better life. In previous studies, some scientists consider smart society from three points of view: as real changes in the socio-cultural paradigm; as an intersubjective space that arises with people trained in terms of using technical means, services and the Internet.

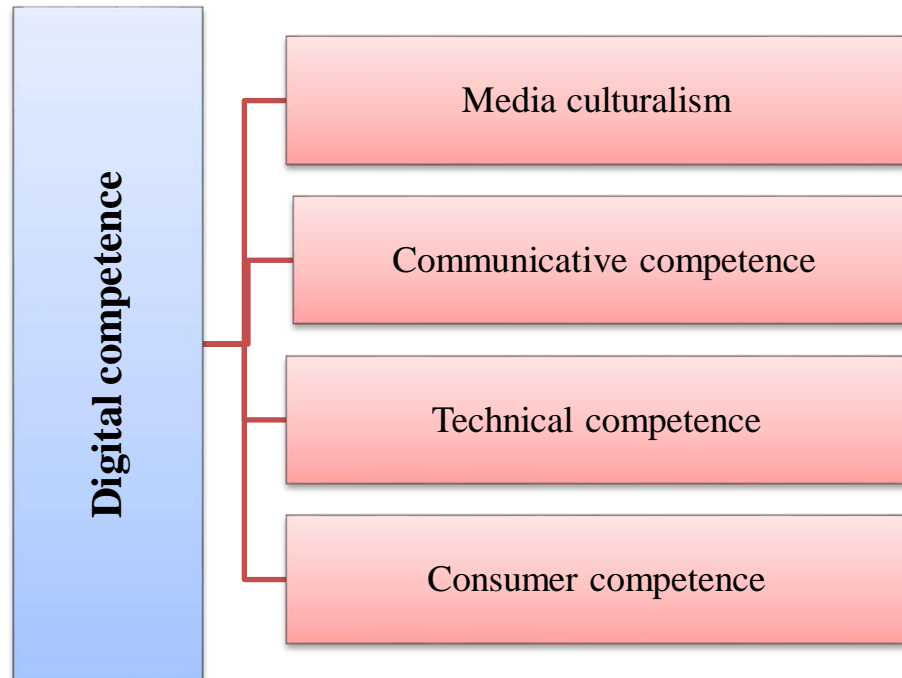


Figure –28.Types of digital competencies

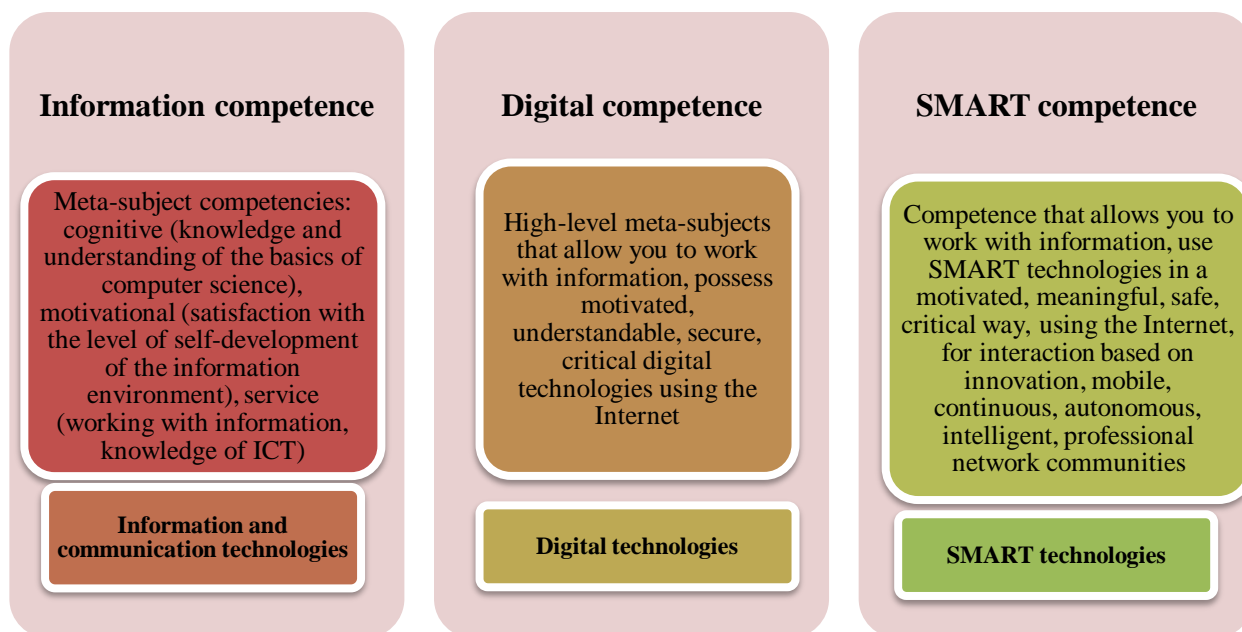
The world of information reality is perceived, in which the main role is played by qualitative changes in the interaction of subjects, allowing them to get new impressions of life associated with the introduction of Smart technologies. Smart society as a formation coexists in the world of SMART technologies.

Scientists as N.V.Dneprovskaya, E.A.Yankovskaya, I.V. Shevtsova, etc. note that smart technologies, on the one hand, are designed to create the «presence effect» of a person in a virtual environment, on the other hand, they can significantly speed up the exchange of content, change its quality and enter into more horizontal connections. They promote the idea of moving from the «closeness» of information technologies to the «seamless» smart technologies, understanding technologies that allow integrating various systems based on flexible standards.

In the context of Smart society, Smart education, Smart technologies contributes to the actualization of information competence, digital competence, smart competence of the individual.

Smart competence in pedagogical science is an unstable and poorly studied phenomenon. At the present stage, approaches to the study of smart competence and its definition as a phenomenon of modern society are being developed. Smart competence determines the formation of a smart personality of a person who is proficient in smart technologies for searching, analyzing information and creating

innovations that interact in professional network communities. Based on the analysis, the views of scientists on the phenomena of «information competence», «digital competence», «smart competence» are summarized (Fig.29).



Figure– 29. Competencies of a digital teacher

Digital technologies, smart technologies identify processes, characteristics and trends in society and education that have influenced the change of views on the phenomena of «information competence», «digital competence». The concept of «digital competence» includes processes, characteristics and trends in society and education in which the competence of smart teachers influenced the change in approaches to the phenomena of information competence (Table 3).

Modernization in modern society as a process of resolving the conflict between old and new, traditional and modern influences the formation of views on the phenomena of «information competence», «digital competence» and «Smart pedagogical competence». This will be related to the focus on innovation. If we focus on the education system as a system that supports and develops these competencies of the individual, then modernization can be associated with innovative processes and the transition to various technologies and forms of learning: distance learning, e-learning, the transition from digital technologies to smart learning, etc.

Digital competence is an integral part of a teacher's smart competence. This confirms the expansion of understanding based on changes in social formations and the influence of the connection between these phenomena, at this stage information competence is digital, and digital competence is part of smart competence: as a result of the processes of social hybridization and modernization, a process of social convergence occurs (the phenomena of «information competence», «digital competence», «smart competence of the teacher»). Each of them becomes a part of another phenomenon, globalization and the phenomenon of convergence in progressive ideas occur: digital integration; interactivity; mobility; innovation.

Table 3 – Smart Teacher Competencies

Type of competence	Global processes affecting society	Processes and their characteristics	Processes in the education system
Computer literacy	Automation	Communication	Distance learning technologies
Information competence	Informatization	Integration, awareness	E-learning
Digital competence	Digitalization, virtualization	Interactivity, high-level meta-subject abilities	Digital technologies
SMART competence	Intellectual personality, modernization, individualization, expansion	Mobility, innovative	Digital technologies

The cultural and historical potential of views on the phenomena of «information competence», «digital competence» and «smart competence of a teacher» is characterized by a change in the direction of their evolution and the formation of an intellectual personality, ensuring consistency. «Information competence», «digital competence» and «smart competence of a teacher» as phenomena of modern reality are reflected in the information society, digital society, SMART society.

The evolution of society and a certain phenomenon associated with the integration of information, digital and smart technologies come to the fore. Changing approaches to these phenomena, their interdependence can be correlated with the synchronicity of the development of society, its modernization, social hybridization and convergence, progressiveness at the present stage, civilization, integrativity, cultural and historical potential, the transition from the «closure» of technology to «seamless».

In this case, the role and importance of the process of implementing smart training of teaching staff increases significantly, and the boundaries of learning become accessible «everywhere and always» not only from the digital side, but also from the point of view of temporal and spatial indicators. For Smart learning, the student needs to create an adapted intelligent learning system based on a centralized and better communication environment.

The introduction of smart training into the teacher training system should take into account the following principles: compatibility; attentiveness; economy; step-by-step; creativity (Fig.30).

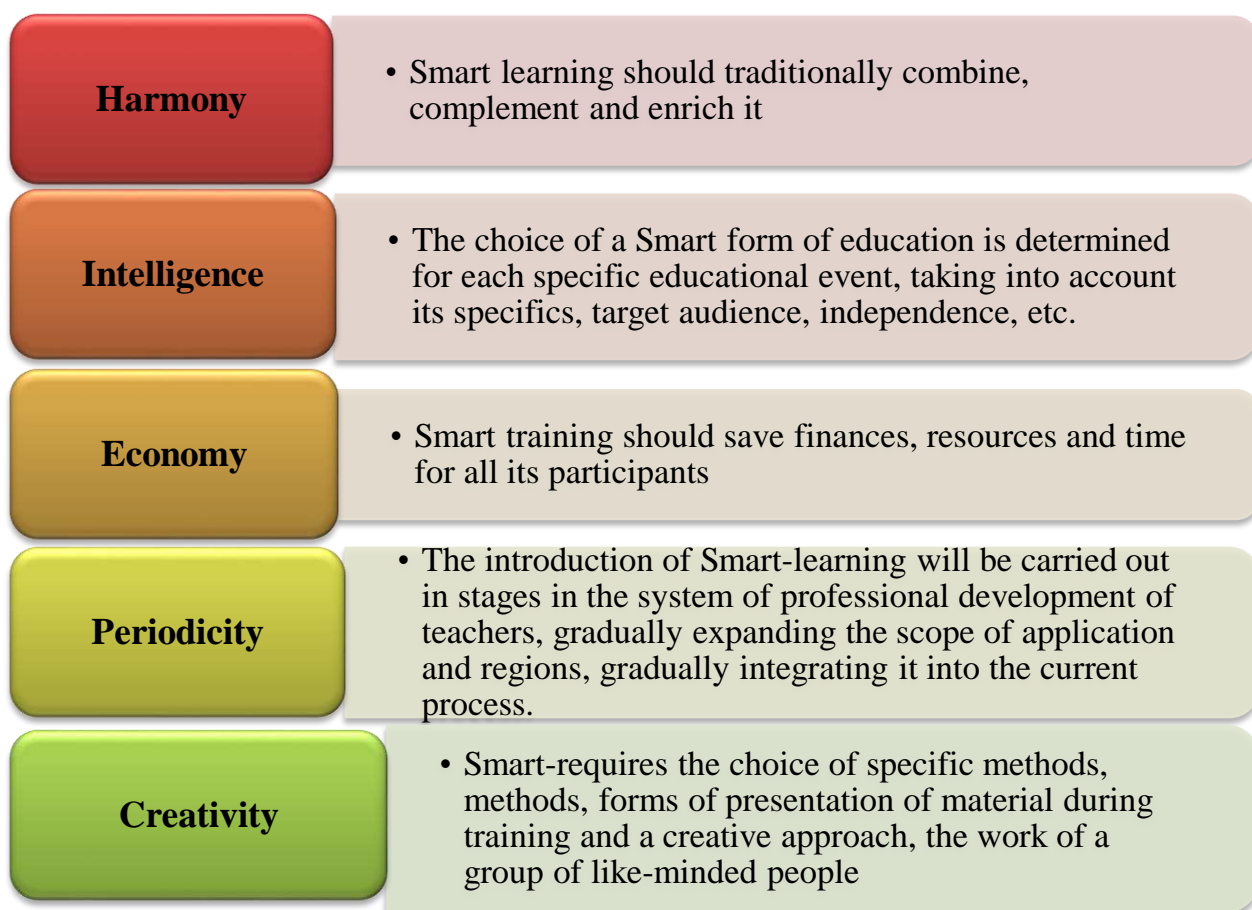


Figure –30. Principles of implementing smart learning in the teacher training system

Communication is the possibility of direct communication, the speed of information presentation, remote control of the process state. This is, first of all, the possibility of quick access to educational resources hosted on a remote server, as well as the possibility of online communication of remote users when performing a collective educational task.

User productivity increases dramatically due to automation of not network, but everyday operations of searching for important smart-learning information and, accordingly, the effectiveness of educational activities increases. To implement smart education in schools, it is necessary to first train teachers who are able to generate new ideas, knowledge and intellectual capital using smart technologies.

In smart learning, the educational approach and the role of the teacher are changing. The teacher becomes a motivator/assistant, on which knowledge on the implementation of smart learning should be formed (Fig.31).

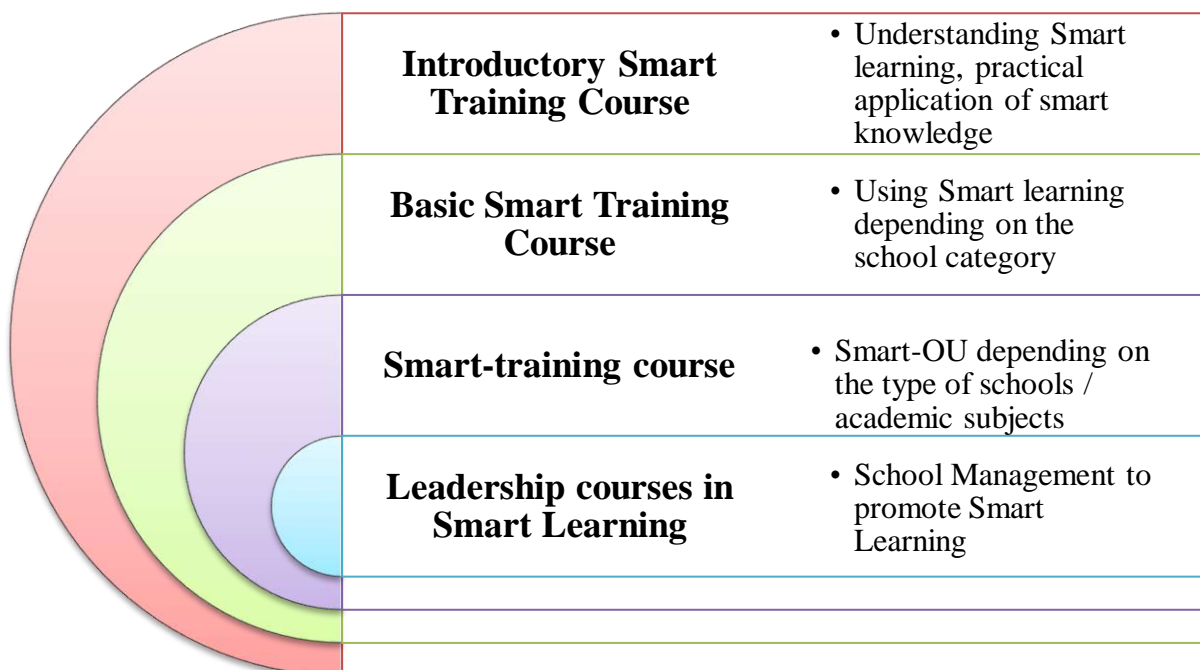


Figure – 31. The essence of Smart learning

Figure 32 shows the necessary prerequisites for the effective management of the new education system on the formation of smart learning and the use of ICT in the educational process.

Activation of Smart training for short-term courses of the teacher training system involves the following tasks:

- 1) postponing the creation of infrastructure for smart learning;
- 2) creation of standard platforms for smart learning;
- 3) conducting teacher training in a specially equipped smart group.

To immediately transfer data from the teacher's board or tablet to the students' devices, tablets and electronic boards must be connected to ensure comfortable work in the group.

It is also important to strengthen the ICT competence of teachers for further education in an electronic environment with Smart devices.

It is necessary to provide the most important smart devices (Galaxy Note, Galaxy Tab, iPad, iPad mini tablets; mobile phones with additional computer functions, laptop computers with phone functions based on Android, iOS, Windows Phone operating systems and others with the ability to download and delete applications):

- 1) training based on wireless Internet with the expansion of the influence of mobile learning;
- 2) smart training;
- 3) building the trajectory of an individual educational route of professional development, reflecting the individual abilities, talents and creativity of teachers;
- 4) transition to a highly effective active reading of knowledge about the content provided on the Internet.

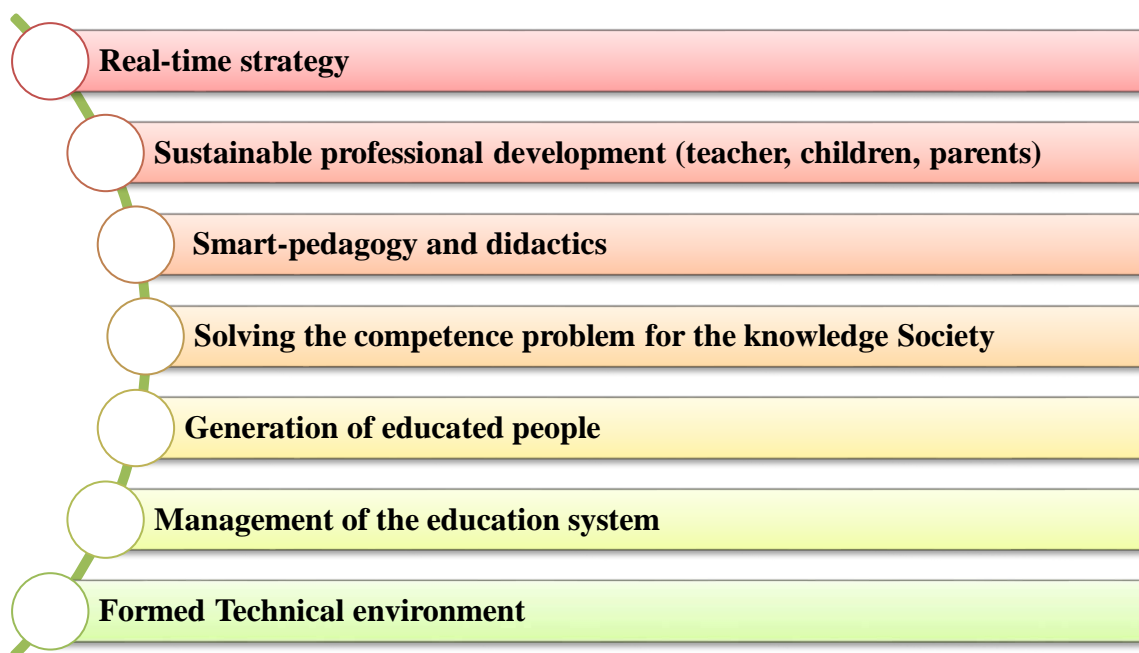


Figure –32. Conditions required for Smart learning

The use of the new «Flipped Classroom» teaching method is a traditional «inverted learning»: students studying at home get acquainted with the topic before the lesson, watch videos or use other educational materials, spend no more than 15 minutes studying the material, and the time in the group is effectively used to work together on tasks.

Creation of flexible learning in an interactive educational center for the purpose of joint educational activities on the Internet based on common standards, agreements and smart technologies with the association of all subject teachers and educational organizations:

1) *support for two-way mode services*: the student chooses different services on the same platform.

2) *using the smart learning platform*: checking the user for access to digital tools and insurance (protection).

3) preparation of tasks for the online assessment system and *conducting competent online lessons*. Explanation of thousands of independent works from the lesson.

4) *improving the learning environment* with resources that support learning in the learning process.

Active use of teachers' resources, social networks to solve professional problems.

Smart-open interaction with various social spheres to determine the results of the formation and development of learning.

Applying the principle of «peer-to-peer» training, each teacher should give new experience in his workplace and other practices.

Preparation of the content of digital textbooks (primary, secondary, senior classes, by subject).

Creation, distribution, management and creation of a single platform for the content of education.

Smart-learning is a differentiated practice and promotion of market expansion through a master of existing teaching methods and a learning platform that meets the needs of students in personalization, integration and education.

Smart-learning is learning using modern technologies, with free access to resources, self-oriented, argumentative, personally adapted.

In working with smart technologies, the role of a teacher (tutor) is increasing as an organizer and coordinator of the learning process, he has the opportunity to flexibly direct the learning process, taking into account the individual capabilities of each student.

The use of the communicative method allows you to build an educational process as a model of the communication process. For example, properly organized «group-organizational work» and the creation of a communicative orientation of the educational process as a whole will be of great importance for the success of training the communication. The success of the teacher and the student is determined by the organization of joint activities.

The teacher should organize the student's educational activities, providing the greatest motivation for learning. At the same time, the purpose of joint activity is the knowledge and consolidation of new information, its assessment, joint discussion of problematic tasks, the formation of different points of view, participation in opinion. In the process of performing interactive tasks, students should recognize creative and independent, rather than passive performers of speech actions. Interactive forms of learning allow you to stimulate these situations.

Smart-learning acquires new features through improving the quality of education, motivation and interest of teachers in studying a large number of electronic materials, opens up new opportunities: exchange of experience and ideas, a bridge through science, personalization of the course in its tasks and competencies, saving time.

The introduction of smart learning not only allows teachers to be educated in their professional field, but also helps to develop a new age-old potential in students: creative, collaborative work and communication, develop great thinking during the period of collaborative problem solving, use innovative technologies and teaching methods.

Questionnaires for testing and evaluating knowledge:

1. Describe the types of digital education in higher education institutions.
2. Reveal the essence of digital competence.
3. What is the place of smart education in the digital society?
4. Conduct a SWOT analysis of Smart education.
5. Study how digital technologies affect teaching and learning using the «Smart» model.
6. Define the basic principles of Smart education.

7. Prove the competence of a smart teacher based on examples.
8. Imagine the «smart teacher» model.

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2.3 Digital education: features of distance learning

The XXI - information age digital education system meets the requirements of the time and the new conditions of human life. During the global pandemic, a distance learning system was introduced into education and the educational process. Distance learning is a new, progressive form of education that arose on the basis of the idea of «open learning» of new information and technological capabilities that arose as a result of the information revolution at the end of the last century.

The term «distance learning» was first used in the catalog of correspondence courses at the University of Wisconsin in 1892, and the origin of this phrase is American.

From the mid-70s to the early 80s of the XX century, the term «distance learning» was used only as a synonym for the terms «correspondence training», «independent learning», «home schooling» or as their generalizing form. And it is translated into Russian as «distance learning». In subsequent years, distance learning became a common name for all forms of distance learning and acquired a new meaning in connection with the use of information and communication technologies in education.

Researchers from the USA M.G. Moore, M.M. Thompson, J.R. Verduin, T.A. Clark indicate that distance learning «broadcasts educational programs through technologies outside the educational organization, such as cable or satellite television, video or audio recordings, fax, modem, video conferencing».

Kazakh scientists such as Zh. Karayev, Ye. Balafanov, Ye. Yesbosynov consider distance learning as a way to implement the idea of open education and a set of special methodological and methodological approaches formed as a result of it.

A.M.Dolgorukov: «Distance learning is a set of publicly available educational services using a specialized information of educational environment, including the methodology of activity education, methods of intensive education, means of remote exchange of educational information (paper version and electronic media, satellite, television, radio, computer network, etc.» [Dolgorukov, A.M. Problems of development of distance learning Education in Russia / A.M. Dolgorukov // Bulletin of the Moscow University, –1999. No.1.-PP.102-117.(Ser. 18 Sociology and Political Science)].

O.Okolelov describes distance learning as a special educational system of pedagogy that organizes the educational process based on telecommunications, information technology, Internet tools [[https://www.labirint.ru/books/691701 /](https://www.labirint.ru/books/691701/)].

Distance learning is defined as a method of teaching based on indirect (remote) or incomplete indirect interaction of a student and a teacher. This system provides for the use of various technological combinations, including correspondence, audio, video, computer and Internet.

Distance learning is a humanistic form of knowledge and skills formation that allows anyone to improve themselves, feel their abilities and independence, improve their cultural and professional level based on pedagogy, psychology, use traditional educational experience, audiovisual devices, information and communication technologies.

The phrase «distance learning» (DL) has firmly entered the world educational lexicon. Over the past three decades, distance learning has become a global phenomenon of educational and information culture, changing the face of education in many countries of the world. United by the common name "distance education", with the growth of the number of students, the growth of educational organizations, the volume and complexity of the infrastructure, a whole industry of educational services emerged and began to develop intensively.

Figure 33 reveals the features of distance learning.

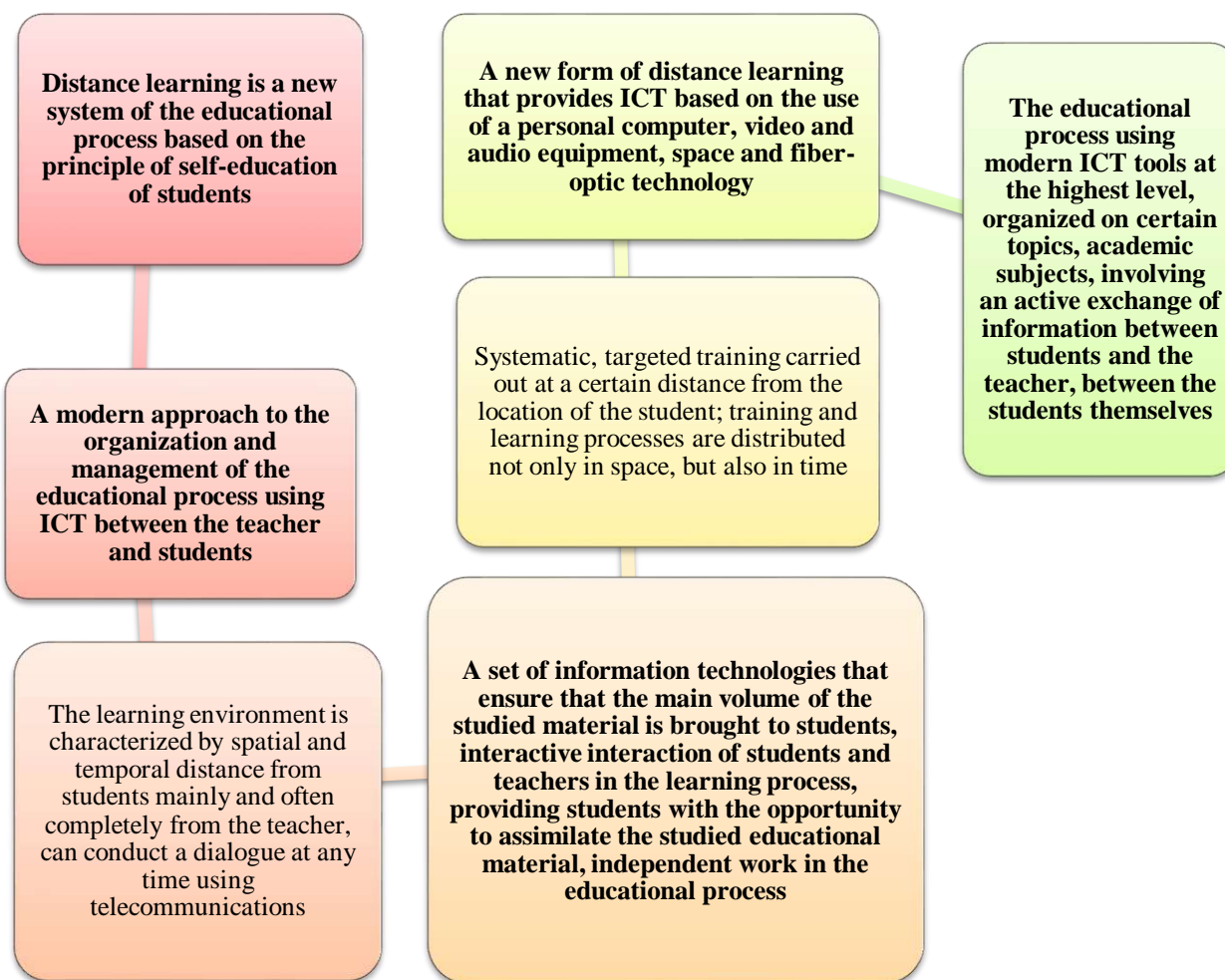


Figure – 33. Features of distance learning

At the same time, it does not matter whether it is possible to attribute a situation when participants in the distance learning process at a considerable distance (live in the same city, district) are not geographically distributed, but cannot interact during training due to asynchrony (mismatch in time) of vital activity and work schedules. In addition, the above definitions do not comprehensively indicate that interaction can occur not only between students and the teacher, but also between the students themselves and the learning tools, the subjects of the educational process are distributed in space and time.

The principles (rules) of university education are the requirements expressing the relationship between the goals of training specialists with higher education and the laws governing the practice of studying at the university (Fig. 34).

The introduction of distance learning shows that these well-structured and well-founded principles are not enough for distance learning. The empirical experience of domestic and foreign distance learning and the research conducted to study the structure of distance learning activities and the content of training allowed us to formulate specific principles inherent in the distance learning system.

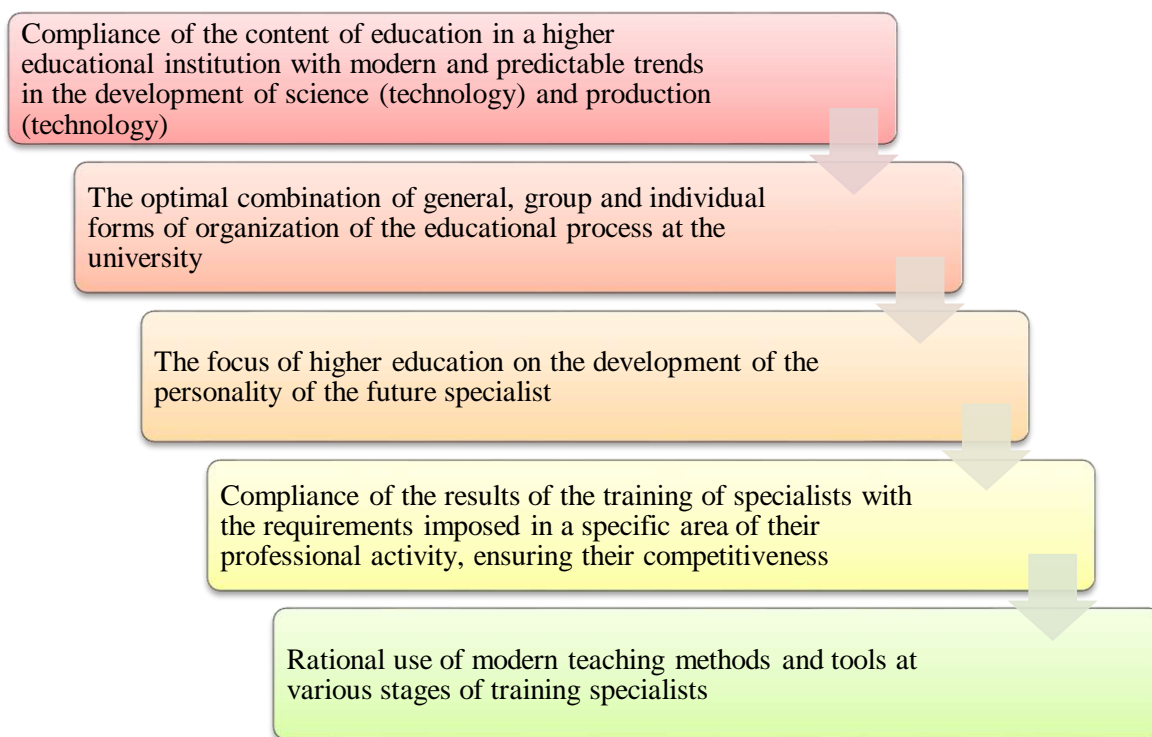


Figure – 34. Principles (rules) of university education

The scientist D.M.Dzhusubalieva offers the following principles of distance learning: humanization; the principle of primary education; interactivity; the principle of identification; the principle of individualization; the principle of systematic learning; the principle of openness and flexibility (Fig.35).

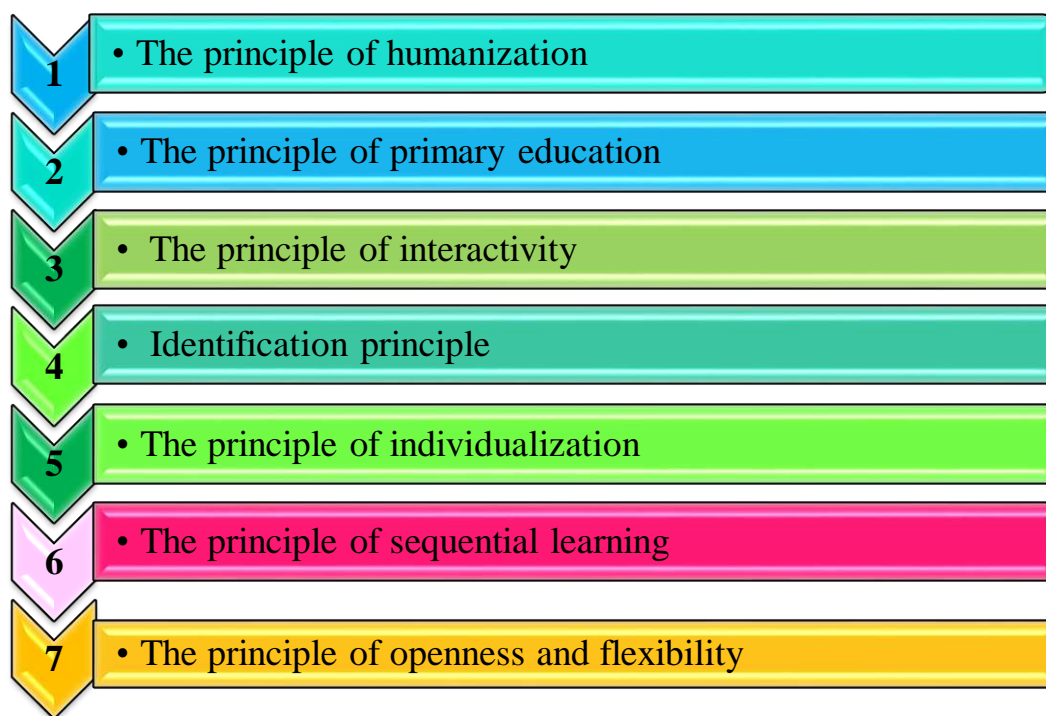


Figure – 35. Principles of distance learning

The principle of humanization. The learning process itself has a humanistic orientation characteristic of the individual: learning is not limited to strict time frames; the listener, relying on the potential of different universities, chooses different subjects for training and develops his own learning trajectory. He can combine training with production activities. In addition, the procedure for enrolling in the distance learning system is «open» with free access.

The principle of primary education. For effective distance learning, some initial knowledge is needed (the initial level of training of potential consumers of educational services in distance learning) and hardware and technical support. For example, during training on the network model, not only a computer with Internet access, but also the student must have the skills to work with information resources on the network.

The principle of interactivity. The peculiarity of this principle in distance learning is that it reflects the regularity of students' relationships not only with teachers, but also with students with each other. Practice shows that in the process of distance learning, the intensity of information exchange between students is greater than that of the student and the teacher. Therefore, in order to implement this principle in the practice of distance learning, for example, during teleconferences, webinars, it is necessary to inform all participants of the educational process of the email address, identification number and incoming password.

The principle of identification. It consists in the need to control the independence of learning, since distance learning provides more opportunities for a different organization of learning than, for example, full-time education. Identification of students is part of the general security measures. The control of

independence in the performance of tests, abstracts and other control measures, except for face-to-face communication, can be achieved using various technical means. For example, using a video conference, you can determine the person who will take the exam.

The principle of individualization. In order to comply with these rules in distance learning, input and ongoing monitoring of the actual training is carried out. For example, entrance control allows not only to create an individual curriculum in the future, but also, if necessary, to additionally prepare the consumer of educational services to replenish the missing initial knowledge and skills that allow for successful training. The current control allows you to adjust the educational trajectory.

The principle of systematic learning. In distance learning, there is often an opinion that due to the fact that the training time is not strictly regulated, it is almost impossible to introduce an independent work schedule for students. However, the practical experience of distance learning, on the contrary, shows that there should be strict control and planning, especially for junior students.

The principle of openness and flexibility. The principle of openness is manifested in the «softness» of age restrictions, on an educational basis, in admission control measures for the possibility of studying in an educational organization in the form of interviews, exams, testing, etc. The experience of foreign organizations as well as domestic educational organizations shows that this fact does not reduce the quality of education, but requires additional efforts on the part of distance learning educational organizations in the subsequent individual training of an enrolled student. An important «indicator of flexibility» is the lack of criticism of the educational process of distance learning to the time schedule of the implementation of the educational process at a distance and a specific educational organization.

Ideally, the final requirement is the need to create information remotely distributed educational networks for distance learning, which allows the student to adjust or supplement the educational program in the right direction in the absence of appropriate services at the university where he is studying. At the same time, it is necessary to preserve information education, which provides the possibility of transition from university to university to study in similar or other areas, as well as the convergence of the content of educational and professional programs of the university.

Information technologies in the distance learning system

The huge interest in distance learning that exists all over the world today has an objective basis. The population's need for higher and continuing education is growing. In addition, the growing mobility of life creates a need for mobile learning systems.

In response to the objective demand of the time, many universities began to develop distance learning programs. However, despite the fact that every organization conducting distance learning declares the use of Internet technologies in teaching, almost all the possibilities of the Internet are used only by e-mail, and paper media, audio-video cassettes are used as educational materials. The Internet seems to be a very good technical tool for distance learning.

The educational process carried out on the basis of distance learning technologies includes both mandatory classroom classes and independent work of students. The teacher's participation in the educational process is determined not only by conducting classroom classes, but also by the need for constant support of educational and cognitive activities of students by organizing current and intermediate control, conducting online classes and consultations.

Information technologies used in distance learning can be divided into three groups:

- 1) information presentation technologies;
- 2) information transfer technologies;
- 3) information storage and processing technologies (Fig. 36).

Together they form distance learning technologies. At the same time, technologies for the transfer of educational information that provide the learning process and its support are of particular importance in the implementation of educational programs.

The basis of the educational process is always the transfer of information from the teacher to the student. In this sense, any technology used in education can be called informational. On the other hand, the term "information technology" is often used to refer to all technologies based on the use of computer technology and telecommunications.

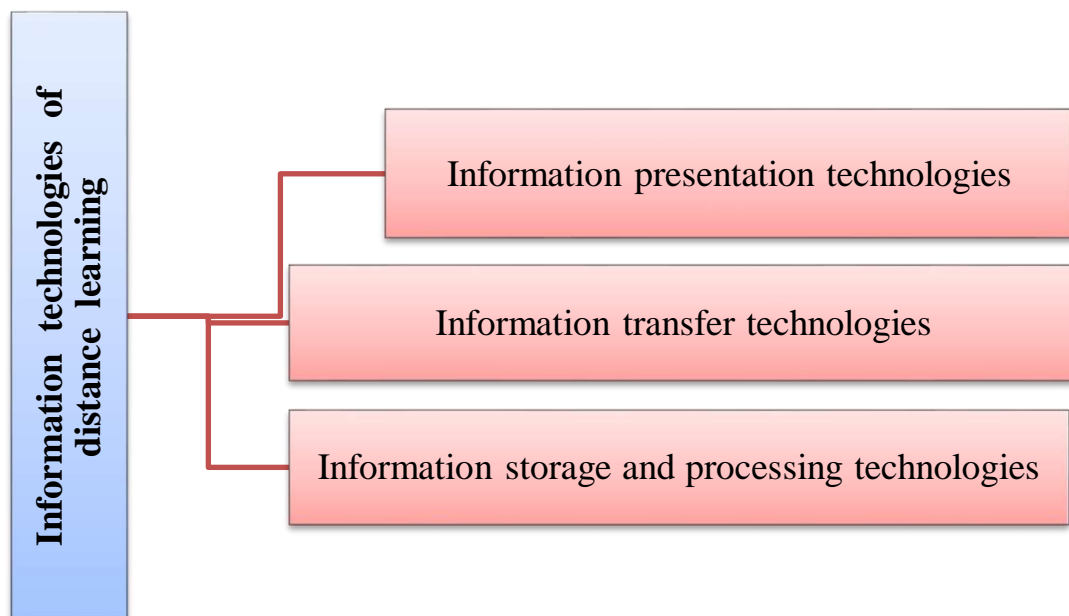


Figure – 36. Information technologies of distance learning

Educational information is the knowledge that must be transferred to the student so that he can competently perform certain activities. In distance learning, the carrier is often the student himself, therefore, high requirements must be placed on the quality of educational information and the ways it is provided. It refers to newly created electronic textbooks, as well as information databases and knowledge banks

used for educational purposes, reference and expert systems. The information in them, unlike the press, should have a completely different organization and structure. It depends on the psychological and physiological characteristics of the perception of information on the computer screen, and on the technology of its access. Such information centers can be large libraries and scientific and educational centers created on the basis of leading universities.

Educational technologies are a set of didactic methods used to transfer educational information from its source to the consumer and depend on the form of its presentation. The peculiarity of educational technologies is the advanced nature of their development in relation to technical means (Fig.37).

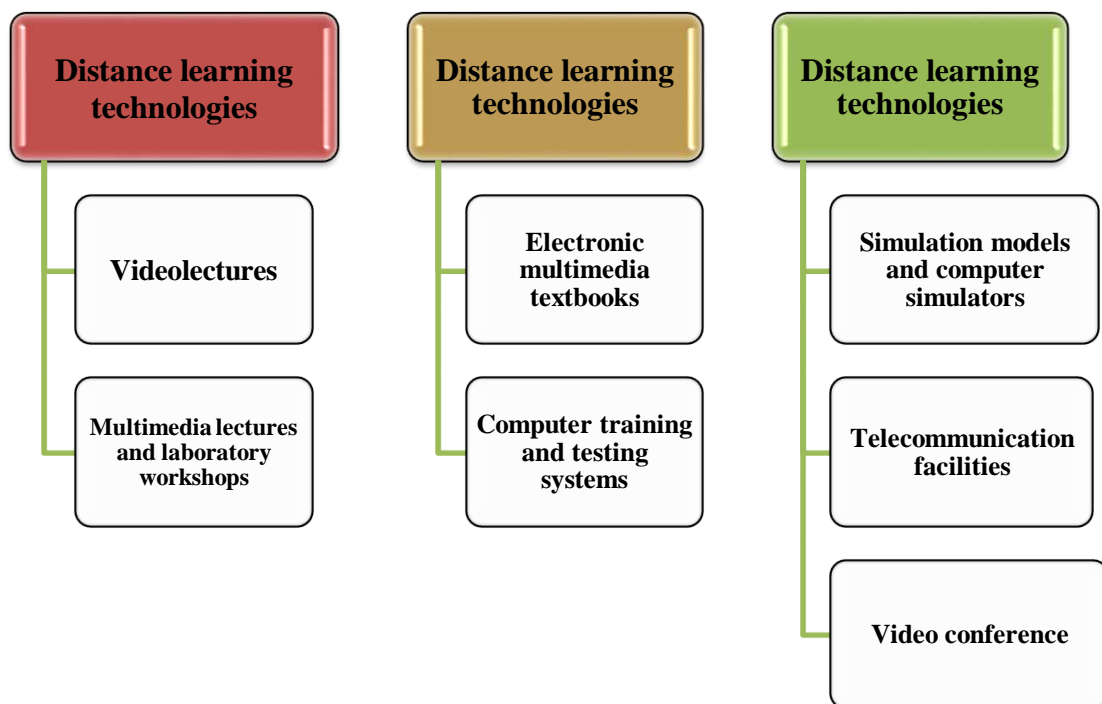


Figure – 37. The essence of distance learning technologies

The introduction of a computer into knowledge leads to a revision of all components of the educational process. Much attention should be paid to the activation of imaginative thinking through the use of technologies that activate constructive thinking in an interactive environment «student – computer – teacher». This means that the presentation of the educational material should reflect the idea of the teacher in the form of an image. In other words, the main problem in distance learning educational technologies is the visualization of thought, information, and knowledge.

Information technologies are hardware and software based on the use of computer technologies that provide storage and processing of educational information, its communication to the student, interactive communication of the student with the teacher or pedagogical software, as well as testing of students' knowledge.

In the educational process, it is not the information technology itself that is important, but how much its application serves to achieve educational goals. The choice of means of communication should be determined by content, not technology. This means that the choice of technologies should be based on the study of the content of training courses, the degree of necessary activity of students, their participation in the educational process, specific goals and expected learning outcomes, etc.

When choosing technologies, it is necessary to take into account the large correspondence of some technologies to the characteristics inherent in students, the characteristics of specific subject areas, priority types of educational tasks and exercises.

The main role that telecommunication technologies play in distance learning is to provide educational dialogue. Learning is impossible without constant dialogue, feedback between the teacher and the student. Learning (as opposed to self-education) is a dialogical process by definition. The possibility of dialogue during face-to-face training is determined by the form of organization of the educational process, the simultaneous stay of the teacher and the student in one place. In distance learning, it is necessary to organize an educational dialogue with the help of telecommunication technologies.

Communication technologies can be divided into two types: on-line and off-line.

The first one provides the exchange of information in real time, that is, the message sent by the sender reaches the recipient's computer and is immediately sent to the corresponding output device. When using Off-line technologies, the received messages are stored on the recipient's computer. The user can view them at a convenient time using special programs. Unlike face-to-face training, in which the dialogue is conducted only in real time (on-line), with distance learning it can take place even in deferred mode (off-line).

The main advantage of Offline technology is that they are less demanding on computer resources and bandwidth of communication networks. They can also be used when connected to the Internet via dial-up networks (if there is no permanent Internet connection). This type of technology includes email, mailing lists, and teleconferences. With the help of the list server, it is possible to organize the dissemination of educational information, individual communication between the teacher and the student is established by e-mail, and a teleconference or webinar allows you to organize a collective discussion of the most difficult or problematic issues. All these technologies allow you to exchange messages between different computers connected to the Internet (Fig.38).

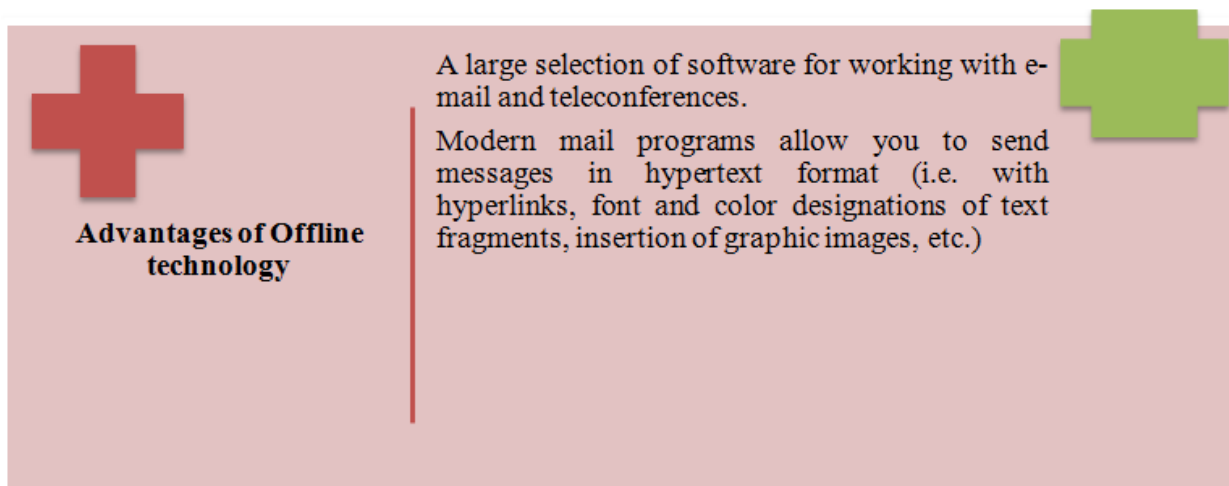


Figure – 38. Advantages of Offline technology

In addition, you can add a free format file to the letter. For example, it allows you to send documents in MS Word format. The effectiveness of Off-line technologies is manifested in the organization of current meetings, current control on the basis of control and independent work, checked by the teacher «manually».

Of the Online technologies, it can be noted, first of all, chat, which allows you to exchange text messages over the Internet in real time. In the simplest case, a «conversation» occurs between two users. For a collective conversation, you need to connect to a dedicated server - an IRC server. Then, while working, the user can see this message on the monitor, which shows who sent it. Many programs also allow you to invite any user to a private «personal» dialogue from other users. There are many programs for working with Chat, for example MIRC, ICQ. The effectiveness of On-line technologies is high when organizing network seminars and group meetings.

When organizing joint educational programs, network technologies of distance learning are of particular importance, since they allow more fully implementing the principle of distribution of educational resources and human resources. When considering options for the delivery of educational information, three main distance learning technologies are considered: case technology, telecommunication technology, network technology.

Case technology is a distance learning technology based on providing students with information educational resources in the form of a specialized set of educational and methodological complexes for independent learning using various media.

Network or Internet technologies are remote educational technologies based on the use of global and local computer networks to provide students with access to information educational resources and the formation of a set of methodological, organizational, technical and software tools for the implementation and management of the educational process, regardless of the location of its subjects.

Telecommunication (information and satellite) technology is a remote educational technology based on the priority use of space satellite data transmission and broadcasting, as well as global and local networks to provide students with

access to information educational resources presented in the form of digital libraries, video lectures and other teaching aids.

Restraining the development of **distance learning network technologies** is due to high prices for Internet services. In rural areas, the bandwidth of communication channels is very low, which creates additional obstacles to the widespread use of Internet technologies in the educational process. Of course, now new IT companies offering their services have started working in Kazakhstan, the competitive environment will allow reducing prices for Internet use in the foreseeable future.

The approach to the introduction of distance learning technologies in universities is ambiguous: in order to raise the level of specialists in all spheres of life, adaptation and effective use of innovations available in the world practice are becoming more diverse. Great importance is given to distance learning, both in many developing countries and in Kazakhstan. Using the experience of educational institutions in Russia and other foreign countries, many universities of the state have begun to develop and implement distance learning, creating the basis for distance learning. University portals for distance learning, software and tools, distance learning technologies have been created.

Digital information resources are introduced into public production along with material, energy and labor resources and become an integral part of any production and social and political process, that is, digitalization becomes an independent branch of scientific, technical, socio-economic, socio-political development of society. At its core, digitalization is an interdisciplinary science and an intersectoral activity. This affects the global education system, where significant structural changes are taking place due to the development of digitalization and the increase in its impact on all spheres of society.

Along with the growing need for digital education, the process of creating international digital educational structures of various purposes and types is intensifying. Currently, the world has accumulated considerable experience in the implementation of distance learning systems using telecommunication systems. A significant place is occupied by systems using computer networks, means of direct television broadcasting using modern telecommunication technologies.

The long-term goal of the development of distance learning in the world is to enable tutors at any time and in any place to post content on a specific educational program at any level (secondary and higher), and the recipient to study it. This implies a broader interaction between tutors and students through digital educational resources.

Figure 39 shows the general principles of distance learning.

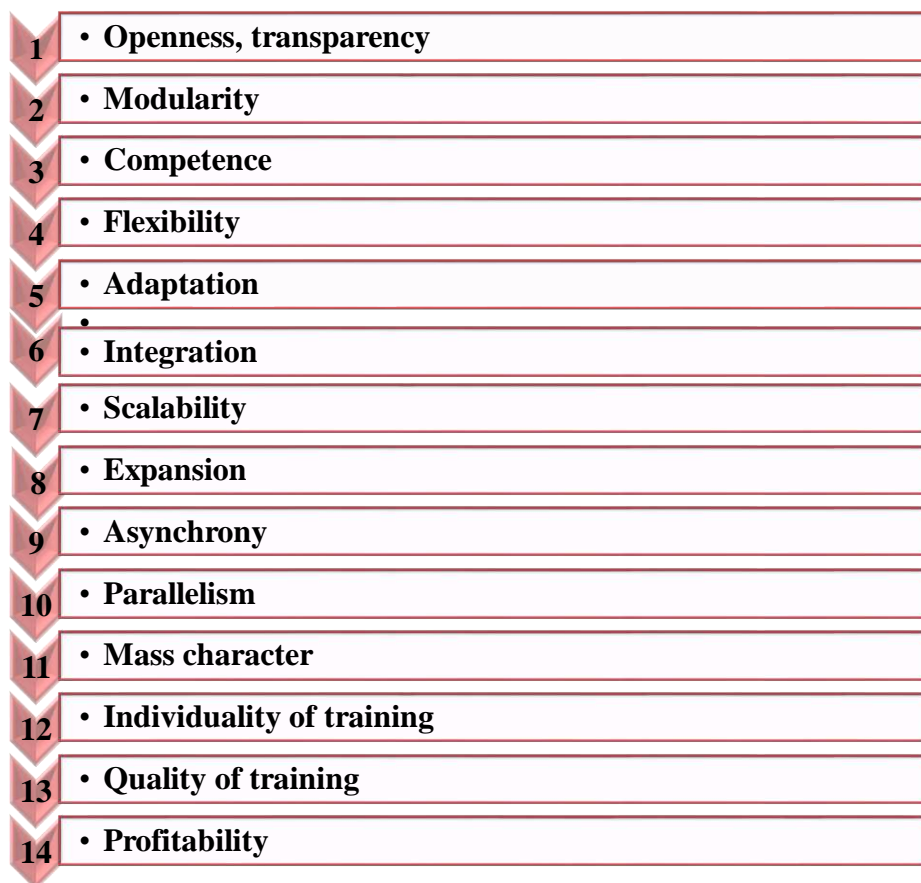


Figure – 39. General principles of distance learning

Mass introduction, distribution of telecommunication channels and global distribution of any type of information (text, graphic, audio and video forms) can ensure the fulfillment of this task due to the features of the distance learning system.

General principles of distance learning:

1) *openness* – compatibility with all modern standards of information educational resources, the Internet, support of Internet technologies.

2) *modularity* – the possibility of forming a module from one or more subjects that create a holistic image of a certain subject area.

3) *competence* – the ability to form and evaluate competencies in each area.

4) *flexibility* – to allow everyone to study as much as he needs to master the content of the module at any time and anywhere with Internet access and get the necessary knowledge on the chosen educational program.

5) *adaptation* – the ability to easily adapt to the needs of users, including in national languages and taking into account individual characteristics.

6) *integration* – the possibility of integration with other forms and methods of learning in a single distributed information environment that implements an active education system, as well as with another learning platform that allows distance learning.

7) *scalability* is a requirement that guarantees that there is no need to rebuild the system as the processed information grows and the number of users working at the same time.

8) **expansion** – the possibility of increasing functionality beyond the originally adopted concept of development and technological base in accordance with the needs of users.

9) **asynchrony** – the ability to use learning technology at a convenient time and pace for each teacher (tutor) and student.

10) **parallelism** – the possibility of combining the educational process with other professional activities.

11) **mass** – an unlimited number of service recipients who have access to many sources of educational information (electronic libraries, databases) and are able to communicate with each other and tutors through networks or other means of information technology.

12) **individuality of learning** – the possibility of creating an informational learning environment with a TV program that allows the use of dedicated teaching methods to enhance the individualization of learning and increase the effectiveness of learning.

13) **the quality of training** is the involvement of highly qualified specialists in the preparation of educational materials regardless of the place of residence and language of communication, and for students the opportunity to independently choose priorities for participation in group work through seminars and teleconferences, performing exercises and practical tasks for a certain period, passing various tests, obtaining the necessary final competencies.

14) **profitability** – the cost of distance learning system services, the absence of a large number of buildings (for the organization of the educational process, libraries and laboratories and other educational activities) and the provision of more consolidated and unified content of educational materials and orientation to the number of students and other factors.

The technology of software and methodological support for distance learning allows you to create a distance learning system for higher and secondary education, the following methods are used in training:

1) **the method of teaching (self-learning) through the interaction of the student, consultant or tutor with educational resources with minimal participation of teachers, tutors, consultants, scientific and technical supervisors.** To implement this method, teachers and tutors create and select various educational resources: printed, audio and video materials, as well as textbooks (interactive databases, electronic publications and computer training systems) supplied via telecommunications networks.

2) **individualized learning method.** This method is characterized by communication of a student or student being consulted, a person in need of scientific and technical services, a scientific applicant with a teacher, consultant or supervisor («one-by-one training»). This method can be implemented in distance learning mainly using technologies such as telephone, fax, e-mail, Skype system.

3) **a method based on the presentation of the teaching material by the teacher (in this case, students do not play an active role in communication).** This method is used by a teacher, a teacher-consultant, and if the whole group is trained and

consulted, they are prepared approximately the same, and the end result is the same for everyone. For example, it is used when advising students on various subjects. Thus, audio or video lectures delivered on radio or television in modern distance learning are supplemented by electronic lectures distributed over computer networks through bulletin board systems.

4) a method characterized by active interaction between all participants of the educational process. This method is focused on group work of students and is of great interest for distance learning. It provides for a wide application of research methods and problem-based learning. The role of a teacher in such training is that students set a topic (set a learning task) for schoolchildren or scientific applicants, after which it should create and maintain a favorable communication environment and psychological climate so that students can work together. The teacher is responsible for the coordination, management of the discussion, as well as for the preparation of materials, the development of a work plan, the issues and topics discussed.

5) The project method includes a comprehensive educational process that allows the student to show independence in planning, organizing and controlling educational and cognitive activities, the result of which is the creation of a product or phenomenon. The basis of the project method is the development of students' cognitive, creative interests, skills of independent formation of their knowledge.

6) The method of problem-based learning is based on the consideration of complex cognitive problems, the solution of which is of significant practical or theoretical interest. In the process of problem-based learning, students' attention is focused on important problems that stimulate cognitive activity, contribute to the development of skills and abilities in solving these problems.

7) The research method of teaching is characterized by the use of relevant and significant goals specially set for participants, a well-thought-out and well-founded structure, extensive use of an arsenal of research methods, scientific methods of processing and formatting results.

The following traditional methods can also be used for distance learning: demonstration, illustration, explanation, conversation, exercise, solving case problems, memorizing educational material, written works, repetition, etc.

Distance learning is a special type of learning, the main feature of which is the interactivity of communication of all participants in the educational process. The presence of a teacher is optional, since distance learning is a process of self-study of the material. With distance learning, a personality-oriented approach to learning is implemented, maximum individualization of learning occurs. The use of new information and telecommunication technologies allows the interaction of distance learning participants through e-mail, chat, forum, videoconferences, webinar, online seminar, regardless of their location.

The methodological feature of distance learning is that the assimilation of knowledge, skills and abilities provided for in the curricula is carried out not in traditional forms of education (lectures, classes, seminars, etc.), but through the independent work of the student using various media. At the center of the distance

learning process is not training, but learning, i.e. independent cognitive activity of the student in mastering knowledge, skills and abilities. At the same time, the student must possess not only computer skills, but also methods of working with educational information available in the process of distance learning.

The information and educational environment of distance learning is a systemically organized set of data transmission means, information resources, interaction protocols, hardware, software, organizational and methodological support aimed at meeting the educational needs of users.

Figure 40 reveals the features of distance learning.

Distance learning is a form of education carried out with the help of telecommunication technologies and Internet resources, based on the educational interaction of teachers and students who are at a distance from each other. Distance learning is characterized by all the components of the learning system inherent in the educational process: goals, content, organizational forms, learning tools, a system for monitoring and evaluating results.

The purpose of distance learning is to provide students with the opportunity to master the basic and additional professional programs of higher and secondary vocational education by educational organizations, respectively, of higher, secondary and additional vocational education directly at the place of residence or temporary stay.

The content of training can be defined as a pedagogical model of social order, the learning process, technologies, methods and organizational forms of its implementation are determined by its content.

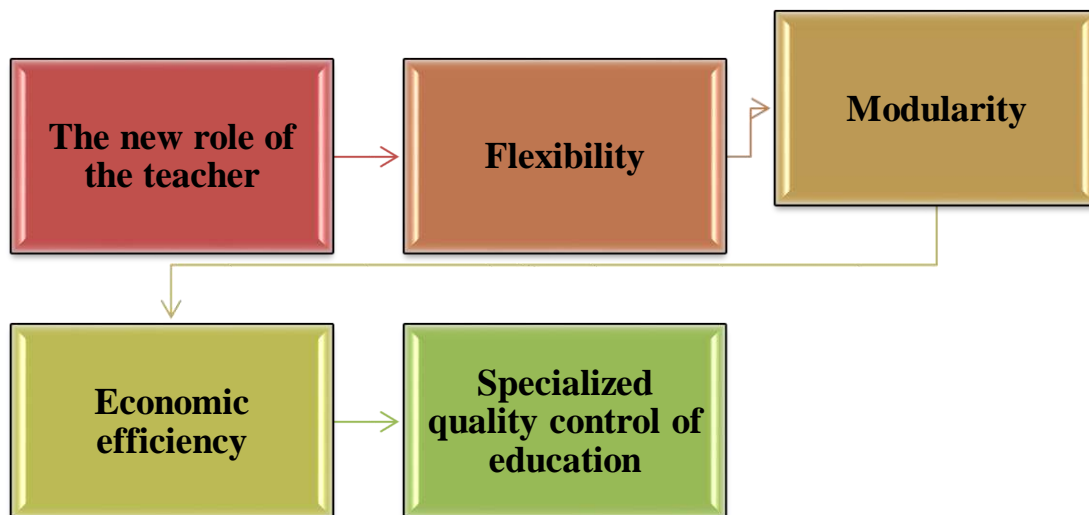


Figure – 40. Features of distance learning

At the same time, it is necessary to take into account additional restrictions on the object (subject) of training, which may be located at long distances or have a special time schedule of vital activity, or the physiological impossibility of traditional training and other reasons (Fig.41).

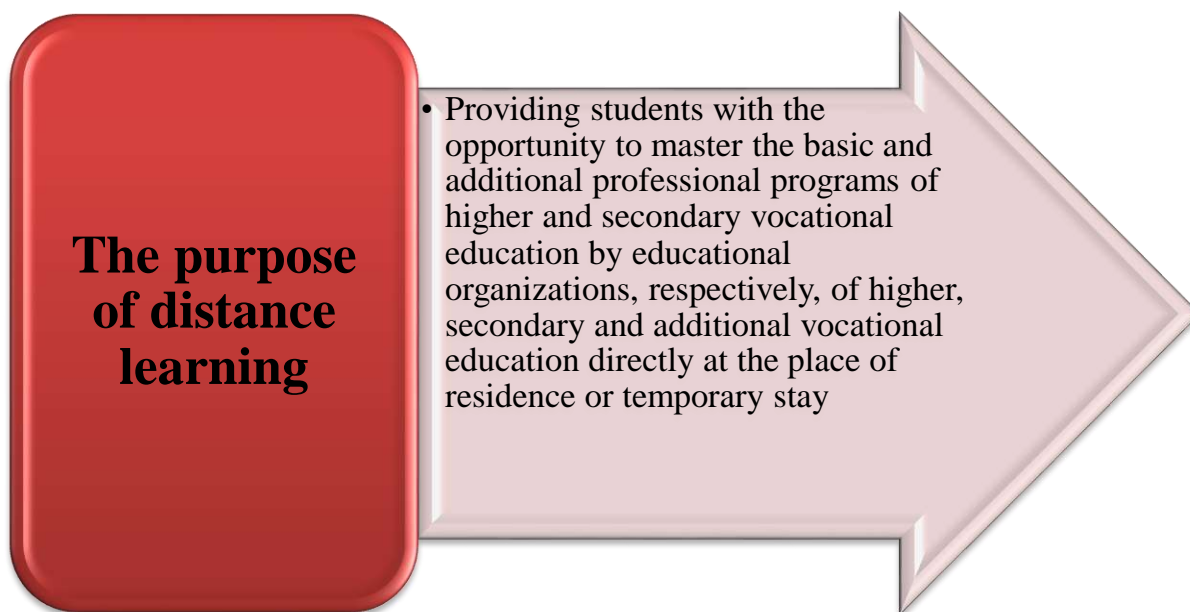


Figure – 41. The purpose of distance learning

The basis of the educational process in distance learning is independent work in a convenient place, pace and time. At the same time, the student is given the opportunity to communicate both with the teacher and with each other, depending on the learning model (in various variants). This is done through its own and information technology tools (e-mail, videoconference, telephone).

It is obvious that distance learning places increased demands on the personal qualities of students: perseverance, purposefulness, honesty and others. They must master the basics of methods and techniques of independent work, the basics of self-education and replenishment with high motivation. In addition, for effective training, they must have the skills to work with information and technological tools.

Training in the distance learning system requires a certain preparation for training, i.e. an initial level of education (a set of certain initial knowledge, skills, and abilities), as well as technical support for the workplace. It is obvious that the student's workplace should be provided with appropriate material and technical support.

An important feature of the didactic process of distance learning was the need to introduce the term «tutor» into practice to designate a student. Tutors can be full-time teachers of higher educational institutions or people of other professions working part-time or on an hourly basis. In distance learning, the main task of tutors is to manage students' own work, which requires them to perform the following functions: formation of motivation; setting goals and objectives; transfer of knowledge, experience; organizational activity; organization of interaction between students; control of the educational process.



The following means are used in the educational process of distance learning: books (in paper and electronic form), online educational materials, computer learning systems in conventional and multimedia versions, audio educational and informational materials, video educational and informational materials, laboratory

remote workshops, simulators, data and knowledge bases with remote access, with remote access didactic materials based on electronic libraries, expert training systems, didactic materials based on geoinformation systems (Table 4).

Textbooks and educational facilities, i.e. a set of material and technical means necessary for training in the areas of training established in accordance with the curricula. It includes educational and laboratory equipment, textbooks, teaching aids and other teaching materials. The significance of the educational and material subsystem consists in highlighting the principle of its correspondence to the content of teaching and the didactic system and including it in the list of elements of the didactic system. Since distance learning is based mainly on information technology tools, the importance of the subsystem is especially increasing.

Control of students' assimilation of educational material and assessment of their knowledge and skills are an integral part of the distance learning system. Distance learning defines increased requirements for the control system and gives it a certain specificity. Control, as in the traditional educational process, performs the functions of verification, training, education, organization.

Table 4 – Distance learning tools

№	Distance learning tools	
1	Email	
2	Computer (Video conference)	
3	Phone, smartphone	

The effectiveness of distance learning depends on the quality of the materials used (academic subjects) and the skill of the teachers involved in this process.

Therefore, the qualitative organization of distance learning (both at the design stage of the discipline and in the process of its application) becomes a priority.

At the center of the learning process is the independent cognitive activity of the student. It is important that the student learns to study independently using various sources of information; he must be able to work with this information using various methods of cognitive activity and be able to work at a convenient time for him. Independent learning should not be passive, on the contrary, the student from the very beginning should participate in active cognitive activity, which is not limited to the assimilation of knowledge, but involves their use to solve various problems of the surrounding reality.

The organization of independent (individual or group) activities of students in the network involves the use of new pedagogical technologies that correspond to the specifics of this type of training, stimulating the disclosure of internal reserves of each student and at the same time contributing to the formation of social qualities of the individual. In this regard, the methods of teaching in cooperation are used in **cooperation** (to increase the cognitive activity of each student in the network), **the project method** (for the creative integrated application of the acquired knowledge), **research, problem methods**. Distance learning involves active interaction both with the teacher – coordinator and with other partners, cooperation in the process of various cognitive and creative activities. Socialization issues are very relevant in distance learning. The control system should be of a systematic nature and be based on operational feedback (provided by the structure of the training material, accelerated access to the teacher or consultant of the course at any time convenient for the student), as well as deferred control (for example, during testing).

Figure 42 reveals the essence of a number of advantages inherent in distance learning by scientist D.M. Dzhusubalieva.

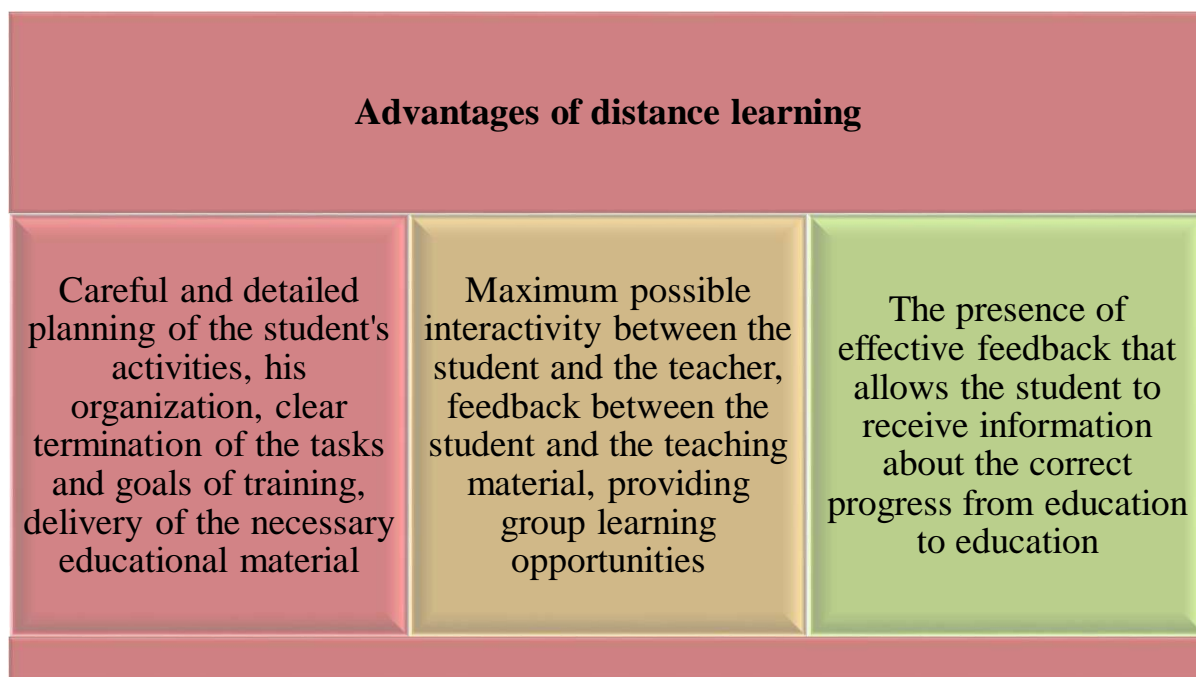


Figure – 42. Advantages of distance learning

Whatever the distance courses, objectively there is a need to present invariant components: general information about the course, its goals, objectives, content (structure), conditions of admission to study groups, final documents. This information is completely open for review on the server. The courses themselves are opened quite often, but only registration allows you to get your password, a web page on the server and become a full participant in the educational process under the guidance of a teacher, in case of successful completion of the course to receive the appropriate document of the educational organization. Reference materials (in the form of databases) on the subject area of the course; survey blocks (a separate file) that allow you to communicate with users, receive and process the necessary information. Structured according to a specific training course, more or less autonomous modules; a block of tasks aimed at mastering the material and checking its understanding, comprehension; a block of creative tasks aimed at the independent application of acquired knowledge, skills, abilities in solving specific tasks; the implementation of projects individually, in groups of cooperation; performs practical work (individual, joint).

The success of the distance learning process largely depends on the professional skills of teachers. Therefore, the concept of distance learning must necessarily include the need to train specialists in this profile. Distance learning, carried out with the help of computer telecommunications, has the following forms.

Web classes are distance classes, conferences, seminars, business games, laboratory work, workshops and other forms of training sessions conducted through telecommunications and other Internet capabilities. Specialized educational web forums are used for these classes. The form of user work on a specific topic or problem, entries left on one of the sites where the corresponding program is installed. Web forums differ from the first form of classes by the possibility of long (multi-day) work and the asynchronous nature of interaction between teachers and students.

Teleconferences are usually conducted on the basis of mailing lists using e-mail. Educational teleconference is characterized by the achievement of educational objectives. There are also distance learning forms in which educational materials are sent to the regions by mail. Today, distance learning is a democratic, simple and free learning system. The student acquires stable automated skills by constantly performing practical tasks. Theoretical knowledge is organically absorbed into exercise management without additional effort. The formation of theoretical and practical skills is achieved in the process of systematic study of the material and listening and repeating exercises behind the speaker on audio and video media (if available).

Thanks to the activities of **electronic libraries and educational Internet portals**, wide opportunities have been opened for obtaining the necessary amount of educational information. At the present stage, a fairly large amount of scientific information is revealed to students thanks to the Internet. All the achievements of this scientific and technological progress contribute to effective training at modern enterprises and educational organizations. With the help of modern communication

technologies, it is possible to conduct remote classes, conferences, seminars, business games, laboratory work, workshops and other forms of training sessions implemented through the capabilities of the global Internet. Distance education allows you to involve a large number of interested persons in the educational process, since students are not limited to the physical criteria of the lecture audience.

In recent years, online seminars or webinars have become actively used in the field of education. A webinar is a form of a web conference that includes online consultations, presentations in real time via the Internet and other interactive functions. During the webinar, each participant uses his personal computer, communication between participants is maintained via the Internet, using special software installed on each participant's computer, or through a web application. The latter method of conducting a webinar is very convenient, since it does not require the placement of specialized software on the workstations of conference participants. Webinars can use various interactive interactions, may include voting and polling sessions that provide full interaction between the audience and the teacher.

Interactive communication is the interaction of students with other webinar participants through software. With more advanced communication opportunities, the possibility of choosing options for the content of training and the training mode is realized. The more features of the software package, the more actively students participate in the learning process and in relationships with other participants of the webinar, the higher the interactivity. In general, interactive communication involves communication of any participant in the educational process with each other, using the available opportunities. When conducting webinars, the «electronic whiteboard» technology is often used. First of all, this interactive tool is designed for commenting, it allows the teacher and students to leave notes of a slide presentation or comment.

Thanks to the use of the global Internet, teachers and students of the webinar can be at a great distance from each other and participate in the same educational process. The webinar cannot be understood as a one-way broadcast. As a rule, a webinar gives participants the right to ask questions of interest to them or express their point of view on the topic under discussion. With the help of webcams, the interlocutors can see each other, which has a positive effect on the educational process. During classes, remote computer controls are often used, with the help of which the teacher can directly help students if he has difficulties with performing a practical task. Tools such as JoinMe and TeamViewer allow the students effectively manage programs on the side of a remote computer.

As a rule, distance learning involves the independent performance of practical tasks by students. Cloud data warehouses are often used to centralize completed assignments, training materials and other documents necessary for the educational process. Cloud data storage is a type of Internet storage in which information and user data are stored on several Internet servers, which are transmitted to students for use. Using cloud storage is often more convenient than using separate servers. From the user's point of view, cloud storage represents them as a single virtual server. Examples of cloud storage are DropBox and GoogleDrive services. In addition, most

cloud storages provide a certain amount of space for free use (VoIP applications- Skype, Google Talk, Twinkle and others). Many IP phone devices also support encryption of the transmitted data, which allows them to be successfully used to transfer private internal information.

With distance learning in higher education institutions, students are not required to be directly in the classroom all the time. In most of the work programs of higher educational institutions that provide distance learning, daytime classes are held in the evening or on weekends. Attending these classes is not mandatory, but is often used to develop students' various practical skills.

The need and benefits of e-learning are important. However, in practice, both students and teachers face great difficulties that hinder successful learning.

1) Difficulties in adapting to the online format

If students are expected to listen passively and take notes, then virtual discussions, work with a personal account and materials in various multimedia formats require. Students with normal thinking may find it difficult to adapt to such changes. To do this, teachers and students are given special offers (Fig.43).

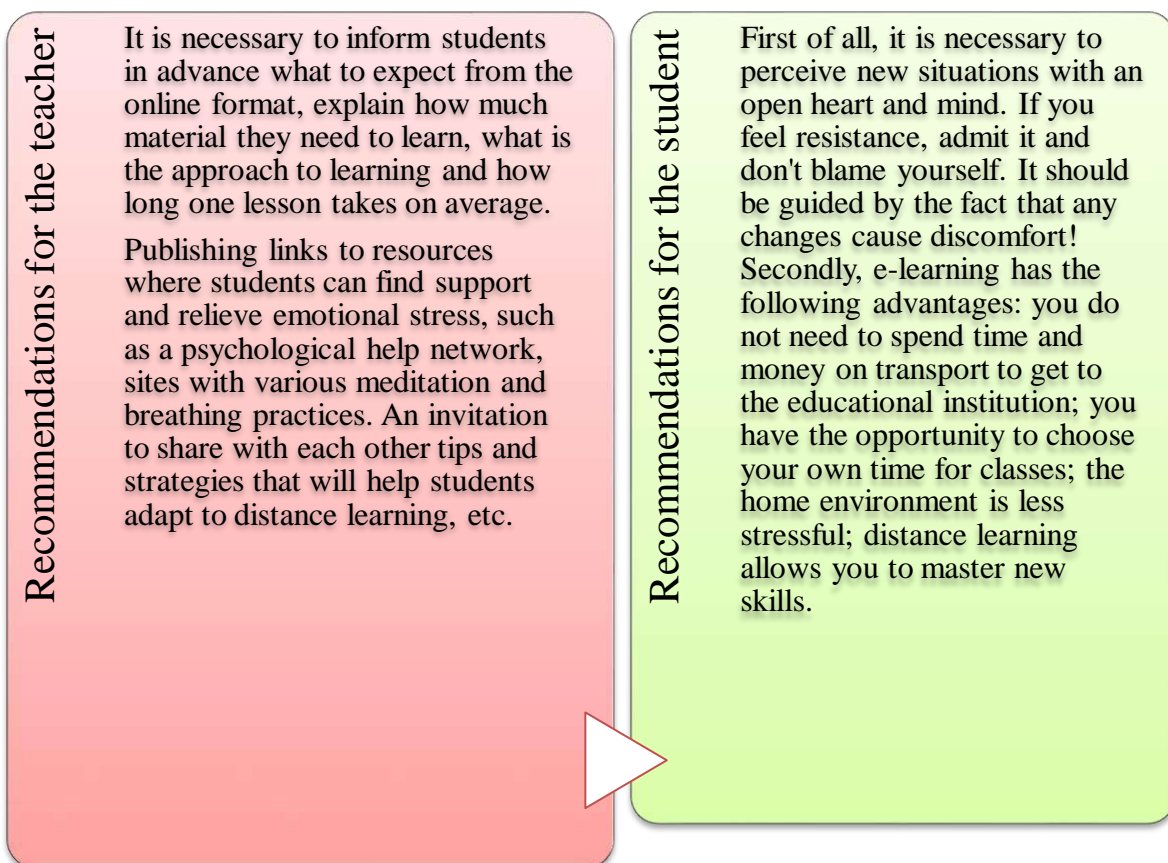


Figure – 43. Tips for the teacher and the student

2) Low computer literacy

The lack of computer literacy is an important problem in the modern world, affecting both students and teachers. Many still work only with a personal computer (PC) and standard office applications such as MS Word and PowerPoint. Even

between experienced teachers and students, there may be misunderstandings regarding various applications related to the use of distance learning tools, such as online educational platforms, video conferencing systems, communication and viewing of educational materials. However, technological skills are mandatory for successful completion of distance learning. To do this, teachers and students are given special offers (Fig.44).

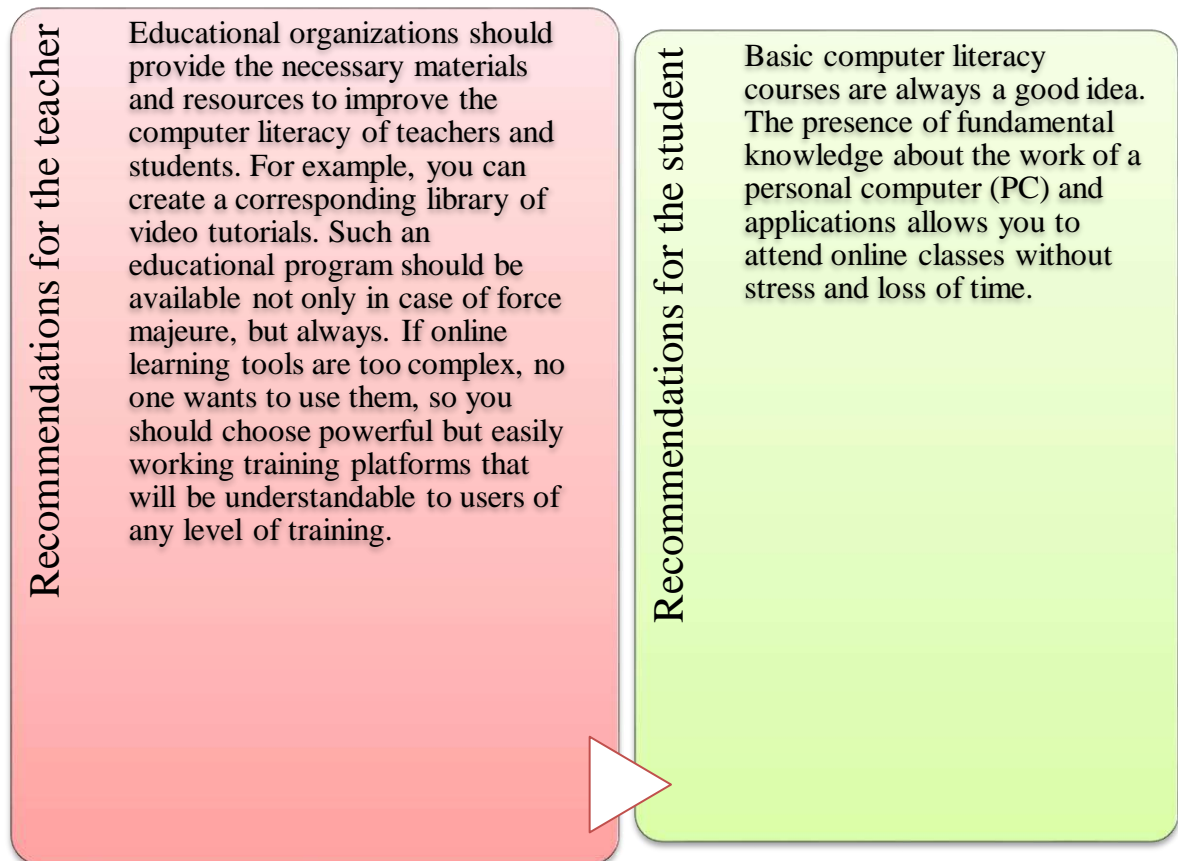


Figure – 44. Tips for the teacher and the student

3) Technical issues

Technical problems often prevent reading online. There may be problems with the compatibility of educational platforms with operating systems, browsers or smartphones, and a low Internet connection speed may lead to missing online lessons or difficulties downloading lessons in video format. All this disappoints students and reduces their involvement in the learning process.

To do this, teachers and students are given special offers (Fig. 45).

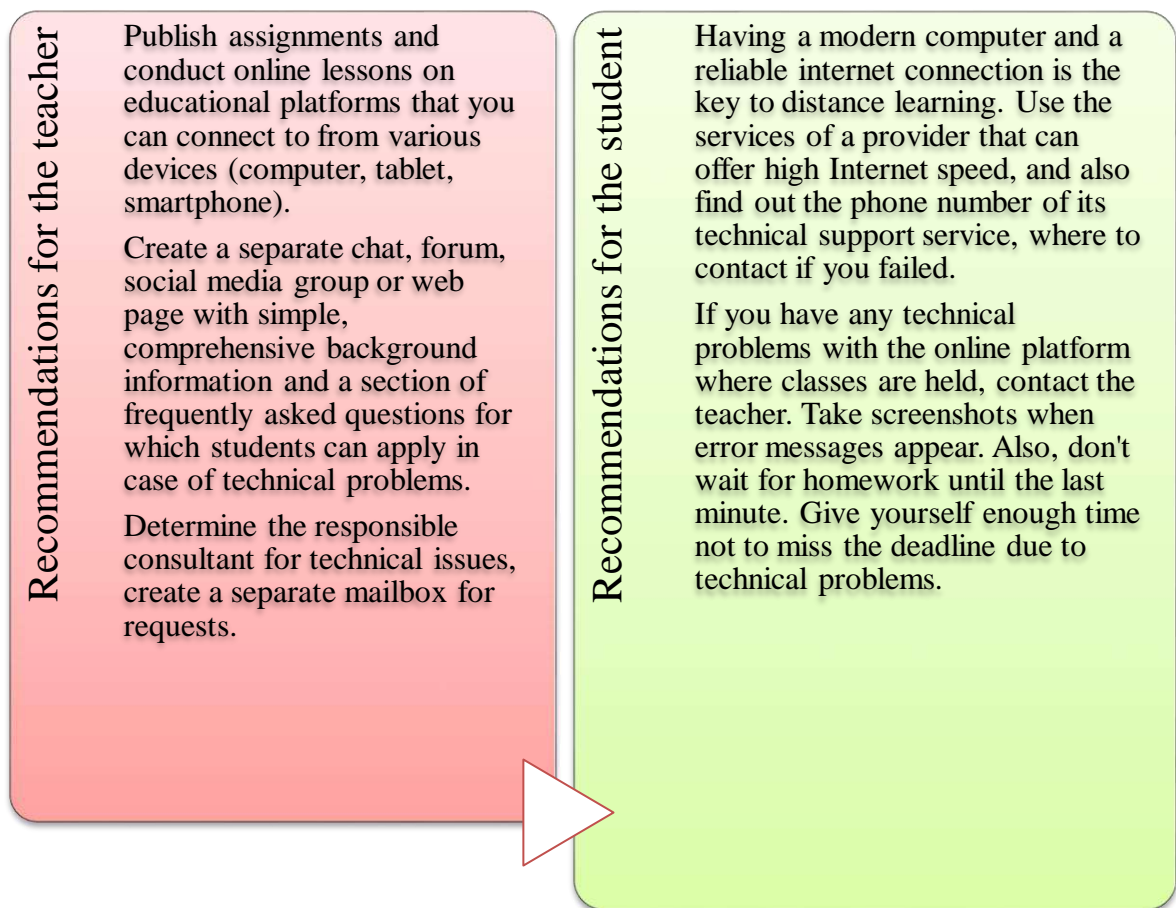


Figure – 45. Tips for the teacher and the student

4) Ignorance of the basics of time management

The freedom provided by the online learning format often requires vigilance and creates a false sense of infinity of time. Distance education places higher demands on discipline and self-organization than its offline counterpart, although this understanding has not yet been formed. Improper time management can significantly lag behind the curriculum and lead to severe stress. Recommendations for everyone: competent time management is a necessary skill for online learning. You can give some tips that will help you manage your time correctly (Fig. 46).

In addition, there are many scheduling services that allow you to set reminders for tasks that will be very useful in the learning process.

5) Weakness of self-motivation

Lack of motivation is a common problem for all students. The online format requires strong discipline and determination to independently complete tasks, show interest and move forward.

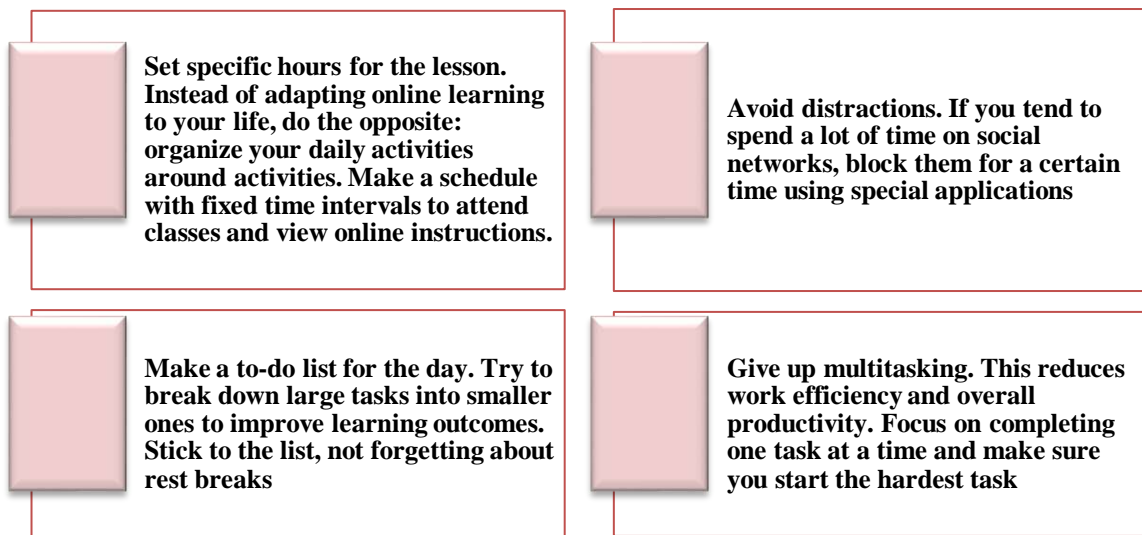


Figure – 46. Tips to help you manage your time properly

Figure 47 shows a special consultation for teachers.

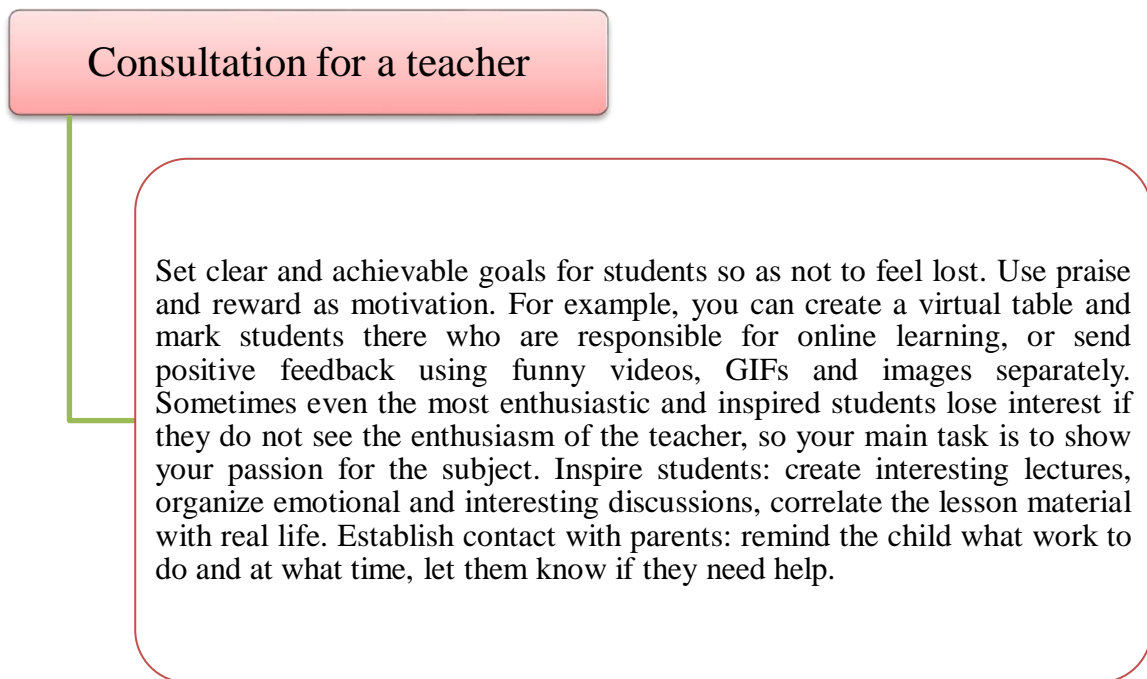


Figure – 47. Special advice for teachers

If a group of students is not surrounded and there is no control from the teacher, the training is postponed.

6) Lack of social interaction

While at the university, students can communicate directly with each other and with the consultant: react instantly, exchange experiences, joke and establish non-verbal connections, strengthening social skills. A lot of communication, discussions – changes when switching to distance learning. Without communication with friends,

without noise, without a group, without personal contact with an adviser, distance learners can feel isolated. This psychological factor negatively affects motivation and academic performance.

Recommendations for teachers: To help students overcome feelings of isolation, create a blog or group chat for communication, and also encourage them to ask questions, help each other or discuss topics. Important strategies will help to form a sense of community in the online environment (Fig.48).

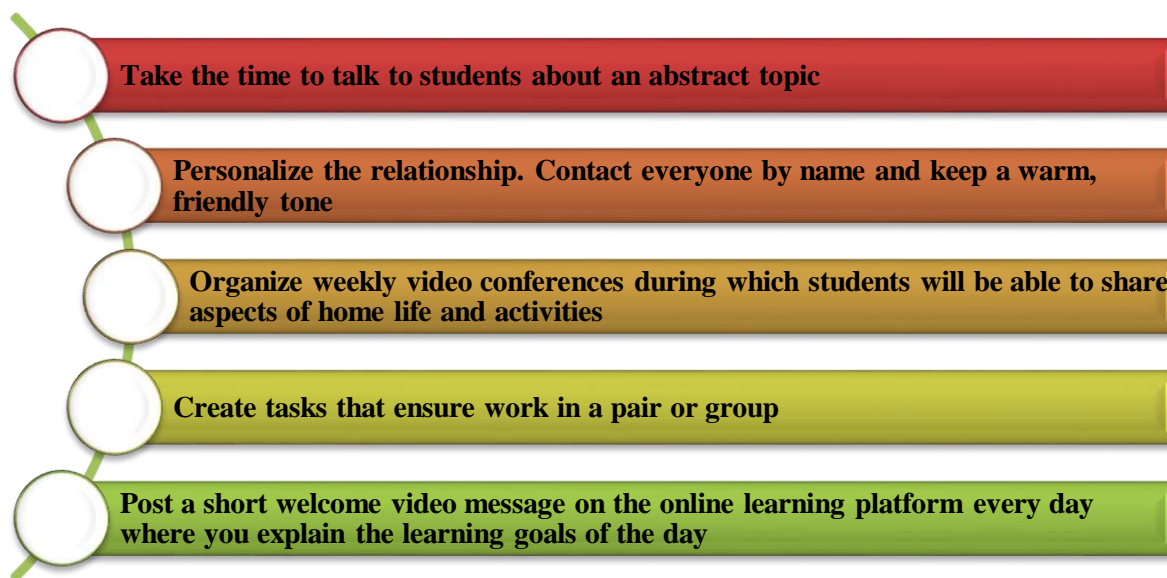


Figure – 48. Important strategies that form a sense of community in the digital environment

It is important to feel that the teacher is open to communication with students.

Questions for testing and evaluating knowledge:

1. Comment on distance learning.
2. Describe the principles of distance learning and give examples.
3. Reveal the essence of distance learning methods.
4. Give a description of distance learning technologies.
5. Give examples of distance learning forms implemented with the help of computer telecommunications.
6. Reveal the actual problems of distance learning and ways to solve them.

Recommended literature

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2.4 Mobile learning: achievements and disadvantages

Mobile learning, also known as m-learning, is a new way to access educational content through mobile devices. With a modern mobile device connected to the Internet, you can study anytime and anywhere (Fig.49).



Figure – 49. Mobile device

Mobile learning is a new way to access the learning process via a mobile phone. Mobile Learning supports continuous access to the learning process.

M-learning in corporate education. You can also work on the Internet via a smartphone. Desktop and laptop computers are still popular, and instead of choosing only one device, it has become normal to own multiple devices and use them for various activities. Mobile training offers the opportunity to connect with employees who are always on the go or working remotely.

In corporate education, mobile learning allows you to access employees who are always on the go, work remotely or want to study outside of working hours (therefore they do not use the desktop).

Mobile learning in corporate education. For mobile consumption, you will need to share educational content. This is the most common way to use mobile learning. After you create your training material (mainly using the desktop), you will have the opportunity to share it with the participants so that they can use their mobile devices at the right time. It is easy to share the material by exchanging links via email or just a text message. This method of mobile learning is more related to personal consumption.

Interaction during classes. Mobile devices can be used for a mixed way of learning. You can also use mobile devices for a blended learning approach. Teachers can ask questions during individual training, and the audience can answer them with a survey via their smartphones. To do this, the trainer can share a link to the survey, invite participants by email, or even create a QR code that can be easily captured using a smartphone camera. You can get immediate feedback, which is especially effective when teaching large groups.

Mobile learning does not lag behind the development of wireless and mobile networks. How should wireless technology change to support this learning method? The phenomenal growth of e-learning continues, but its development mainly affects the wired infrastructure. It is believed that the emergence of new wireless and mobile networks, the rapid increase in the penetration of smartphones into society, will lead to the emergence of new applications for mobile learning. One of the last and most important changes in the learning environment was the need for mobility. Smartphones are becoming more and more popular in society. In addition, the exponential growth of wireless and mobile networks will lead to significant changes in mobile devices, protocol development, standardization and implementation of the network and user perception.

Mobile training is mainly carried out over a wireless WiFi network (Fig.50). It can adapt quickly to meet changing learning needs. Students have the opportunity to study at the right pace and in a convenient place for them. Mobile learners can collaborate with teachers and other learners to get a better education. With the help of mobile learning, you can quickly and economically deliver educational materials in a multimedia format.



Figure – 50 . WiFi-wireless network

Mobile learning structure. This mobile learning system establishes several functional layers, simplifying design and development so that different actors (e.g. suppliers, carriers, designers) can access individual layers. Using this structure, an individual subject does not need to do everything to create mobile learning systems, instead he can start with the highest level of functionality offered by others. This structure is divided into four levels. At the mobile learning application level, many new applications are possible, and most of the existing e-learning applications can be modified for the mobile environment. When developing new applications for mobile learning at the infrastructure level for mobile users, it is necessary to take into account the capabilities of users' mobile devices. At the mobile protocol level, the goal is to hide the network being used from applications, providing a stable and easy-to-use interface. The quality of service at the cellular network infrastructure level largely depends on the resources and capabilities of the network.

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Level 1 - Mobile learning applications. In the conditions of an unlimited number of potential applications for mobile learning, the organization of educational activities and the organization of active learning in mobile learning is of particular interest. Outside the walls of educational institutions, there are a huge number of types of educational activities. For example, students can visit museums or get basic information about the production activities of geographically distributed enterprises. The organization of educational activities in mobile learning allows you to track the location of the student and assess his needs in a specific situation, thanks to which it is possible to correctly convey the material of the training course, thereby correcting and stimulating the attitude of students to learning. For example, when students are studying an unknown experience, they may need certain information for reference. The relevant information is downloaded via a mobile device. In addition, when

students move from one place to another, they can receive information about the specialization of stores, their current load in real time.

The success of organizing educational activities in mobile learning depends on the costs, reliability of the wireless infrastructure and the level of convenience of students of the new technology. Such a system helps students to carry out educational activities without the participation of another person. In a mobile learning environment, students use an application that guides the user through a sequence of actions that help them complete learning tasks. Examples include intelligent databases used to solve problems with typical training tasks, and research progress maps for routing daily activities. The system provides execution, on-demand support and indicates the steps necessary to complete the training task. In learning management, applications collect information about the user's needs and then send an alarm to the learning system for information and training. The teacher can adapt the educational information to the students. This can be achieved by collecting information about it when students connect to and interact with mobile devices. The program starts a dialog, asks questions and the user answers. This can be used to adapt the form and content of communication in real time, to attract attention to some aspects of the educational material that may interest students, depending on their purpose and interest. For example, the application can collect information about what students did during the first round on the topic. After the tour, students can be given a task to perform certain works based on such data. Teachers can use this information to better organize the content of the lecture in the future. Such detailed information will allow you to send the curriculum to students who may need certain skills and knowledge in future classes.

Level 2 - Infrastructure for mobile users. Mobile devices and wireless networks can transmit text messages, video information, images and other data. Users will need appropriate mobile devices, such as smartphones and high-speed wireless networks. It is important to have network interaction, as communication breaks have a significant impact on the quality of information services. To implement these applications, the user needs several functional components. First of all, you need a mobile device with sufficient memory and computing power, an appropriate display and communication function. It can be a personal digital assistant (PDA) with a wireless modem or smartphone, designed for both communication and data processing. While these devices have more capabilities than ever and expand memory and processing capabilities, an operating system is needed to manage resources. Currently, the following operating systems are the most popular: Android OS, iPhone, Windows Phone, Bada, Symbian OS.

Level 3 - Mobile protocol. The mobile protocol connects various applications, tools, networks and technologies, creating a standard user interface. It is important to achieve the independence of the application from the device and wireless technologies. Currently, the abundance of operating systems makes it difficult to solve this problem. For the correct operation of the application, it is necessary to develop an individual version for each operating system, which significantly complicates the implementation of universal solutions. In addition to this problem,

developers have a choice: developing a web application or a local application. This choice determines the availability of the application to the smartphone resources, respectively, computing capabilities and the quality of personalization of training courses.

Level 4 - Mobile network infrastructure. Unlike mobile devices and protocols, mobile training programs depend on network support. The two most important factors are data transfer speed and coverage. GPRS, 3G or WiFi coverage everywhere is necessary for the successful reception of mobile learning. In general, mobile learning requires the quality of wireless service, which affects the performance of mobile learning applications in terms of latency, loss and other quality attributes. There is also a need to manage location, which is an integral part of many mobile learning programs, especially applications that include location or student search. Currently, the vast majority of smartphones are equipped with a GPS module that allows you to get good accuracy when determining geographical coordinates. Also, using cellular communication technology, communication can receive the sector in which the mobile phone user is located. Therefore, reliable and "viable" wireless networks are needed. Students also have access to mobile learning applications with varying degrees of network errors. Finally, roaming allows students to access mobile learning applications from anywhere, even in conditions of uneven coverage in a single wireless network.

Mobile learning is becoming more useful and effective, which improves the Internet and mobile networks. These are information materials for existing industries; knowledge management; public construction; journalism; systems of education, training and preparation of training courses. Mobile learning is dynamic, it offers not outdated news, but today's news. With real-time mobile learning features, learners get what they need when they need it. Mobile learning is based on collaboration because people learn from each other. Each student chooses the desired action that individualizes the learning options corresponding to his current level. It offers learning activities from many sources, allowing learners to choose the desired format or method of learning.

The possibilities of mobile technologies. The power of mobile learning in changing learning paradigms develops a person's ability to instantly shape the game. You can receive ideas from other people and share them with the whole world within seconds; feedback, comments, materials, etc. Connections and interactions are also easily established, creating learning communities between mobile learners. Innovative educators invite students to create excellent and personalized mobile websites. Students are more motivated when they are responsible for the content they write, edit, review and publish.

In the future, training can be carried out by forming your own digital savings projects. Any training is a social process. Previously, people learned to achieve the desired effect by communicating with each other in everyday life. Mobile learning provides students with freedom, special time, thereby stimulating learning. However, it increases your chances of success by offering several possible ways of learning. Its main advantage lies in its focus on the student (Fig.51).

When students search for any information or amount of knowledge, the central component is the human component, i.e. the need to obtain any knowledge. Students in the learning community have a pragmatic approach and want to know what they need to accomplish certain tasks. In the learning community, education is often a function of the quality and strength of personal relationships.

Learning in mobile learning, which allows students to communicate systematically, goes beyond the physical limitations of the group and educational resources. Knowledge Management transfers information and knowledge to anyone, anywhere, instantly and in real time. Together, they describe mobile learning in a way that is more appropriate, and it is part of the learning culture rather than inclusion in it, which is a key factor in the success of mobile learning.

In a mobile learning community, when a student needs information, they can use it to collaborate with other students. From this point of view, learning is not about getting new information, but communicating with people who help put this information into context and offer new ways to think about it.

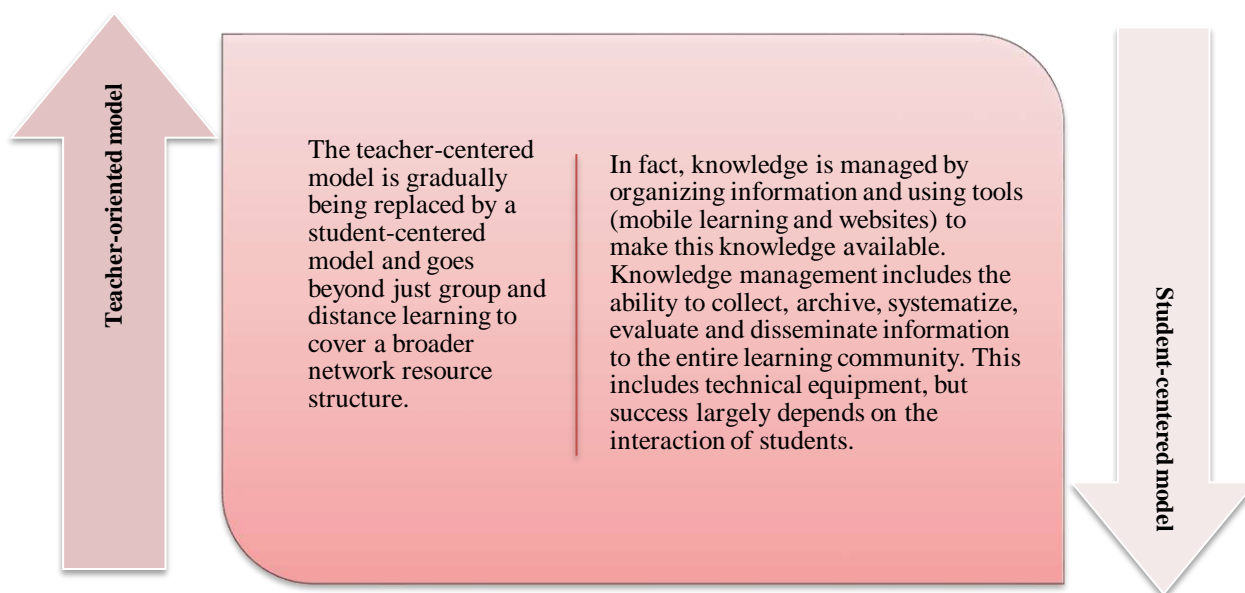


Figure – 51. Features of mobile learning

This social aspect is central to how learning happens in the mobile learning community. Changes occur continuously, students constantly need knowledge and education at the level of the requirements of the time. Mobile communication has led to the transition from an environment located in an educational institution to a mobile environment. Students should be able to contact teachers and other students to ask questions and receive instructions.

The best mobile learning systems should use pedagogical and informational approaches. It is necessary to focus on both information and training and look for opportunities to introduce the concept of knowledge management. Technology is an important opportunity for mobile learning, but the main challenges may be content, strategy, and transformational change. Ultimately, reading means acting from person

to person. By teaching, people get the knowledge they need when they need it. Traditional classrooms cannot be replaced by mobile learning. Maximizing the pedagogical effectiveness of mobile learning requires mastering new skills and methods. Education is the most important resource for future social and economic development.

Studies in which students are motivated to learn using mobile devices show that their academic performance improves. Mobile learning is a great opportunity for educators, but in most cases you can get access to new opportunities. With proper preparation and enough time to use high-tech gadgets, teachers will soon make a breakthrough and will be able to support and direct the constant use of such devices in the classroom. Currently, students mostly use individual mobile devices.

Mobile learning technologies. Mobile learning only makes sense when the technology used as a learning activity is fully mobile, and technology users become mobile while learning. These clarifications point to the mobility of learning and the importance of the term «mobile learning». Mobile learning is defined as wireless and digital devices and technologies created for the general public and used by students as participants in the education system. Others define and demonstrate mobile learning, focusing on the mobility and learning mobility of students, as well as the learning practice of students using mobile devices.

Figure 52 shows the main objectives of mobile learning and Table 5 describes mobile devices.

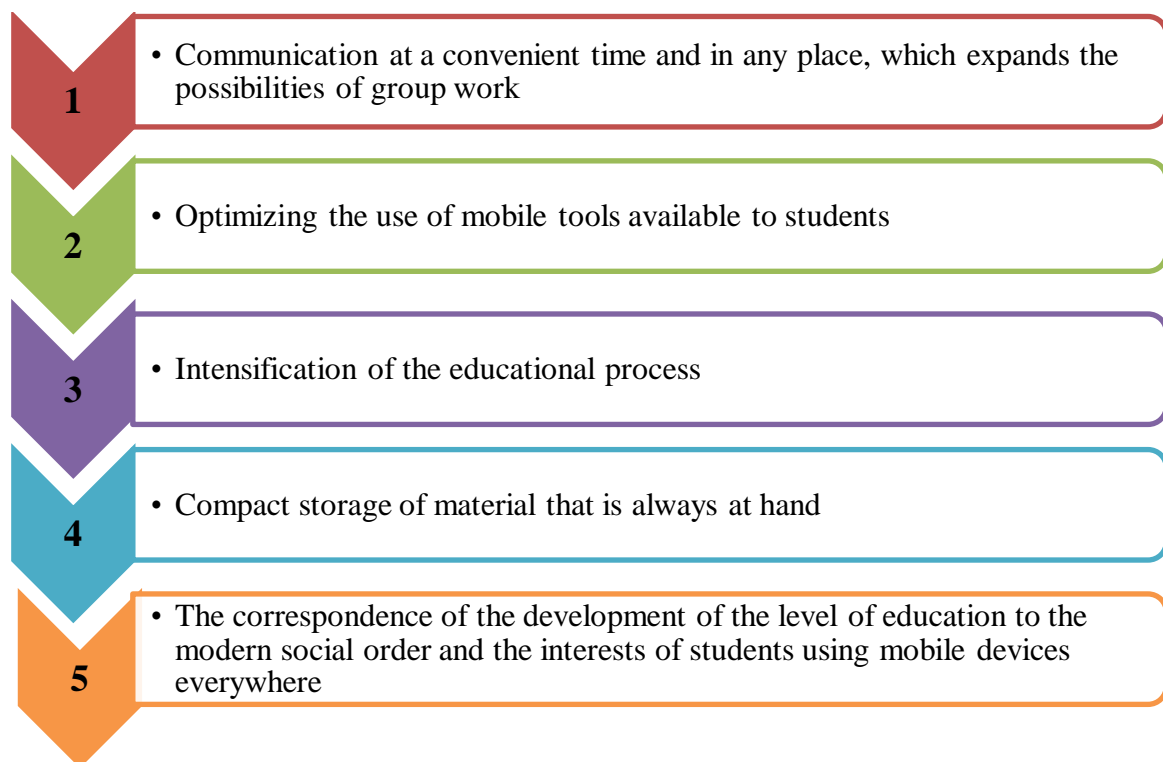



















Figure – 52. The main objectives of mobile learning

Table 5 – Mobile devices

№	A brief note	Description
1		<p>MPEG – used to reduce and deliver audiovisual content related to mobile learning</p>
2		<p>Provides access to teachers and resources via Wi-fi Internet</p>
3		<p>LTE service provides high connection speed and normal data transmission</p>
4		<p>Courses and presentations in HTML5 format can be viewed on modern mobile devices</p>
5		<p>Socrative – online service for supercharging testing in educational institutions</p>
6		<p>Kahoot is a gaming learning platform that is used as an educational technology in schools and other educational institutions</p>
7		<p>Quizizz is a platform for learning in a playful way, suitable for any academic subject and a person of any age</p>
8		<p>Zoom is a platform for video conferences, webinars and other similar online events</p>

9	 SKYPE	Skype – software for communication with the whole world
10	 MICROSOFT TEAMS	Microsoft Teams is a Microsoft corporate platform that combines chat, meetings, notes and applications in a workspace developed by the company
11	GOOGLEMEET 	Google Meet (formerly Hangouts Meet) is a business – oriented version of the Google Hangouts platform, compatible with a company of any size and allowing for video conferences, remote conversations, webinars, virtual trainings, remote interviews
12		WizIQ virtual laboratory
13	 GOOGLE CLASSROOM	Google Classroom is a platform that allows you to fully translate learning online
14	 NEARPOD	Nearpod is a platform that allows teachers to create presentations for lessons and show them to students directly at the appointed time
15		Learning Apps – an application to support the learning process through interactive modules (applications, exercises)
16	 WIZER.ME	Wiser.me – free, easy to use, with tasks and exercises, including a video-based, fast tool for quickly creating interactive worksheets.m
17	 EdApp	EdApp bilim I take Platforms is the leading LMS system used by large and small organizations in the world.
18	Daryn.Online	Daryn.Online is a distance education platform that allows you to study with highly qualified teachers anywhere and

		anytime.
19	Система EDUS	EDUS system – electronic school-educational platform for schools
20	Bilimland (www.bilimland.kz)	Bilimland is a digital educational platform based on the advanced achievements of the world leaders of e-learning
21	Platform «Kundelik»	Kundelik – unified electronic educational environment for teachers

Mobile learning is now becoming more relevant than ever: on the one hand, it has the attractiveness of innovation, and on the other hand, it can be practically convenient and feasible. Most students will be very pleased with this innovation.

Many individual technologies can support mobile learning:

- 1) individual digital assistant, the ability to use in the classroom and outdoors;
- 2) Tablet PC UMPC mobile phones, Mobile cameras and Smartphone;
- 3) studying Mobile Author, for example, for publishing WAP, J2ME and Smartphone;
- 4) a separate audio player, for example, for listening to audio recordings of lectures;
- 5) sound and multimedia guides in museums and galleries;
- 6) modern portable game consoles such as Sony PSP or Nintendo DS/Wii.

The main types of m-learning

Socrative is an online service for testing lessons in educational institutions. This service allows you to quickly create crosswords, vote, conduct surveys and tests. In addition, Socrative allows you to quickly view the test results in real time and evaluate the achievements of not only the group, but also each student. The test can be obtained from 50 people at the same time.

Figure 53 reveals the essence of the didactic values of Socrative.

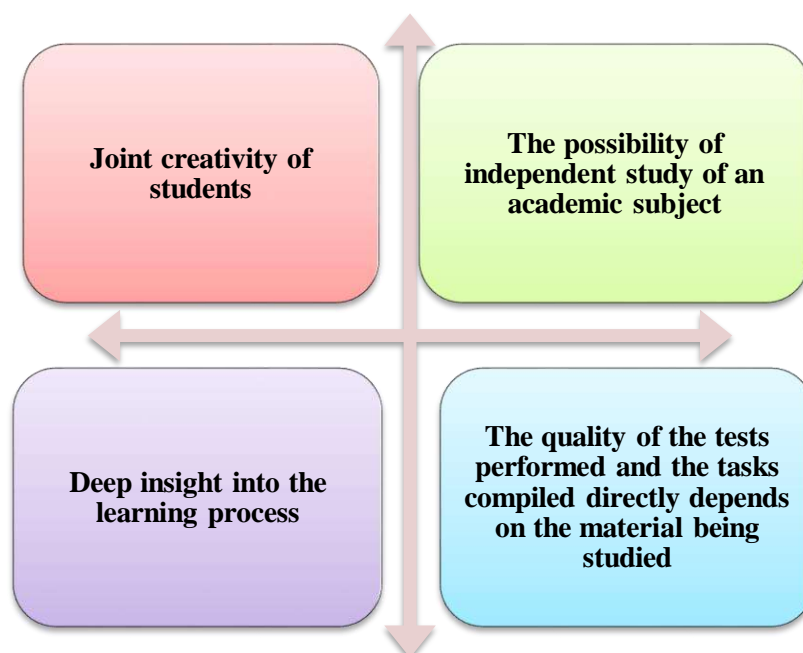


Figure – 53. Didactic values of Socrative

Kahoot is a game-based learning platform that is used as an educational technology in schools and specialized secondary and higher educational institutions. Educational games «Kahoot» is a quiz with many options that allows you to activate users and is available through a web browser. This service can be used to test students' knowledge, for formative assessment in the classroom.

The use of the new Kahoot online service in the educational process contributes to the comprehensive development of students, increasing their motivation, as well as simplifying the work of a teacher. The content of this service is social, transparent and easy for teachers to use. It is a tool that quickly forms all interactive methods – survey and discussions. Everything that is done on this platform is called «kahoots» according to its name. In these mini-games, you can include videos and pictures, enter polls (if, of course, the polls are ready). To give the effect of a race, you can add a timer for questions. To start a game in a classroom or group, a teacher or teacher must provide a group of students with a code compiled by the system, which they then insert into their devices (tablets, smartphones, desktops), and a fun reading begins. The teacher prepares questions, and students, using their mobile devices, answer them.

Kahoot has a number of interesting features that will help motivate and interest students. When a question appears on the screen, different music plays for each question, and a knock sounds, meaning that the answer time is limited. The faster the students answer, the more points he will get. There is also a Leaderboard that shows who scored the most points. After the test is completed, the result will be presented in the form of a table. Kahoot has a very large library of open mass tests for everyone.

Quizizz is a platform for learning in a playful way, which is suitable for any academic subject and a person of any age. This service allows the teacher to create their own tests, edit them, and also allows you to better manage the group, track the individual work of each student: all students are given the same task, but each is given differently on his device in an arbitrary sequence and each works on his device at his characteristic pace (Fig.54).

Each test not only introduces the results, but also allows you to get data in an Excel spreadsheet. If desired, the teacher can use not only his own tests, but also tests placed in the ready-made Quizizz library.

The electronic educational environment is an educational space that allows students to form all the qualities and qualifications necessary for a modern person, such as media education, critical thinking, the ability to solve creative tasks, global thinking, willingness to work in a team and civic consciousness.

Advantages and disadvantages of mobile technologies. The advantages of mobile technologies come to the fore, since the teaching methodology is focused on the mobility of the student and his interaction with portable devices such as smartphones, MP3 players, tablets, PDAs, eReaders, MP3 players, laptops and other smart devices. Today, it is constantly expanding to cover digital sound recorders, e-books and dictionaries, and assistive technologies for students with disabilities. The

devices have become multifunctional, they include the reproduction of oral speech, audio and video materials, reading, recording, searching for information, performing calculations, games, etc. the choice of the device depends on age, location, tasks and other factors. Young people and teenagers often use mobile phones and private media players. Adults can use individual digital assistants (PDAs), smartphones and laptops that they use for work. Advanced mobile devices are very popular among people because they are wireless and portable. These functionalities allow users to communicate on the go. Also, the popularity of these devices is a consequence of their ability to work at several levels, that is, to perform the functions of several devices.

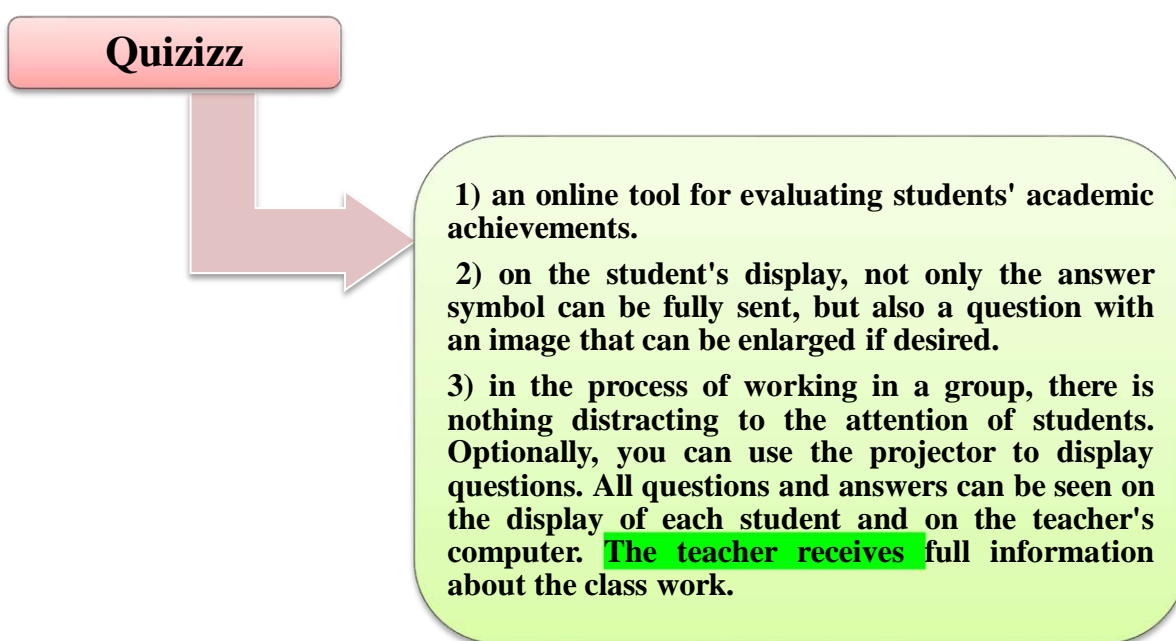


Figure – 54. Features of the Quizizz platform

In addition, intense commercial competition in the mobile communications industry forces manufacturers to be very innovative and constantly strive to introduce new features that can give them a competitive advantage. As part of this, visionary educators, designers and developers should consider applying these devices to modern teaching and learning. In such an environment, content and services can be delivered to students via their own wireless mobile devices. This adds another layer of learning and a personal computer-based learning model. This also means that e-learning will take place in conditions that are fundamentally different from those that concern teachers and students.

Figure 55 shows the advantages of using mobile learning for students.

Participants can study anywhere and at any time. More motivation, more real-time feedback. The millennial generation has grown up with digital devices. Thus,

mobile learning is adapted to the way millennials work and think. But m-learning has many advantages that all generations can take advantage of.

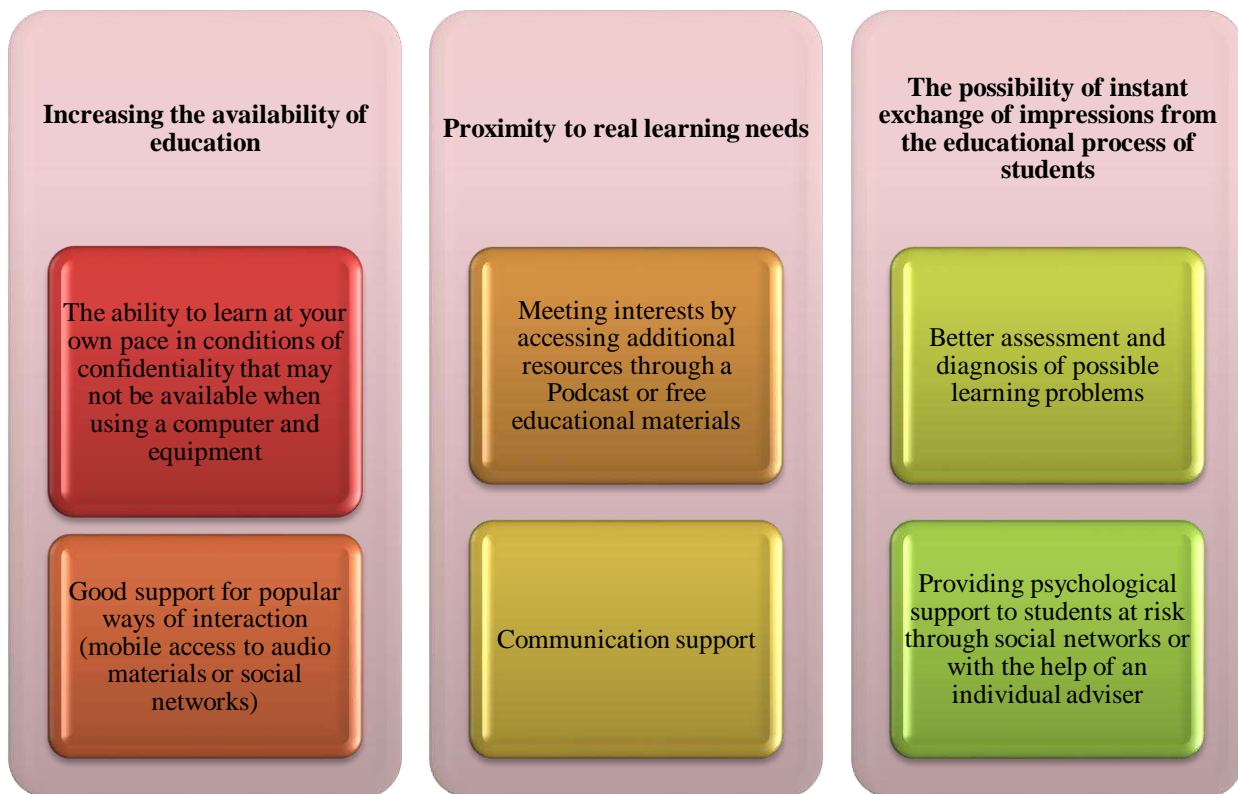


Figure – 55. Advantages of using mobile learning

Some advantages of m-learning:

Learn where and when you want. M-learning allows recipients to take learning materials with them. It is not necessary that employees or consumers, students are in a certain place or receive education at the same time. Their educational content is available in their folders. Waiting time, such as waiting for an airplane or flight time, can be used for more productive tasks, such as learning something new.

More motivation. When employees, students know that they can take educational materials with them everywhere, they have a desire to learn something new or study online. This is especially true if they don't have time to study during normal working hours.

Mobile learning facilitates and accelerates feedback.

Real-time feedback. Mobile learning facilitates (and speeds up) any feedback you want from your team. Since it is easier for your employees to access the content you share, the completion rates of training courses are higher, and you can expect faster results and statistics from your online tests!

Long distances are not a problem. Get access to disparate employees who are always on the go and need easy access to content. Content such as product updates, customer faces, compliance updates, and sales offers can be easily accessed in a few clicks.

Mobile learning fits well with many goals of educational organizations, including:

- 1) reconstruction of the curriculum;
- 2) personalization of training;
- 3) digital literacy
- 4) cost reduction (doing more with less money);
- 5) attributes and performance of graduates;
- 6) increase evaluation and feedback;
- 7) improving attendance and memory of students.

Mobile learning has many hidden benefits, but measurement and granularity include: portable-Allows you to read anywhere, anytime; efficiency of communication (including speech and data exchange); allows access to learning in divided communities and in isolated cases.

Figure 56 shows the advantages of M - learning.

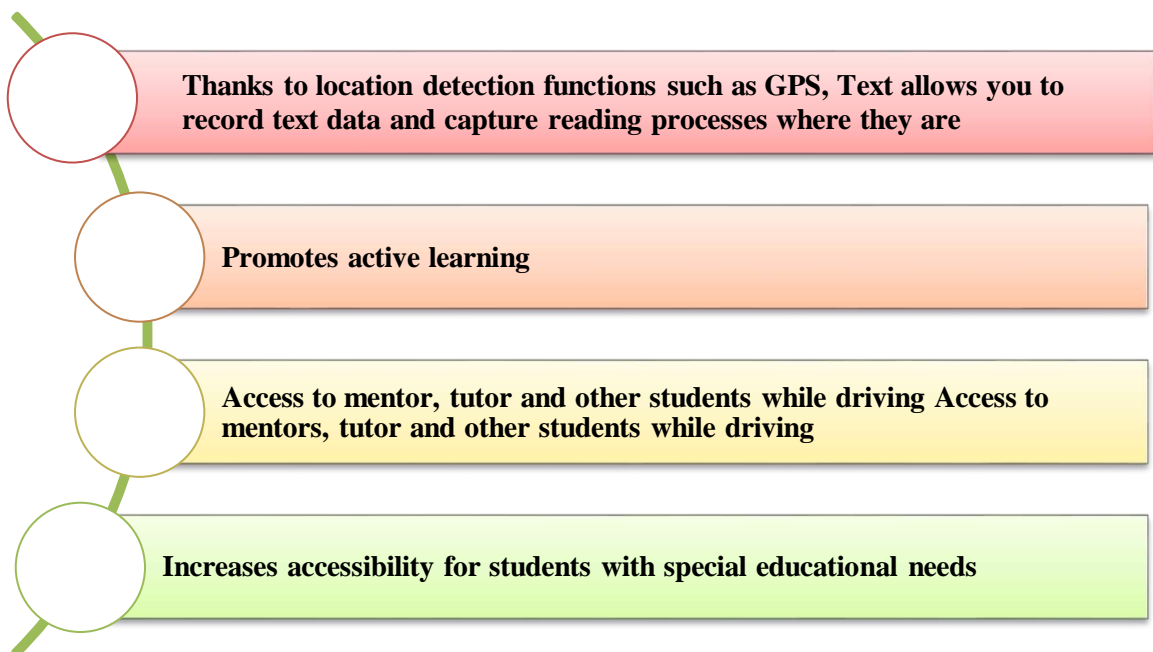


Figure – 56. Advantages of m-learning

Advantages of mobile learning. Mobile learning is very popular, and its use has expanded over the past few years.

Figure 57 reveals the essence of the advantages of mobile learning.

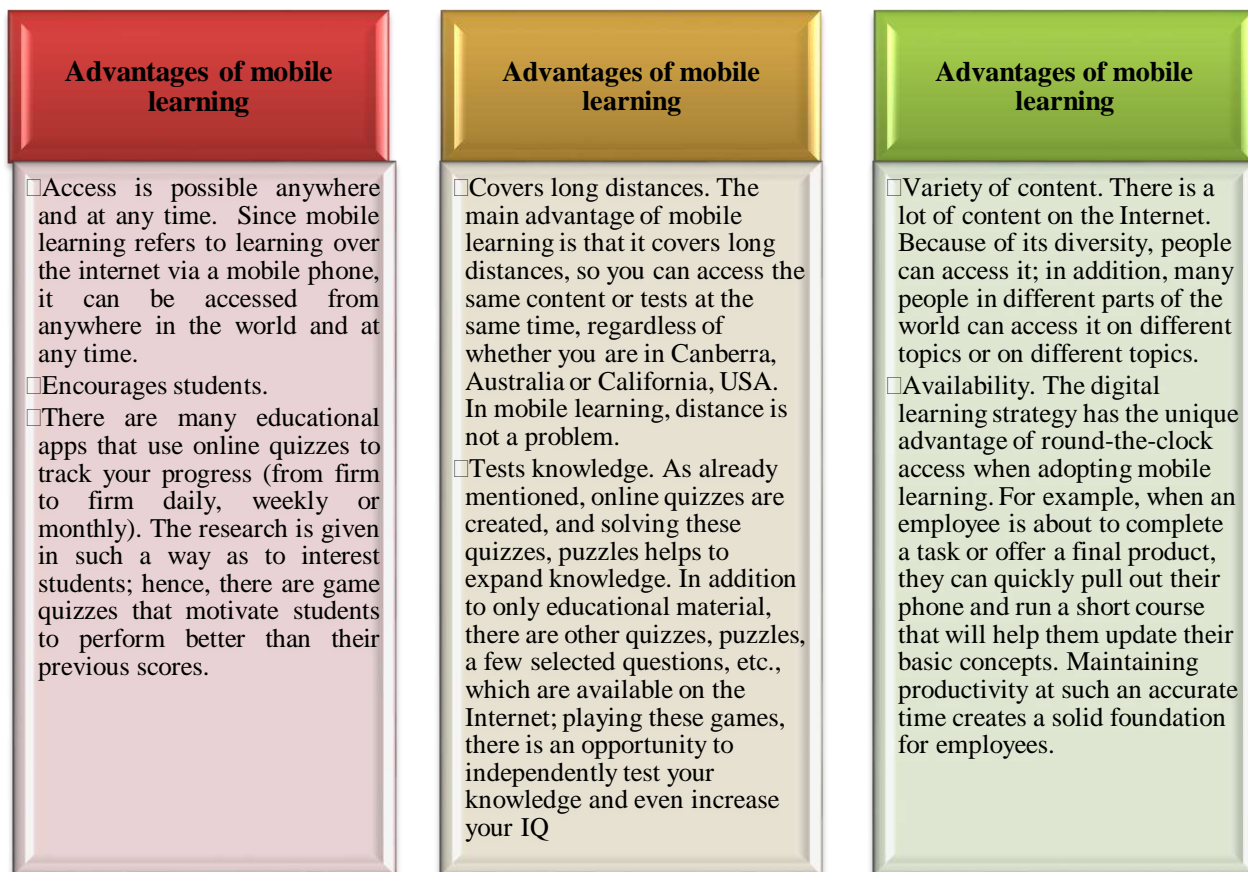


Figure – 57. Advantages of mobile learning

Responsive design that is easily perceived and leads to content validation in the future. Adaptive design allows the interface to adapt to multiple device sizes, be it desktop, laptop, smartphone or tablet. Responsible design is accompanied by mobile learning. This shift has helped to "prove the future" of content and design as mobile technologies evolve. The future of education lies in the development of technologies that provide access to mobile learning and the necessary resources in the most necessary place.

Disadvantages of mobile learning. As an educational tool, it is necessary to reflect in detail the various advantages and disadvantages of mobile learning devices.

The following disadvantages of mobile learning can be identified:

- 1) You can use the internet, which can provide broadband access anywhere in the world, but it is the most expensive financially;
- 2) The use of mobile technology can jeopardize human relationships and increase stress levels or cause feelings of overload;
- 3) Widespread use of mobile devices can negatively affect privacy and a sense of personal security. However, despite the disadvantages and limitations, mobile learning is rapidly expanding and may become one of the most effective teaching methods in the future;
- 4) Worry about some types of content (too many notifications), inability to connect to the Internet and too small screen size;

5) Mobile devices can be a serious problem. If your users are constantly interrupted by text messages and notifications, playing Mobile Learning can be distracting. Therefore, he needs self-education and attention;

6) Lack of internet connection, poor connection quality and limited access to electricity;

7) Participants may have a problem using mobile devices for e-learning if they do not have access to the Internet or electricity;

8) The screen is too small;

9) Topics with detailed images may not be readable on a small screen;

10) Mobile learning may not work well on certain types of content you want to share. Technical titles with detailed images may not be readable, for example, on a small screen. (Refers to complex mathematical equations or even long essays).

11) Although students are used to reading text on the relatively small screens of their hand-held devices, their eyesight may be compromised in this process;

12) Complains of eye fatigue and headaches associated with using a mobile phone;

13) Increases the screen time used by students during one day.

Tools used in mobile learning. Mobile learning is possible with our Easy LMS learning management system. The user interface is fully responsive, which means that the educational content is perfectly displayed and works on all devices, desktops and mobile phones. Participants can receive educational content on any modern device with a screen and an internet connection.

With Easy LMS, you can easily create tests and training materials with videos, images, etc. You can also use a mixed approach to learning.

Questions for testing and evaluating knowledge:

1. What is mobile learning?
2. What are the examples of m-learning in corporate education?
3. Expand the possibilities of mobile technologies.
4. Give a description of mobile learning technologies.
5. What are the advantages of mobile learning?
6. What are the disadvantages of mobile learning?
7. Can Easy LMS be used for mobile learning?

Recommended literature

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2.5 Steam - teaching

Currently, STEM education, associated with the accelerated development of digital technologies and the rapid development of digitalization of all spheres of human activity, is an important and urgent problem that requires special attention at all levels of the education system.

What is STEAM education? In a word, integrated teaching of innovations that enter and keep up with the times in traditionally studied sciences (Table.6, fig. 58).

Table 6 – STEAM – education

	<p>S – science T – technology E – engineering A – art M – mathematics</p>
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Modern knowledge requires not only STEM, but also STEAM i.e., A (Art) is added to the disciplines of the STEM course. The main innovator who upgraded STEM to STEAM by adding Art is the Engineering and Technology Teacher Georgette Yakman, who was the founder of the STEAM education system in 2006.

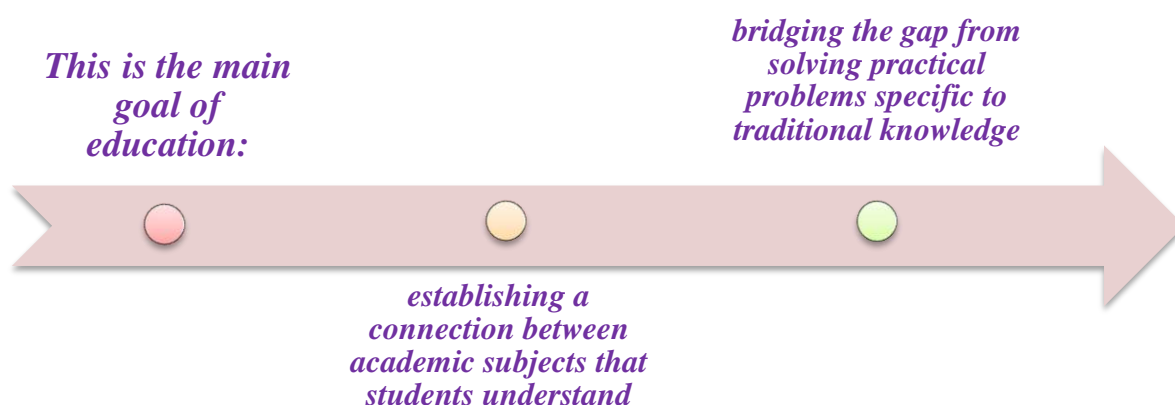


Figure –58. The main goal of education

STEAM is an educational subject aimed at instilling in children from an early age an interest in art and science and love for life. Science, technology, engineering, art and mathematics are included because they all involve creative processes, and none of them uses only one method when researching. Teaching students relevant, in-

demand skills that prepare them for innovation in a constantly evolving world is important not only for their future, but also for the future of the country.

STEAM allows teachers to use project-based learning covering each of the five subjects and creates an inclusive learning environment in which all students can participate and contribute. Unlike traditional learning models, teachers using the STEAM framework combine subjects, for example, using the synergy between modeling methods and the modeling process in scientific and mathematical thinking and the content of mathematics and science. Thanks to this holistic approach, students can train both sides of their brain at the same time.

Sandy Buchinsky, associate professor of the Master of Education Program at the University of San Diego «Communication of science concepts through Art: 21st century skills in practice», emphasizes the interaction of art and science: «There is a dynamic synergy between the visual arts and natural sciences. For example, science relies on people with visual and artistic skills to create detailed pictures illustrating everything from atoms to zebras. Similarly, artists use analytical, linear and logical thinking to create and scale their artwork».

«These parallel spaces of science and art gravitate towards each other with the educational needs of the 21st century», Buchinsky believes. In his opinion, STEAM education is especially important in scientific disciplines, as it is necessary to develop communication skills using traditional written and speech means, as well as using traditional methods of writing and speech, including illustration, animation, videography, model construction.

A. Andover has attracted public attention for his approach to teaching geometry through an art object. He wrote: «Picking up trash at a local museum, math and art students explain that scale in geometry is the same as perspective in art».

Both scientists and engineers use templates, including sketches, diagrams, mathematical relationships, simulations, and physical models to predict the possible behavior of a system. They also collect data to revise the sample as a result of evaluating forecasts. Linking with basic artistic skills through STEAM and equipping them with ideas to better «see» can help them become a better engineer.

STEAM, which is also considered very useful in preparing high school students for success in higher education, has become popular among teachers, parents, corporations and other institutions.

Without creativity, it is impossible to generate new scientific ideas and discoveries. STEAM - the concept of Arts in education – creativity. The activity of art objects gives creative conclusions in solving any innovative tasks, and its nodule lies in Arts education. Therefore, in world practice, there is an active movement in the transition from STEM to STEAM education. Thus, STEAM education is considered a continuation of the STEM educational concept. In STEAM education, various art directions can be considered in the «Arts» category: as separate types – painting, architecture, sculpture, graphics, music, literature and poetry, as well as synthetic types – theater, choreography, ballet, cinema, design. STEAM is the main teaching method used to integrate artistic creativity into the educational system - design. For example, children with not very pronounced design and mathematical

abilities can help a group that carries out design aesthetically. An important feature of the work on this technology is the organization of a collective form of work on the project. A modern teacher, when teaching children, should be sure that the knowledge gained within the walls of the school will help them adapt to a changing world. Because tomorrow's workplace requires creativity and innovation.

Daniel H. Roin showed that «the future belongs to other thinking people». Now web designers, inventors, and researchers are leading the labor market. Therefore, in countries with developed high-tech production, priority is given to STEAM education or NTV (scientific and technical creativity of young people). Because today IT specialists, programmers, engineers, specialists of high-tech production are in demand. For example, in the United States, STEAM is trying to solve the implementation of education at the government level.

The entire education reform in the United States is aimed at improving the competitiveness of the American economy. In the USA, over the past 10 years, a National training program for 100 thousand teachers for the STEAM industry has been adopted. State support is provided to organizations of STEAM centers. The implemented program develops educational and sports robotics, and also assumes the active participation of business companies in the implementation of a subject-oriented project for teaching children and students. The positive result of STEAM activity proves the correctness of the strategic course. Consequently, STEAM education helps students to master the creative skills of the XXI century, such as problem solving, interaction, the use of creative approaches and critical thinking. These skills will be needed for academic performance in any subject throughout the entire period of study.

According to forecasts, jobs in the STEAM segment will double in comparison with other employment sectors in the next ten to 7 years. Learning these skills from today helps children prepare for future professional activities.

STEAM is a new way to develop the skills necessary for the XXI century. The paper is about a new way of developing the skills necessary for the XXI century – STEAM training. This is one of the main directions in the education system of many countries at present. Here, the main attention is paid to the formation of students' ideas about the unity of the world without individual study of subjects, especially subjects of the natural science cycle. Therefore, the importance of conducting integrated classes in the direction of STEAM training is currently being considered. The course «Robotics» has been introduced in secondary schools. The school curriculum includes modern subjects that teach information analysis, such as «introduction to science», «information and communication technologies».

At the international conference «STEM forward» in Jerusalem, it was announced that STEAM training should be conducted from preschool children, that is, from kindergartens. In addition, by the decision of the conference, it was noted that the language of science is English, and knowledge of English is necessary in STEAM education. In this regard, it is very important that the process of learning English, conducted in a young sovereign state, is widespread and takes time. In addition, it is important to remember: knowing the language, being a high-quality,

competitive specialist, being a patriot of your Homeland is the main task of every citizen.

STEAM inspires our children – the future generation of inventors, innovators and leaders - to conduct research as scientists, model as technologists, design as engineers, draw as artists, think analytically as mathematicians and play as children. Along with the development of technological progress, the improvement of robot modeling and programming, the global introduction of IT technologies, mass English language teaching is not ignored not only as a means of international communication, but also as a basic element of globalization processes.

The importance of STEAM education. The scientific and technical orientation of STEM application in education is due to the development of modern technologies. Currently, specialties related to high technologies: IT specialists, big data engineers, programmers are becoming very popular specialties. The modern education system strives to conduct active work related to the social demand for an increase in the number of circles, such as robotics, programming, modeling (STEM). However, the younger generation does not have enough scientific and technical knowledge, this is a reality. It is known that in the future, the skills of the XXI century, called 4C skills, will be needed.

The skills of the XXI century or 4C skills are actively discussed at different levels. The essence of this concept is as follows: in the industrial era, the main factors determining literacy were reading, writing and arithmetic. And in the XXI century, the main direction is shifting towards critical thinking, the ability to interact and communicate, and a creative approach to business. So, the future of 4C skills is being formed (Fig. 59).

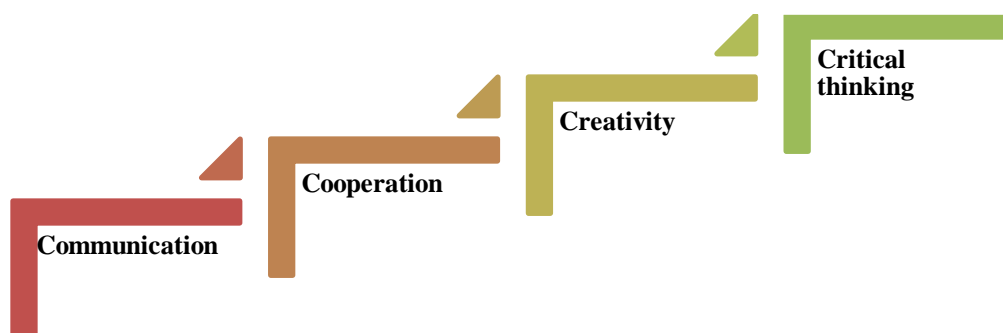


Figure – 59. 4C Skills

The active development of STEM education has begun in Kazakhstan. Evidence of this is the transition to the updated content of education at school in the context of STEM within the framework of the state program for the development of education and science of the Republic of Kazakhstan for 2016-2019. To implement the new educational policy, STEM elements aimed at the development of new technologies, scientific innovations, and mathematical modeling are being actively introduced into curricula.

STEAM is a new educational technology that includes several subject areas as a means of developing critical thinking, research competencies and group work skills.

The abbreviation STEAM stands for as follows: S – science, T – technology, E – engineering, A– Art and M – Mathematics. Translated from English, it sounds like this: natural sciences, technology, engineering, creativity, mathematics. Sequential disciplines are the most popular disciplines in the modern world. Therefore, the STEAM system is developing as one of the most modern and promising trends. STEAM education is based on the application of an interdisciplinary and applied approach, as well as the integration of all five disciplines into a single learning scheme.

The educational goal of STEAM is to develop a highly organized game of students and to teach the effective use of the acquired knowledge through project training in such disciplines as natural sciences, technology, engineering, mathematics and art (Fig.60).

Special attention is paid to increasing the number of "transitional topics" among the subjects of natural and mathematical sciences. Since the 2015-2016 academic year, every first-grader studies the subject of "natural science", which is the basis for studying natural sciences when attending high school. In addition, since the 2016-2017 academic year, the acquisition of all schools with information and communication technologies, digital educational resources, and Internet access has begun. Also, since 2019, subjects of the natural – mathematical direction in high school have been taught in English, which in turn contributes to the integration of the first new knowledge into the world scientific society.

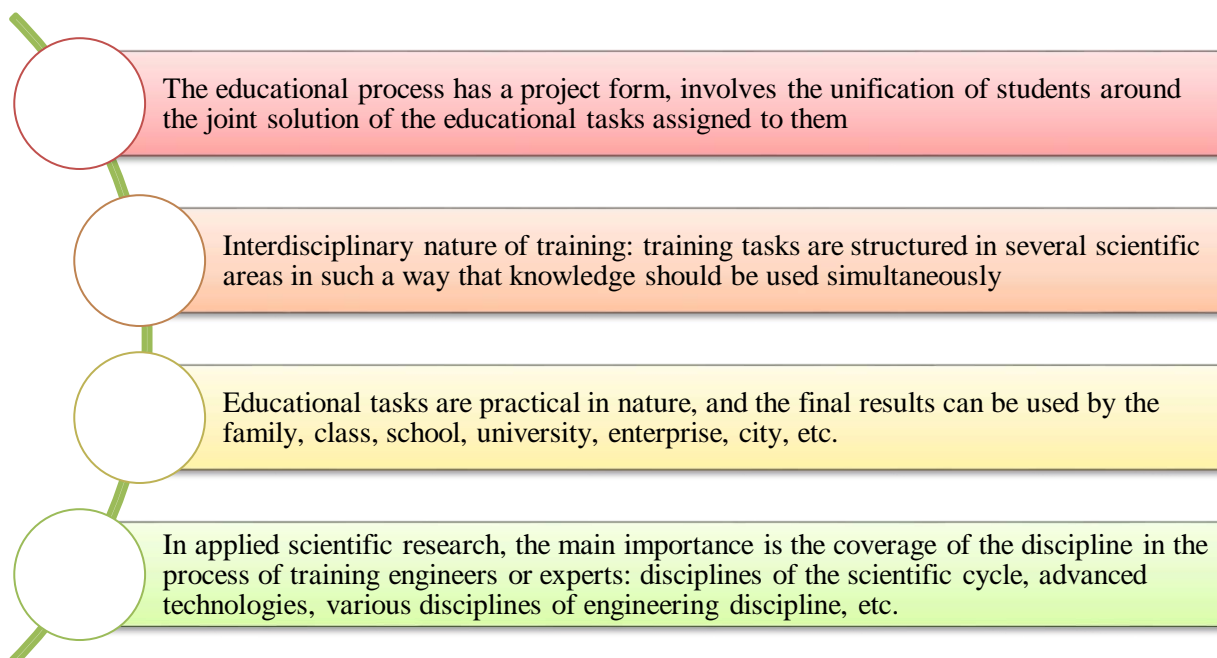


Figure – 60. Advantages of STEAM education

So what do we need to do to develop and deepen?

Various actors take part in the promotion and implementation of the STEAM approach in education. These are state bodies, structures, local communities and self-government bodies, businesses and corporations, private educational institutions and networks, public associations and professional communities, private teachers. Each of them chooses their own strategy of action based on the general situation, their interests and capabilities. In order to navigate in different types of activities, we offer a typology of different practices in which each activity can find its own direction.

Figure 61 reveals the activities aimed at the development of conceptual and methodological support of the STEAM approach in education.

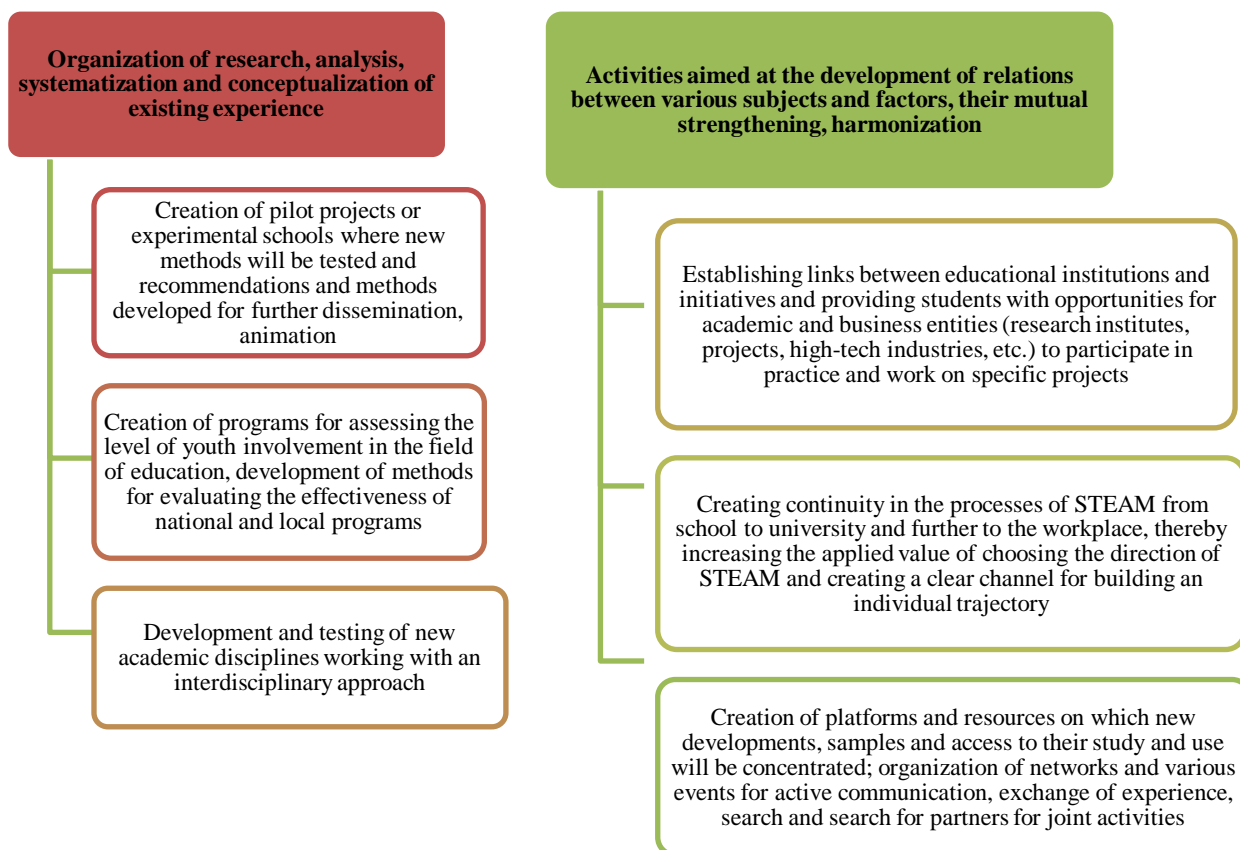


Figure – 61. Development of conceptual, methodological and methodological support of the STEAM approach in the education of activities aimed at

Organization of wide access to STEAM education, involvement of various groups in it, organization of career guidance work:

- creation of STEAM centers or STEAM clubs (based on schools or other organizations) as a network of design laboratories for schoolchildren, whose activities are aimed at organizing practical research and increasing interest in the study of concrete, engineering and natural sciences.

They often play the role of primary career guidance (Fig.62).

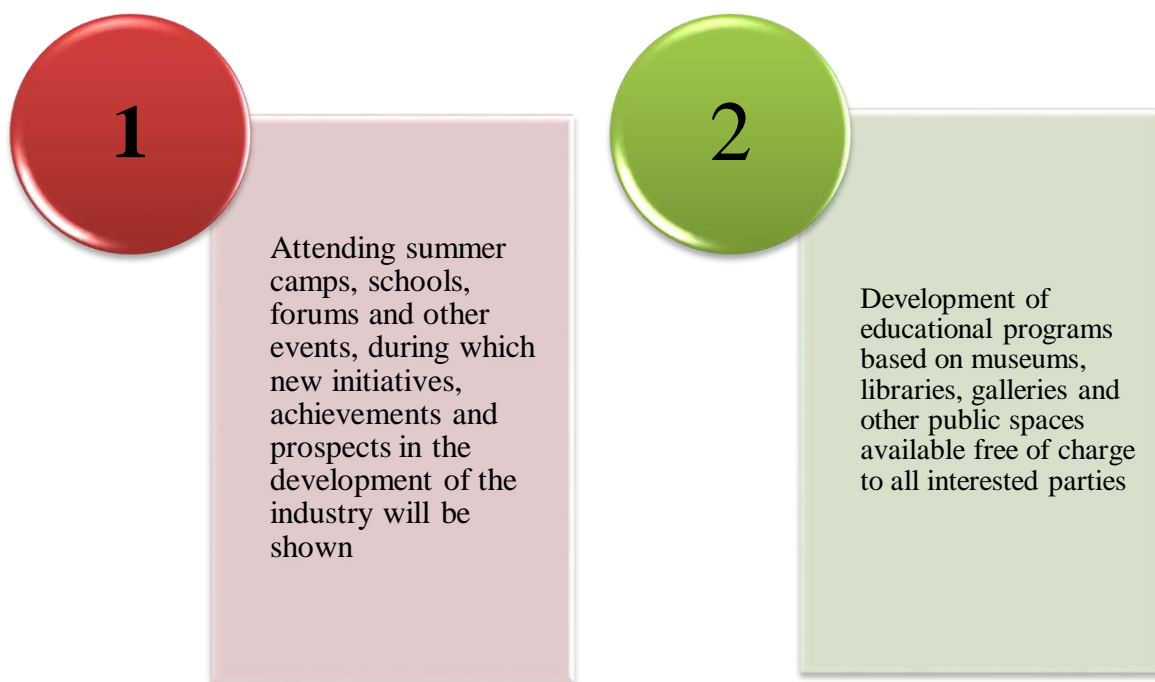


Figure – 62. Initial professional orientation

Training, retraining and advanced training activities for teachers, school staff and school management:

- internship and exchange of experience, STEAM – inclusion of teachers in communities and communities using education;
- teacher training programs (short-term and long-term);
- development of programs, methods, methodological materials and initiatives of employees of educational institutions.

1) project thinking allows you to analyze the problem in several stages. Project thinking helps to express your idea with the help of bright and accessible visual means, a detailed sketch, computer graphics.

2) Spatial thinking as a factor in the formation of prerequisites for successful socialization. Spatial thinking teaches us to perceive an object as a whole, to look at it from all sides. Develops speculative abilities – not only with the eyes, but also with the mind, understanding the structure of the three-dimensional form, reproducing it in the mind, developing the ability to represent projections and other angles.

3) A «clear» view, the artist's view of the world and life phenomena. When working with nature, the artist performs important analytical operations – in order to depict an object on the plane of the sheet, he must highlight the specific features of this object, generalize them and highlight only the essence. An object or phenomenon, a person, a situation, etc. The ability to fix important features in your mind is an important skill that is necessary not only for artists, but also for professionals in any industry.

4) The humanitarian component of culture. In cultural objects, especially in those that have proven their originality over time, people have learned to express unchanging values for a person and society as a whole. Through communication with

authentic works of art, a person learns to accurately identify something destructive and truly creative for him, his thinking, culture and society.

The importance of additional education within the framework of the STEAM education concept can be traced from several sides (Fig. 63).



Figure –63 . The importance of additional education within the framework of the STEAM education concept

STEAM inspires our children, future generations are innovators and leaders, inventors conduct research as scientists, model as technologists, design as engineers, create as artists, analyze as mathematicians and play as children. Thanks to the STEM approach, children can understand the logic of the phenomena occurring, their interrelation, systematically explore the world, while developing their intelligence, an engineering style of thinking is formed, the ability to get out of difficult situations, teamwork skills and master the basics of management, which in turn provides a new level of development of the child.

Today, innovative technologies are of particular importance for the education and development of a child. Currently, the fourth technological revolution is taking place in the world: an intensive flow of information, high-tech innovations and developments are changing all areas of our lives. Both the demands of society and the interests of the individual are changing.

Thus, STEAM education at the stage of introducing a new interdisciplinary and project-based learning approach, by integrating several subjects, will allow primary school students to strengthen their research and scientific and technological potential, develop critical, innovative and creative play, solve problems, develop communication and teamwork skills.

Advantages and disadvantages of STEAM education. One of the most valuable aspects of STEAM education is how it motivates students to learn "soft skills". These are skills that are more related to emotional intelligence and how a person can interact with other people. The most important of these skills is the ability to communicate clearly. Through STEAM education, students are encouraged to do several things that shape communication skills, such as testing art in everyday life, presenting research, collaborating with peers for group projects, and presenting results in scientific articles.

The following advantages of Steam Education:

Critical thinking. At any time, we can get answers to many of our questions by simply searching the Internet. We are very glad that the information is available to the majority of the world's population and lives in their free time. And if you believe that knowledge is power, then an ordinary person is stronger than ever in history.

But knowing one thing is only part of the value of information. Simply trying to get information is not as important as knowing what to do when you get it. To be able to think critically means to know how to apply the acquired knowledge. You understand how to filter effectively, which allows you to sort out the factors that define life-either through unexpected difficulties, or by navigating through what can be defined and understood as academic goals.

There will be many important problems in your future career or personal life that you can solve over time. This is an important skill that we have brought over the centuries, and it is very important when we travel in the 21st century.

STEAM projects require students to think systematically about problems, using the information they receive about technology and engineering to find the best solutions. Interdisciplinary projects also involve different parts of the learners' brains so that they can see the project through different lenses, focus on details, and learn to step back and look at the big picture.

Creation. When students are engaged in activities that combine various elements of the STEAM program, they experience a directed request that should ask thoughtful questions, find answers, apply the knowledge gained and creatively solve the problem. Students who are learning to sculpt a burning wire should ask questions about how it works, try different ways to connect wires to illuminate the statue, reflect on the meaning they put into the artwork, and feel the creative process, design on paper for a material, functional object.

Along with creative thinking, creativity is one of the most important skills of the 21st century. Unlike collaboration and communication, creativity is not something that can be taught specifically. But STEAM education creates an environment in which students learn to express their thoughts. If there is a supportive and accepting climate in the group, students get the opportunity to learn more about who they are. This helps students to reject bias and allows them to think outside the box on various topics.

Cooperation. Collaboration is an important part of any STEAM role. Everything from the apps and devices you use on a daily basis to the transportation you drive to school is the result of a group of people coming together to do a better job. Even discoveries and inventions are rarely the work of one person, but rather a team that gives each member of the party the opportunity to do their best work, gives a reason for a team member to discover something important.

The best teams are the teams that allow each member to shine and make their own unique contribution to the table without evaluating each other's contribution. STEAM education encourages this by bringing a spirit of cooperation rather than competition to the classroom. When students work together with chemical reactions or learn to see value in the artistic expressions of their classmates, they learn to collaborate and evaluate their peers.

Many STEAM projects include group work and thoughtful dialogue in which students exchange ideas and discuss ways to solve a problem. Through these actions, students learn to share responsibility, find compromises, listen and motivate each other. Some learners may be excited or curious, while others may be shy or skittish.

By strategically grouping students into groups, students can create strong teams that determine how to help each other and how to use different strengths and skill sets. If students are learning to create 3D art depicting marine animals, one student may learn about aquatic animals, another may be familiar with optical illusions or enjoy drawing 3D glasses. Together, their knowledge, enthusiasm and skills can be used to help them successfully complete a project as a team. Offers a unique way to solve the problem

When it comes to international assessment, which measures math, science and problem-solving skills, American students are not as good as students from other countries. STEAM projects allow students to solve problems in unique ways, as they are forced to use various methods to solve problems that arise during these activities. By experiencing trial and error, learning to take risks and, in fact, determining the way to «think outside the box», students help solve a set of problems in one step from the commonly used way of using a known method or formula and a step-by-step instructions. With STEAM, they have to solve creatively, non-linearly.

Provides all students with practical learning experience. Some students grow up in homes, teaching them how to build and repair things, and they are given a lot of manipulation for this, while others are not exposed to these important learning opportunities. STEAM projects allow students to gain practical knowledge. Students often use various materials and tools to learn how something works, how to create

and how to fix it. This levels the playing field so that all students, regardless of gender, socioeconomic status or race, can master these important skills.

Shows students another way to evaluate art. Using art in STEAM projects helps students understand how diverse art is and whether it is an integral part of products, including engineering, technology and mathematics. Art helps to increase engagement in STEAM projects, because students can connect the artistic environments they like (such as visual art and music) with technical projects that at first seem intimidating, such as creating applications or programming robots. They can combine familiar and unfamiliar things, acquire new skills and discover the world of artistic innovation.

«Education is under pressure to respond to a changing world», says D. Vasagar, an education writer at the Financial Times. «As repetitive tasks have been eliminated through technology and outsourcing, the ability to solve new problems is becoming increasingly important».

And the sooner students are exposed to STEAM disciplines, the better. A Microsoft study says that 4 out of every 5 STEM college students (78%) decided to study in high school or earlier, while one in five (21%) decided to study in high school or earlier. However, only 1 in 5 STEM college students believe that their C-12 education has prepared them perfectly for college STEM courses. In addition, it seems that there is a big difference in the ratio of women and men in relation to those who work in STEM industries. Getting more girls interested in STEAM items is another aspect of the movement. Shows students another way to evaluate art. Using art in STEAM projects helps students understand how diverse art is and whether it is an integral part of products, including engineering, technology and mathematics. Art helps to increase engagement in STEAM projects, because students can connect the artistic environments they like (such as visual art and music) with technical projects that at first seem intimidating, such as creating applications or programming robots. They can combine familiar and unfamiliar things, acquire new skills and discover the world of artistic innovation.

«Teaching students in STEM subjects (with proper training) prepares students for life regardless of their chosen specialty», says Stephen F. DeAngelis, technology innovator and president of Enterra Solutions in his article in Wired magazine. «These subjects teach students to think critically and solve problems-skills that can be used throughout life to help them get through difficult times and seize opportunities when they arise».

An important part of this educational approach is that students studying on the STEAM system do not just study the subject, but also teach how to learn, how to ask questions, experiment and do.

This is becoming an important part of the modern STEAM education curriculum. With the growing development of technology, we see that more and more jobs appear in the industry, and in this regard, more and more recipients of services are preparing for a career as an engineer, developer or analyst. Obviously, students who seek a career in technology will benefit from this academic focus, and students in all fields of study will benefit from STEAM education.

Figure 64 reveals the advantages of STEM education.

STEM-requirements for the introduction of education:

1) creation of an extensive system of search, support and assistance to talented students;

2) in every secondary school, it is necessary to develop a creative environment to identify particularly gifted children. Providing high school students with the opportunity to study in correspondence, full-time and distance schools, allowing them to master specialized training programs regardless of their place of residence;

3) to develop a system of support for talented children. These are, first of all, educational institutions with round-the-clock stay. Dissemination of the existing experience of physics and mathematics schools and schools for gifted children;

4) work with gifted children should be properly organized for economic purposes. The work of a teacher whose student has achieved high results is stimulated by significant payments;

5) introduce a system of moral and material incentives for domestic teachers. The main thing is to attract talented young people to the teaching profession.

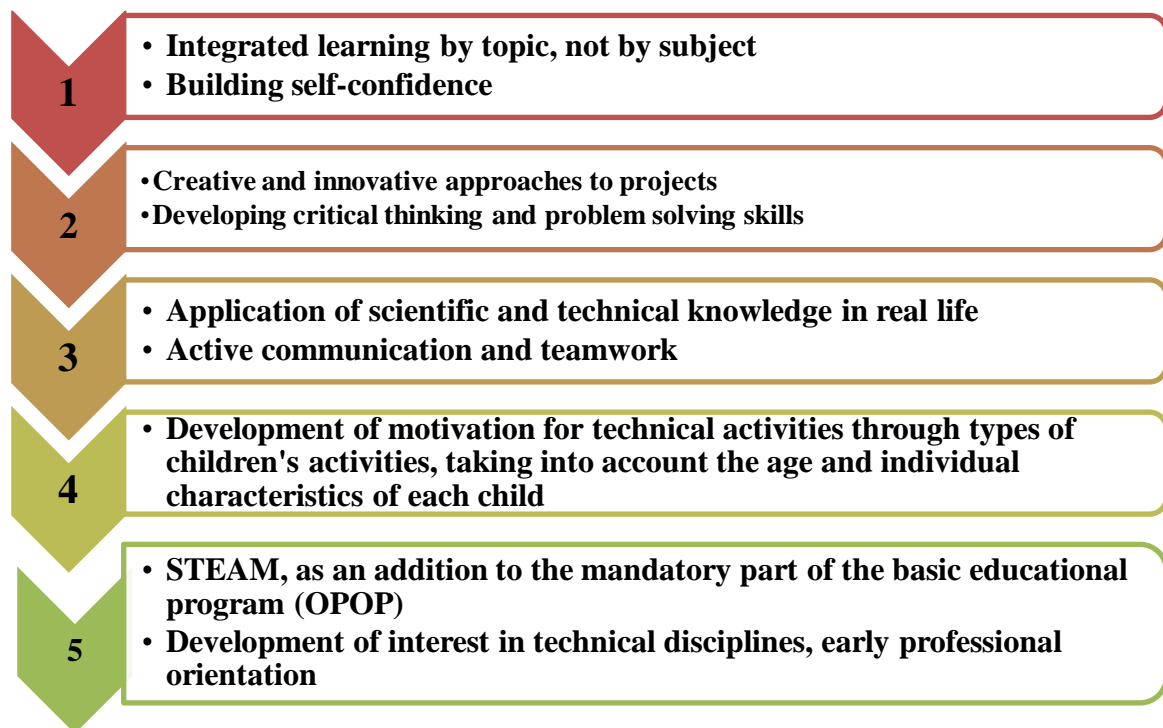


Figure – 64. Advantages of STEAM education

Figure 65 reveals the disadvantages of STEM education.

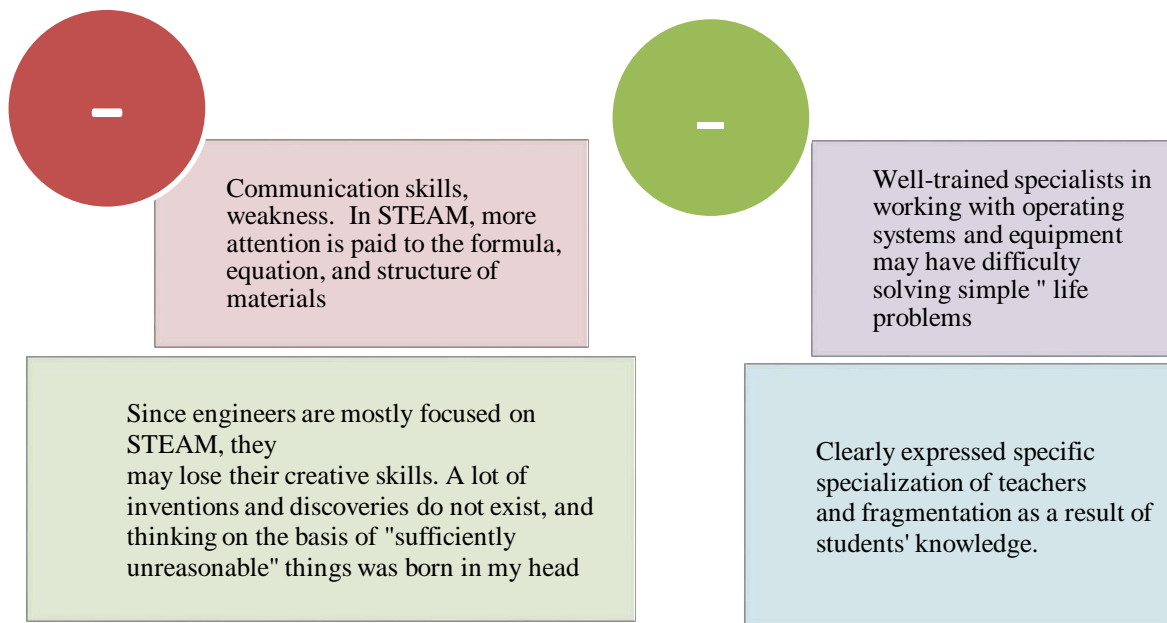


Figure – 65. Disadvantages of STEM education

Only teachers who have completed additional professional training and are ready to work in a unified system of natural science academic disciplines and technologies will be able to implement this direction.

Questions for testing and evaluating knowledge:

1. What is Steam Education?
2. Prove the value of Steam education by example.
3. List the advantages of Steam Education.
4. Analyze the disadvantages of Steam education.
5. What do you think is needed for the development and deepening of Steam in education?

Recommended literature

1. <https://peremena.media/stem-v-odnoi-iz-luchshih-shkol-kazakhstana/>
2. Experience of STEAM training in Kazakhstan. Balgyn Akhmetova, ENUim.L. Gumilyova.
3. STEM education in the world and Kazakhstan. <http://otbasym.kz/category/obrazovanie>.
4. Applied research of STEM education in Kazakhstan: current state and prospects of development. <https://courses.caravanofknowledge.com/course/view.php?id=446>.

3. DIGITAL LEARNING TECHNOLOGIES: DIGITAL EDUCATIONAL PLATFORMS AND TOOLS

3.1 Digital Education Platforms

In the country, information technologies have been successfully used in the field of public administration for a quarter of a century. Currently, most of the services provided by the State are provided electronically. At the same time, it should be noted the role of the e-government Network - e-gov, which is beginning to spread to remote regions.

Digital educational platforms are the main component of the e-learning system. These include photographs, artistic excerpts, statistical and dynamic models, virtual reality and Interactive modeling objects, cartographic materials, sound recordings, iconic objects and business graphics, text documents and other educational materials presented in the CMFR, necessary for the organization of the educational process.

The main goal of digitalization is to increase competitiveness, improve the quality of life of the population, accelerate and facilitate the educational process, reduce the burden on students and teachers. The main thing is to improve the quality of education. Our graduates must be internationally competitive in various fields, including artificial intelligence and large-scale data creation.

As the head of state noted, the digitalization of the country is not a goal, it is the whole process as a means for Kazakhstan to achieve absolute advantage requires consistency and an integrated approach.

The most popular digital educational tools for teachers and students have been developed to give the student freedom, improve the management of learning processes, stimulate collaboration and facilitate communication between teachers and students.

Consider the 11 most popular digital educational tools:

1) Edmodo. Edmodo is an educational tool that unites teachers and students and is integrated into social networks. In this case, teachers can create joint online groups, manage and provide educational materials, evaluate student performance and, among other things, communicate with parents. Edmodo has more than 34 million users who have joined it to create a personalized learning process that empowers technology and the digital environment.

2) Socratic. Socratic is a system that allows teachers, students to create educational games that they can solve using mobile devices, whether smartphones, laptops or tablets. Teachers can see the results of actions and change the classes associated with them to make them more personalized.

3) The project. Project is a tool that allows you to create multimedia presentations with dynamic slides, in which you can embed interactive maps, links, online quizzes, Twitter timeline and videos, as well as other operations. During the session, teachers can share academic presentations with students that are visually adapted to various devices.

4) Thinglink. Thinglink allows teachers to create interactive images with music, sounds, texts and photos. They can be shared on other websites or on social

networks such as Twitter and Facebook. Thinglink offers teachers the opportunity to create tutorials that arouse students' interest through interactive content that can expand their knowledge.

5) TED-Ed. TED-Ed is an educational platform that allows you to create educational classes through the collaboration of teachers, students, animators, people who want to expand general knowledge and good ideas. This website allows you to democratize access to information for teachers and students. Here people can actively participate in the learning process of others.

6) CK-12. CK-12 is a website that tries to reduce the cost of academic books for the K12 market in the United States and around the world. To achieve its goal, this platform has an open source interface that allows you to create and distribute educational materials over the Internet, which can be modified and which can include video, audio and interactive exercises. It can also be printed and meets the necessary editorial standards in each region. Books created in CK-12 can be adapted to the needs of any teacher or student.

7) ClassDojo. ClassDojo is a tool for improving student behavior: teachers give students quick feedback so that good behavior in the group is «rewarded» with points and so that students have a much higher attitude to the learning process. ClassDojo offers students real-time notifications, for example: «well done, Zhaydarbek!» and «+1», are given for collaboration. The collected information about the behavior of students can later be shared with parents and administrators via the Internet.

8) EduClipper. This platform allows teachers and students to share and study recommendations and study materials. In eduClipper, you can collect information found on the Internet during classes and share it with members of previously created groups, which allows you to more effectively manage academic content found on the Internet, improve research methods and have a digital record of student achievements. In the same way, it allows teachers to organize a virtual group with their students and create a portfolio in which all the completed works will be stored.

9) The story of the bird. Storybird focuses on developing students' writing and reading skills through storytelling. In this tool, teachers can create interactive and artistic books online using a simple and easy-to-use interface. Created events can be embedded in blogs, sent by email and printed out, among other things. In Storybird, teachers can create projects with students, provide constant feedback, and organize classes and assessments.

10) Animoto. Animoto is a digital tool that allows you to create high-quality videos in the shortest possible time and from any mobile device, inspiring students and helping to improve academic studies. The Animoto interface is convenient and practical, allowing teachers to create audiovisual content tailored to educational needs.

11) Kahoot!

Kahoot! is an educational platform based on games and questions. With this tool, teachers can create surveys, discussions, or surveys that complement academic classes. The material is designed in a group and students answer questions

simultaneously in the process of playing and learning. Kahoot! promotes game-based learning, increases student engagement and creates a dynamic, social and fun educational environment.

Currently, the digital educational tools used in the domestic education system include the Zoom platform.

Zoom is a platform for video conferences, webinars and other similar online events. The meeting can be arranged by anyone who has created an account. Free recording allows you to hold video conferences lasting 40 minutes. The program is well suited for individual and group classes, students can access it from different devices – computer, tablet, phone. Anyone who has a link or a conference ID can join the video conference. The event can be planned in advance, as well as make a recurring link, which means that you can insert one link to attend at a certain time for a lesson that is held regularly.

Zoom Features:

Video and audio communication can be established with each participant. The organizer has the ability to turn off and turn on the microphone, as well as turn off the video and ask all participants to turn on the video. You can only get to the conference as a participant with the right to review. The service interface allows all users to see and listen to each other. The one who speaks in the picture automatically shows this person. Now you can share the screen with sound (screensharing). You can pause the display of the screen. In addition, you can share only individual applications, not the entire screen, for example, enable browser display. In the settings, you can give all participants the opportunity to share their screen or set restrictions so that only the organizer can do it.

The interactive whiteboard is built into the platform, you can easily and quickly switch from the screen display to the whiteboard. There is a chat for writing messages, sending files to all or one selected participant. You can save the chat automatically or manually save it at each conference (Chat→Learn more→Save chat).

The lesson can be recorded both on a computer and in the cloud. The ability to set up automatic recording, as well as pause it, is convenient. During the conference, an organizing partner can be appointed, who will also have the same capabilities as the organizer: turning on or off the microphone of individual students, changing the name and distribution to session halls (rooms, mini-conferences).

The distribution of session halls is the distribution of students, as in offline-classes, and the provision of individual tasks. The students can be divided into pairs and groups and distributed into separate rooms, where they can only communicate with each other, the rest cannot see or hear them. The number of rooms is set by the teacher, participants can be divided automatically or manually. The organizer has the opportunity to walk through the rooms and check what is happening there. In addition, participants can be moved from one room to another.

Adding virtual backgrounds to create a good atmosphere in the online classroom. You can surprise the participants with various interesting backgrounds and thereby attract their attention to yourself. You can draw, mark, erase and more

with the «leave a comment» tool (Co-annotation) when the screen is displayed. This can be done by both the teacher and the students, but in the settings (configuration), as necessary, this function can be disabled for students.

Participants can draw on a virtual whiteboard, but they can't move anything. However, the teacher can turn on the display of his screen and transfer control to another, which means that the student, for his part, can do what is required on his computer by moving the presentation on the screen (rotate, click on the card in the presentation, add pictures, etc.), as well as transfer keyboard control another. During a Web conference, the participant asks the person showing his screen to grant him the right to control. A confirmation request will appear in the index. If confirmed, both can work with the mouse and keyboard, the priority is in the pointer.

SKYPE. Skype is a software for communicating with the whole world.

With Skype, you can make private and group video calls, as well as send instant messages and files to other Skype users.

Skype can be used on any convenient device on a mobile phone, computer or tablet.

Skype is free to download and easy to use.

To organize a video meeting, you need to create a link to the meeting and send it to the participants. You can also join as a visitor without logging in to a video call. No registration records are required for this. There is no need to register anywhere.

If you don't have the app installed, the web version of Skype will open in the browser. You can hold a meeting for as long as you need.

The link to the set remains a command for an unlimited time. It can be used at any time. You can record calls for further analysis and work with notes. Records are stored for 30 days. If you're on your way or haven't had time to prepare for video printing, don't worry: just turn on the background blur feature.

During the teleconference, you can easily demonstrate presentations and share work materials and plans. The chat serves as a place for you to collaborate and get feedback.

MICROSOFT TEAMS. Microsoft Teams is an enterprise platform that integrates chat, meetings, notes and applications in a workspace developed by Microsoft. Microsoft Teams is part of the Office 365 suite and is distributed by corporate subscription.

Teams is a collaboration center that allows tutors, teachers, students, schoolchildren, as well as parents to actively communicate and work together in real time. In Teams, you can conduct classes, conduct conversations, quickly make adjustments to the project, work in a team with shared files and prepare materials for delivery together (Table 7).

Creating a Microsoft account

To use the Microsoft Teams solution, you need to have an Office 365 account (login/password).

1) <https://www.microsoft.com/ru-ru/education/products/teams> by, go through and register your group for free.

2) Take free the Office 365, including Microsoft Teams.

- 3) Login to Teams.
- 4) Enabling Teams.
- 5) Click «Add» in Windows, then «Start» Click the Microsoft Teams button.
- 6) On a Mac, go to the Applications package and click Microsoft Teams.
- 7) Tap the Teams icon on your mobile device.
- 8) Login using a Microsoft 365 username and password.
- 9) Team and channel selection.

Table 7 – Microsoft Team Capabilities

Microsoft Teams Features	
Creating a team / team	<ul style="list-style-type: none"> • Creating a team • Team Administration • Team Management • Channel management
Sending educational materials to students	<ul style="list-style-type: none"> • File Sharing • File search and selection • Using the Group Notebook
Team messaging	<ul style="list-style-type: none"> • Working on channels • Sending email messages to the channel • Creating and formatting notes
Audio recordings	<ul style="list-style-type: none"> • Create and approve chats • Making calls
Conducting gatherings (webinars)	<ul style="list-style-type: none"> • Joining a Meeting • Quick creation of sets • Channel collection planning • Managing Sets • Displaying the screen while typing
Tasks for students	<ul style="list-style-type: none"> • Private • Doubles • Group
Grading assignments	<ul style="list-style-type: none"> • Formative • Set
Built-in collaboration capabilities	<ul style="list-style-type: none"> • Applications • Bots • Connectors

Groups are a collection of people, stories, files, and tools that are all in one place. A channel is a discussion in a team dedicated to a section, project, or topic. The best way to get to know the teams and channels is to choose one of them and start experimenting.

10) in the left part of the application window, click the «commands» button of the Teams item and select a group.

11) if you are not in the group yet and you need to create one, select the «Join a team or create» button.

12) start a new conversation with the team. In Teams, click the «teams» button, and then select the group and channel.

13) to name what needs to be taken into account in the line entering the message, click the «Send» button.

14) start a new conversation with one person or group. Click the «create Chat» button at the top of the app.

15) writing the names of people who want to say «to whom».

16) to name what needs to be taken into account in the line entering the message, click the «Send» button.

17) reply to the conversation message.

Channel histories are configured by date and then by chain. The answers in the paragraphs will be under the first message, which will allow you to easily track multiple conversations:

1) find a conversation thread that you want to leave an answer to.

2) click the «reply» button, add your message, click the «Send"» button.

3) file transfer.

4) in a conversation on the channel, click the «Upload» button and the «Select File» button under the message entry line.

5) you need to choose one of these options:

- overview of commands and channels;

- one drive;

- sending from my computer;

- file-link exchange selection.

If the file is being sent from a computer, select the file, click open, and then click send.

Files sent to the channel can be viewed at any time on the Files tab.

@ **Mark users.** You need to put @ in the line that enters the message, and then write the first few letters of the person's name. You can also mark @ whole commands and channels.

You can choose the ones you need. Repeat this procedure for all the people you want to tag @.

Every person you tag with @ gets a warning message for their activity stream.

GOOGLE MEET. Google Meet (formerly Hangouts Meet) is a business-oriented version of the Google Hangouts platform, which is suitable for companies of any size and allows for video conferences, remote conversations, webinars, virtual trainings, remote interviews.

Initially, this product was created as a secure video conferencing service for business. Now it is absolutely free and available to everyone.

Individuals can use Google Meet for secure video conferencing for free. Organizations can use G Suite Essentials to access advanced Meet features, as well as Google Drive, business documents, spreadsheets, and presentations.

Invited participants can connect to online video conferences from their computers using any modern browser—without the need to install additional software (software). And on mobile devices, you can use the Google Meet app.

Google Meet Features:

Unlimited number of meetings

You can communicate with everyone – colleagues, students - the way you need to.

Up to 100 participants can be invited to the meeting. If you are using the free version of Google Meet, you will need access to your Google account so that every person you call can join the meeting for security purposes.

It is possible to broadcast corporate events. It is possible to hold events in a live broadcast, for example, a general meeting of students, a teaching staff. They can be viewed by up to 100,000 users simultaneously with your domain.

Messaging at a meeting. The messaging function helps to increase the motivation of participants for the meeting. Tap the chat icon to share files, links, and other content with your interlocutors. The sent messages will be available until the end of the current meeting.

A management tool for meeting organizers. Any participant can pin the window, turn off the microphone, or pull out another user. For privacy reasons, you cannot turn on another participant's microphone. You are asking to add it yourself.

Disabling microphones and deleting users when using accounts can be done by the meeting organizer.

Preview screen and video and audio settings, you can set up the camera and microphone by clicking on the meeting code or link, and see how you look on the screen. You can also see in advance who is participating in the meeting.

Show the screen to the participants. To make a presentation or collaborate with documents, specify the entire screen or the necessary additional window. Setting up the screen and window layout. Meet automatically changes the location of windows on the video conferencing screen to draw attention to important content and active participants. To change the layout of the windows, click on the icon in the form of three dots in the lower corner of the Meet screen.

Compatible with various devices

Google Meet works on any device. You can join the meeting using a computer or laptop, as well as from Android or iPhone/iPad devices.

Integration with Google and Microsoft Office applications. Join meetings directly from Gmail or calendar. Microsoft Office users who are on the guest list will see the meeting in their Microsoft Outlook calendars.

Full control. Security features for meetings are enabled by default. Meet uses the security and privacy practices adopted by Google. Meet video conference data is encrypted during transmission.

Google Meet is configured depending on the data transfer rate on your network to ensure the best video communication, wherever the user is. New technologies with elements of artificial intelligence allow you to keep the image and sound in high quality even in difficult conditions.

WIZIQ. The modern WizIQ virtual laboratory, specially designed for the educational field, provides all the necessary functions and tools for simulating face-to-face classes in a group. It includes features such as real-time audio-visual communication, text chat, discussion rooms, interactive whiteboards, screen sharing, online tests and assessments, participation reports and alerts, surveys and much more.

WizIQ offers a more comprehensive online learning system that is accessible to teachers. Teachers can create synchronous courses consisting of figurative lessons, or independently create basynchronous training courses. This allows teachers to add almost any curriculum and files, such as Word, PDF, PPT, audio and video files to their curricula.

There is no download or adverse client software required to use WizIQ Virtual Classroom. It works from any web browser, and also offers apps for iPad and Android devices. All you need is a web connection.

It has a multilingual interface and supports 20 languages. WizIQ can interact with Virtual Classroom, as well as with any learning management systems such as Moodle, Blackboard, Instruction Canvas, Sakai, Joomla or with any website via the WizIQ API.

Specially designed for the field of education: Unlike other platforms that offer only some of the features needed for online learning, WizIQ, Virtual, Classroom offer a one-stop shop of all the tools needed to conduct classes online.

The platform offers teachers everything they need for online learning, from a virtual classroom to functionality that allows them to develop and conduct courses with assessment tools and content sharing capabilities.

GOOGLE CLASSROOM. Google Classroom is a platform that allows you to completely transfer learning online: drawing up lessons on topics, adding materials, issuing and checking homework. Google combines useful services organized specifically for training. The following actions can be performed on the platform:

- 1) creating your own group/course;
- 2) organization of registration of students for the course;
- 3) share the necessary educational material with students;
- 4) offer students tasks;
- 5) assessment of students' tasks and monitoring of their achievements;
- 6) organization of communication of students.

Advantages of Google Classroom

Simple setup (configuration). Teachers can organize courses, invite students and other teachers there. It is convenient to place assignments, announcements and questions in the course feed.

Saves time and paper. Planning the educational process, drawing up courses, distributing assignments and communicating with students-all this can be done in one service.

Convenience. Students can view assignments from the course stream or calendar, or on the to-do list page. All materials are automatically added to packages (folders) on Google Drive.

Productive communication. In the group, teachers publish assignments, distribute announcements and start discussions, students exchange materials, leave feedback on the course flow and communicate by email. Information about assigned jobs is constantly updated, which allows teachers to quickly check assignments, give grades and leave comments.

Integration with popular services. In the group, you can work with Google Docs, Calendar, Gmail, disk and forms.

Accessibility and security. It is worth knowing that the group is a free service. There is no advertising in it, and the materials and data of the students are not used for marketing purposes.

NEARPOD. Nearpod is a platform that allows teachers to create presentations for classes and show them to students directly during classes. Effectively designed for mobile phones. It is necessary to send the presentation code by email or via social networks so that they can be activated together from their mobile phones. Independently setting the pace of classes, you can scroll through slides, involve students in performing creative tasks and track the result in real time.

Nearpod can participate in sessions independently of other applications from any device and from any platform (iOS, Android, Windows Phone). Tablets and laptops are also suitable for working with presentations, but the developers have paid special attention to the convenience of the interface for connecting from a mobile phone.

To start working with Nearpod, you need to register on the site (you can use your social media profile or email for this). For those who join by invitation to the created session, registration is not required.

It is worth remembering that there is no Cyrillic alphabet on the platform. When you make a presentation, you can see your text correctly, but for others it is not visible.

The free version of Nearpod allows you to create slides with images, texts and audio recordings, as well as invite up to 30 students to participate in an online session.

The paid version of Nearpod Gold offers much more features: creating slide shows, entering video files, creating quizzes, open questions, drawing tools, you can add graphs and diagrams.

Compiled presentations can be stored in PDF format and distributed for offline use. Another useful feature is homework. In this mode, students can independently work with the presentation without connecting to the general session.

The service offers the services of an online store: you can purchase presentations created by other teachers, and some of them are distributed free of charge.

LEARNING APPS. Learning Apps is an application to support the learning process through interactive modules (applications, exercises). This online service

allows you to create modules, store and use them, provide free exchange between teachers, organize the work of students (including the creation of new modules).

LearningApps.org the native language is German, but the site has multilingual support. However, there is no clear translation of some phrases. Therefore, sometimes there are untranslatable phrases or errors in the service.

The functionality and navigation are very easy to understand. To do this, just click «all exercises» at the top of the main page, and a list of exercises created and published by other users will open.

To create and save your tasks, you need to register. After registration, samples will be available for students to help with interactive learning.

Learning Apps templates are grouped by functional features:

- 1) **selection**– exercises for choosing the right answer;
- 2) **division**– tasks for determining compliance;
- 3) **sequence** – determining the correct sequence;
- 4) **filling** – exercises that require the right answer in the right places;
- 5) **online games** – the student can play with a computer or other
- 6) **competitions** – exercises with students.

You can compile the task and publish it immediately or save it for personal use. Ready-made resources are also available to unregistered users. Tasks created by other users, copying the link at the bottom of the task in the "binding" field, many bloggers can put on their own website, as teachers do.

In addition, you can create an account for your students and support your resource to test their knowledge directly on this site.

KAHOOT. Kahoot is a free platform for learning in a playful way that is suitable for any academic subject and any age. You can use it to make a test, a survey, an educational game or organize an educational marathon. The application works both in the desktop version and on smartphones. With the help of the Kahoot application, you can create and conduct online surveys, discussions and quizzes.

Tasks created in Kahoot allow you to add images and even video clips to them. The pace of quizzes and tests is regulated by introducing a time frame for each question. If desired, the teacher can give points for correct answers to the questions and speed. The scoreboard is displayed on the teacher's computer monitor.

To participate in the testing, students need to open the service and enter the PIN code that the teacher provides from his computer. It is convenient for the student to choose the correct answer from his structure. The answer options are given by geometric shapes.

Conducting an online event with the help of Kahoot is carried out in synchronous mode only when launched by the host of a survey, discussion or quiz. In addition, if there is an image or video fragment in the question, they can only be seen on the teacher's screen.

Currently, the program is completely free. To work with the program, you need to register on the website. To conduct a survey, discussion or quiz in the audience, you will need technical devices: a personal computer that broadcasts a video/image to the teacher; smartphones or tablets with Internet access to students.

One of the features of Kahoot is the ability to duplicate and edit tests, which saves time.

QUIZZZZ. Quizizz is an online student assessment tool that is very similar to Kahoot, but has some differences.

Firstly, when starting a quiz in a group, students, moving at their own pace, answer questions and at the same time do not depend on the speed of the answers of other participants.

Secondly, you can schedule the execution of a quiz created in Quizizz, that is, present it as homework. Kahoot adds this option to its service.

Thirdly, it is possible to remove the «time» parameter so that the student can take his time with the question asked, and not about the time that passes. It also allows you to find a paragraph of a textbook, a chapter of a book or the necessary information in the Google system when answering a question.

With this tool, you can do the following:

- 1) support of the educational and learning process;
- 2) conducting games and quizzes;
- 3) organization of competitions;
- 4) conducting testing;
- 5) doing homework;
- 6) monitoring the results of each student;
- 7) automatic provision of feedback to each student.

WIZER.ME. Wizer.me free, easy to use, with tasks and exercises, including a video-based, fast tool for quickly creating interactive worksheets.

Interactive Worksheet (ILE)-it is a digital means of organizing students' learning activities using cloud services and web tools.

Wizer allows you to create and use interactive worksheets in order to perform independent work of students in distance learning, effective work on a computer and an interactive whiteboard in a group.

Interactive tasks in Wizer can be compiled in several ways:

- 1) an open-ended question;
- 2) a question with a choice of answer (alternative test);
- 3) write a comment on the video, photos;
- 4) compliance tests;
- 5) identification/sequence determination tasks;
- 6) filling in the table;
- 7) filling in the gaps in the text;
- 8) fill in a comment to the picture;
- 9) digital dictation, providing for filling in the gaps.

You can post videos and pictures and attach recordings or assignments for students to them.

Everything that can be done in Wizer, students can use in the Google classroom. Or you can send them a link. The great advantage of this service is the wide possibilities for working with images and videos that can be inserted into a worksheet.

On the platform of the service, it is possible to organize joint remote work of teachers on the compilation of didactic material.

EdApp educational platform. The **EdApp educational platform** is the leading LMS system used by large and small organizations in the world. EdApp is an educational platform that is available for free to all users, both private and corporate. It offers design solutions and templates to make creating and sharing courses simple and effective. In addition, it offers ready-made courses developed by the world's leading experts, which you can include in your curriculum. The key feature of EdApp in Microlearning is that they create their own programs so that they work well with mobile devices, which allows you to study anytime and anywhere, provide a data-driven development tool, and create your own well-organized and effective courses. You can make them more attractive. EdApp is integrated with powerful Canva design tools.

The «diary» platform. The diary is a unified electronic educational environment for teachers. It combines the possibilities of electronic document management for educational organizations and social network tools for organizing interaction between all participants in the educational process (teachers, parents, students) (Fig.66).

The main directions:

- 1) modernization of school education;
- 2) integration of advanced ICT in the educational process;
- 3) development of interactive communication «Teacher-student-parent»;
- 4) introduction of a unified information exchange environment;
- 5) creation of a school ecosystem and maintenance of this system;
- 6) provision of distance education opportunities.

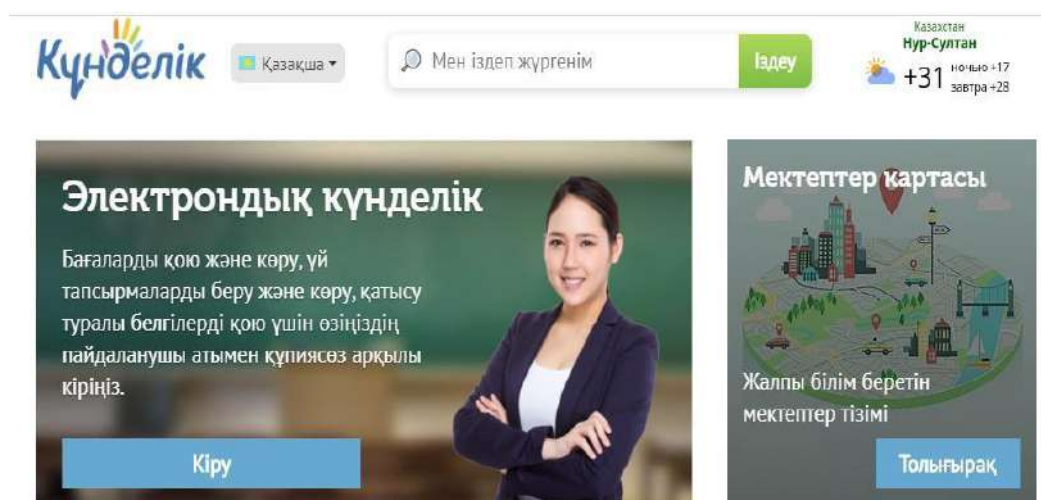


Figure – 66. The Diary platform

The Bilimland platform. **Bilimland** is a digital educational platform based on the advanced achievements of the world leaders of e-learning. This is the largest digital library of modern educational content, presented in the form of more than 40 thousand electronic lessons, filmed on the basis of the school curriculum, simulators,

interactive exercises, video and animated educational films covering all subjects in Kazakh, Russian and English.

To date, about 230 thousand teacher accounts have been connected to the BilimLand electronic educational portal, along with all schools in the country. Teachers actively use digital content to organize learning and teaching process in the classroom. Now, as part of the subscription of schools to the platform, all students receive user accounts that provide access to digital content outside of school and at a time convenient for them.

BilimLand is a digital educational platform created on the basis of advanced achievements of world leaders in e-learning. It is the largest digital library of modern educational content, including about 30 thousand electronic lessons, simulators, interactive exercises, instructional videos, animated films in Kazakh, Russian and English with coverage of all subjects.

Exciting electronic classes help children prepare for school and arouse interest in reading among younger students. He is also an indispensable assistant for high school students, explaining the most difficult topics in mathematics, physics, chemistry, biology and other school subjects in a simple and accessible way. Unlimited and free access to digital educational resources is a good initiative aimed at improving the quality of education.

The Online Mektep platform. In 2020, the Center, together with **Bilim Media Group**, an innovative company in the field of online learning, developed and launched the Online mektep digital educational platform (www.bilimland.kz). The main goal is to provide opportunities for adaptive learning of secondary school students online (Fig.67).

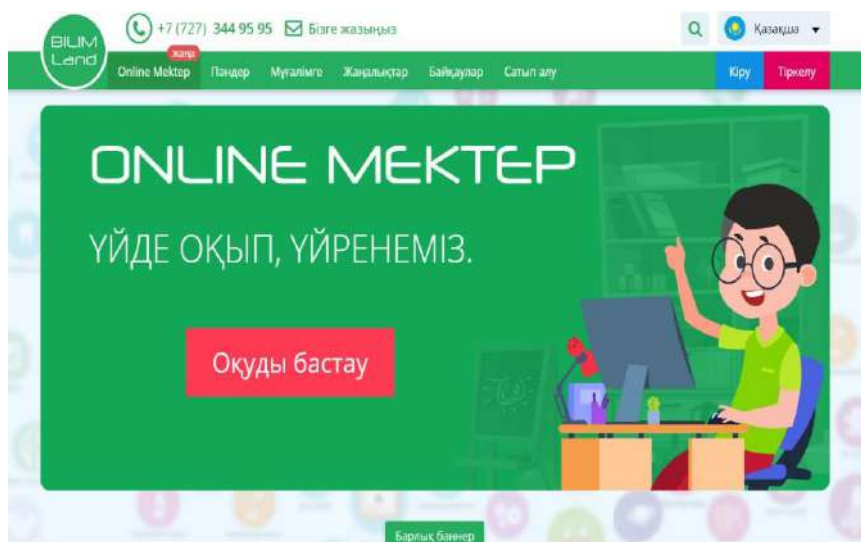


Figure – 67. Online Mektep platform

Online Mektep includes digital educational content in all subjects for grades 1-11 in accordance with standard curricula for students of secondary schools in the country.

The content of classes, a set of exercises and tasks are developed by the leading teachers of Nazarbayev Intellectual Schools and are moderated by the subject specialists of the Center.

The main idea of the platform is the development of theoretical material for each lesson in the form of a synopsis, a diagram, an intellectual map, and the practical part of the lesson is given in the form of level tasks that allow systematically and consistently develop the skills necessary for the formation of functional literacy of students.

The site presents a tiered system for organizing the content of classes. When developing lessons, the principle of task-based learning was taken as a basis. The student, performing a certain level task, plunges into an active cognitive process. Each task is accompanied by the headings «important to know» and «explanatory» in the form of a brief theoretical material that will help the recipient consolidate knowledge on the topic of the lesson and more consciously complete the tasks.

Given that the level of assimilation of the material and the pace of learning of students are different, the student is given the opportunity to independently study the material on the platform. This, in turn, allows you to qualitatively consolidate the material you have passed, as well as create an individual training schedule.

Online Mektep – containing digital content developed in accordance with standard curricula for students of secondary schools of the country www.bilimland.kz is a new data transfer portal module. This module consists of specially developed digital educational resources: video tutorials, level tasks, interactive exercises providing for the systematic formation of skills aimed at the development of functional literacy of students.

«**Daryn.online**» platform. Daryn.Online is a distance learning platform that allows you to study with highly qualified teachers anywhere, at any time (Fig.68).

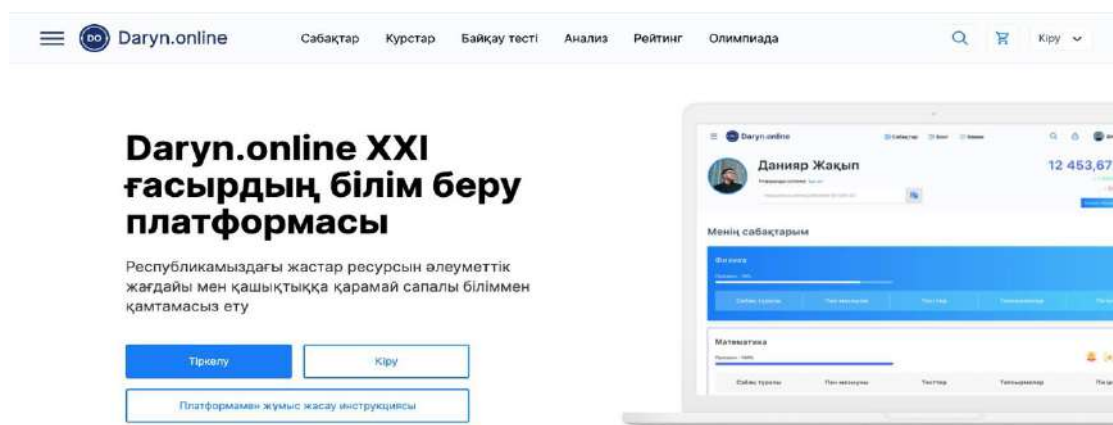


Figure – 68. «Daryn.online» platform

The EDUS system is an electronic school – an educational platform for schools. This platform was created in order to centralize the data of the educational process of secondary schools of the Mangystau region (the contingent of schools,

journals in electronic format, class schedules, student performance, individual questionnaires, parental accessibility, etc.) by adapting to a single format for the formation of resources of the educational contingent (Fig.69).



Figure– 69. EDUS system-electronic school

Methods of using digital educational platforms

Firstly, the method of application when explaining new material or fixing a new lesson. In this case, it is better to use CBR, such as animation, video files, sound files, rendering of graphic images.

Secondly, all the materials of the educational complex can be useful in the case of organizing independent educational activities of the student.

Thirdly, computer testing of students of control and diagnostic orientation in the case of the organization of various controls by digital educational platforms (input, current, cut-off, final).

Fourth, a method that allows you to group the central bank by a specific discipline or direction using multimedia tools.

Fifth, digital educational platforms when performing laboratory work, the advantage of the central bank allows you to replace educational laboratories consisting of very large and expensive to use devices.

Sixth, we can talk about the method of using interactive digital educational platforms for subjects of the natural science cycle and computer science and ICT.

Seventh, we can name a method of organizing distance learning, which allows students to get acquainted with theoretical material at their own pace, perform laboratory work and test tasks without the participation of a teacher at a time convenient for them.

A digital educational resource cannot replace a teacher, but provides him with additional materials, i.e. it allows him to supplement the content of the lesson with information and communication technologies and multimedia capabilities, attract the attention of students to important parts of the educational topic, if necessary, focus their attention on the features of the studied ideas. In addition, the digital educational

resource allows you to visualize the material, determine the content of the topic with changes taking place in society, life experience, interests in the subject, etc. allows you to provide communication with phenomena.

Education is the basis of professional life, it has always been and remains a reality to this day. As new technologies develop, so does the world. Innovations come to all spheres of life, including education. The modern requirement in education has become not just knowledge, but also the search for information, it is necessary to teach children to search for information independently, process it using the latest technologies, use their time wisely and interact effectively with classmates, teachers and parents. In connection with these trends, how to build an educational process for the effective use of school time and modern information technologies to achieve the goals? After all, the possibilities of traditional education are not unlimited. Thus, a new branch of «digital education» is being formed in education.

The modern classification of digital education technologies is quite extensive and depends on the level of economic development of the country, the process of digitalization in education is uneven: this creates a gap between those who, for a number of reasons, have access to digital technologies, and those who face inaccessibility. The division caused by inequality in access to digital technologies is commonly referred to as «digital divide». A generalized classification of digital educational technologies is presented in Fig. 70.

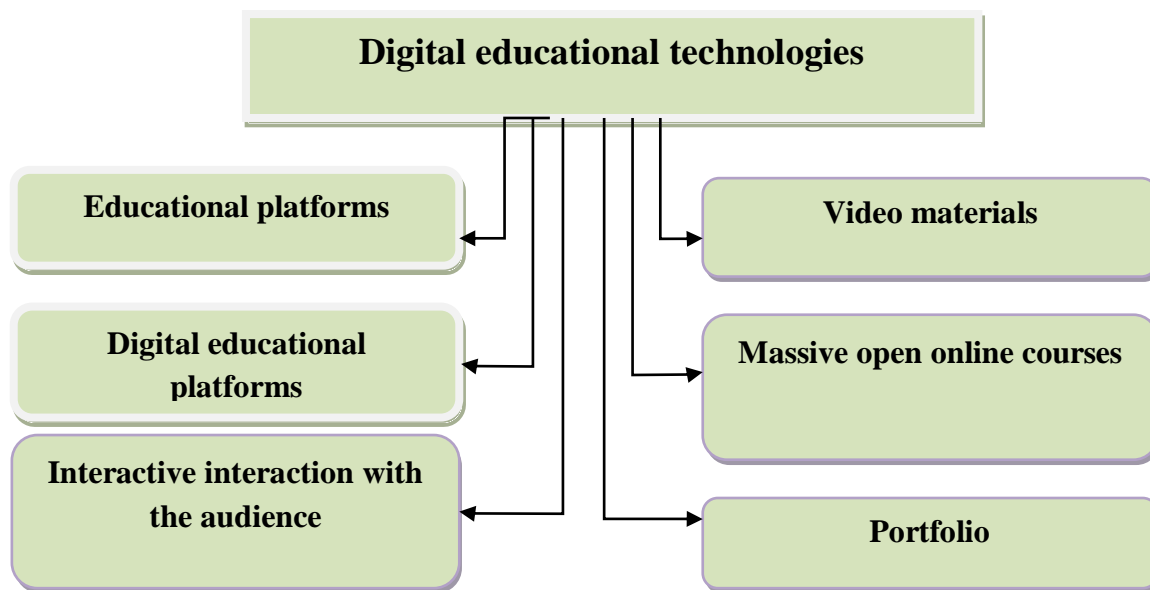


Figure –70. The classification of digital educational technologies

Digital education is the use of digital tools and innovative technologies in teaching and learning, which is often referred to as advanced technology learning or e-learning. Just as technology evolves and diversifies over time, educational technology is also rapidly evolving. In the late 1990s and early 2000s, it was only information and communication technology (ICT), and there were many initiatives to provide teachers and students with more equipment (such as personal computers) in

order to improve teaching and learning and explore how they can be used in various ways. In the 2000s, the emphasis was on e-learning or digital learning (LwDT).

A special role in the digitalization of education was played by the digital competence of participants in the educational process. Taking into account the conceptual definition of «digital competence», let us consider the conditional definition proposed by the team of scientists of the Faculty of Psychology of Lomonosov Moscow State University under the leadership of G.U.Soldatova: «Digital competence is based on the continuous mastery of the ability to choose and apply information and communication technologies in various spheres of life (knowledge, skills, motivation, responsibility). Information environment, communication, consumption, technosphere) and accessibility of these activities».

The main business processes of digital literacy are presented in Figure 71.

In recent years, the language of digital policy in educational institutions has become the concept of digital fluency (digital free speech), the meaning of which, apparently, still needs to be explained, but also means something beyond «digital literacy». Thus, digital free speech is not only the knowledge of how to use technological tools, but also the knowledge of how to create important things with these tools.

Taking into account the active integration of digital learning and the electronic learning environment, it is necessary to determine the role of teachers in the educational process. Oxford University has studied student support systems for digital learning, which have shown that teachers play an important role in mastering new skills. J. Yarbrough: «In the digital space, the pace of learning, the process of obtaining a subject is determined by the teacher himself. The teacher is responsible for the development of the student».

Learning to use digital technologies allows teachers to develop interesting learning opportunities in the courses they teach, and they can be mixed or completely in the form of online courses and programs.

The concept of digital learning implies an individual approach to each student, focused on the formation of new skills and abilities among students, and not just an assessment on any subject. The introduction of digital tools will become an integral part of the organization of a successful educational process.

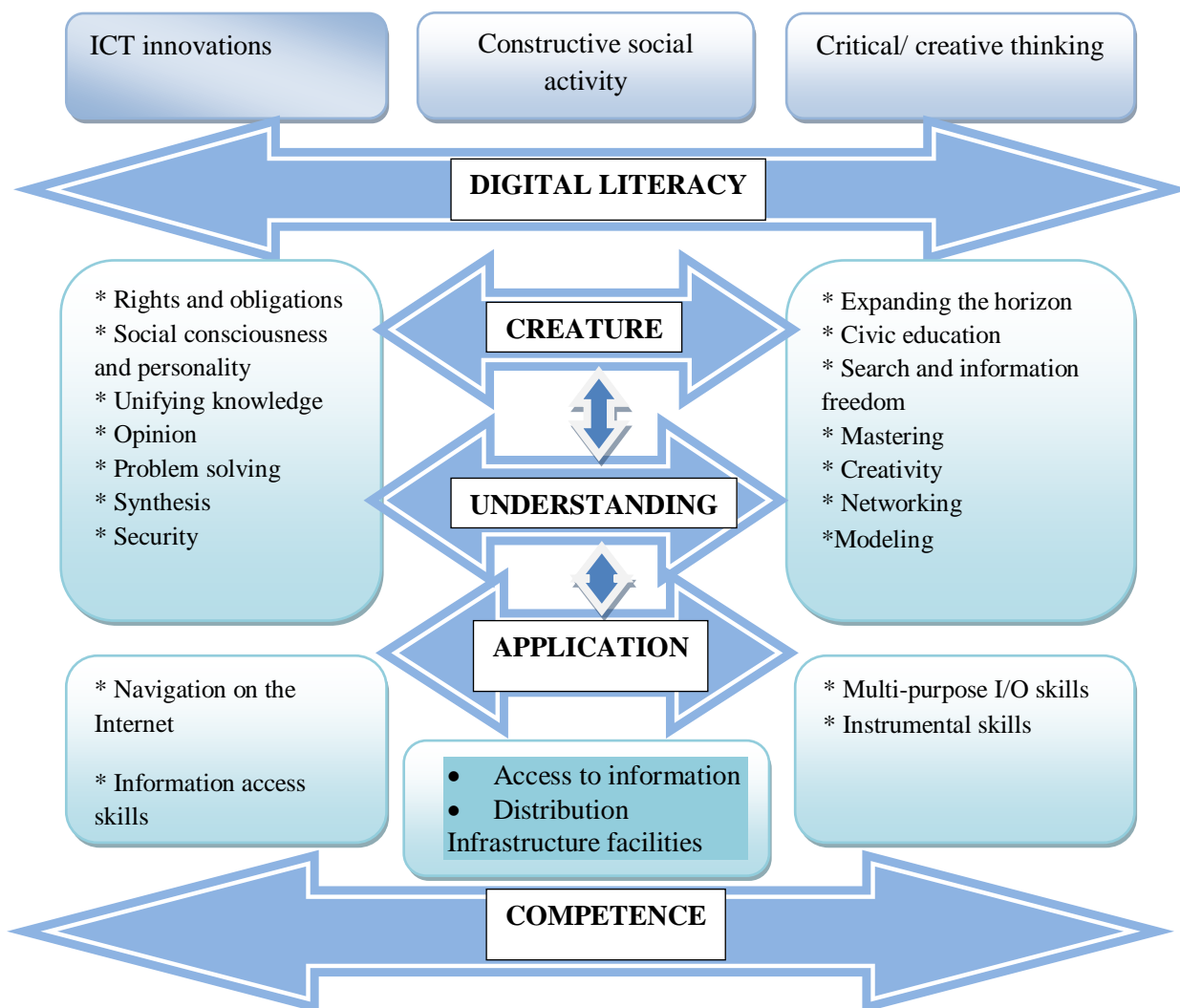


Figure –71. Digital literacy

Let's look at examples of automated digital technologies used in the educational process in different countries, and what opportunities they provide to teachers and students, the analysis is given in Table 8.

Table 8 – The examples of automated digital educational technologies

Educational environment	Users	User capabilities	The role of the teacher	Disadvantages of the system	Example
Modular systems	Students in educational institutions (as well as teachers)	Users have access to records, tables and other tools for monitoring and organizing the educational activities of	A teacher of the classical type. The teacher selects and creates textbooks for students	Not suitable for users. The need to use only predefined modules	PIES, NGDLE and etc

		students. The system contains information on each student and his individual achievements, the requirements imposed on him during training, instructions on the educational process	(tests, tests, assignments, etc.).		
Distance education	Any user	Students are given access to various test educational videos during training. Upon completion of the training, the student can take an exam and receive a certificate. Teachers can create online courses, practical departments, but not participate in educational activities	Self-education without a teacher or mentor	Lack of motivation for students to complete the course or low motivation . The basic tools for creating a course are not flexible enough and are the same for all types of courses	Coursera, edX, Xeuetang X, FutureLearn, Udacity, etc
LMS and LCMS systems	Students and teachers in some higher educational institutions of paid online schools	Creation, management and presentation of online training materials. LMS creates a unified learning environment convenient for studying theory, active practice and receiving	A teacher as a tutor or mentor. Students choose a course, and a mentor or tutor accompanies and supports the learning	Lack of flexibility in installation, paid tool	Netology of LMS System, LMS, Moodle, Claroline, etc. Adobe Captivate Prime Higher School of

		feedback from the teacher. Such systems allow teachers to create courses in a visual, virtual environment	process throughout the course. The teacher chooses educational means depending on the capabilities and academic performance of the student		Economics
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The schematic structure of teacher-student interaction using digital educational tools is shown in Fig.72.

The modern digital strategy sets several goals for educational organizations:

- Modern infrastructure (including reliable high-speed broadband and data);
- Study and teaching of the 21st century;
- Equal access to high-quality content and resources.

The most important thing is the continuous improvement of their skills and knowledge, the trend of lifelong learning education (lifelong learning) has become widespread. Thus, the knowledge received digital items. Today it is possible to get distance education using modern information technologies. Consider the most popular digital educational platforms in Kazakhstan.

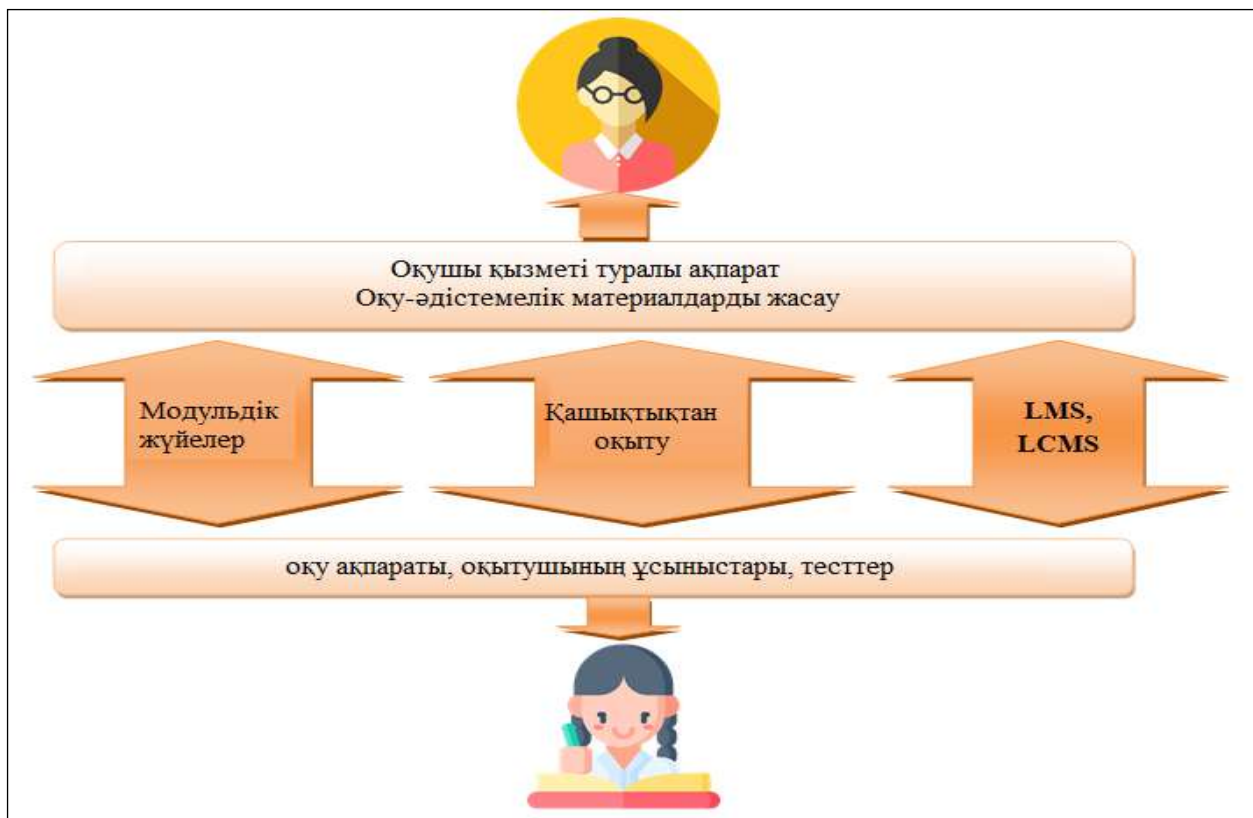


Figure –72. The structure of teacher-student interaction using digital educational tools

Information educational portal Kundelik.kz

In 2016, the automated information system (AIS) «Kundelik» was created on the basis of a public-private partnership between the state partner-investor "Kundelik" LLP (Kundelik), recommended by the Ministry of Education and Science of the Republic of Kazakhstan (MES RK).

Kundelik.kz system is an education management system in terms of academic performance in secondary education in Kazakhstan (the so-called LMS-Learning management system), which can automatically perform all the necessary educational processes and much more online. That is, you must first fill in the correct data and get grades, homework, academic performance and come daily or with a certain frequency, and the rest of the data, reports, tables, digital educational platforms, etc. will be automatically calculated.

The main page of the Kundelik.kz system is shown in Fig. 73.

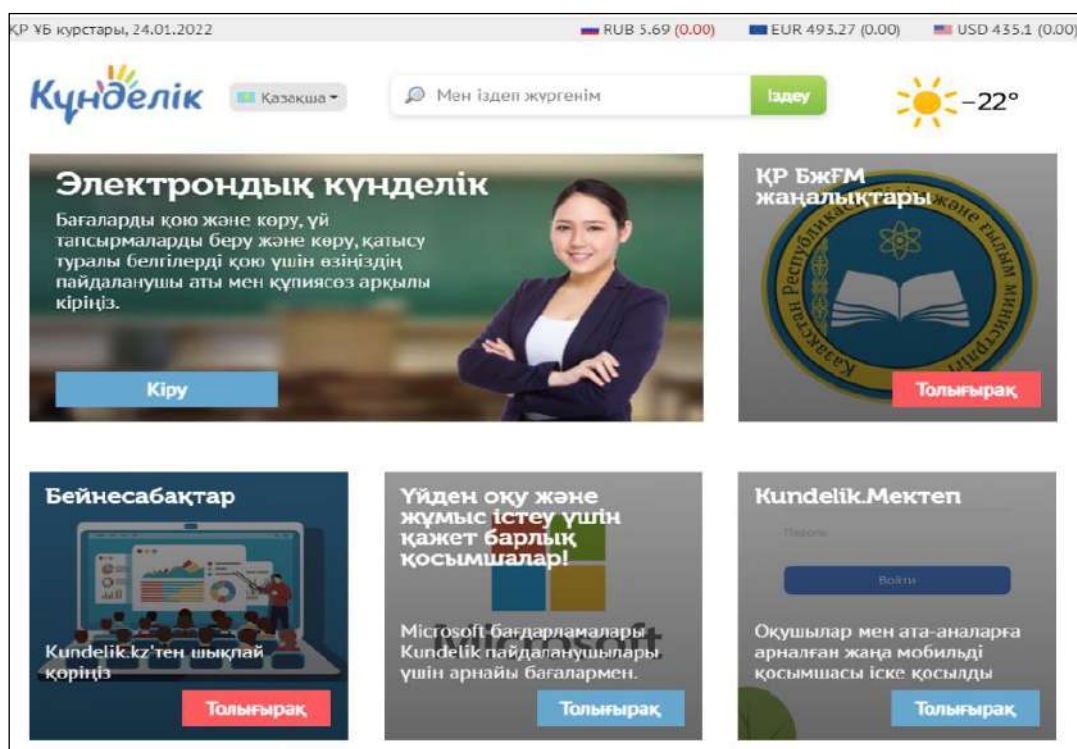


Figure –73. Kundelik.kz educational information portal

The mobile app for the Play Market (Android) and App Store (iOS) has been available since 2017. «Diary. The school» has simplified access to the resources of the Kundelik.kz system, providing the opportunity to work from anywhere in the world.

An electronic diary is somewhat more preferable than a paper one: it contains all the functionality and presentation of information than a paper diary, and you can also see grades for previous periods, attendance, academic performance statistics, as well as a social section, forums.

Features of the Kundelik Education Management System:

1) login to the system using credentials from the Kundelik system (login authorization to the portal).

2) displaying the pages of the Monitoring system in accordance with the roles of users (for example, the head of the education management body, when logging in, first gets not to the page with the indicators of the whole country, but to the page with the indicators of his district).

3) a convenient and informative page of the activities of management bodies.

4) the possibility of establishing a second integral indicator with higher activity limits for monitoring the activity of schools that meet the conditions for schools with a large volume of digitized paper.

5) the indicator for timely statement.

6) combining information on all indicators: in the edges with indicators, information is indicated on the proportion of schools that fulfill the specified values, as well as information is indicated on how many schools cannot complete the task.

The profile surface of the Kundelik system is shown in Fig. 74.

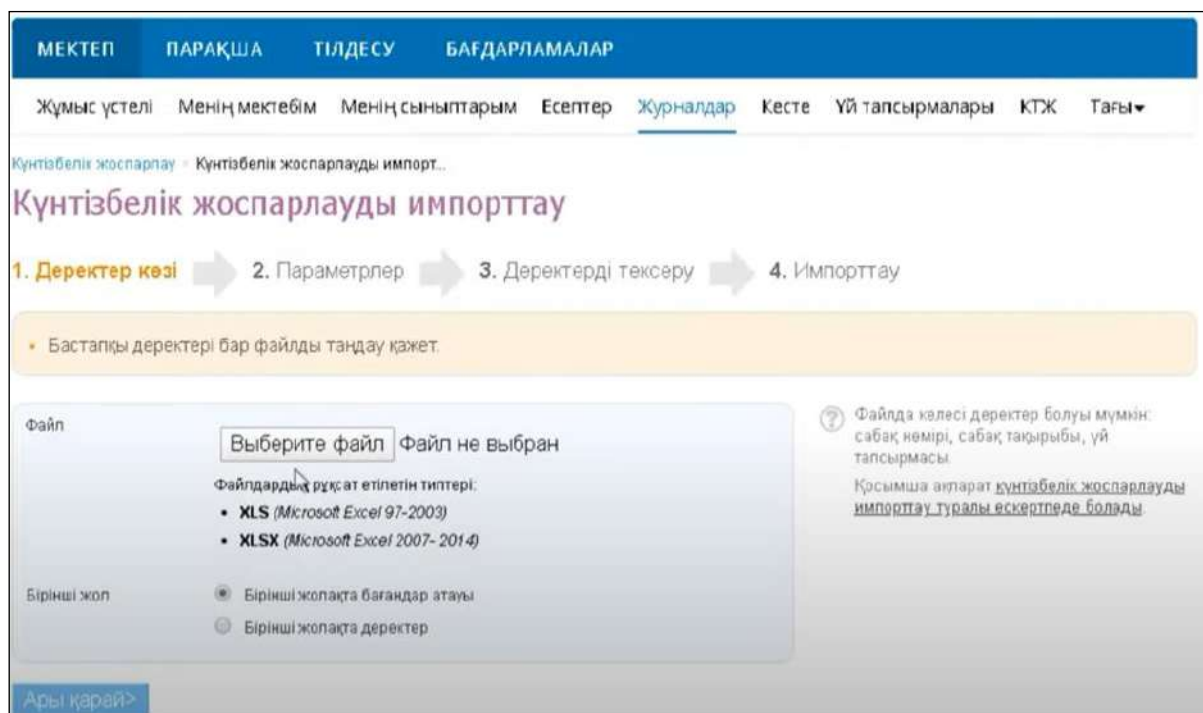


Figure –74. The profile surface of the Kundelik system

According to the results of a survey conducted among 14 thousand teachers from different regions of Kazakhstan (teachers of East Kazakhstan, Zhambyl, Almaty and Turkestan regions took an active part in it), 70% of teachers have a positive attitude to the introduction of electronic journals in schools. Half of the respondents noted the convenience of viewing the schedule and viewing changes in it online, and 40% of teachers said that instead of filling out "papers" they began to devote more time to the educational process.

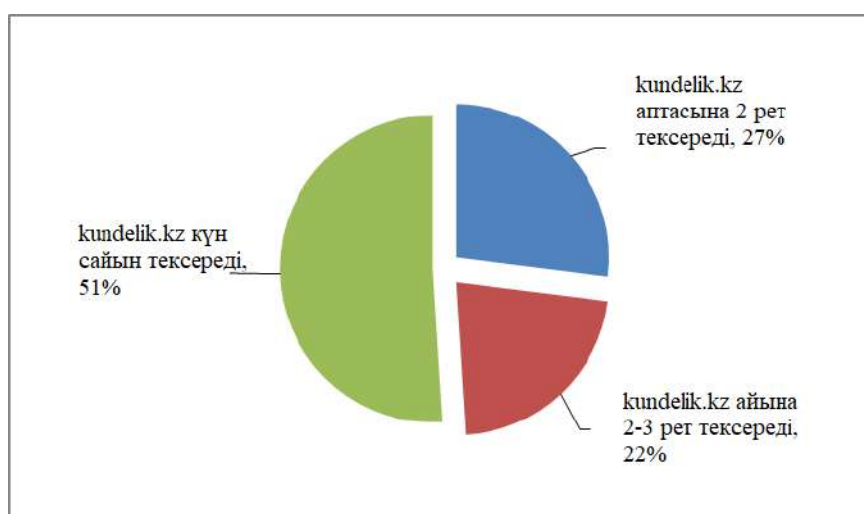


Figure – 75. The impact of an electronic diary on the learning process

In addition, parents of students noted the convenience of using LMS Kundelik. This is evidenced by the results of a study conducted by the developers of the system in 2019, in which 24 thousand parents from different regions of the country take part. Almost half of the respondents, in particular 43%, often check the electronic diary, 38% reported that they see the digital and paper version, thus 81% of parents watch the digital diary, and only 19% correspond to the classical version. The survey data is shown in Fig. 75.

93% of respondents answered the question that an electronic diary is more convenient than a paper one.

The results of the implementation of AIS «Diary» are shown in Table 9.

Table 9 – The results of the implementation of AIS «Diary»

Project implementation results			
State	Education	Social	Economic
Integration of the country into a single digital educational space	Informatization of education and destruction of paper reports - as of May 2019, 824 schools are giving 100% marks to electronic journals every day	Eliminating digital inequality	For 3 years of the project implementation, the state budget connected schools to the e-learning system in the amount of \$ 910 million. saved tenge (2016-2019)
Educational services have been converted to electronic form	Criteria and formative assessment is automated in accordance with the provisions of the reform of the knowledge assessment system	Formation of new competencies and improvement of computer literacy of students, parents and teachers	
An effective system for monitoring the current work of schools has been created			
Transparency of the educational process has been ensured -local corruption has decreased		The general level of computer literacy of the population of the Republic of Kazakhstan in accordance with the concept of the project Increase by 5% - 25%	

Kundelik.kz -they can see the exact schedule, grades, assignments and school attendance of the child at any time and anywhere.

In addition to the educational benefits of implementing the project, which are noted by both teachers and parents of students, it is possible to highlight state, social, as well as economic benefits.

According to the general director of Kundelik M. Ilyasov, the uniqueness of the educational portal lies in the fact that it provides coverage of users, starting from the internal structure. The transition from paper to digital, saving money and human resources. There are wide opportunities for direct communication: parents with each other, parents with teachers, executive authorities with schools. In addition, there is the possibility of expanding and upgrading the functionality.

Electronic educational portal Bilimland

In 2011, as part of the Industrialization Day, JSC "National Agency for Technological Development", dedicated to the implementation of the "Nurly Zhol" and industrial innovative development of the country, presented to the head of state one of its projects - the BilimLand multilingual education platform. Its founder is the holders of the Bolashak scholarship, who studied at leading universities in the USA. Having studied the world experience in the field of education, the guys have developed a Kazakhstan service for trilingual education in Kazakh, Russian and English. Having studied international experience in the field of education, young people have created a Kazakhstan trilingual learning service available in Kazakh, Russian and English.

Bilimland is a digital education system based on the best practices of e-learning leaders around the world. It is the largest digital library of modern textbooks, with a total of 102,380 educational resources and 40,000 interactive lessons, interactive exercises, educational videos covering almost all subjects of textbooks and educational programs.

In March 2020, Bilim Media Group and the Ministry of Education and Science of the Republic of Kazakhstan announced the opening of full free access to the digital educational resources of the Bilimland platform for all students of secondary schools.

Currently, all schools of the country are connected to the electronic educational portal Bilimland, according to the Ministry of Education and Science of the Republic of Kazakhstan, more than 230 thousand teacher accounts have been launched in the system. Now digital content is available not only to teachers, but also to students who receive user accounts.

The main page of the platform is shown in Fig. 76.

The platform exists not only in the education system, but many organizations consider it as a useful platform for training and improving their employees. The courses include virtual simulators. They are designed to describe scientific phenomena in a simple and easy way using diagrams based on real research models, and students can test and experiment without the help of a teacher.

Currently, the developers of "BilimLand" are actively working with the Ministry of Education of the Republic of Kazakhstan. The online platform is used in more than 7000 schools in Kazakhstan.

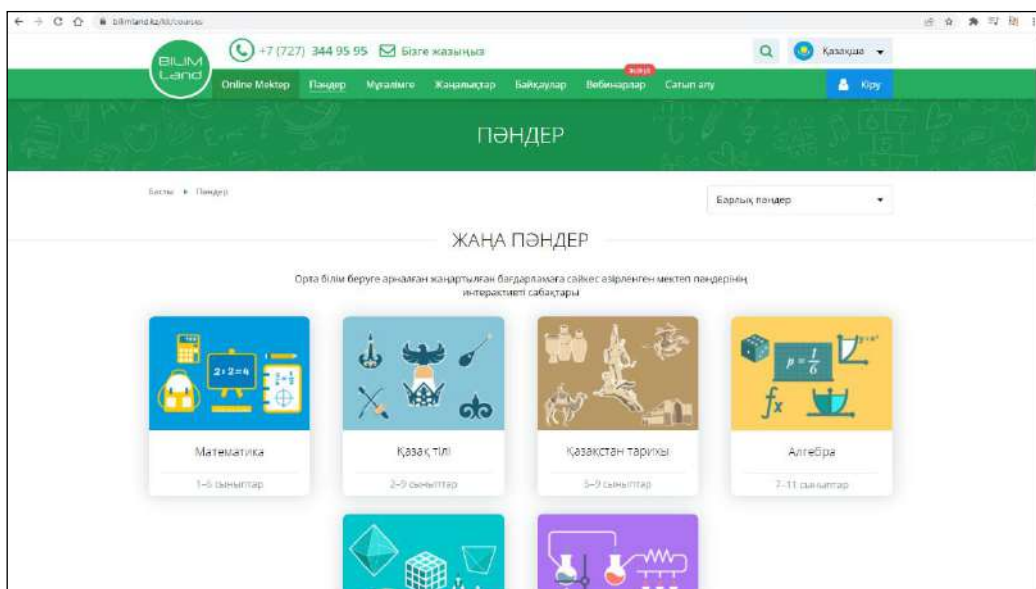


Figure-76. Bilimland electronic educational portal

With the beginning of the coronavirus pandemic and the introduction of a state of emergency in Kazakhstan, all educational organizations were forced to switch to distance learning. From March 23, 2020 on the basis of the Bilimland project.kz launched the OnlineMektep project with recording video tutorials for broadcast on the TV channels «Balapan» (in Kazakh) and «El Arna» (in Russian). The video tutorials were shown from April 6 to May 22, 2020. Within the framework of the project, more than 3 thousand video tutorials, about 20 thousand exercises and tasks were created in 42 school subjects. The project was implemented on the initiative of Bilim Media Group. Organizational and methodological support was provided by the Ministry of Education and Science. In total, 160 teachers, 40 methodologists and more than 100 employees of the company took part in the project. In the fourth quarter, 77% (3 million 400 thousand) switched to distance learning of the students of the country. In addition, information support was provided to teachers of the country, advanced training courses agreed with the Ministry of Education and Science of the Republic of Kazakhstan are presented on the portal.

In 2020, the Center for Educational Programs, a branch of the AEO «Nazarbayev Intellectual Schools», together with Bilim Media Group, an innovative company in the field of online learning, developed and launched the **OnlineMektep** digital educational platform. OnlineMektep includes digital educational content in all academic subjects, starting from grades 1-11, in accordance with standard curricula for students of secondary schools of the country. The content of classes, a set of exercises and tasks were developed by the leading teachers of Nazarbayev Intellectual Schools, the subject students of the center were moderated. More than 500 development teachers, including NIS and teachers of secondary schools of the country, are involved in the project. The total number of lessons developed from the 1st to the 4th quarter for grades 1-11 is 24,074. Currently, the number of schools connected to OnlineMektep is 3,910, the number of active students is 238,754, 72,875,697 active users daily, and a total of 51,779,298 views since September 1.

Each course has a «business card», which contains general information about the course, the possibility of obtaining a certificate and the cost of the course.

An example of the «business card» of the OnlineMektep course is shown in Fig. 77.



Figure –77. The «Main» page of the course

Each course consists of modules, the number of which depends on the complexity of the materials. The information is presented in the form of a table, text and video. The structure and interface of the course are shown in Fig. 78.

The test tasks can be different, there can be both tests with one or more correct answers, and tasks in which answers are entered from the keyboard.

Taking into account the different level of assimilation of the material and the pace of learning, the student is given the opportunity to individually study the material on the platform. This, in turn, allows you to qualitatively consolidate the material you have passed, as well as create an individual training schedule.

Зачная школа для учителей
Тест 1

Тест 1

Бөлшектер және олардың құрылымы - кристалл торларының түрлері

Сұрақ.1

Кестеде белгіленген әр бір затқа берілген ақпаратты қолдана отырып, құрылым типінің қандай екенін-иондық па, ковалентті ме, металдық па, молекулалық па, гиганттық па екенін анықтаңыздар.

	$T_{пл}$ °C	$T_{кип}$ °C	Ерігіштік	Электрөткізгіштік	Басқа қасиеттері
A	98	890	Белсенді әрекеттесіп, өнімдері түссіз ерітінді мен газ	Электр тоғын өткізеді	Жұмсақ, жылыр, қатты, ауада тез тотығады
B	3730 (сублимацияға ұшырайды)	3730 (сублимацияға ұшырайды)	Ерімейді, әрекеттеспейді	Электр тоғын өткізеді	Қою-сұр түсті, қатты, қабыршақты (чешуйчатый)
C	-117	78	Ериді	Электр тоғын өткізбейді	
D	5.5	80	Ерімейді, әрекеттеспейді	Электр тоғын өткізбейді	Органикалық еріткіштерде ериді, мысалы гександа
E	747	1390	Ериді	Қатты күйінде электрөткізгіш емес, балқыған күйінде E электролизге ұшырайды	Кристалдары морт сынғыш

Figure – 78. OnlineMektep course interface

Educational platform edus.kz

The educational platform AIS EDUS automates the entire educational process of college, school, kindergarten. Allows you to organize and control the learning process, monitor and output the necessary reporting data. The pilot version of the project was launched in 2008, the developer of the platform is the Kazakh IT company Mediana Services Limited.


Edus educational platform.kz is shown in Fig. 79.

EDUS образовательная платформа

Соответствует требованиям информационной безопасности
Службы Министерства образования и науки РК

Автоматизируем процессы работ колледжа, школы и детского сада

Весь процесс организации и контроля учебного процесса, мониторинг и генерация различных отчетов.



Компоненты программы ИС "EDUS"

- Электронный журнал
- Расписание занятий
- Оценки и успеваемость
- Четвертные оценки, семестры
- Онлайн тестирование
- Отчеты и мониторинг
- Интеграция с СЭБД
- Электронная библиотека
- Система контроля доступа
- Электронное столовое/меню
- Видео-наблюдение здания
- Интерактивные дисплеи
- GPS-трекинг (для родителей)
- Программа учета персонала
- Дистанционное обучение
- Видео-конференц связь (ВКС)
- Мобильные приложения
- Электронный архив данных
- Обучение персонала
- Техническая поддержка
- Государственные услуги

Написать в поддержку

Figure –79. Edus.kz educational platform

The services of the EDUS educational platform include:

1) educational platform EDUS AIS «Electronic College» (<https://college.edu.kz/>) automates the learning processes of educational institutions of secondary technical and vocational education (VET) of the Republic of Kazakhstan. Currently, 22 colleges of Kazakhstan are registered on the educational platform, it is possible to track applications from applicants through the Virtual Admissions Committee of the college. The system allows the college to manage the admission and rejection processes. The entrance to the office for the Department of Education (type) allows monitoring the admission of applicants of subordinate organizations (colleges). Current statistical data are indicated. There is a virtual blog. To register in the system, the college administrator must have the PIN code of the individual identification number. The registration form in the service is shown in Figure 80.

The screenshot shows the registration form for the EDUS AIS platform. The header includes the EDUS logo and the text 'Білім беру платформасы Электронды колледж'. There are two buttons in the top right: 'Тілді ауыстыру' (Change language) and 'Бастапқы бетке' (Back to home page). The main heading is 'Деректерді енгізіңіз'. The form consists of five input fields: 'Логин' (Login), 'PIN кодты енгізу' (Enter PIN code), 'эл. пошта' (Email), 'Құпия сөз' (Password), and 'Құпия сөзді қайталау' (Repeat password). Below the fields is a checkbox 'мен келсем' (I agree) and a link 'пайдаланушының келісімімен' (with user agreement). A yellow 'Тіркелу' (Register) button is at the bottom. On the right side, there are instructions: 'Логин' (Login) - 'Бұл сіздің жеке сәйкестендіру номеріңіз' (This is your unique identification number); 'PIN код' (PIN code) - 'Егер сіз студент болсаңыз PIN кодты курс жетекшіңізден, Егер сіз оқытушы болсаңыз PIN кодты колледж администраторынан, Егер ата-ана болсаңыз PIN кодты балаңыздың курс жетекшісінен аласыз.' (If you are a student, get the PIN code from the course supervisor; if you are a teacher, get it from the college administrator; if you are a parent, get it from the course supervisor of your child.); 'Электронды почта' (Electronic mail) - 'Электронды почтаның мекен-жайы жүйеге бұрын тіркелмеген болуы қажет' (The location of the electronic mail must not be registered in the system before); 'Сенімді құпия сөзге қойылатын міндетті талаптар' (Mandatory requirements for a reliable password) - 'Құпия сөз кемінде 8 таңбадан тұруы керек' (The password must be at least 8 characters long), 'Құпия сөз латынның бас және кіші әріптерінен, сандардан құралуы қажет' (The password must contain uppercase and lowercase Latin letters and numbers); 'Құпиясөзде мыналар болмауы тиіс' (The following should not be in the password) - 'Білуге оңай жеке ақпарат. Мысалы: аты, тегі немесе туған күні' (Easy-to-know personal information. For example: name, surname, or date of birth), 'Айқын және қарапайым сөздер, фразалар, тұрақты тіркестер және таңбалардың оңай жиынтығы.' (Clear and simple words, phrases, fixed expressions, and easy combinations of characters).

Figure – 80. College.edu.kz registration form in the service

2) educational platform for the school «Electronic school» (<https://mektep.edu.kz/>) is a single school educational and cognitive platform (electronic educational journals, school schedules, diaries of academic performance and students, a contingent of teachers and students), forming a single electronic format of school information on the introduction of digitalization of everyday educational processes in schools, exchange of educational data, school resources through EDUS.

3) Electronic kindergarten **balahi.edus.kz** is an innovative solution with its own software designed to improve the interaction of the processes of parenting. Interactive communication is the desire of modern children. BalaHi is an updated digital model of the puppet theater stage. This interactive product allows you to play

small animated scenes in front of children by controlling graphic and animated objects using the touch panel. With the help of Balahi ICT, any verbal conversation turns into a beautifully designed cartoon-animated plot. In the interactive action of Balahi there are many characters and pictures that are easy to choose, you can switch to other storylines.

4) **web.ok.edus.kz** is a platform for viewing educational materials and completing homework in distance learning. In addition to the school curriculum, the system has various educational resources, a training diary. To log in to this system, you need a special key to log in to this system.

Moodle e-learning and testing system

Moodle is a free, open source LMS written in PHP and distributed under the GNU General Public License. Developed on the basis of pedagogical principles, Moodle is used for blended learning, distance learning, inverted classroom and other e-learning projects in schools, universities, workplaces and other areas of life.

Moodle was developed by M.Dungiamos during his postgraduate studies at the Curtin University of Technology in Australia. In 2002, he became the webmaster of the university and the administrator of the WebCT system installation. The original version is designed for small classes and cases, but developers and other users of the system around the world have constantly added many new features. Currently, Moodle has a large and diverse user community with more than a million users speaking 86 languages in 212 countries around the world (Al-Ajlan et al., 2008), the platform is rapidly developing under Martin's management and is promoted by an active global community of users and developers.

Moodle allows you to expand and customize the learning environment through community plugins. This electronic environment offers the following functions:

- 1) structurally present educational material on lessons and courses;
- 2) verification of the acquired knowledge using the built-in testing mechanism;
- 3) monitoring of student activity;
- 4) analysis of learning outcomes;
- 5) preservation of archival information about the history of the educational process of each student.

The Moodle e-learning and testing system is shown in Figure 81.

Effective learning management makes it possible to improve the work of teachers in the exchange of knowledge and monitoring of relationships.

E-learning also helps to free up personal relationships with each student. New information technology tools improve, make more efficient and simplify the learning process. It is important to improve individual and group classes. For example, co-education promotes the development of communication and cooperation skills among students.

The integration of computer education has led to the emergence of new information technologies in education that improve the quality of knowledge, create new means of influencing knowledge and effectively use computer skills in teaching. Using IT tools, students can access relevant information on research topics at a higher education institution. Mastering new information technologies in the classroom is

achieved by creating projects that demonstrate students' skills in the field of specialization and their interests.

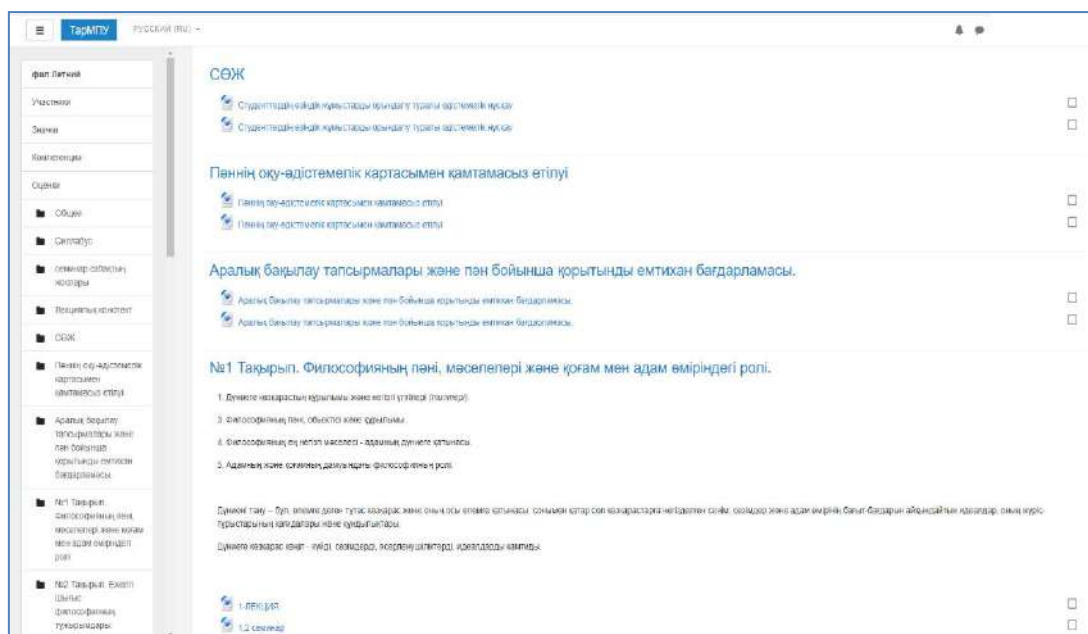


Figure – 81. Moodle e-learning and testing system

The advantage of this type of training over traditional methods is the choice of an individual approach to the study of educational material, control of the speed of access to resources and a comprehensive restructuring of the psychological training system that supports research.

Mobile Learning Management System EdApp

Edapp Mobile LMS is a new standard of corporate e-learning LMS. Using micro-learning, gamification, interval repetition and many other features of LMS, it is a mobile-oriented system that allows you to learn on mobile devices, the most effective and attractive way to create, distribute and analyze learning in corporate, educational and other environments.

Figure 82 shows the advantages of the EdApp knowledge management system.

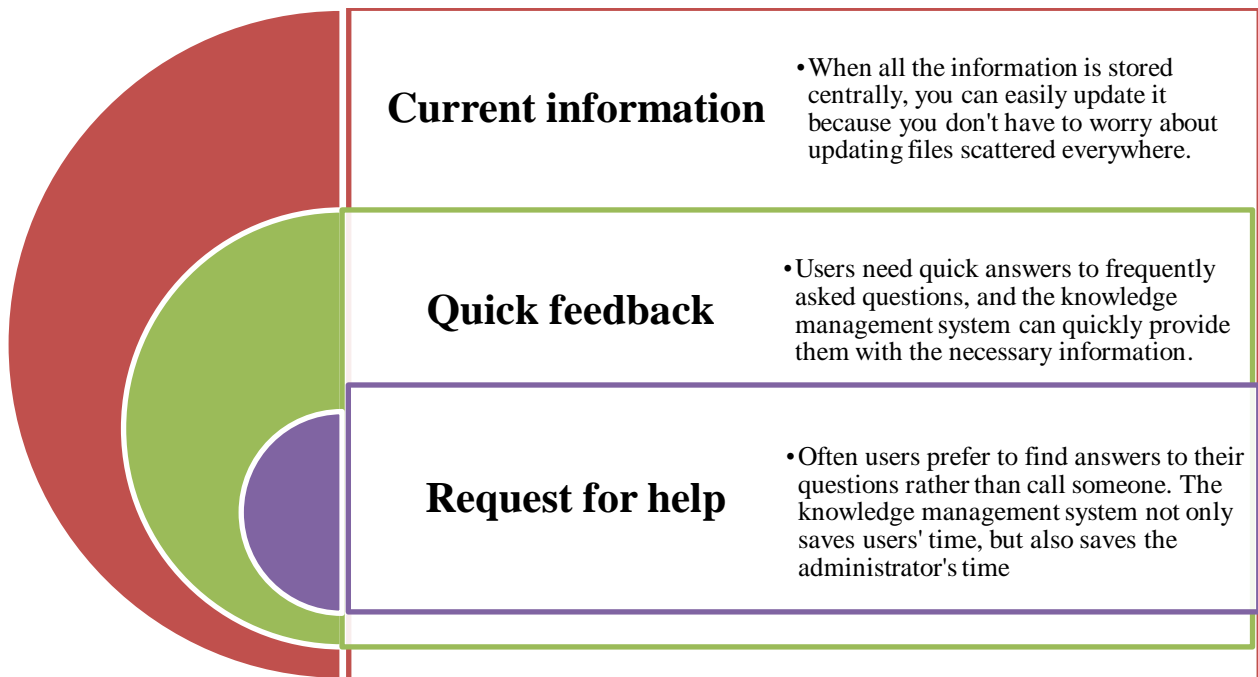


Figure – 82. Advantages of the EdApp knowledge management system

The interface of the course is shown in Fig. 83.

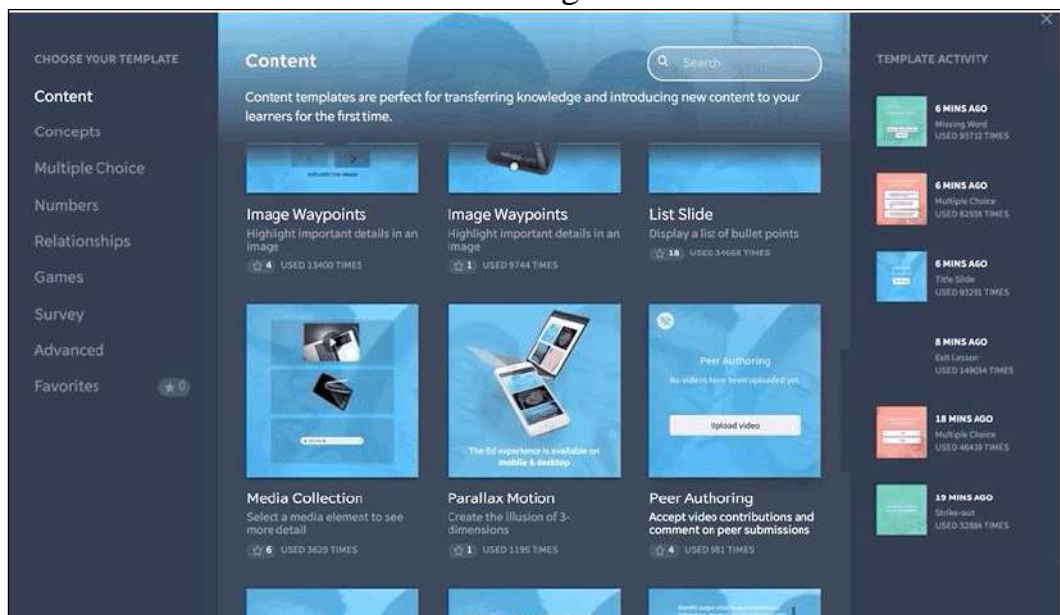


Figure – 83. EdApp course interface

The knowledge management system developed in EdApp must follow the most theoretically sound principles in order to be effective. The most important principles include scalability, adaptability, and design.

Scalability, organizations are constantly changing in size and scale. Any knowledge management system should be flexible enough to switch from typing to storing and transmitting high-resolution video.

Adaptation is also necessary, as the ways users access information are constantly changing. The system should be flexible and responsible for various client devices.

Designing. It should be easy for the administrator to configure the system to meet the needs of users. The installation of the Evap system is simple and clear, the installation interface is shown in Fig.84.

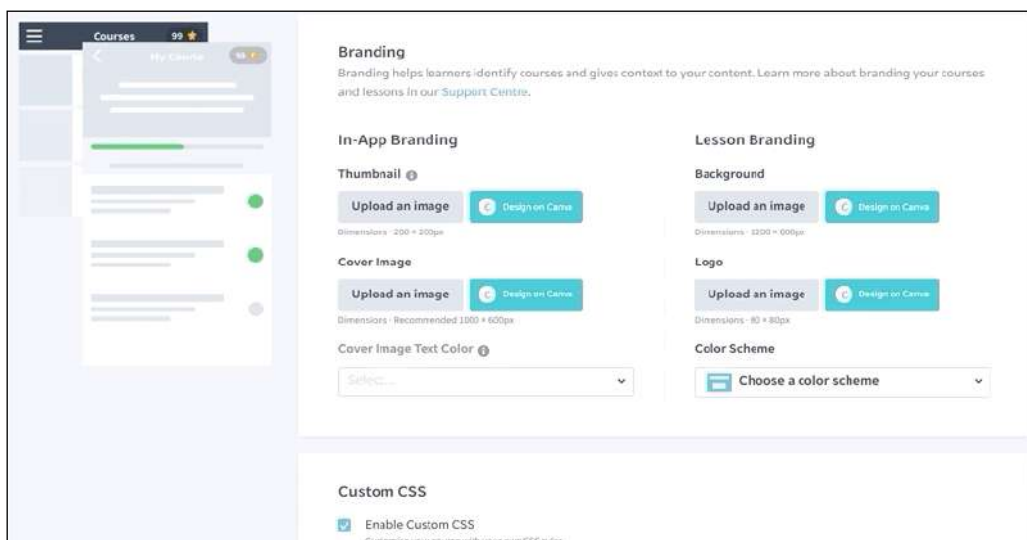
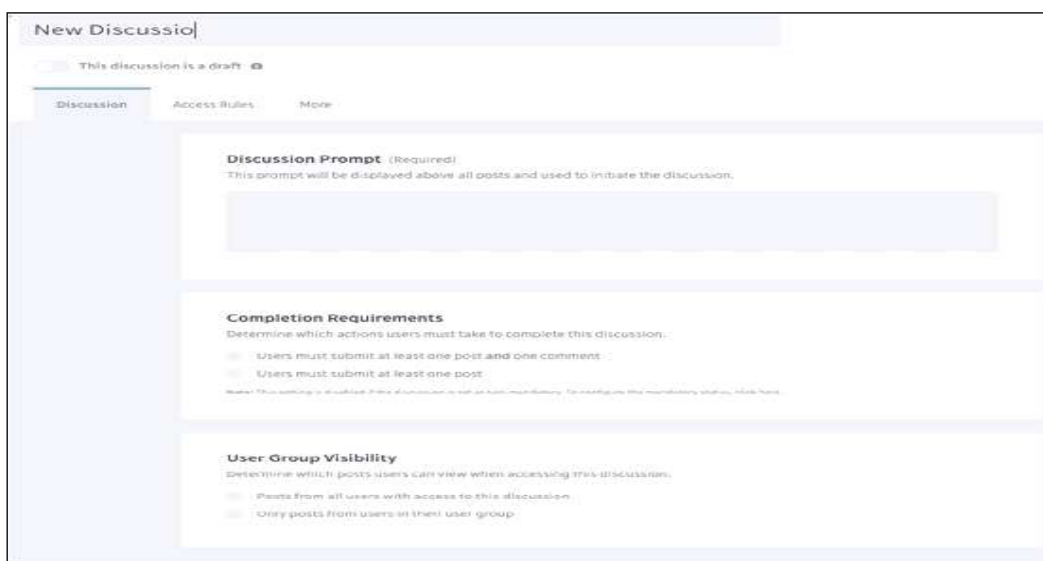


Figure – 84. Setting up the course of the EdApp system

EdApp also provides the functionality of a knowledge management tool through social learning functions. When the "discussion" function is included in the course, students can express their thoughts and ask questions about the material. This discourse can be saved for future students who have similar ideas or want to ask the same questions, so the answers can be found in the archive.

The discussion window is shown in Figure 85.



**Figure– 85. The «Discussion» window
The Pedagogical Educational Portal www.smart-pedagog.kz**

The pedagogical educational portal www.smart-pedagog.kz – is an intelligent innovative virtual educational platform that provides access to all educational resources to provide distance learning and advanced training. AP09259497 within the framework of the international project «Improving the system of pedagogical education in Kazakhstan in new conditions: technological and methodological aspects of the formation of digital competencies of future teachers in distance learning in the Republic of Kazakhstan» (project manager, textbook author K.D. Buzaubakova) It was created on the basis of innovative cooperation between Taraz Regional university named after M.Kh.Dulaty (Dulaty University) and Shadrinsk State Pedagogical University of Russia (SHSPU).

The advantages of the Smart-pedagog educational portal concern not only students, but also current teachers. The interactive teaching and learning methods used on the portal open up a new perspective for teachers who can use these methods in regular classrooms and thus help future educators better understand the concepts.

Some advantages of the portal:

- 1) To promote a comprehensive understanding of the subject through interactive teaching methods of video, audio, etc.
- 2) There is an opportunity to study everywhere.
- 3) It is economical because the portal offers free educational content.
- 4) The content is constantly updated. Therefore, children, teachers and parents are always watching and assimilating up-to-date information.
- 5) High-quality training thanks to high-quality content written by experts.

In the XXI century, in order to turn education into the central link of a new model of economic growth, it is necessary to direct the training program to the development of critical thinking skills, independent search, distance learning.

In Kazakhstan, in the new conditions, there is a need to modernize the system of pedagogical education, the formation of digital and creative competencies of future teachers.

The pedagogical educational portal **www.smart-pedagog.kz** is the digital and creative competency of future teachers, the ability of a future teacher to creative thinking, methodological reflection, the desire for novelty, creative use of innovative technologies, constant searches for the purpose of improving the educational process, systematic use of pedagogical innovations in their practice, the development of the ability to independently search and analyze information, creative activity.

In Fig. 86 www.smart-pedagog.kz has been issued a special badge of distinction (logo) of the pedagogical educational portal.



Figure –86. www.smart -pedagog.kz special distinctive mark (logo) of the pedagogical educational portal

The pedagogical educational portal www.smart-pedagog.kz works in 3 languages: Kazakh, Russian and English (Fig.87).

In the upper left corner of the main page there are flags of Kazakhstan, Russia and England.

In which language you want to get information, you can select the language by clicking on the flag of that country.

In the upper middle part there is a mobile application «Survey-Test» with the label «Google play».

The «Search» cell is located at the top left. You can find the necessary information by writing the reference words of the information you are looking for.

6 blogs are grouped in 2 pages of the main page:

- 1) Home page.
- 2) News.
- 3) About us.
- 4) About the project.
- 5) Media.
- 6) Online department (SHSPU).

Clicking «Home» – leads to the main page.

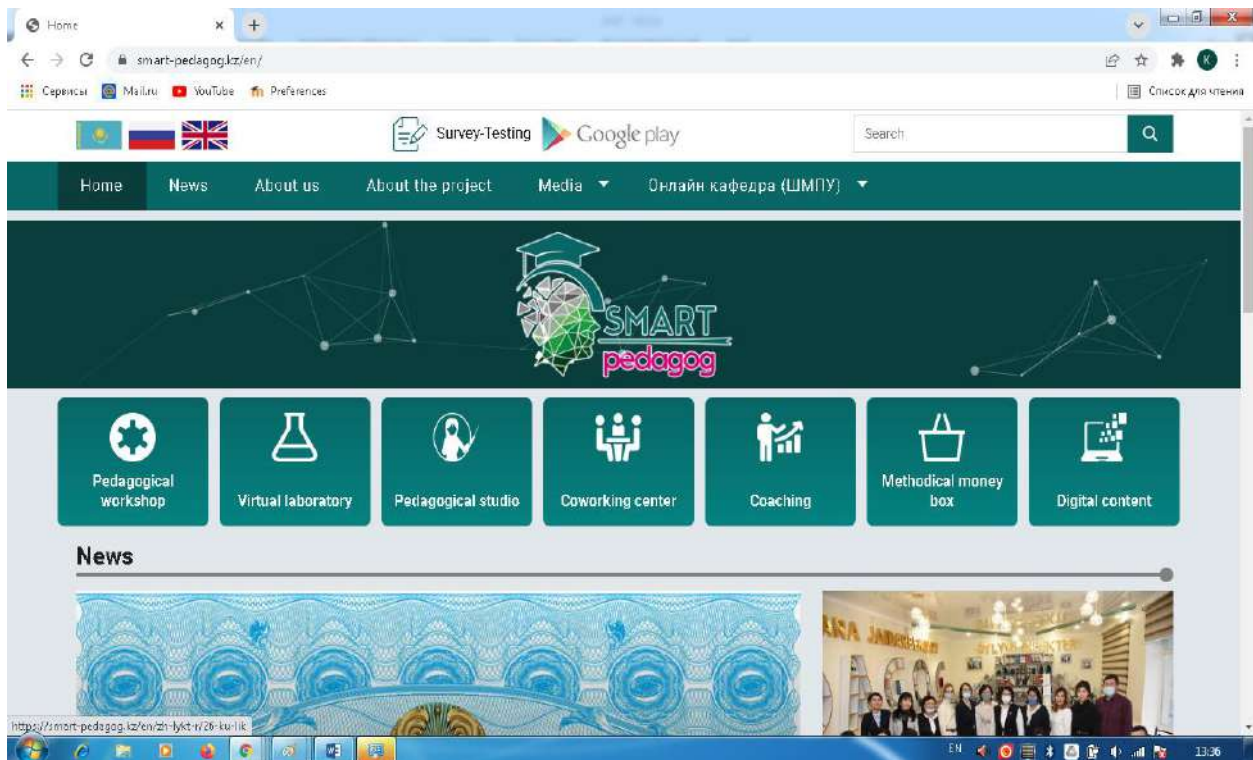


Figure –87. The home page of the pedagogical educational portal www.smart-pedagog.kz blog

On the main page of the pedagogical educational portal www.smart-pedagog.kz there is a block «About us». The «About us» section of the pedagogical educational portal provides brief information on the project manager and project members.

On the main page of the pedagogical educational portal www.smart-pedagog.kz there is a block «about the project».

The «About the project» section of the pedagogical educational portal presents the project topic, the relevance of the project, the research methodology, the project goal, the project objectives, the expected results from the project (Fig.88).

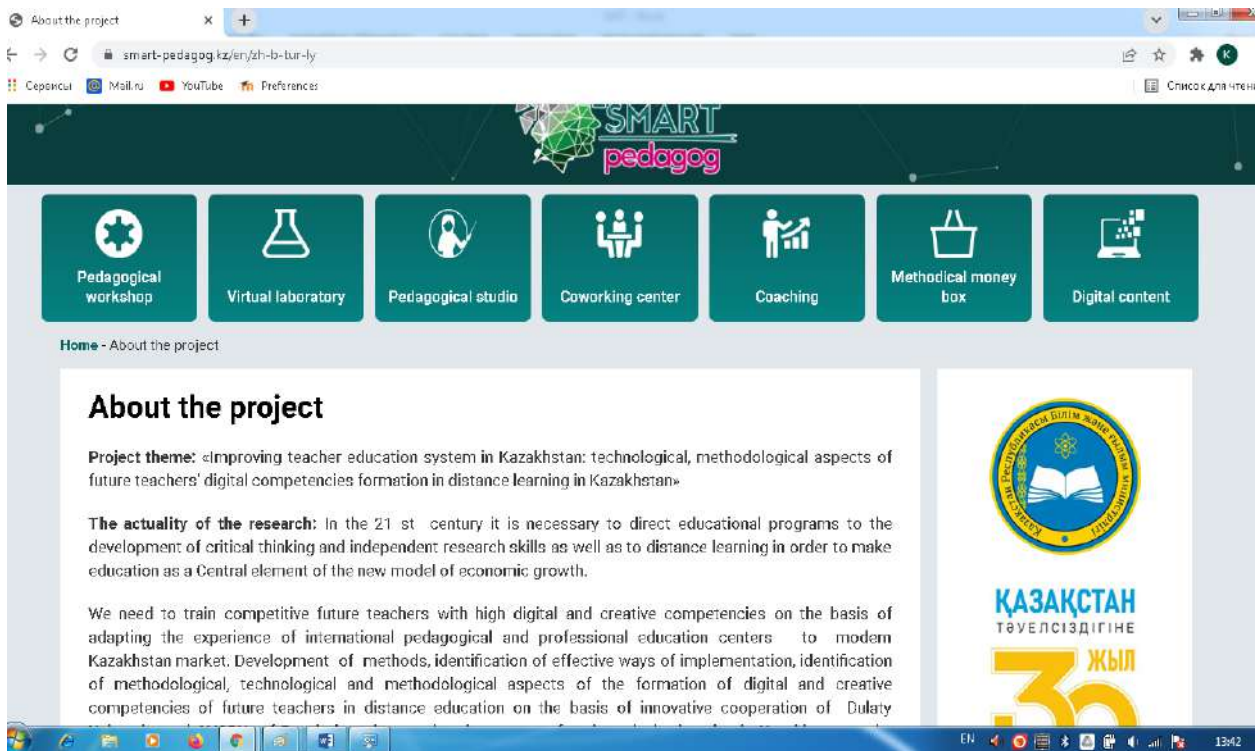


Figure – 88. The blog «About the project» of the pedagogical educational portal www.smart-pedagog.kz blog

On the main page of the pedagogical education portal www.smart-pedagog.kz there is a block «News». The «News» section is constantly updated with new information about the activities carried out on the project. So, on February 5, 2022, 2 materials were posted on the main page of the pedagogical educational portal in the «News» block:

1) certificate No. 23213 dated February 1, 2022 On Entering information into the state register of Rights to Copyrighted Objects issued for the electronic textbook «Pedagogy» by the author of the project – Doctor of Pedagogical Sciences Buzaubakova K. D.;

2) brief information on the conduct of collaborative research by Kazakh and Russian scientists (Fig. 89).

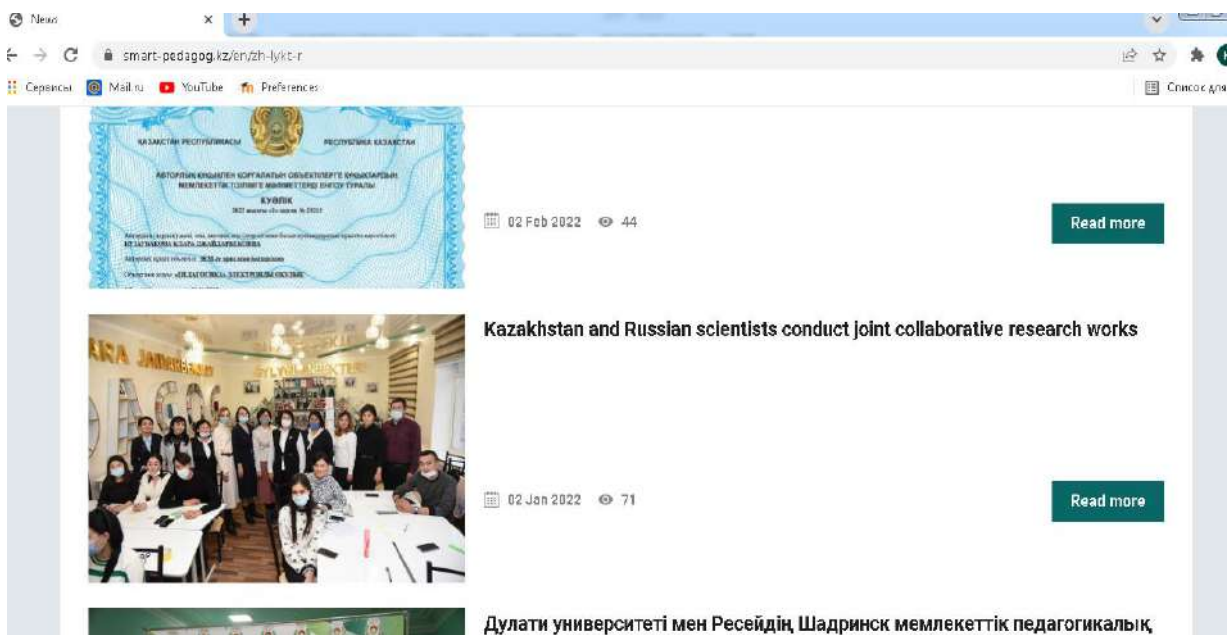


Figure – 89. The blog «News» of the pedagogical educational portal www.smart-pedagog.kz blog

On the main page of the pedagogical educational portal www.smart-pedagog.kz there is a block «Media». The Media block of the pedagogical educational portal consists of 2 parts: a video gallery; a photo gallery.

In the «Video Gallery» section of the «Media» blog of the pedagogical education portal, 12 video tutorials on the subject «Pedagogy» by the author of the project Buzaubakova K. D. are presented (Fig. 90).

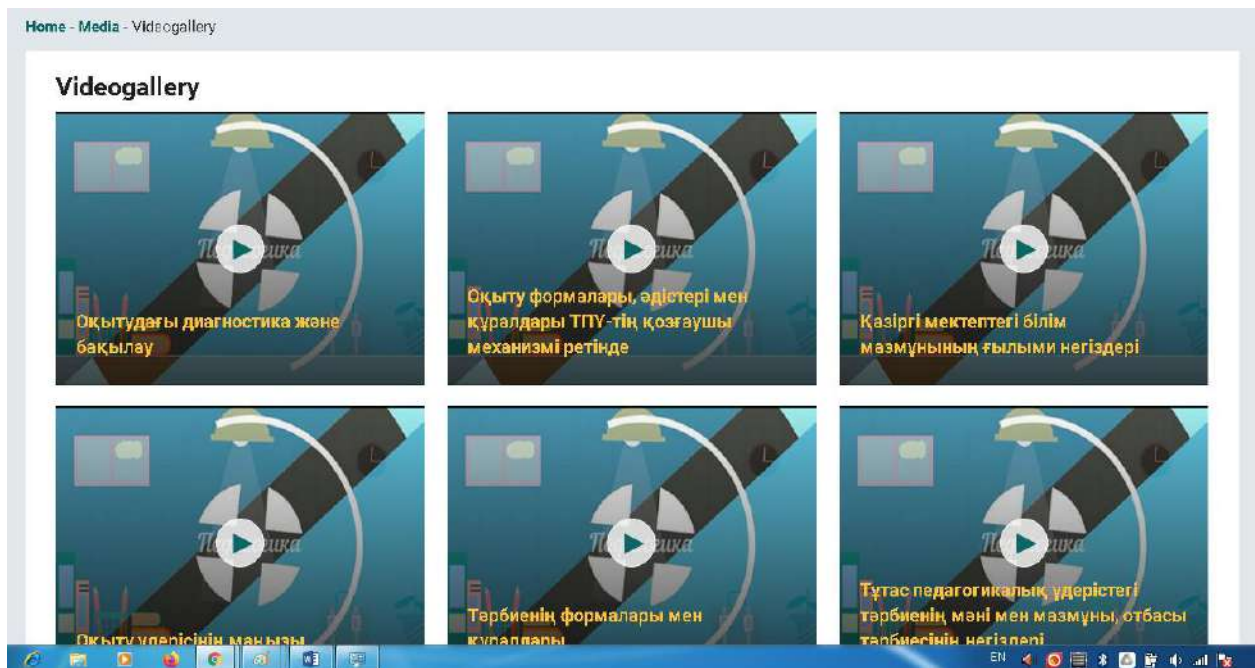


Figure – 90. Part of the «Video gallery» of the «Media» blog of the pedagogical educational portal www.smart-pedagog.kz

In the «Photo Gallery» section of the «Media» blog of the pedagogical educational portal, photo-drawings are grouped, revealing the content of events held within the framework of the project (Fig.91).

In the «Online department» blog of the pedagogical educational portal, special documents prepared as part of the project to open an online department of the Department of Pedagogy will be presented M. Kh. Dulaty Regional University, opened at Shadrinsk State Pedagogical University.

The advantage of the proposed pedagogical educational portal is that a digital pedagogical hub (pedagogical campus) of DULATY will be created in Kazakhstan under new conditions to train teaching staff and improve digital literacy and competence of future teachers.

The Digital Pedagogical Campus is an intelligent innovative virtual educational platform that provides access to all educational resources in teaching, distance learning and advanced training.

The digital pedagogical hub will be the Smart-digital methodical office of the future teacher, in which the digital-creative competencies of the future teacher are formed.

Photogallery



Figure –91. The part of the «Photo Gallery» of the «Media» blog of the pedagogical education portal www.smart-pedagogog.kz

In order to train teaching staff in the Republic of Kazakhstan and improve the digital creative competence of future teachers www.smart-pedagogog.kz. The portal of pedagogical educational works in the following direction and uses 7 online pedagogical resources:

- 1) smart - online pedagogical workshop (pedagogical center);
- 2) smart - online teaching studio;

- 3) smart-online methodical basket;
- 4) smart-online coaching;
- 5) smart-online coworking center;
- 6) smart-online virtual laboratory;
- 7) smart-digital content online.

SMART-online pedagogical workshop (pedagogical center) - here future teachers get acquainted with the subtleties and amazing secrets of the pedagogical profession as a result of viewing, analyzing, testing video tutorials of teachers-innovators of Kazakhstan, Russia and other leading foreign countries during pedagogical practice; develop distance learning classes, etc.

SMART-online pedagogical studio – here future teachers receive the knowledge, skills, and abilities necessary to record their first innovative online lessons in a video series; develop and prepare the first video tutorials.

Smart-online methodological box – the future smart teacher acquires the necessary IT competencies for the study, application, dissemination of advanced innovative pedagogical experience of teachers-innovators of Kazakhstan, Russia and other leading foreign countries (Fig.92).



Figure – 92. The blog of online methodological box of the pedagogical educational portal www.smart-pedagogog.kz

SMART-online coaching – here future teachers will master the necessary competencies for conducting pedagogical coaching, trainings on topical issues of pedagogy, cyber pedagogy, media pedagogy, digital pedagogy.

SMART-online working center – an open platform for creative teachers and future teachers; pedagogical hackathon for the creation of educational startup projects, a simulation center for creative future teachers sharing their experience and ideas where smart-future teacher-creative competencies related to conducting

innovative research projects on topical issues of pedagogy, cyber pedagogy, media pedagogy, digital pedagogy.

SMART-online virtual laboratory – future teachers conduct some laboratory work in virtual laboratories.

SMART - online digital content-smart – a future teacher develops electronic content on his subject.

The video gallery block of the pedagogical educational portal www.smart-pedagog.kz contains video lectures by the author of the textbook on the discipline «Pedagogy», project manager Buzaubakova K. D.

Also on the pedagogical educational portal www.smart-pedagog.kz, you can access the web version and mobile application of the online test and online questionnaire «Smart-future teacher» (Fig.93).

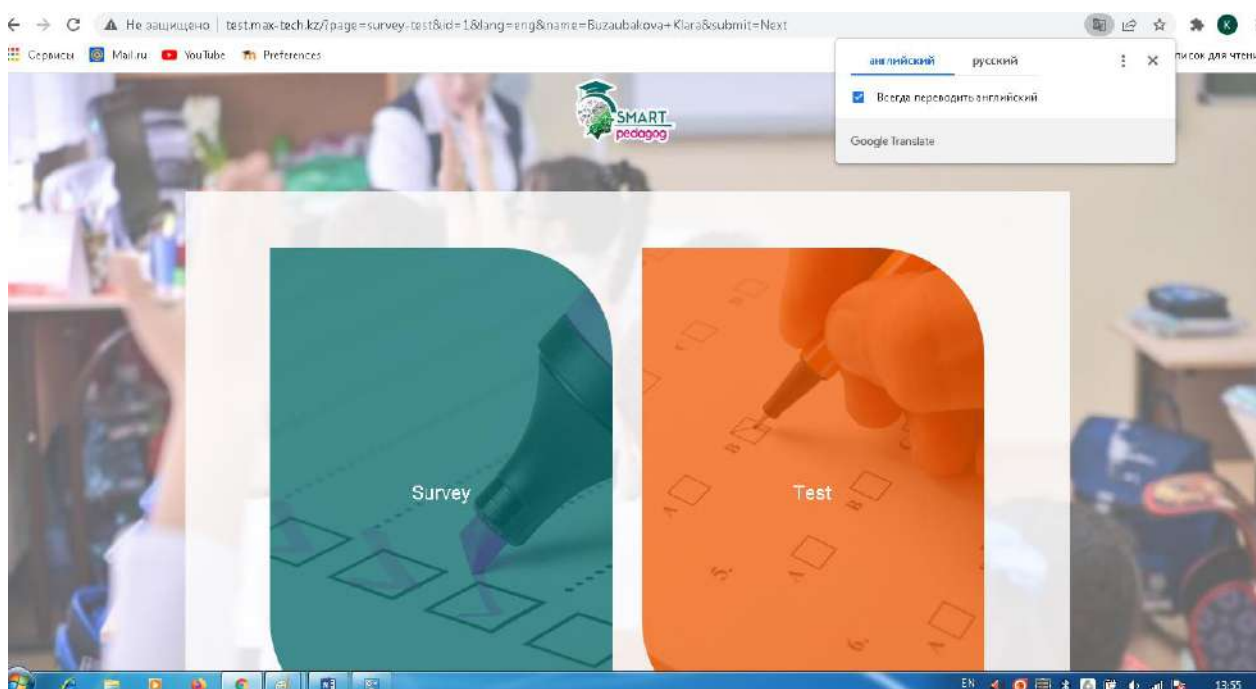


Figure – 93. The web version of the online test and online survey «Smart-future teacher» on the portal of pedagogical education www.smart-pedagog.kz

In the online questionnaire «Smart-future teacher» on the pedagogical educational portal www.smart-pedagog.kz there are 10 questionnaires, there is an opportunity to choose the language by pressing the above buttons (Fig.94).

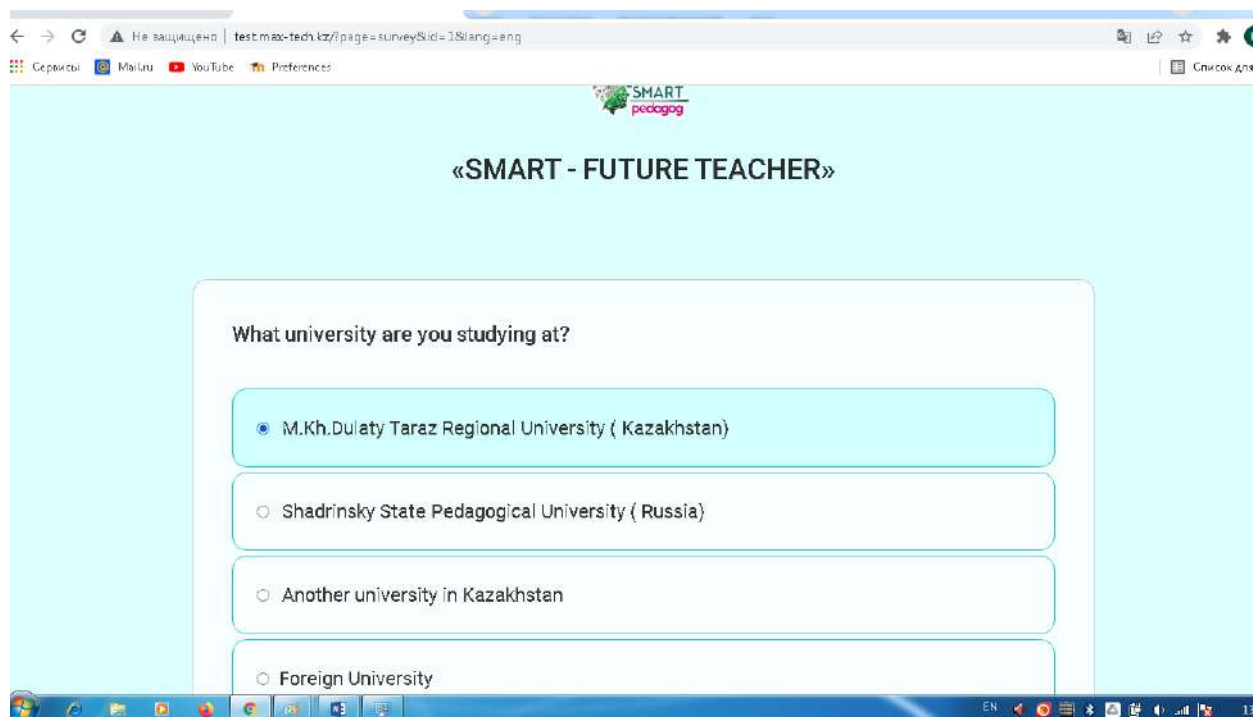


Figure – 94 . The online questionnaire «Smart-future teacher» of pedagogical educational portal www.smart-pedagog.kz

On the portal of pedagogical educational portal www.smart-pedagog.kz, you can access the web version of the online test «Smart-future teacher». By clicking on the button of the online test «Smart-future teacher», after passing a test consisting of 15 test tasks, the future teacher gets the opportunity to test his knowledge (Fig.95).

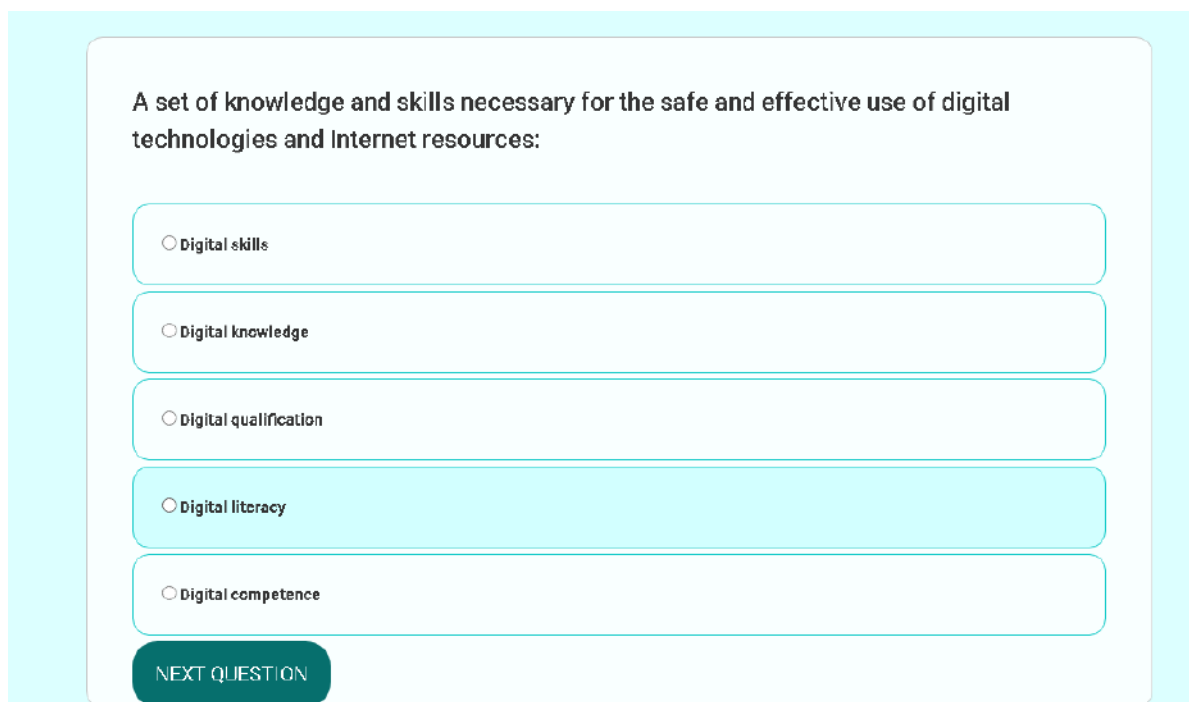


Figure – 95. The online test «Smart - future teacher» of pedagogical educational portal www.smart-pedagog.kz

The «Search» cell is located at the top left. You can find the information you need by writing reference words for any information you are looking for. For example, if you write the word «Project» in the «Search» cell, you can get data about the project (Fig. 96).

The author of the project is Doctor of Pedagogical Sciences, Professor K.D.Buzaubakova of pedagogical educational portal www.smart-pedagog.kz is protected by certificate No. 23588 dated February 14, 2022 On Entering information into the State Register of Rights to Objects Protected by Copyright.

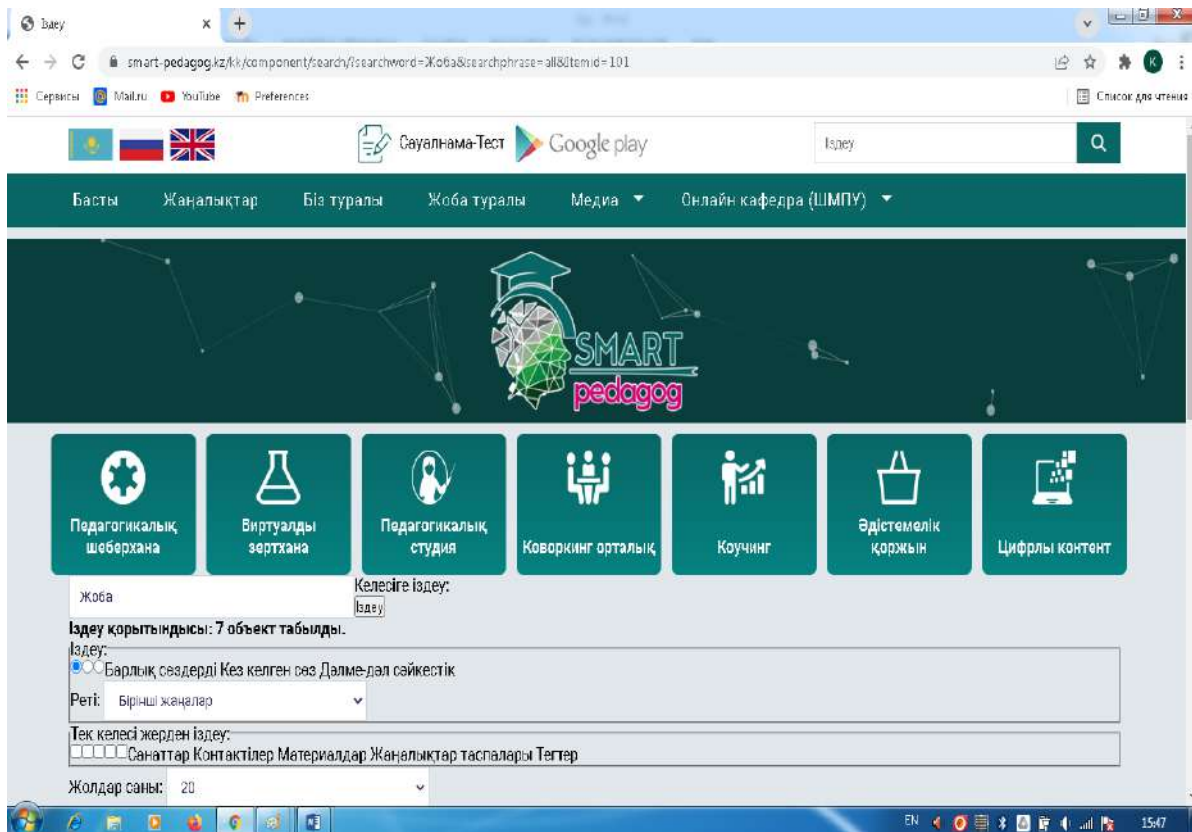


Figure – 96. The blogs «In search» of the pedagogical educational portal www.smart-pedagog.kz

The pedagogical educational portal www.smart-pedagog.kz will make a significant contribution in the formation of a creative guard of the figures of future teachers.

Questions for assessment and verification of knowledge

1. Give a description of digital educational platforms.
2. Expand the Zoom capabilities.
3. Expand the possibilities of Skype.
4. Describe the capabilities of Microsoft Team.
5. Explore the possibilities of Google Meet.
6. Define the functions of Google Classroom.

7. Analyze the capabilities of Kahoot.
 8. Analyze the advantages of the EdApp educational platform.
 9. Find out the features of the Online Mektep platform.
 10. Explore the advantages of the «Daryn.online» platform.
 11. Consider the methodology of using digital educational platforms.
 12. Classify digital educational technologies.
 13. Reveal the essence of the concept of «digital literacy».
 14. Give examples of automated digital educational technologies.
 15. Explore the possibility of an information educational portal Kundelik.kz .
- What is the impact of an electronic diary on the learning process?
16. Reveal the structure of teacher-student interaction using digital educational tools.
 17. Study the features of the electronic educational portal Bilimland.
 18. Specify the advantages of the educational platform edus.kz
 19. Reveal the essence of the Moodle e-learning and testing system.
 20. What are the advantages of the EdApp knowledge management system?
 21. Reveal the advantages of the pedagogical educational portal www.smart-pedagog.kz

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9. Aimaletdinov T.A., Baymuratova L.R., Zaitseva O.A., Imaeva G.R., Spiridonova L.V. Digital Literacy of Russian Teachers. Readiness to use digital technologies in the educational process. –M.: Publisher NAFl, 2019. – 84 p.

10. The structure of ICT competence of teachers. UNESCO recommendations. [Electronic resource]. 2011. URL: https://unesdoc.unesco.org/ark:/48223/pf0000213475_rus (accessed on: 08.03.2022).

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3.2 Cloud services for education

The concept of «cloud» is still new for many industrial countries, some are not familiar with this concept at all. Despite this, cloud technologies have long entered our lives. In 1960, J. McCarthy once suggested that 8 computer calculations would be done using «national utilities». It is believed that it was at this moment that the idea of cloud technologies arose. The ideology of cloud computing has become popular since 2007 due to the rapid development of communication channels and rapidly growing user needs. All kinds of online games, various electronic registrations, banking services on the Internet, that is, all online services that we use daily. Cloud technologies are software, applications and services hosted on the Internet not on local servers, but in remote data centers.

Of course, it is very convenient to use cloud technologies. However, the main drawback is the absolute dependence on service providers. In fact, service providers and internet access providers are taking over the business. To ensure the reliability and security of data, great efforts are required, such as feedback channels, re-exchange functions, and, of course, it is necessary to take into account the availability and security of information.

To create an up-to-date information and educational environment in the educational process, you can use the Google Apps cloud application package, which allows you to organize joint interaction between teachers and students, allocate resources and learn how to use the necessary tools to solve certain educational tasks.

The Google Apps package includes other tools that help to effectively organize the learning process (Fig. 97).

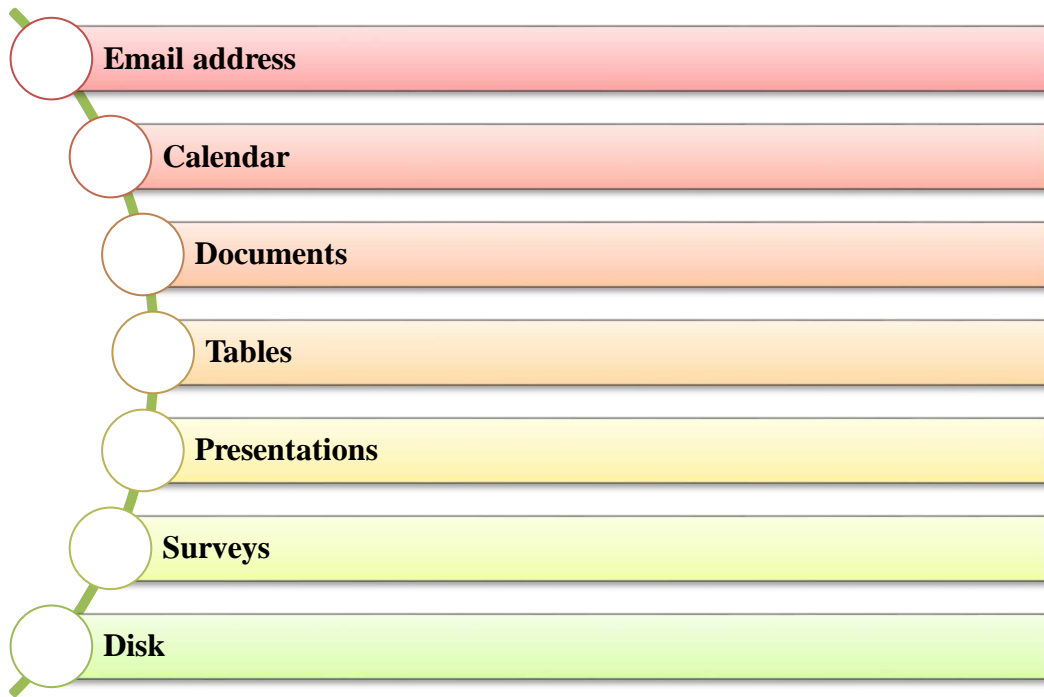
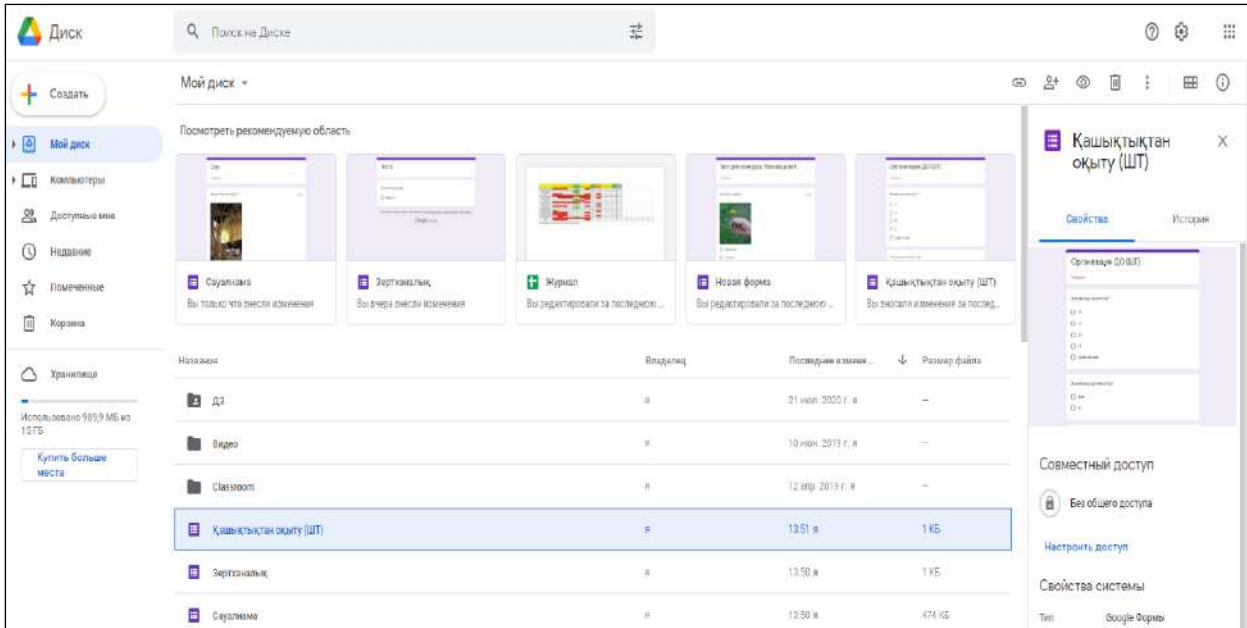


Figure – 97. Google Apps Tools

Figure –98. Google Drive

Google Drive is a separate secure data storage with the ability to access from any device at any time. Advantages of using this cloud storage in the educational process:

1) access to Google Drive is possible from any device with internet access at any time, regardless of its location;

2) the users of Android devices have a Google account, so they do not need additional registration;

3) does not require the installation of additional software products, the access is carried out from any browser installed on the device, or through the built-in applications of Smart devices;

4) no additional monetary resources are required, you can use the cloud storage and all the documents included in the Google kit for free;

5) does not require special knowledge from the teacher and students, the resource has an intuitive interface.

6) the volume of Google Drive 15 GB allows you to place large files, for example, a video that will teach you how to work.

The Google Drive interface is shown in Figure 98.

One of the most convenient services for organizing the educational process is Google class. This is a free service developed by Google specifically for schools, but it can be used in all educational institutions. Google's classroom capabilities for teachers include video conferencing, posting announcements and student surveys, and commenting on work.

In addition, it is possible to create tasks, as well as evaluate them.

The tasks shown in Figure 99 are available in various types:

1) **The task** – the answer is carried out by entering text from the keyboard or displayed in the attached file;

2) **Test assignment** – the student answers the test questions submitted in Google Forms, while the assessment is automatically imported into the class;

3) **A Question** – an answer is a short text message or functionality that allows you to choose one correct answer from the suggested answers;

4) **Material** – the task is intended to familiarize students with the material, not evaluated;

5) **Reuse** – imports assignments from other previously created courses;

6) **Topic** – allows you to group the task by meaning.

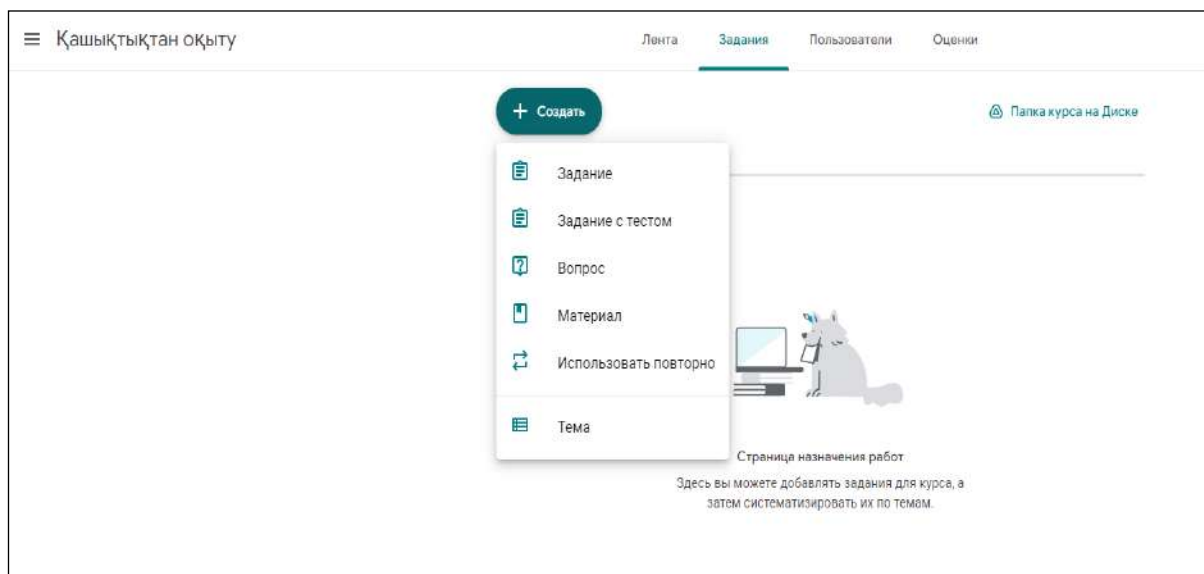


Figure – 99. Google Glass

The class tools allow you to specify the target audience (all/selected students) for each specific task, give points for completion (it is possible to create underestimated tasks), specify deadlines (the date and time allotted for the answer). In addition, for the transparency of the assessment, it is possible to develop evaluation criteria that include the division of the final score into component parts according to specific conditions.

The construction of the evaluation criteria is shown in Figure 100.

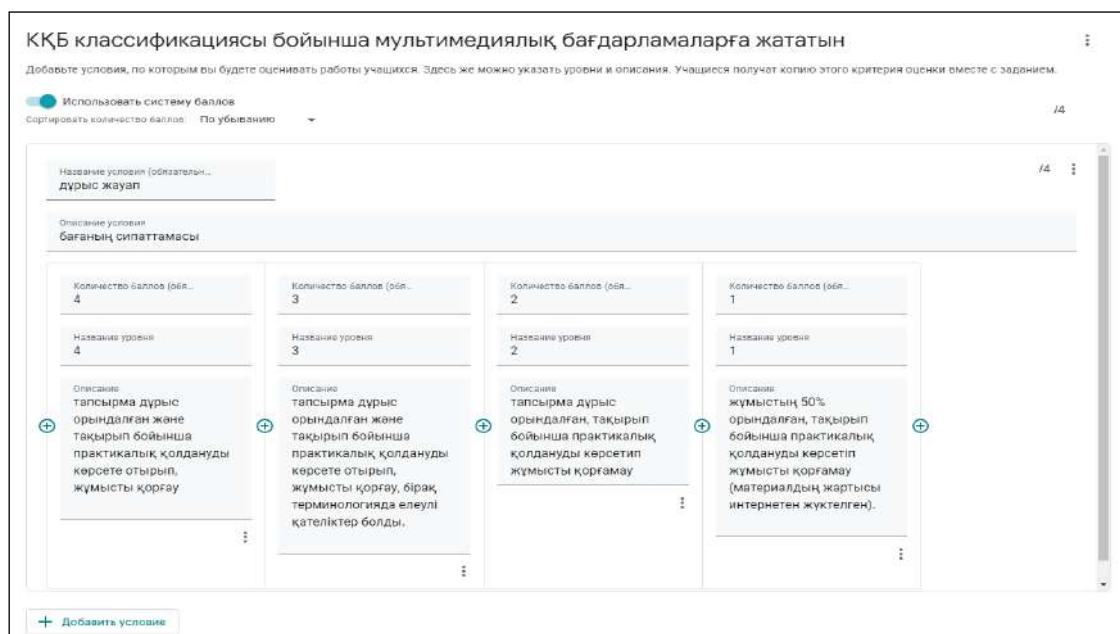


Figure – 100. Evaluation criteria

The Google classroom for students includes tracking and completing assignments, receiving explanations and grades from the teacher, as well as communicating with course participants.

Google cloud services offer analogues of the usual office programs. Google Spreadsheets, Google Docs, Google Presentations are online applications with which you can create and format documents, spreadsheets, presentations. There is an opportunity to share with other users.

The main features of the Google presentation:

- Allow presentations to friends and colleagues.
 - Uploading presentations to disk and converting them to Google presentation format.
 - Export presentations in PDF, PPTX and TXT format.
 - Inserting images and videos, formatting slides.
 - Publication and implementation of presentations on the website for wider access.
 - And drawing in the presentation of structural diagrams, flow diagrams, etc.
- Add effects and add animations and themes to switch between slides.

Thus, the functionality offered by Google cloud service is more similar to Microsoft Office software.

The slide editing window in Google presentations is shown in Figure 101.

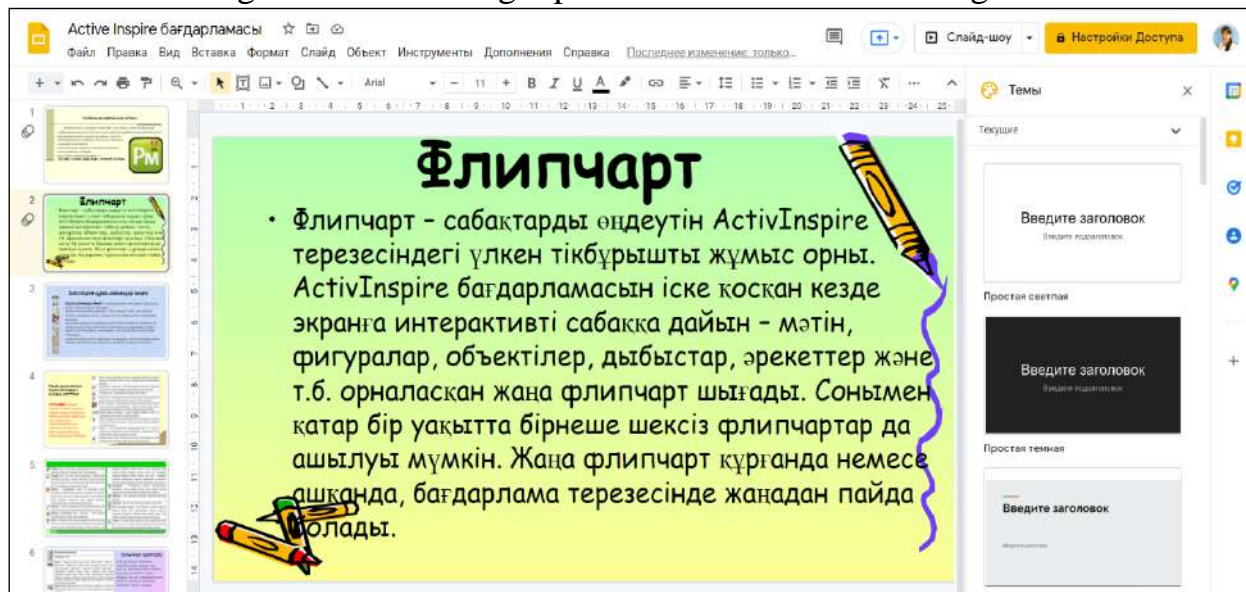


Figure – 101. Google Presentation Interface

The website for teachers is a platform for the exchange of experience, communication with colleagues from other cities and even countries, participation in partner programs within the framework of state and foreign educational programs for the exchange of methodological materials, ready-made lessons and pedagogical experience. Previously, the implementation of most of these steps required the user to have the skills to use professional software, use programming languages and document markup. Recently, many specialized designers of web resources have become widespread, the use of which does not imply strict qualification requirements for authors. One of these tools is the Google Sites service.

Google Sites (sites.google.com) is a Google service that provides its users with the service of free creation of websites and their placement on the Internet. The service is part of Google Apps and is intended to replace the outdated Google Page Creator service. The main difference when creating Google Sites is the ability of multiple users to work on the site. The user-owner of the site can invite other users to cooperate, distribute access rights to materials, use information on the site from other Google services.

From a technological point of view, the process of designing an educational resource on the Internet can be reduced to a sequence of stages presented in Fig. 102.

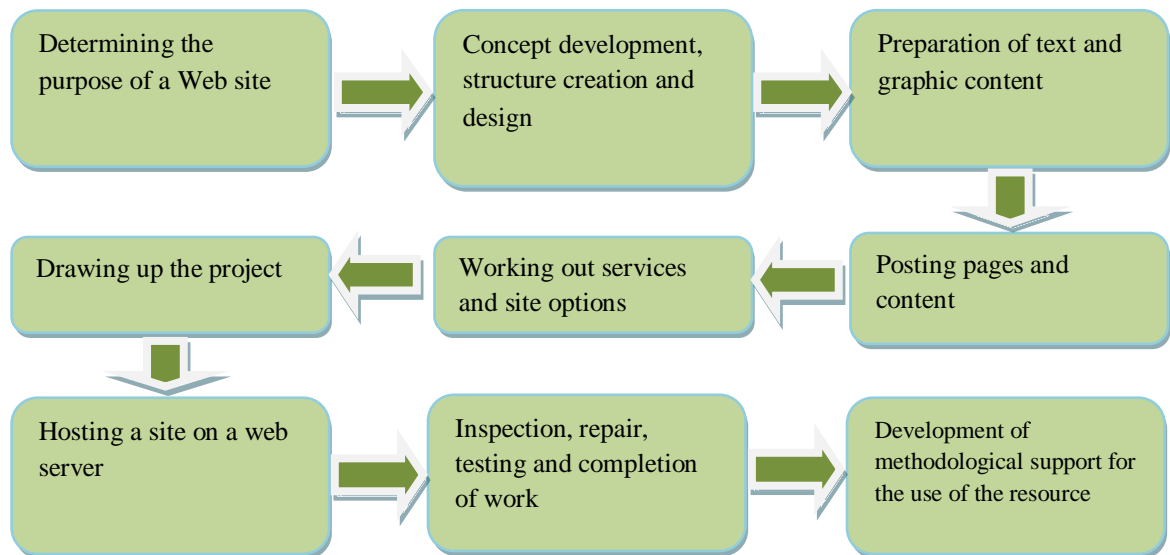


Figure –102. The process of designing an educational resource

The Google Sites service makes it easy to create and update your sites. Using Google Websites, you can display various information in one place, including videos, slideshows, calendars, presentations, attachments and text, and this allows you to view and edit information to a small group of people, an organization or the whole world. In this case, the user owner decides who to grant access to the specified resources. Below is an opportunity to work with «Google sites».

- Create internal pages to customize the content.
- Selection of page types: web page, advertisement, file manager, list.
- Centralized storage of Web content and offline files.
- The ability to close and open the site for public use if necessary.
- The ability to search for content on Google sites using search.
- Google technology.
- Detailed site setup.

The installation window is shown in Fig. 103.

Creating a website using free hosting from Google Sites has the following limitations: the amount of disk space is up to 100 MB for storing information on the site and up to 10 GB for each domain for storing information when using Google Apps services; the domain name of the site has the following form sites.google.com / creating websites using "site name". Google Sites limited: there are limited site design settings - only the color, size and style of fonts change; anonymous comments are prohibited, changing the content (including adding comments) is allowed only to authorized users. To start creating websites in Google Sites, you must have a Google account or register.

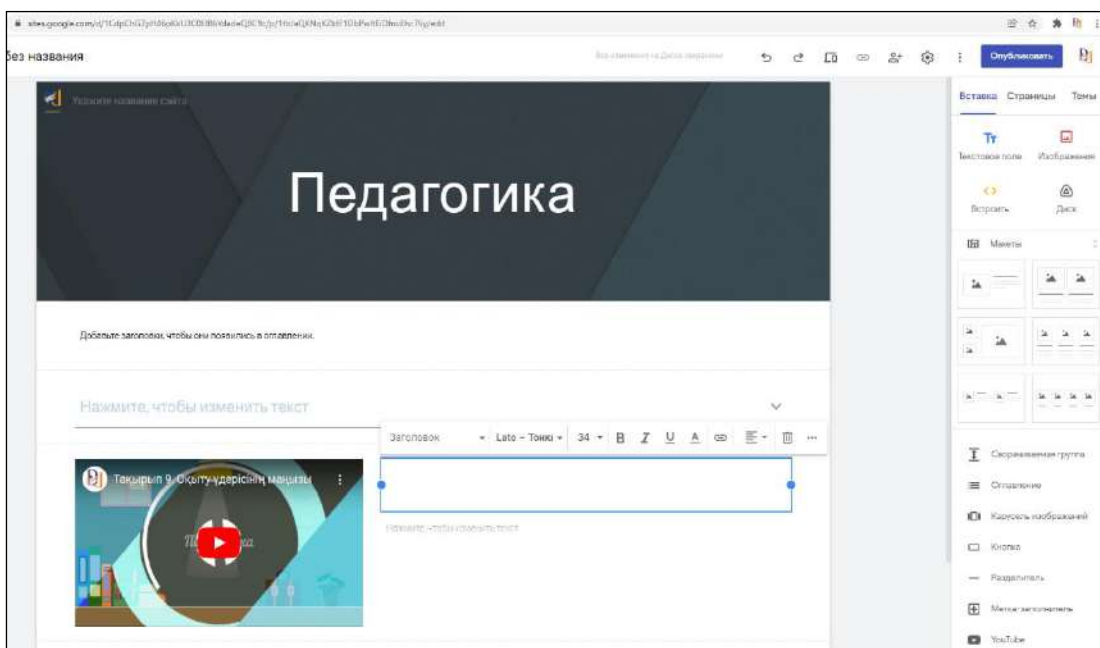


Figure –103. Google Sites installation window

It is recommended to use the Google Sites service to create websites of educational institutions, their departments, educational projects, training courses or team sites that require collective access and processing of information.

To be an effective teacher, it is very important to communicate. Communication not only provides information, but also stimulates efforts, changes attitudes and stimulates students' thinking. Without this, stereotypes develop, messages are distorted, and learning «suffocates».

Communication is a process of understanding and sharing information, in which listening plays an important role. Personal or internal communication includes planning, problem solving, communicating with yourself and evaluating yourself and others. This is a continuous process that prepares the speaker for a clear and short speech. Interpersonal relationships are the exchange of meanings with each other and with at least one other person. The purpose of interpersonal communication is to send relevant and objective messages. Communication can be a key element of the learning process, which contributes to the involvement of stakeholders.

In the traditional format of the lesson, interactive whiteboards, as well as tools and components for them, were widely used to create a game moment in the educational process, as well as for interpersonal communication of participants in the process.

The difference between digital learning is that a significant part of the material is assimilated using Internet technologies, that is, the student's work is organized and justified independently. The information is transmitted by visual communication (video communication) or by third-party digital means. Thus, the role of interactive tools that raise the interest in reading increases. Guided by this cyberpedagogy, it is necessary to increase the effectiveness of the quality of education using innovative methods.

Personalization and interaction with content can help students improve their learning environment by giving them control.

There are many wonderful digital resources that teachers can use in teaching.

The first interactive whiteboards were created in the USA in 1990 and were used for meetings and round tables in small groups.

ActivBoard Touch offers teachers a variety of tools for daily learning. Teachers and students can easily interact with content using capture, compression, and zoom gestures to share ideas, work on projects, or learn concepts. Special ActivInspire software is used to create educational materials for interactive whiteboards.

ActivInspire is the basis of any training in the XXI century. Designed for classroom use, allowing teachers to conduct lessons on an interactive whiteboard. The advantages of the program include:

- The ability to create lessons filled with diverse and effective activities, and support assessment tasks for teaching with students, groups and students of all grades.

- By choosing an age-appropriate interface, ActivInspire provides teachers with access to many learning tasks, tools, images, sounds and models, as well as many additional resources available on Promethean Planet.

- Through the browser properties, a detailed configuration of components is available, as well as the purpose of each individual component of the action.

The window of the ActivInspire program is shown in Fig.104.

Thanks to the advanced pen and touch input functions (using ActivePen), ActivInspire allows teachers and students to go beyond the flipchart and interact with the page using specific tools.

The ActivPen Replacement Pen/Pen is a wireless battery-free pen that combines the full functionality of a mouse with the precision of a pen, providing natural and dynamic interaction with ActivBoards and ActivSlate. The magnet is used in the stylus, so the battery is not needed. ActivPen allows you to view icons with their functions and access useful tools, which allows you to quickly and easily learn the software. Dragging tools and applications, selecting, opening, switching between pages and launching sounds and images. The precise and precise ActivPen functions, such as mouse and pen, allow you to measure and label in millimeters or degrees on the ActivBoard panel.



Figure –104. ActivInspire program window

For convenient preparation for classes, there is an interactive tablet solution ActivTablet. The Activtablet tablet allows teachers to remotely prepare materials for lessons using the Activboard interactive whiteboard, emulating its work. This means that teachers can use the ActivStudio and Activprimary software outside of the classroom without experiencing any discomfort.

Activtablet is a type of A5 mini-board that connects directly to a computer. Portable, equipped with a personalized Activpen pen, Activtablet is the perfect partner for preparing for classes.

Use physical devices (computers, smartphones) and specialized software for real-time video communication. A well-chosen video communication system provides users with a wide range of opportunities: from high-quality distributed data to connecting many new participants to the dialogue.

Video communication carried out through a computer has historically been the first method of interactive video: interaction between users located at a distance. This allows communication participants not only to hear each other, but also to interact (if there is appropriate functionality): exchange information, files, presentations, hold mass discussions, show each other the desktop screen, etc.

When communicating from a workplace or home computer, it is convenient to go online via a computer. Modern video communication programs can be installed on any computers and laptops, regardless of operating parameters and software.

To implement such communication in education, conference communication systems are used: Zoom, Cisco Webex, Google Meet, Webinar, etc.

Zoom - a platform for conducting online lessons

ZOOM is a cloud platform for video conferences, webinars and other similar online events. For work, the user receives an ID and uses it for meetings. Many teachers prefer to use this platform to conduct lessons in real time.

Zoom was founded in 2011 by Eric Yuan, former vice president of Cisco WebEx. In April 2011, he and 40 engineers left Cisco to create a new company called Saasbee, Inc. The company tried to attract investments, as investors believe that the videoconferencing market is already saturated. In June 2011, Saasbee, Inc. WebEx received an initial \$3 million funding from founders Subra Iyer, Dan Sheinman and several other venture capitalists.

Zoom was officially launched in January 2013 and reached 1 million users by May 2013. In the first year of launch, Zoom collaborated with a B2B partner software provider. Working with Redbooth (then called Teambox) was necessary to add a video component to Redbooth. Shortly after this collaboration, ZOOM created a project called «Working with Zoom», working with several hardware and software vendors such as Logitech, Waddio and Infocus. At the end of the year, Zoom was able to integrate the software into InterviewStream, which provided remote video chats to employers. Interview Stream uses Zoom Video to enhance video chat features.

The main page of the platform is shown in Fig. 105.

At the beginning of April 2020, the number of daily ZOOM users increased to 200 million people against 10 million in December 2019.

Growth due to the introduction of quarantine measures in many countries of the world due to the COVID-19 pandemic, Zoom has provided the following training opportunities:

- A teacher can teach a lesson from anywhere in the world.
- Demonstrate presentations, videos, drawings during the lesson.

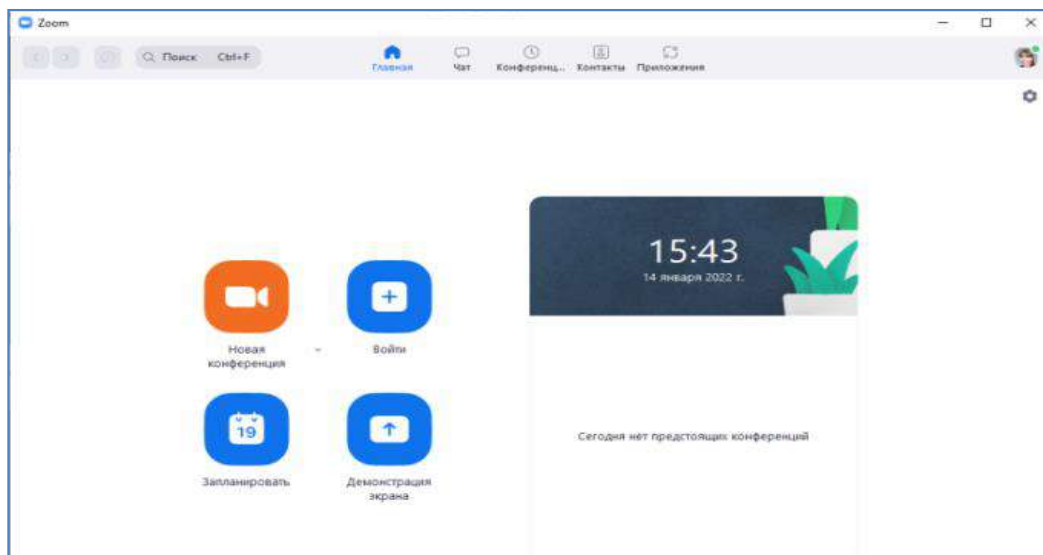


Figure –105. ZOOM application interface for computer

The display of images, graphs and documents using zooming is available to everyone. To do this, launch the «Show screen» function, select what you want to display, and click «Share».

The window for launching the on-screen view is shown in Fig. 106.

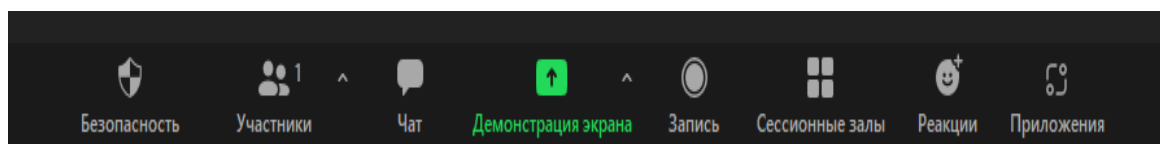


Figure –106. Functionality of the ZOOM application for a computer

In addition, if you select the «fullscreen mode» and «audio sharing» functions, not only video, but also a series of audio distribution will be available to conference participants.

- They can write on the interactive whiteboard and communicate through the notification bar located in the «**show screen**» section. It is physically impossible to allow each listener to speak during autonomous classes. During the scaling, participants can share their impressions and ask questions on the bulletin board.

- **An attempt to divide.** Zoom has session rooms where you can send certain or random participants. This allows you to focus on each student when performing group tasks. However, a separate speaker is required for each hall.

- **Questionnaire survey.** Ask questions during the lesson to increase interest and attract the attention of the audience. You can create a survey with different answers, as well as make it anonymous.

- **Configuring security settings.** To increase the level of security, the founder of the conference can include a waiting room, thereby it will be possible to select participants for inclusion in the conference (excluding "outsiders" at the conference). After all the participants are created, you can use the "lock conference" function, which simulates closing the door in real life. The security parameters are shown in Fig. 108.

- **Conference recording.** Saving the conference recording as an mp4 file on the device, as well as audio support and chat recordings will be saved additionally.

The creation of a session hall is shown in Fig. 107.

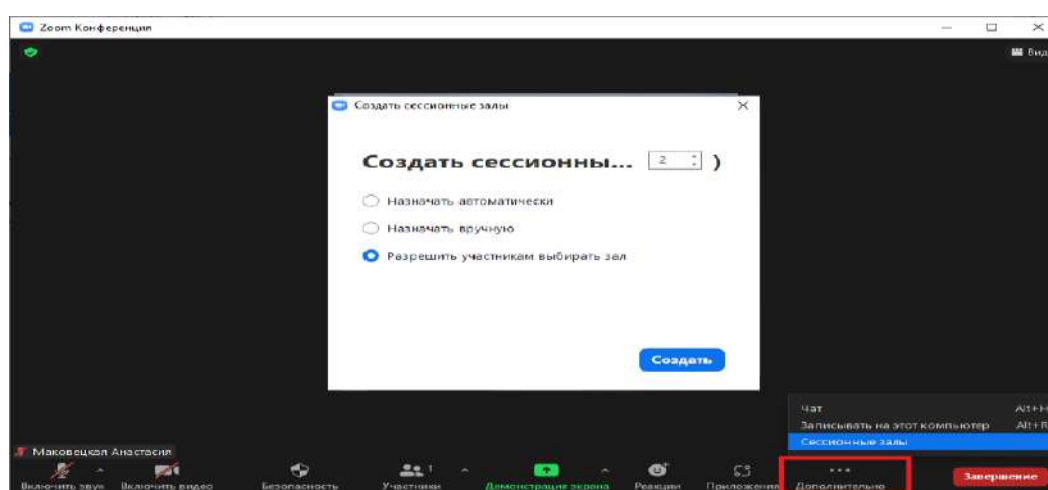


Figure –107. Creation of session halls

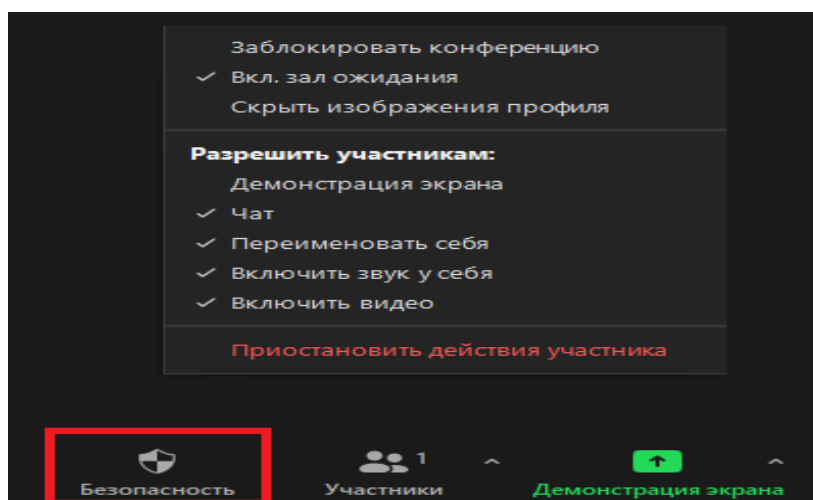


Figure – 108. Security parameters

Google Meet for Distance Learning

Google Meet is a video conference service that supports desktop display for users and conference participants. The app was officially developed by Google in 2017 as a replacement for the outdated Google Hangouts service.

Educational institutions and other organizations can use Google Meet for video meetings with employees and students. The duration of one video meeting for subscribers of Google Workspace for Education Fundamentals and Google Workspace for Education Plus should not exceed 300 hours.

Google Workspace comes with various tools and programs that users can use effectively when using Google Meet. However, the features of Google Meet are limited compared to other programs that serve the same purpose in terms of productivity, interaction, and remote collaboration.

For example, Google Meet does not have the "Annotation" function needed during a video conference. Annotations help users highlight certain parts of the presentation and stimulate interaction between participants. Currently, such additional features are being added via Google Chrome extensions from third-party developers.

The service interface is shown in Figure 109.

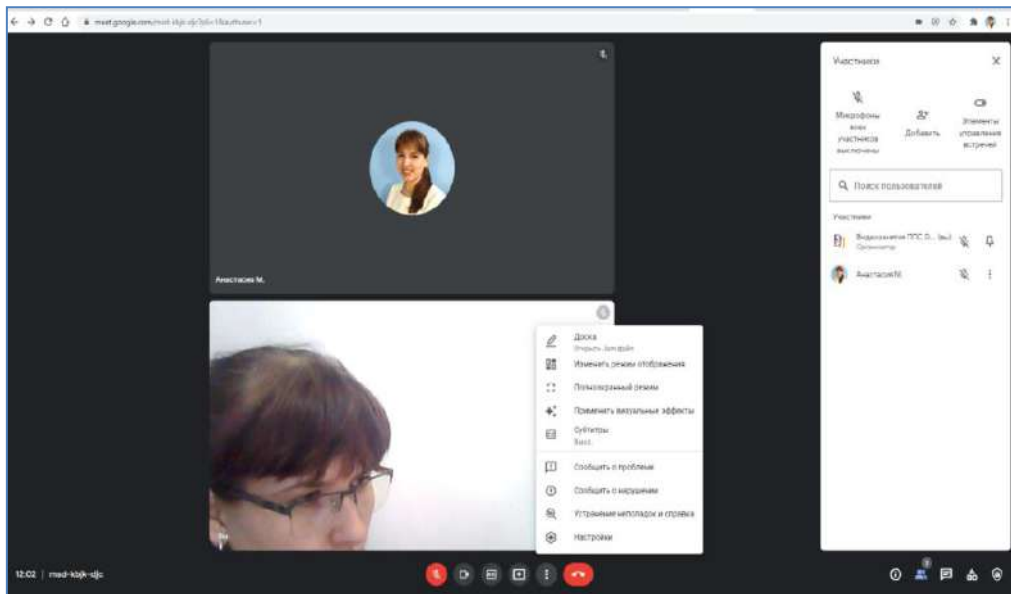


Figure –109. Google Meet service interface

Teachers when using Meet for Distance Learning:

- can start video meetings and join them in class using a special link for courses;
- use of moderation capabilities to control access of participants;
- receive a report on the participants of the meeting;
- can start a video meeting with Gmail;
- manage access to video meetings;
- use the Jamboard interactive online whiteboard in your classes;

The main advantages of the service include:

- intuitive interface allows participants to work quickly, show up to 49 people at a time and hide their ideas to reduce meeting fatigue;
- offline progressive web application and updated mobile applications allow you to connect from your device, regardless of whether you work from your desktop or connect from your phone while hiking;
- increasing the volume of consultations for some Education, Business and Enterprise tariff plans to 500 participants will help ensure each seat at the meeting;
- attendance reports that can track visitors, whether it's a job, a class, or a new seminar.
- full setup by the organizer of participants' access to meeting elements (audio, video, general, controls, subtitles).

The window for configuring destination controls is shown in Figure 110.

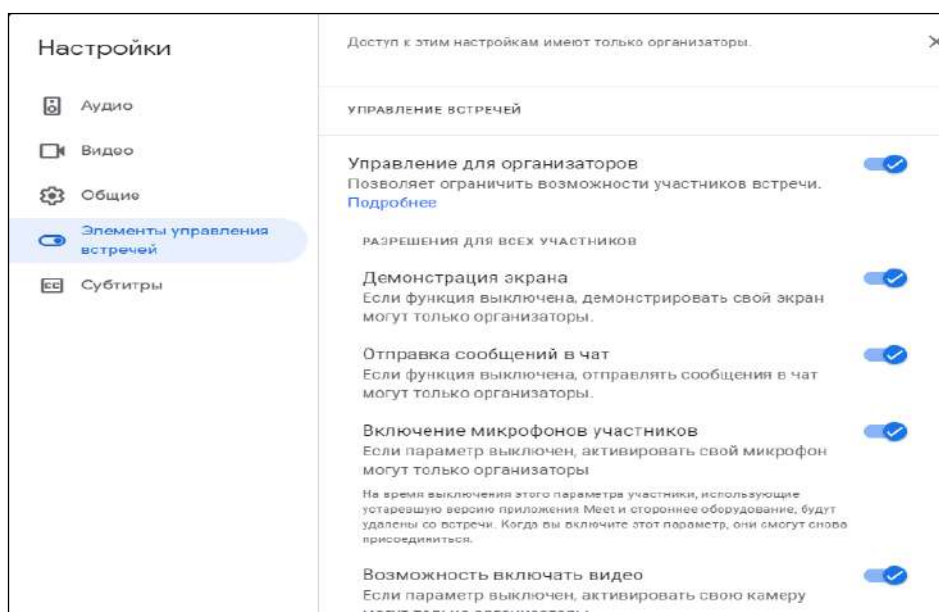


Figure – 110. Meeting controls

To ensure that meetings are equal and inclusive, regardless of video conferencing experience or communication language, Google has updated its functionality by adding new features:

- New virtual backgrounds, automatic lighting control and noise reduction help people focus and ensure that participants will be seen and heard, regardless of whether they are connected from the office, cafe or kitchen table.
- Improved "hand-raising" with automatic unloading allows participants to share their views, and discussion rooms allow deeper participation in discussions in small groups.
- Surveys, questions and answers will help to keep the topic of the presentation, help to make sure that the audience has participation and answers to questions.
- Subtitles with translation, which will appear soon, and support for live subtitles for several spoken languages will help deaf or hard of hearing participants who speak another primary language or speak in a noisy place to better understand and participate in meetings.

Webinar is a platform for webinars and online conferences

Webinar is an IT company specializing in the development and delivery of web and video conferencing services. It was established in 2008. In 2012, it merged with COMDI, a service for organizing online broadcasts. After the merger, the products began to be sold under the Webinar brand, but in some countries, as well as in mobile applications, the COMDI trademark was still used. In 2016, the company released an updated platform for webinars and video conferences Webinar 3.0.

Webinar Company provides services for organizing online events based on its own software solutions. A modern and convenient program for webinars has the following features:

1) Transmission via encoder. The encoder is a tool for conducting television-level webinars. The encoder allows you to broadcast an image from multiple cameras, achieve professional image quality and complement the video with live broadcasts and special effects. Room Interface Webinar.ru shown in Fig. 111.

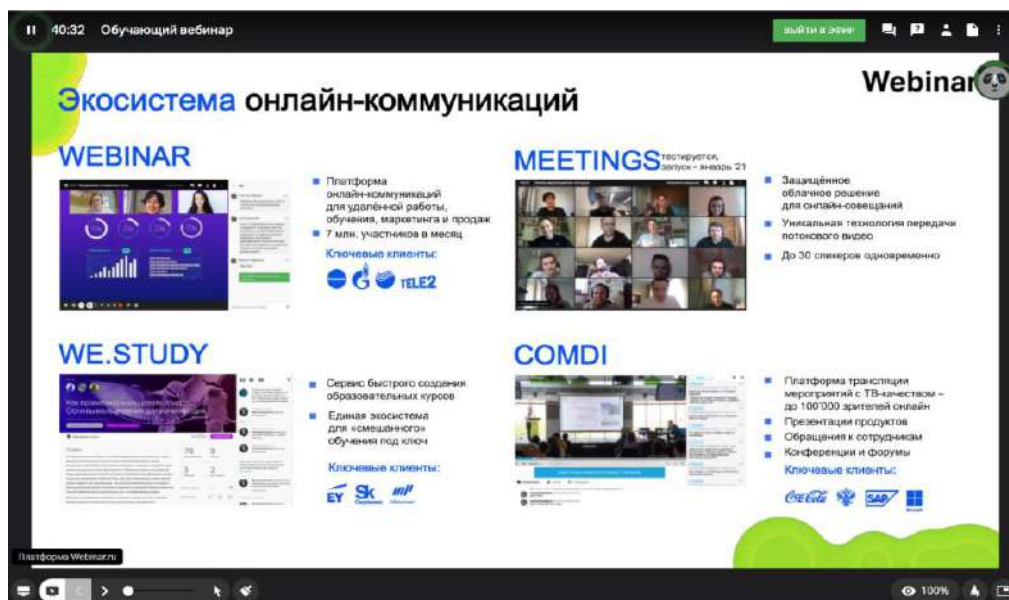


Figure – 111. Room Interface Webinar.ru

1) Chat. Through the Chat, the audience can influence the course of broadcasting and receive feedback from the presenter in real time. In order not to miss something important in the chat, we usually ask participants to ask questions in a separate tab. You can also activate chat moderation: then participants will see only the replicas and questions approved by the presenters.

2) Online whiteboard. The platform has a built-in function - an online whiteboard that allows both the organizer and the conference participants to write on an electronic canvas in handwritten, printed form. It is possible to create additional "pages". In this case, all records are stored as png images, on the files tab, with the possibility of their subsequent download for participants.

3) Showing videos on YouTube. The training is not limited to staging and presentation: the presenters launch videos from YouTube, for example, for the production and assembly of microwave ovens. YouTube

The setup of the video presentation is shown in Figure 112.

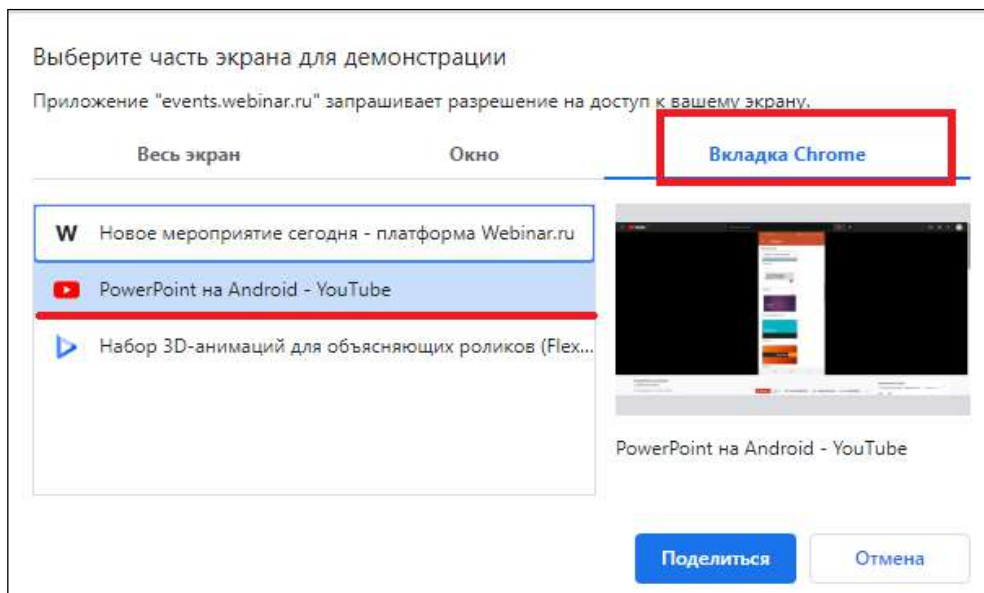


Figure – 112. Assignment controls

The online panel of the Webinar platform is shown in Fig. 113.

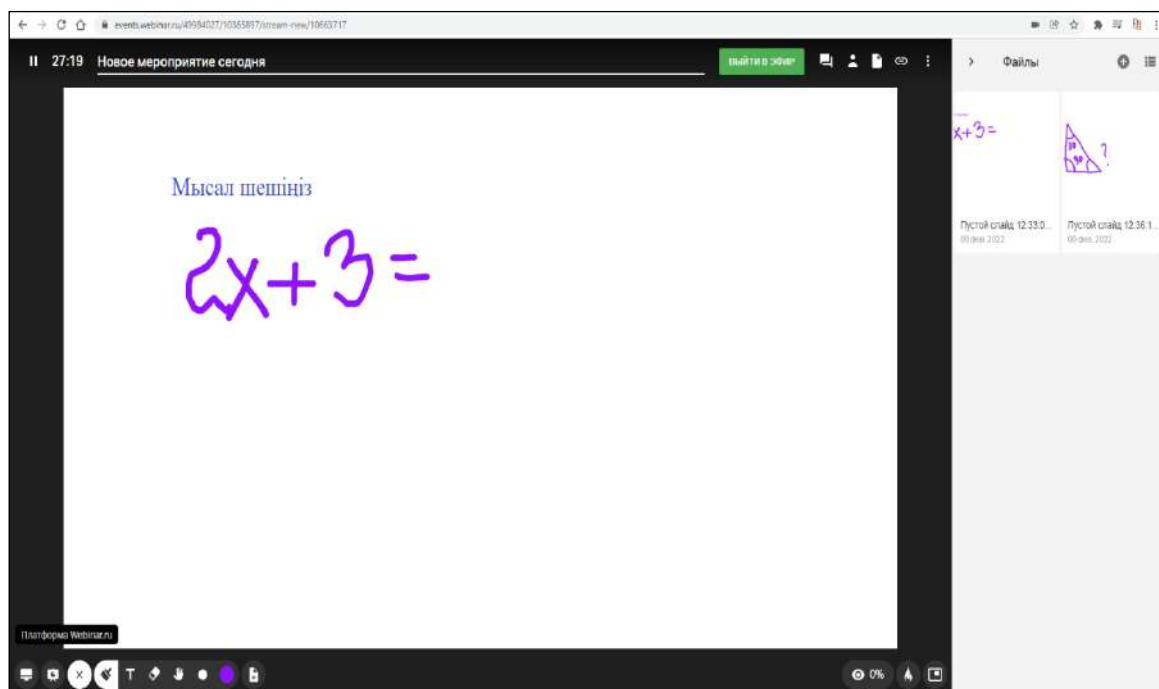


Figure –113. The online panel of the Webinar platform

In addition, the platform contains a number of useful «chips», such as creating test tasks for conference participants (questions with one correct answer, several, a free answer, etc.), as well as the ability to track the activity of conference participants, display data about who turned the window, who turned off the camera, etc. Events will be recorded automatically saved on the platform server and will be available to all participants when the organizer opens access rights.

Cisco Webex Classrooms

WebEx was founded in 1995 by Subrah Iyar and Min Zhu. An initial public offering of shares was held in July 2000. WebEx was listed on the NASDAQ national market and then on the NASDAQ Global Select Market in 2006. On November 17, 2014, Cisco announced the evolution of Webex under the name Project Squared. On March 17, 2015, this initiative was named Cisco Spark. On April 18, 2018, Cisco announced the integration of Cisco Spark with the Cisco Webex platform. On the same day, Cisco named all other Spark Webex products, including the Spark Room kit (now Webex Room Kit) and Spark Board (now Webex Board). In September 2020, Cisco launched a new Webex Classrooms platform for virtual homework.

The program interface is shown in Fig. 114.

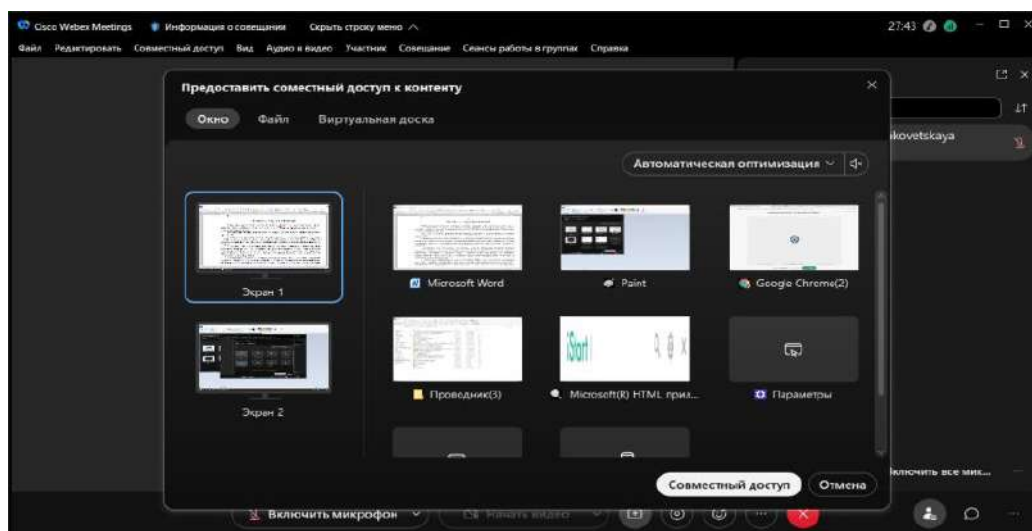


Figure –114. Cisco Webex Classrooms

Cisco Webex Classrooms is a secure solution that provides intuitive online learning for students, teachers and parents. The program offers a lesson schedule that allows teachers and students to manage lessons, manage them, schedule virtual working hours, etc. Students can communicate with each other and access learning materials, and parents can schedule time for virtual communication with teachers.

Webex classes are combined with Webex conferences for hybrid learning and convenient video communication. Many schools around the world use Webex for hybrid learning.

Webex Meetings has introduced many new learning opportunities for teachers, students, parents and IT staff to simplify the learning process.

New features of Webex Meetings allow teachers to focus on their studies:

- **Close the virtual classroom door.** The automatic closure function prevents access by all unregistered users. The entry rules are set by the teacher. In the virtual "foyer" visitors are waiting for permission to enter the classroom.

Creation of groups and subgroups for maximum assimilation of the material. This feature helps to improve learning dynamics. Students work in small groups, study the material and solve problems together. Teachers can track the group

and join the group, as well as send messages to the group with the necessary information, including completing group assignments.

The configuration of groups is shown in Figure 115.

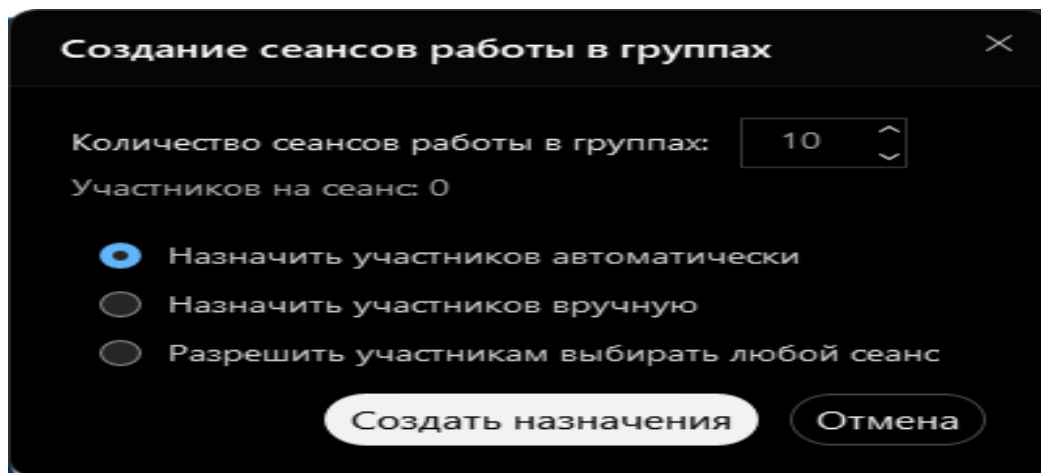


Figure –115. Configuring group work in Cisco Webex Classrooms

- **Discipline in the classroom.** Webex microphone mute features help eliminate distractions and better manage the virtual classroom. Raising your hand is moved to the top of the list, so the teacher will never miss a question. Webex allows you to attract an assistant to work with several classes at the same time.

- **Filling the class with energy.** Various Webex devices help everyone to optimize the classroom and the learning process. Thus, the teacher can sit, stand, walk around the classroom – the speaker's control device, as a rule, keeps the teacher in the center of attention when he is in the classroom. Online learners remain interested and active, as if they had moved into the classroom.

For schoolchildren. Students learn the material better when the environment arouses interest, helps them learn and learn safely and without restrictions.

1) Learn at your own pace. WebEx Assistant for Meetings helps to create seminar recordings so that everyone can access these resources according to their perception characteristics. Essays, resumes and textbooks are fully documented, so you can review and check them at any time.

2) Communication with classmates. Webex Teams allows students to send messages, share content, chat, use an online whiteboard and call team members in one application using all the tools.

For parents. Parents play an important role in the educational process, often replacing school attendants, teacher assistants, educators, etc.:

1) Online communication with teachers. As part of Webex Teams, teachers can schedule personal meetings with parents, report educational news, assignments, etc.

2) Control of homework. Webex Assistant helps you view notes and topics taken in class, even track progress and keep track if you need help.

For IT employees. IT staff provides a safe learning environment:

1) **Simplicity and safety.** Webex supports the improvement of training programs and service methods. Now it has become more convenient and easier to install convenient and secure virtual rooms.

2) **Working with many tools.** Webex easily integrates with Education Connector Schoology, as well as with control systems such as Canvas, Moodle, Blackboard and others.

Skype is a web-based communication tool

Skype is a free web communication tool that allows people to hold video conferences, make calls and exchange instant messages. Skype has more than 300 million active users worldwide. Skype was developed in 2003 by Janus Friis (Denmark) and Niklas Sennstrom (Sweden). Then Microsoft bought Skype, paying \$8.5 billion.

Skype offers many educational opportunities for classes. Students can communicate with each other, expand their knowledge and interact with other cultures. They can use Skype to exchange projects, improve language skills, and exchange useful information. Skype also allows students and teachers to participate in virtual tours of historical sites, communicate with authors and researchers, and communicate with audiences around the world. Skype offers a simple platform for student development and growth.

The main page of the program is divided into logical zones: in the upper left part of the window, the tabs «Chat», «calls», «contacts», «notifications» are displayed, below is a list of personal and group chats, on the right is the chat content and function buttons for audio and video calls, buttons for sending text, illustrative and audio messages.

The program interface is shown in Fig. 116.

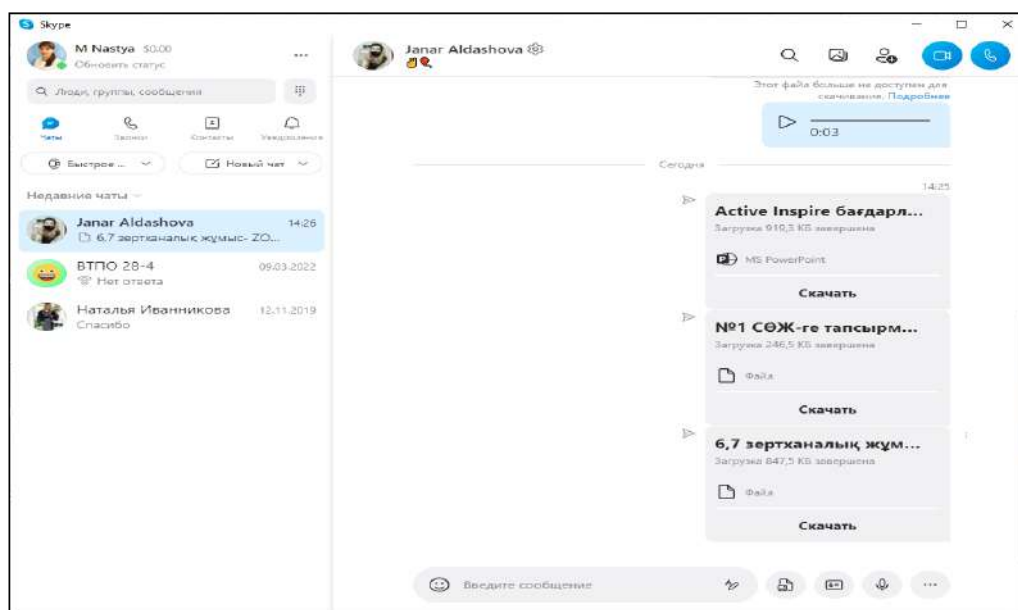


Figure –116. Skype interface

When creating a new chat, it is possible to choose the type of chat. The program supports the following types:

- Group chat.
- A group with a moderator.
- Personal chat.
- A separate conversation.

The chat creation window is shown in Fig. 117.

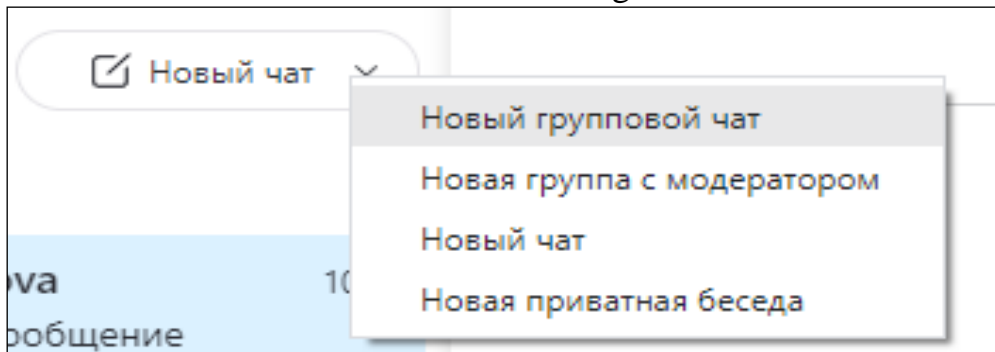


Figure –117. Skype chat types

Functions and features of the program:

1) Calls. With Skype, you can make calls and chat with other users for free. In addition to making calls to other Skype users, it is possible to make calls to mobile and landline phones anywhere in the world at low rates. For such calls, a minute billing or subscription is used. Skype also supports sending calls to mobile and landline phones.

2) The message. A text chat in which users send and receive instant messages, even if they are not online. Chat is useful when you want to send notes, links to web pages, fragments, complex codes, instructions or other data that is difficult to remember and that cannot be transmitted by voice. In addition, you can use Skype to send SMS messages to other countries at low rates. Given that the text of SMS messages is typed on the computer keyboard, this function will be inexpensive and very convenient. Other messaging functions are «video messages» and «voicemail». The first one allows you to send and receive video messages regardless of the network status, and the second one allows you to record missed calls or calls that you cannot answer.

3) Free video calls. Video transmission via a video camera. In addition, Skype allows you to communicate via video with several users at once. For a group video meeting, you must first create a group chat by adding all the participants. There are two ways to add participants: add from the contact list or send a link to connect to the group.

Adding contacts to a Skype group chat is shown in Figure 118.

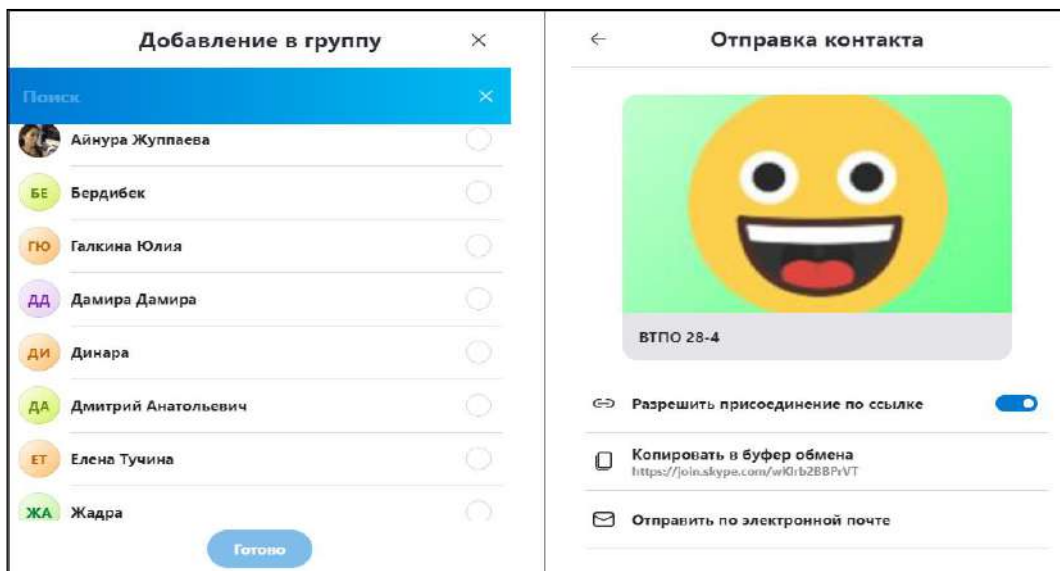


Figure –118. Adding contacts to a group

4) Display the screen. The «show screen»function has the same functions, only in addition to the speaker, the computer screen is displayed. For example, show a step-by-step guide, make a presentation, or view photos together. In addition, there is a «group screen display», and it allows you to add 10 people to a call and show the screen to everyone at the same time.

The selection of the screen to display the screen is shown in Figure 119.

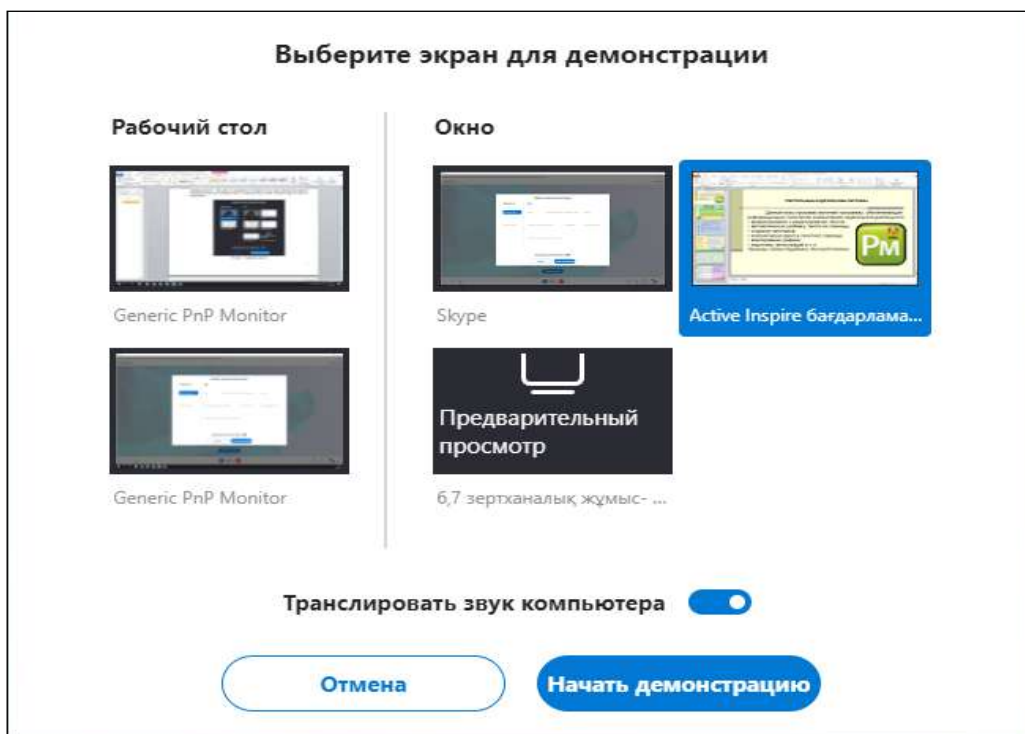


Figure –119. Screen display

5) Group conversations. One of the most useful features of Skype is the ability to communicate with several people at the same time. In addition, depending on personal needs, users are free:

- 1) creation of group audio recordings (up to 25 people);
- 2) video communication (up to 10 users);
- 3) screen sharing (up to 10 users);
- 4) creation of a group chat (up to 600 participants).

6) Files. With Skype, you can easily send files of any size and format. To do this, you need to drag the desired file into the chat window (if you are sending multiple files, you need to drag them at the same time). If you do this during a group call, the file will be sent to all participants.

Another interesting feature of Skype is the ability to share photos, even if they are not online when the recipient sends them (or, conversely, not online when the sender receives them). Also, if the computer is broken or lost, the next time you log into Skype on another computer, the files will be automatically downloaded from the Skype server within the last 30 days.

To develop students' critical thinking, as well as digital literacy, teachers have developed an educational game Mystery Skype. The goal of the game is to develop cultural knowledge and geography skills with predicting the location of another class using a series of Yes/No questions. It is suitable for all ages and offers students an interactive method of developing skills on the same problem at the same time.

Microsoft teams Corporate Platform

In 2016, Microsoft introduced an enterprise platform that integrates chat, meetings, notes and attachments into the workspace.

Microsoft Teams is a unified platform for communication and collaboration that performs regular workplace conversations, video greetings, file storage (including file collaboration) and application integration. The service integrates with the Office 365 office suite by subscription and includes extensions that can be integrated with third-party products. Teams can be used for meetings, online classes, and discussion sessions. The volume of meetings can range from two to 1000.

The Microsoft Teams home page is shown in Figure 120.

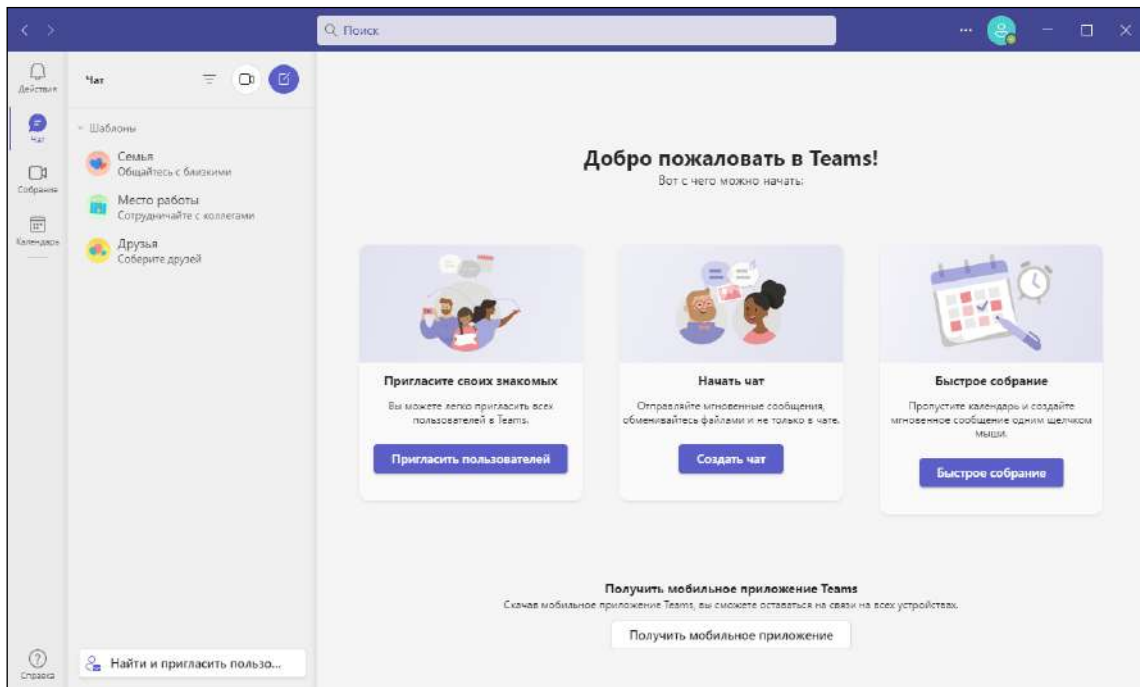


Figure – 120. Microsoft Teams Home page

The Microsoft Teams conference interface is similar to the interface of other similar programs and offers all the basic collaboration opportunities, from high-quality video conferences to phone calls, text chats and group messages.

As for working in meetings, the service provides users with various tools, such as customizable and blurred backgrounds, various viewing modes, discussion rooms and text chat. Users can also share their screen during the presentation, which makes it easier for the viewer to keep track of what is happening.

The Microsoft Teams conference window is shown in Figure 121.

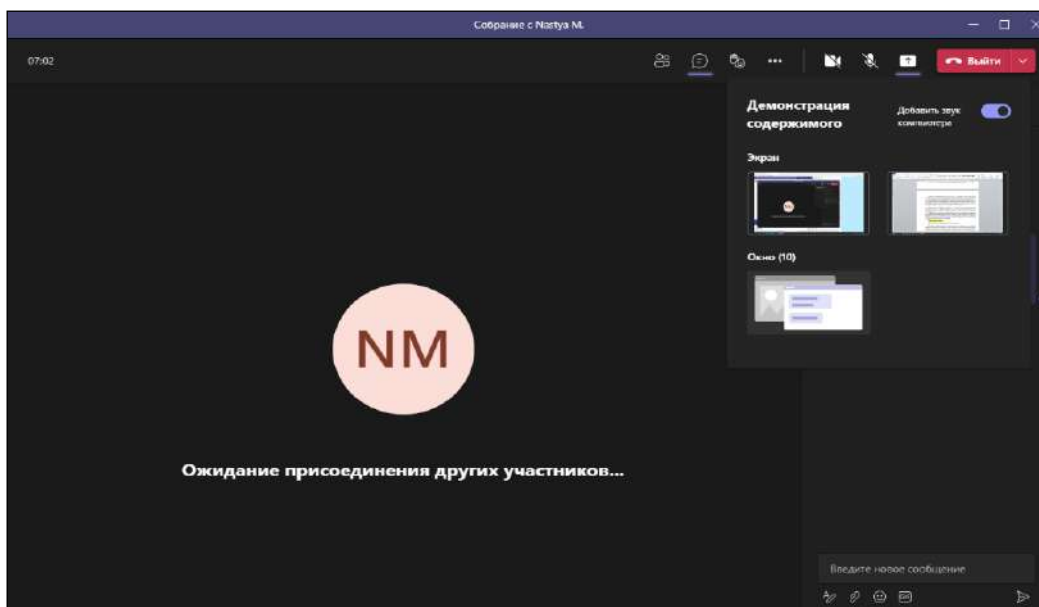


Figure – 121. Microsoft Teams Conference window

Teams allow you to record meetings, meaning those who can't participate can catch up. Since the beginning of the pandemic, Microsoft has introduced several important access features, such as live subtitles and transcriptions.

Teams allows you to plan your conference in advance, while in the settings you can specify not only the date of the conference, but also the duration of the conference, if necessary, you can add repetitions, a description, conference participants in advance. The installation window of the new assembly is shown in Fig. 122.

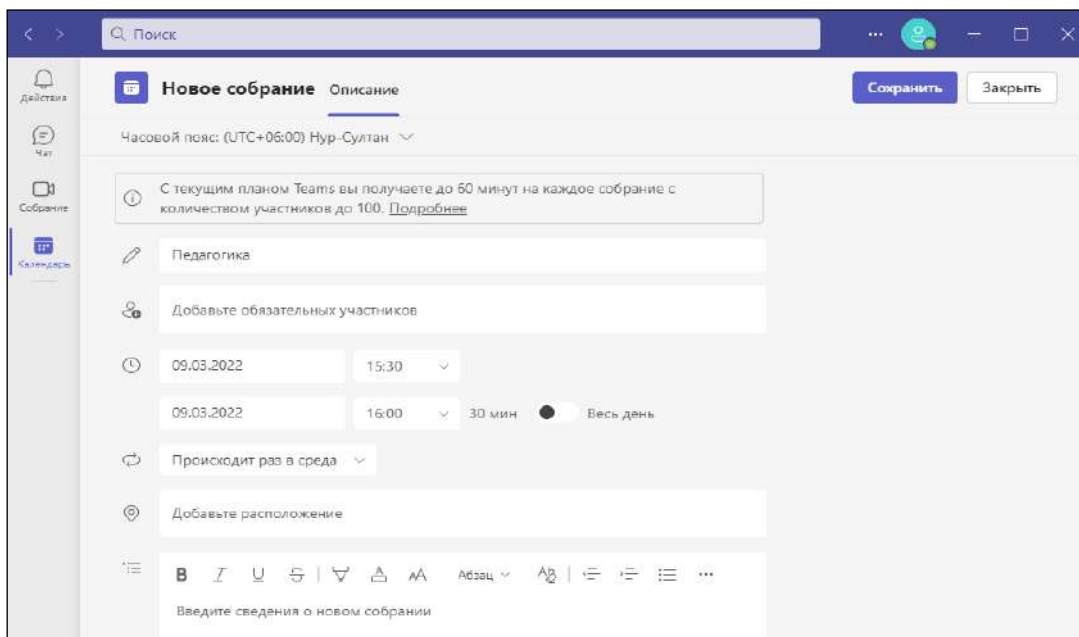


Figure – 122. The installation window for a new Microsoft Teams build

A big advantage of the service is the automatic creation of a meeting calendar, while the calendar is created both by the organizer and by the participants who were previously added by the organizer when the meeting was set up. To connect to meetings, click on the «Join» button in the calendar or click on the invitation link.

The Microsoft Teams meeting calendar is shown in Figure 123.

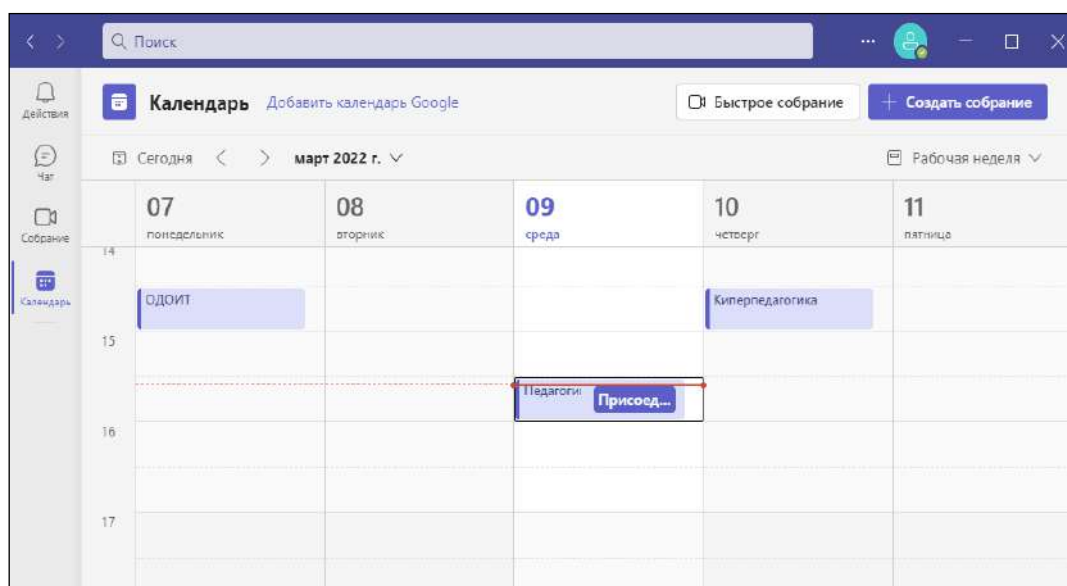


Figure –123. Microsoft Teams Meeting Calendar

However, what distinguishes teams from competitors is their place in a wide range of Microsoft 365 applications and services. For example, the teams are closely linked to OneDrive and SharePoint, which makes file sharing simple and intuitive. The upcoming PowerPoint integration is designed to simplify record management and audience interaction during presentations.

WizIQ Virtual Classroom

Virtual Classroom is an online conference tool specially designed for online lessons.

WizIQ Virtual Classroom is a full-fledged collaborative software for agencies and startups. The WizIQ Virtual Classroom offers detailed solutions for web applications. This online collaboration system offers real-time processing, brainstorming, video conferencing, discussion boards and document management in one place.

Not only thin virtual classes, but also a really effective but innovative version. In particular, the WizIQ virtual classroom offers a number of advantages for both teachers and students.

Benefits for teachers

In the inverted classroom paradigm, WizIQ helps teachers achieve the best results from their students. Features that facilitate these improvements include the following:

Create and record lectures in the WizIQ virtual classroom for asynchronous viewing (you can record lessons and send them back to students, helping those who miss or want to repeat the lesson).

- Use a writing and drawing board.
- The use of advanced mathematical, textual and graphical tools.
- Sharing various content during sessions, including text documents, spreadsheets, PDFs, slides and YouTube videos. The media of the WizIQ virtual class is shown in Figure 124.

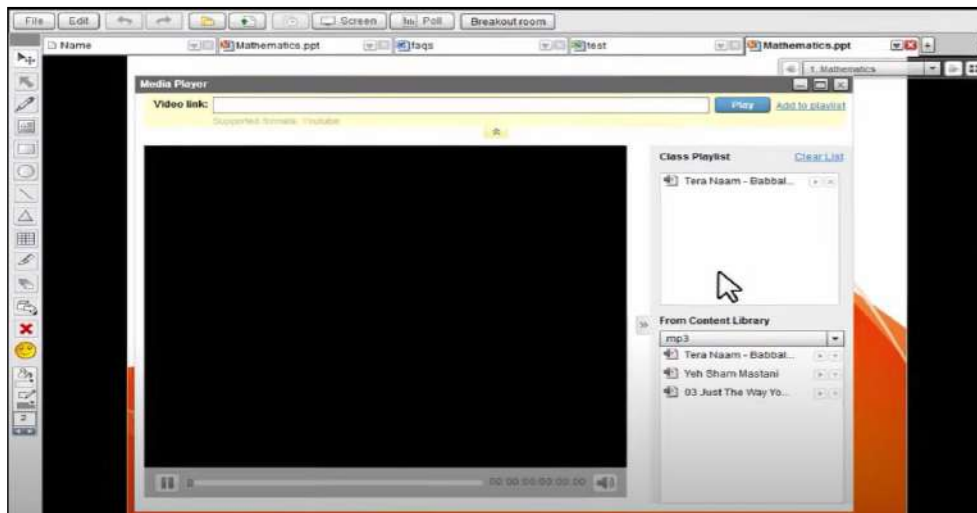


Figure –124. WizIQ virtual class Media player

Teachers themselves benefit from the following WizIQ features:

- Organization of lecture content in folders.
- Receive student reviews and post them on the profile page.
- Integration of Wiziq virtual class with LMS, CMS or website using API for developers.
- Conducting practical classes.
- Conducting questionnaires, testing.

The questionnaire creation window is shown in Fig. 125.

Figure –125. WizIQ questionnaire

In 2011 WizIQ won the nomination «World Public Choice Award for Education» at the World Education Awards. As the name of the award suggests, the

moose award really was the result of a public choice, while WizIQ is ahead of this award in the category of «good innovation in open and remote learning».

Questions for testing and evaluating knowledge:

1. Give a description of cloud technologies.
2. Learn the Google Apps tools.
3. Expand the main features of the Google presentation.
4. Reveal the features of the Google presentation interface.
5. Study the process of designing an educational resource.
6. Show the features of installing Google Sites.
7. Features of the ActivInspire program.
8. Study the advantages of the ZOOM application interface for a computer.
9. Analyze the functional services of the ZOOM application for a computer.
10. Consider the interface of the Google Meet service.
11. Tell us about the interface of the room Webinar.ru .
12. Study the Webinar platform's online whiteboard service.
13. Explore the capabilities of Cisco Webex Classrooms. Consider group work in Cisco Webex Classrooms.
14. Analyze the Skype web communication tool.
15. Learn the Skype interface.
16. Discover the advantages of the Microsoft teams corporate platform.
17. Learn the WizIQ Virtual Media player.

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3.3 Implementation of the assessment of educational achievements

Constant assessment of the student's work provides information about the progress of both the teacher and the student, shows strengths and areas that need improvement, helps the teacher to plan the work correctly to meet the needs of the student. This formative assessment is part of the educational process. Formative assessment can be built with the help of questionnaires, tests. These can also be formal questions asked at the learning stage to quickly test these concepts, or vacation tickets provided at the end of the lesson. This is valuable for students, as it provides a mechanism by which they evaluate their progress in achieving their goals. The use of information and communication tools in both traditional and distance learning is a significant help to the teacher and a stimulating (interesting) factor for the participant.

Interactive tests and an online whiteboard are the main tools of the classroom and lecture hall. These are effective ways to make learning interactive and useful. An excellent solution for distance learning is an online whiteboard on which you can write and draw, make plans and drawings. Unlike a traditional whiteboard, an online whiteboard can be saved for future use. Interactive online tests allow not only to assess the level of knowledge of students, but also to introduce a playful moment into the process of conducting a lesson, to clearly see the statistics of students' responses.

Testing is of great importance at the present stage of training. The use of multimedia materials and computer networks reduces reading time by three times, and with the simultaneous use of images, sound, text and other functions, the memory level increases by 35-50%.

When choosing software tools, it is necessary to take into account the difficulties that students may have, for example, the problem of accessing the program (distrust of the service), the lack of a device that allows testing (programs must work both on a computer and on smart devices). We will look at some modern services and platforms for online testing and creating online boards.

Nearpod: You'll be surprised how you taught without this tool

Nearpod is a website and app-based digital tool that allows teachers to create interactive slide-reading resources through which students can interact and learn.

The main page of the service is shown in Figure 126.

Nearpod can also use gamification of information to make reading more interesting. The service also works well with many tools, such as Google Slides, Microsoft PowerPoint and YouTube. Teachers can easily import media files to make lessons faster and easier using existing resources.

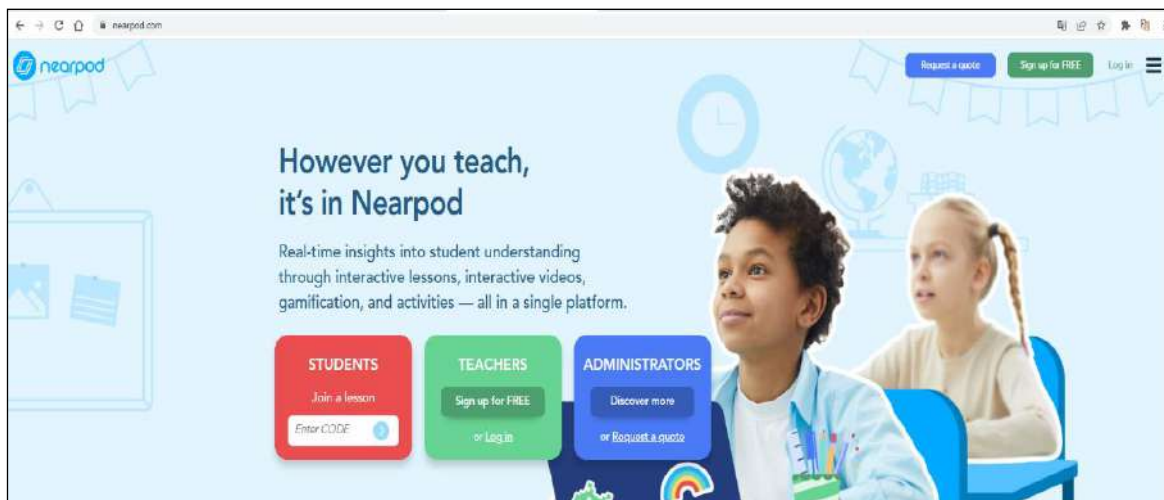


Figure –126. The main page of the Nearpod service

Advantages of Nearpod:

1) **Training.** Nearpod allows you to quickly and easily assess students' understanding. If you have read the information on several slides, organize a quiz to find out how clear they are. Add «Draw It» to ask the information to draw conclusions. Use the game «Time to Climb» to attract students to repeat the material. Students participate in the learning system, and you immediately get feedback on what information they have learned and what material should be paid more attention to.

2) **Visibility.** All the information is on the student's personal device: computer, iPad or mobile phone screen, which allows everyone to clearly see all the materials. When using a projector or a TV screen, some students may have difficulty viewing from another part of the room. With Nearpod, every student can easily access information. In addition, students can take screenshots of basic information or diagrams to save them.

Nearpod Features:

With a free account:

Slides – you can upload PPT or create slides in Nearpod.

Draw it – students can draw pictures or comment on photos to answer a question.

Quiz – questions can be asked immediately with feedback.

Survey – you can ask questions to see the general answers of the class (great for pre- and post-assessment).

Open Questions – students can enter answers on the keyboard to answer the question.

A board for collaboration – students can post brainstorming ideas such as Padlet.

3D modeling – you can study 3D models, you can take screenshots and write inscriptions on draw it. The content creation window is shown in Figure 127.

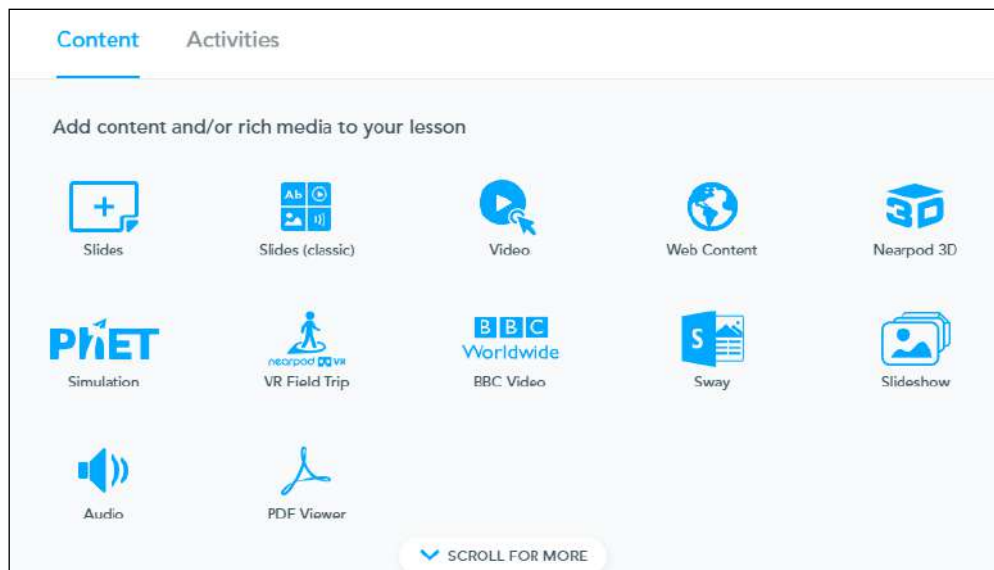


Figure –127. Content creation window

In the commercial version:

Matching – match words with an image or definition

Embedding Web links – you can redirect students directly to a website, for example, a slide in a presentation.

PhET Simulations is an integrated simulation lesson.

Intensive classes for schoolchildren. Give students the code and give them the opportunity to pass Nearpod at their own pace. It works as homework, notes, reviews, or works in the classroom to allow students to complete them when needed.

Online Test Constructor Onlinetestpad.com

Onlinetestpad.com - multifunctional constructor with which you can create tests, surveys, crosswords, interactive simulators, etc.

Figure 128 shows the types of questions.

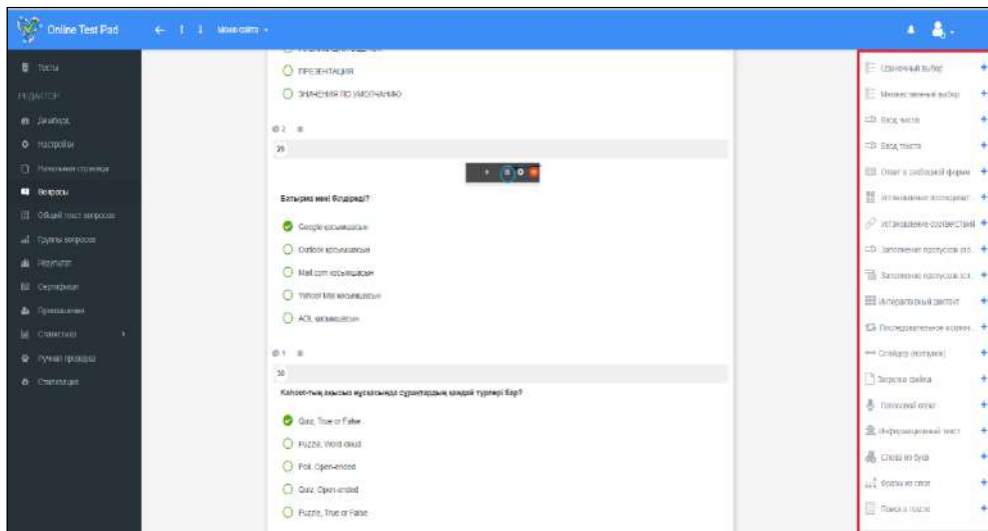


Figure –128 . Onlinetestpad.com types of questions

The Constructor site has been available since 2011, now there are more than 600 thousand users on the site, more than 25 thousand tests have been created, 4500 crosswords. All Online Test Pad products are available for free.

Figure 129 presents a question about the type of crossword puzzle.

The constructor allows you to ask several different questions-one or more options, enter a number or text, free answers, scales, etc. In this case, depending on the specified answers, it is possible to implement the necessary logic for calculating the result (useful when creating various psychological tests, etc.).

The only choice is the type of question to which the user chooses only one answer from the proposed list. This type of question is the simplest and most common.

Multiple choice is a type of question in which the user selects one or more answer options from a suggested list. The number of correct answers in such tasks is unlimited.

Filling in the blanks is a type of question in which you need to enter a number or text in a field located inside the text. There is a separation of allowed characters into number input using control and text input.

Matching is a type of question to which the user must link the answer options to each other.



Figure – 129. One of the types of tasks "Crossword"

The main advantage of the test with various types of questions is the efficiency and objectivity of monitoring the indicators of students' learning outcomes, which allow us to assess the level of formation of communicative competence in accordance with the requirements of the curriculum.

The system collects statistics on each issue, the results can be viewed in tabular format and downloaded to a personal computer.

The created forms are adapted to all types of screens - this allows you to take tests and surveys on any device. If necessary, you can change the appearance of the form (color, size, frame, etc.), as well as add your own logo.

You can share the created form using a regular link or widget (just enter the HTML code of the questionnaire or test on your site). With the help of invitations, you can send personal emails. You can also post your form on the site in the public domain – anyone can conduct a survey or decipher a crossword puzzle.

Onlinetestpad.com The constructor editor is shown in Figure 130.

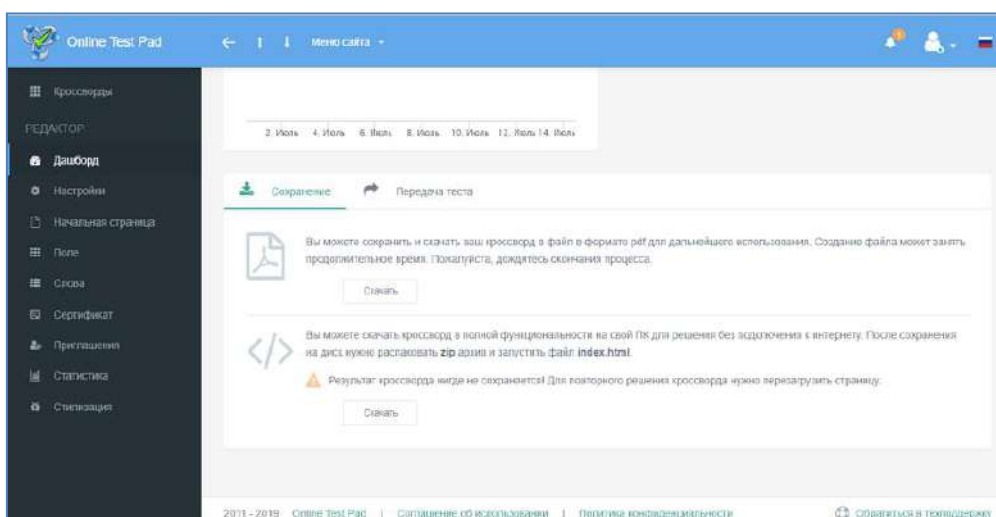


Figure –130. Onlinetestpad.som constructor

Quizizz.com online quiz tool

Quizizz is, first of all, an online quiz tool that works on the entertainment principle. The platform works in web browsers, as well as on iPhone and Android devices with special applications for both. Quiz was founded in 2015 by Birla, BITS Pilani Ankit Gupta and Deepak Joy Chinyat, graduates of the Institute of Technology and Sciences who teach mathematics at a school in Bangalore, India. Today, Quiz supports millions of students in more than 100 countries and has offices in Bangalore and Santa Monica, California.

Various Quiz game modes allow students to play in a group or do homework. Features like glasses, customizable memes, and an optional spreadsheet personalize the experience for each class. Instead of creating quizzes from scratch and evaluating each task manually, teachers cover the main problems by setting public quizzes, and students receive instant feedback when answering each question. As a result, teachers have more time to focus on priorities such as individual support and curriculum development.

From the student's point of view, using the Quiz makes learning more interesting due to the game interaction and the ability to work with the quiz using their devices. There are many tests ready to choose from for teachers, as well as the ability to edit and create them from scratch.

Quizizz.com The creation of the question constructor is shown in Fig. 131.

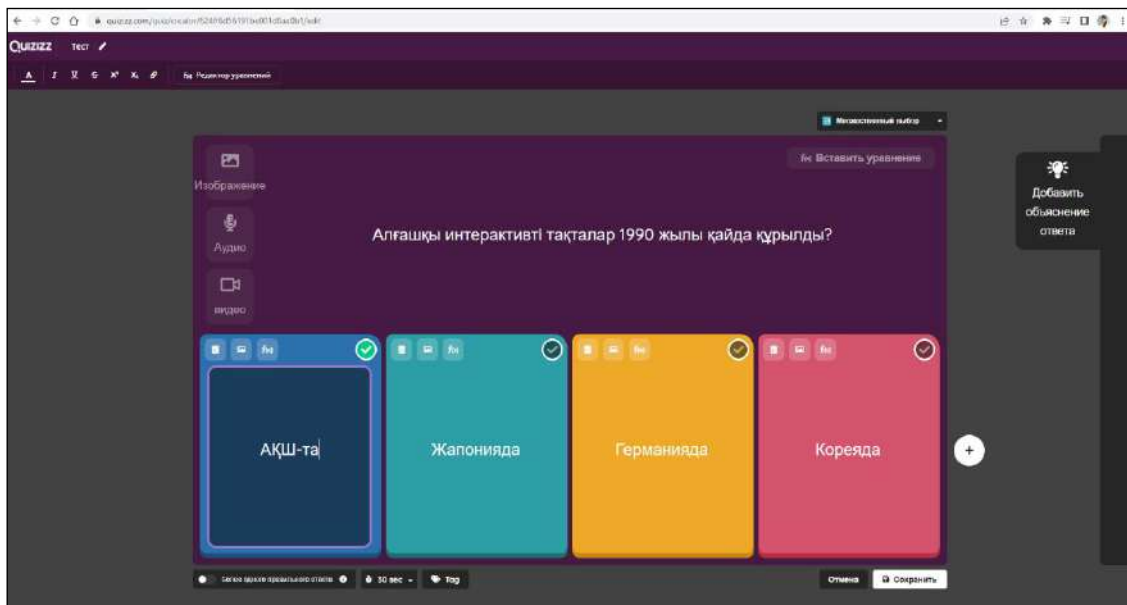


Figure –131. Quizizz.com the compiler

Since students only need an access code, you don't need to register an account, which makes it easier for everyone to access. This also means that their privacy and personal data can be protected. The quiz code entry window is shown in Fig. 132.

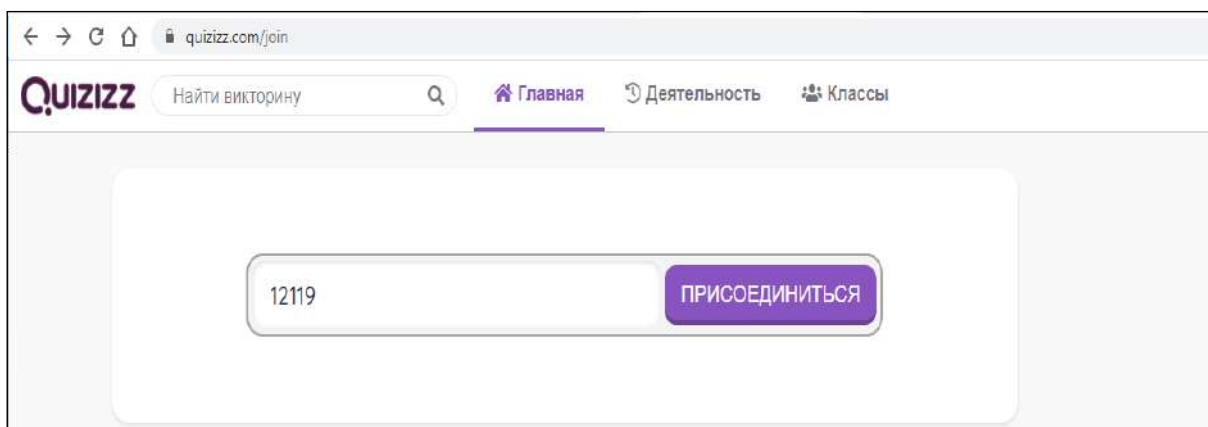


Figure – 132. Quiz code entry window

All this makes Quiz a powerful platform for both classroom and distance learning. This is evident in the fact that quiz is widely used in more than half of US schools, as well as in 150 countries in general.

It is worth noting that Quiz is similar to another popular program for creating quizzes with game elements-Kahoot, but there are also significant differences:

- In Kahoot there are only two types of questions for free use, in Quiz there are five of them;
- There are many ready-made games in Quiz that can be copied and edited;
- The ability to integrate Quiz with Google Classroom and add trivia to it makes this tool more interesting and practical than Kahoot.

LearningApps

LearningApps.org -a free online service founded in Germany in 2012, which allows you to conduct interactive training sessions to test your knowledge. The service presents 20 interactive exercises in a game format (in LearningApps they are called applications). Hence, first of all, the service is intended for teachers working with children. For example, tasks such as «jumping» or «finding a pair» are clearly borrowed from children's games. The types of completed tasks are shown in Fig. 133.



Figure –133. LearningApps.org types of tasks

There are two ways to work with LearningApps:

1) choose one of 20 game mechanics options and do the exercise yourself. After that, you will be offered to familiarize yourself with examples of such exercises and understand the logic of the task. Then it remains only to fill in the necessary fields and upload the necessary images. All forms are equipped with tips, so you do not need to fight with them for a long time.

The interface of the LearningApps exercise editor, using the example of the Aquarium exercise, is shown in Fig.134.

The screenshot shows the LearningApps exercise editor interface. At the top, there is a header with the title "Название упражнения" (Exercise name) and a language selection menu "Язык дисплея" (Display language) with flags for various languages. Below the header is a text input field containing "Аквариум" тапсырмасы. Underneath is the "Описание задания" (Task description) section, which includes a text input field with the text "Әр элементті тиісті еріске жіберу керек." (You need to put each element in the correct tank). The "Описание" (Description) section follows, with a text input field containing "Поле приложения (от 2 до 4 групп) разделяется на зоны, фоном могут служить изображения или текст. Каждый элемент нужно отправить в соответствующее поле." (The application field (from 2 to 4 groups) is divided into zones, images or text can serve as a background. Each element needs to be sent to the corresponding field). Below this are three groups of elements. Group 1, "Задний фон" (Background), has a text input field with "рыба клоун" (clownfish) and a "Подсказка" (Hint) field. Group 2, "Элемент 1" (Element 1), has a "Выберите картинку" (Select image) button, a "Размер: 782 x 599" (Size) field, and a "Редактировать" (Edit) button. Group 3, "Элемент 2" (Element 2), has a "Выберите картинку" (Select image) button, a "Размер: 790 x 599" (Size) field, and a "Редактировать" (Edit) button. At the bottom, there is a "Элемент 3" (Element 3) section with buttons for "Текст" (Text), "Картинка" (Image), "Озвученный текст" (Text-to-speech), "Аудио" (Audio), and "Видео" (Video). A "+ Добавить следующий элемент" (Add next element) button is at the very bottom.

Figure –134.Exercise editor

2) using ready-made works of other authors as a template, changing the data contained in them to yours. Sometimes it is easier to change what is ready than to create a new one. The essence of the problem: in the gallery, applications are grouped by topic, not by type. Therefore, it may take some time to find a good example of the «find a pair» exercise. It is not always possible to quickly find an exercise of the right type for alteration. The finished set of exercises is shown in Figure 135.

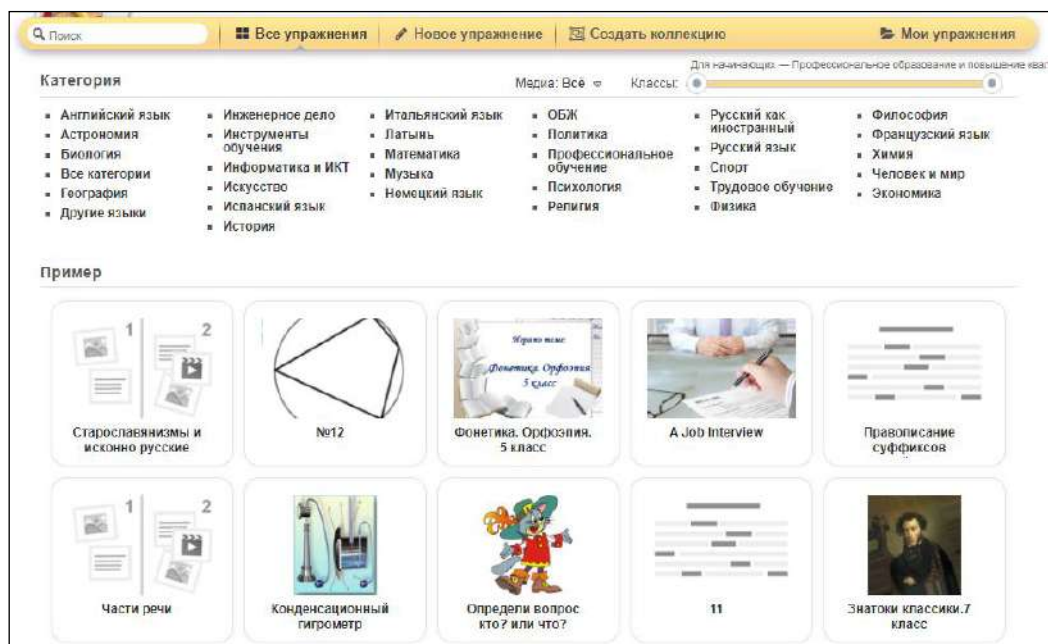


Figure –135. A ready-made set of exercises

After the application has been created, it should be saved and, if you want, made publicly available to LearningApps users. This means that it will appear in the «All exercises».

Those who do not plan to share their creativity with the world can save the material as an ebook in iBooks format or a lesson in SCORM format for iPad and Mac. Materials of this format are supported by most distance learning systems. In addition, you can send or use a link to study for students. This link is intended for entering training in Teachbase. The window with links to the material is shown in Fig. 136.

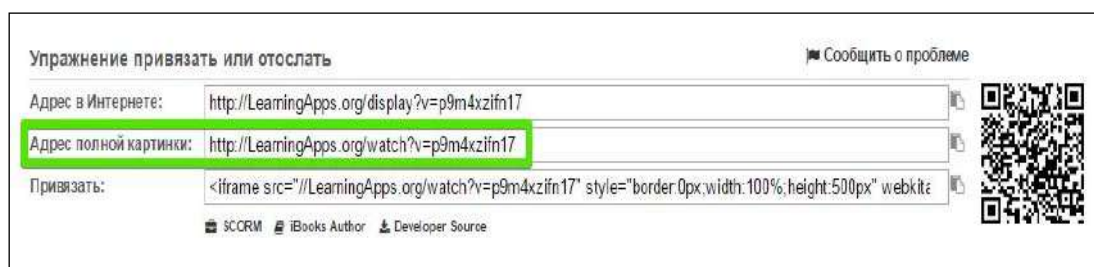


Figure –136. The window for sending a link to the material

LearningApps has a feature, which is that it cannot use the service for large-scale projects in distance learning: to see the results, the author of the exercise must first create a class with his students, that is, create new user accounts and manually send them usernames and passwords. In total, to access the analytical report, in which only one parameter is recorded: the student has passed or has not passed the training (the points scored and other data are not displayed).

Instead of wasting this time, it is better to abandon the idea of testing knowledge with the help of LearningApps exercises and use them as a method of self-testing in a playful way to consolidate the material passed.

There are five additional functions of the service in the «Tools» section:

1) Voting. Allows you to conduct surveys: the list of questions to which the author has several answers, in the report he sees the number of votes cast for a certain option. The survey can be conducted among LearningApps users or made publicly available.

2) Chat. You can create a chat, send links to the right people and communicate with them. Registration is not required to connect to the chat. Everything works flawlessly, but the interface is not translated into Russian.

3) Calendar. Simple functionality. The only plus: You can collaborate with other people on the calendar, and they don't need to register with LearningApps.

4) A notebook, the peculiarity of which is that entries in it can only be made by the author of the application. The rest can only read them.

5) Bulletin board. You can leave text and multimedia notes. All users can add them, and only the author of the application can delete them.

Jamboard-Google interactive online whiteboard

Google Jamboard is an interactive whiteboard service that helps you easily communicate your ideas by demonstrating them on jamboard and working on a simple whiteboard and making interesting creative decisions together and in real time. The Google interactive whiteboard was introduced in October 2016. This device is based on cloud technologies and helps to organize teamwork, and you can work in real time from any gadget.

Jamboard stands out among similar applications with its functions that work continuously. It's not as strong as drawing or graphic design apps, and it doesn't try to be like them. Instead, Jamboard focuses on features that provide a quality of life, making it easier to take notes, communicate ideas, and interpret concepts as it happens on a real board. The app is completely free and available to all Google Workspace users. You can also use the Jam panel on other smart devices using a special app in Google Play or iTunes.

Each individual frame serves as a blank screen representing the panel. You can use this space to draw, write text, insert notes, and even insert images. There is a wonderful little function that automatically translates handwritten text to the printer (when writing with a pen). The Jamboard with connected components is shown in Figure 137.

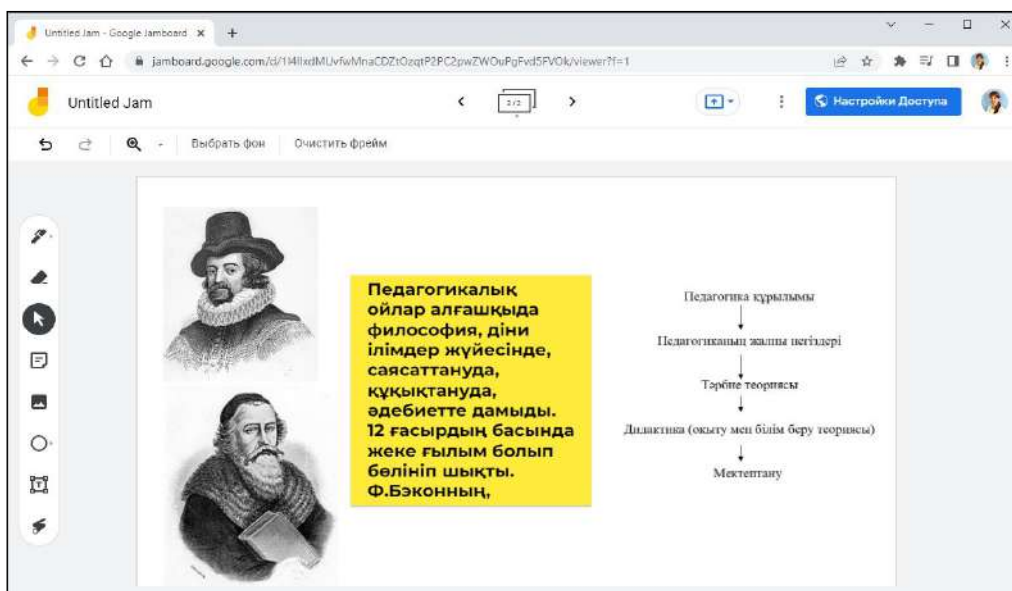


Figure –137. Jamboard project

In Jamboard, each project is presented as a separate slideshow or Jam, where each slide works as a separate frame. The maximum allowed number of Jam frames is 20. Each slideshow or presentation is stored in the cloud on Google Drive, which allows you to access them remotely from any device and from anywhere.

It is possible to insert an image into the frame directly from the device library or from Google Drive. In addition, you can choose to automatically convert the image into shapes, although this feature requires some work in terms of accuracy.

The toolbar is shown in Figure 138.

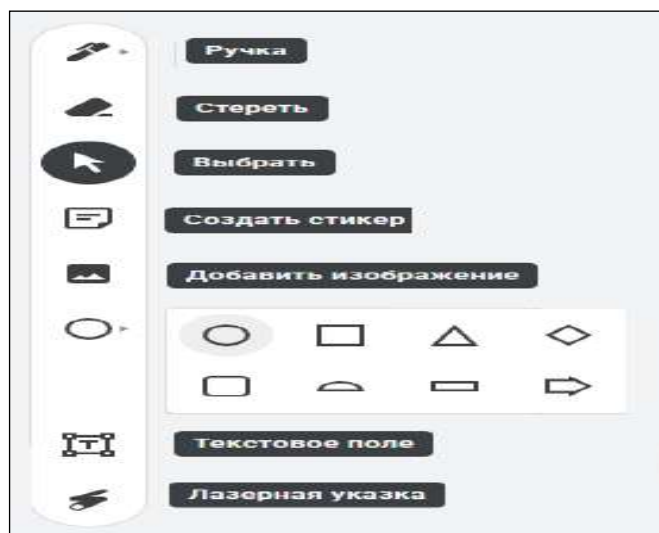


Figure –138. Jamboard Toolbar

The pen has several colors, including black, blue, green, yellow and red. The eraser tool allows you to delete what you have written, and the tool you can use to

move text and drawings. Thus, the laser tool is useful for displaying certain parts of the presentation when displaying the screen on the Internet.

A few additional features include the ability to add stickers from a very limited set and add notes that you can make, instead of writing with a pen, you can type text directly. There is a cancel button, as well as the ability to share frames in the form of images or PDF files. You can even make everything Jam as a direct link to Google Drive.

Padlet Online Whiteboard Creation Platform

Padlet is a platform for creating boards for posting content. The company, originally known as Wallwisher, was founded in 2008 by two friends Nitesh Golem and Pranav Pish from India and registered in the financial sector in 2012 based on the support of the startup accelerator Start-Up Chile. As of April 2021, Padlet is among the top 150 websites in the world, and its sites are visited by more than 3.25 million people daily.

Padlet is widely used by teachers: its use as a pedagogical tool has been studied at various academic journals and conferences, including the conference of the Association of Educational Technologies and Computer Technologies and the IEEE International Conference of Educational Innovations.

Using Padlet, you can brainstorm, make presentations and hold briefings. The platform can also be used for educational purposes to conduct interactive classes. Padlet is available as a browser and desktop version, as well as a mobile application.

Padlet users have a dashboard that can connect to colleagues' boards, edit an already created board or create a new one. When creating a board, you can choose one of the ready-made templates for placing content (wall, tape, speakers, etc.) or choose the possibility of placing content in an unknown location.

Padlet platform templates are shown in Figure 139.

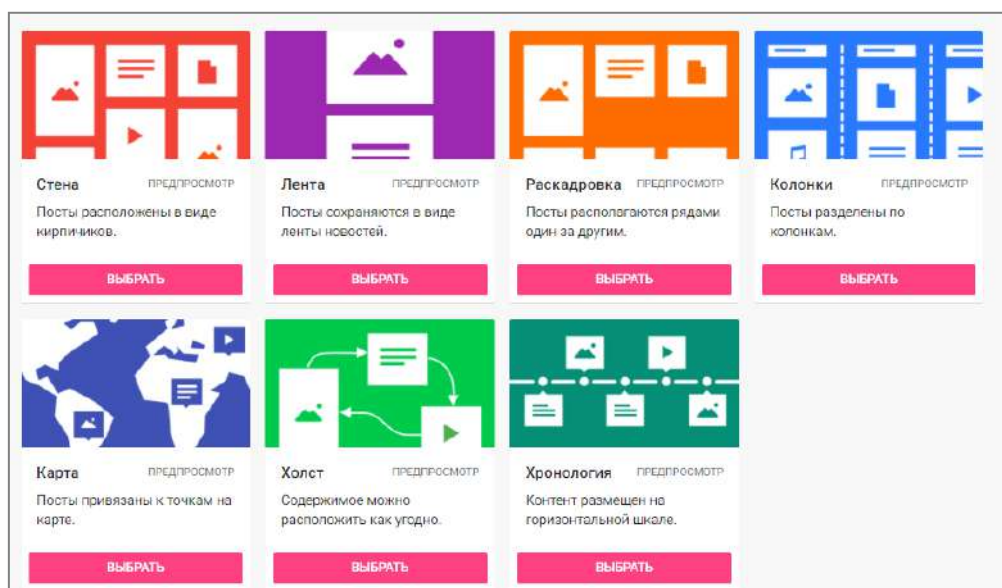


Figure –139. Padlet platform models

You can brand the boards, choose the background for them, the fonts used and the primary colors. Once you create a board, you can add content to it. These can be videos and images, links, files and other elements. They are located on the map with the name, description and content. Cards can be placed anywhere on the board, change their size and background color and make bundles between several cards.

The content options of Padlet.com are shown in Fig. 140.

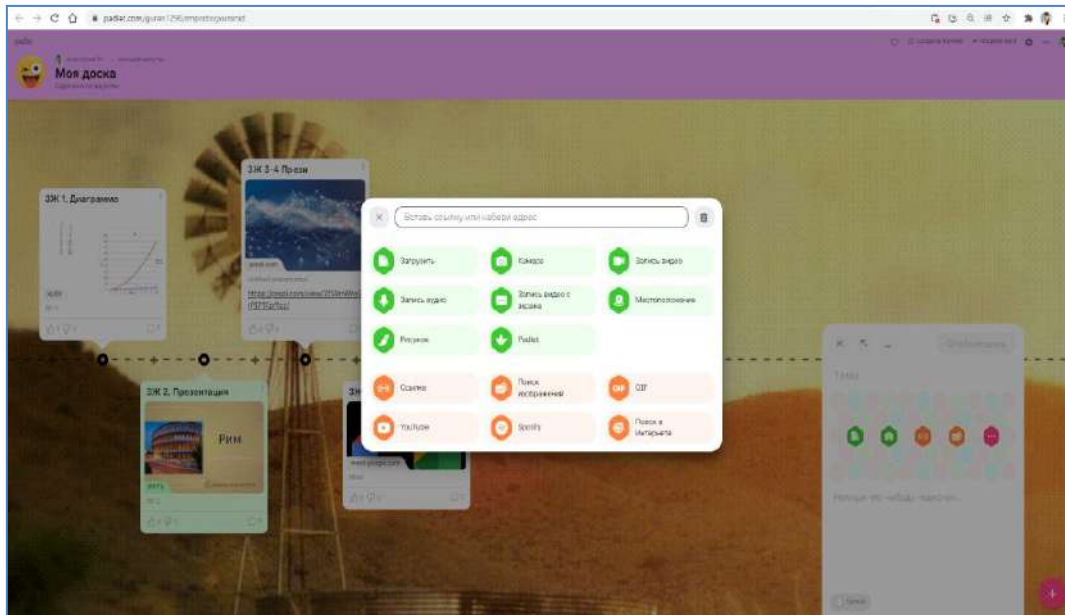


Figure –140. Padlet.com content options

In order to work together on boards, it is enough to link users to new users via QR-code, social networks or call to e-mail.

Thus, new participants were shown on the figure 141.

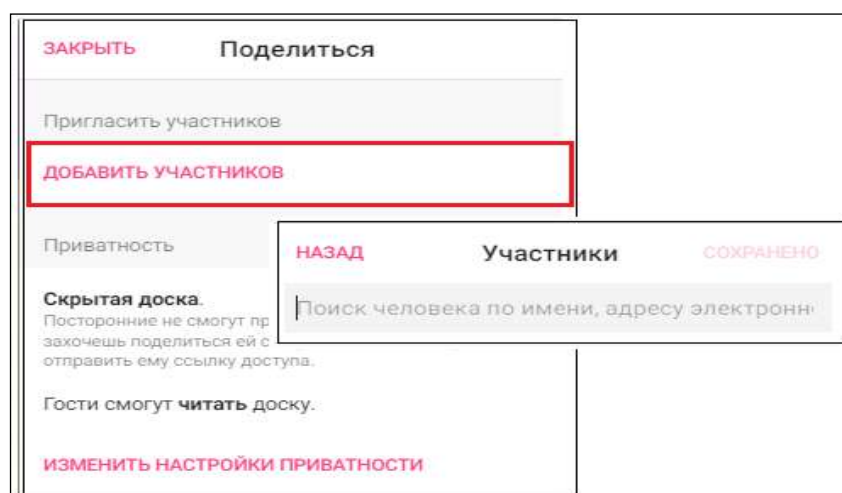


Figure –141. The window for calling new participants

Invited users can be given a role: viewer only or editor.

Users with the editor role can change the appearance of the board and add new cards. Finished boards can be saved in PDF format.

Padlet Features:

- creation of interactive whiteboards;
- collaboration and editing;
- branding of boards;
- adding media files, links and documents;
- access control;
- ready-made templates.

Wizer.me : interactive worksheets

Wizer.me - this is a community of teachers who create innovative educational resources for classes in an open information educational environment. Wizer can be used by teachers to create resources for the introduction of an «inverted» lesson, formative assessment, mixed learning technologies (interactive worksheets for practical work or homework, forms for final forms, forms for assessment, questionnaires and feedback). The capabilities of the service allow you to quickly create a wide range of tasks: open questions, choosing multiple answers, identification, matching, ordering, filling in gaps in the text, filling in explanations to an image, table, audio recording of a fragment. The Wizer service is an educational resource that publishes the experience and creativity of teachers and accumulates them in an open electronic gallery for further use or editing. On the platform of the service, it is possible to organize joint remote work of teachers to create didactic material.

Figure 142 shows the main page of the service.

The open gallery of the Wizer service presents a wide range of ready-made interactive worksheets created by the pedagogical community, including in Russian. The materials are structured by thematic and age categories. Any worksheet from the gallery can be used by the user by clicking the «use» button under the thumbnail of the worksheet. Then you can make the necessary corrections to the copy of the worksheet in the user account. You can share an interesting work page with your colleagues via links on social networks.

The design of interactive worksheets is carefully thought out so that users can choose the background and themes for formatting the font.

To create a personal interactive work page, the user must click the active «Create» button in the top menu or click the red button «Start now!» («Beginning») at the top of the main page.

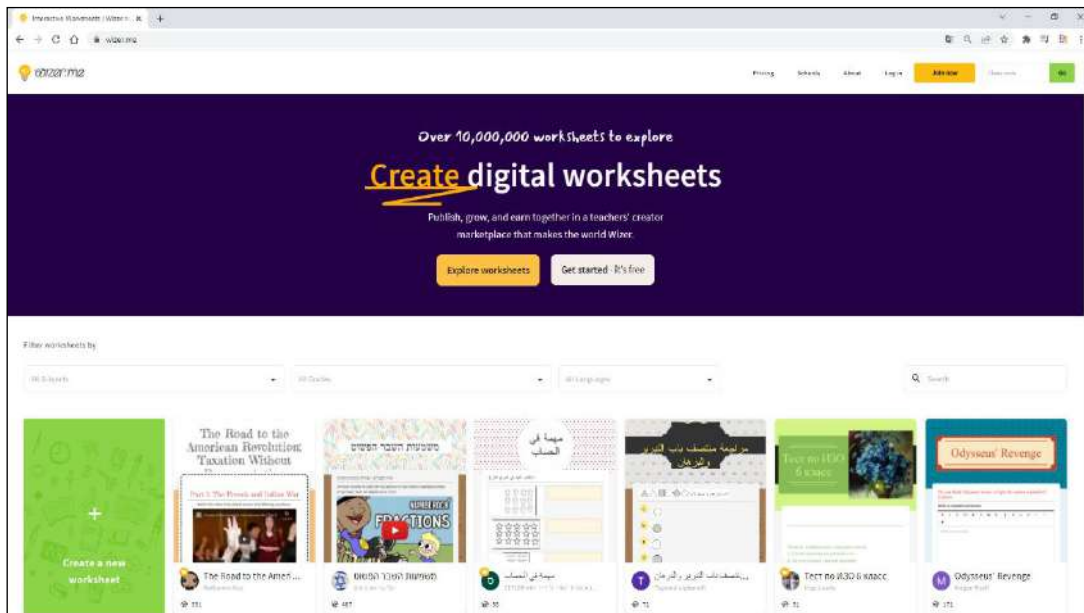


Figure –142. Wizer.me home page

Next, the user selects the type of task: an open answer, a choice of several answers, a text that fills in the gaps, a response by drawing, matching, filling in a table, classification, drawing, creating text, working with an image, working with a video fragment, adding a link, adding an interactive task from third-party resources (Google map, interactive poster ThingLink, Presentation of Slideshare, etc.).

The types of activity issues of Wizer.me are presented in Figure 143.

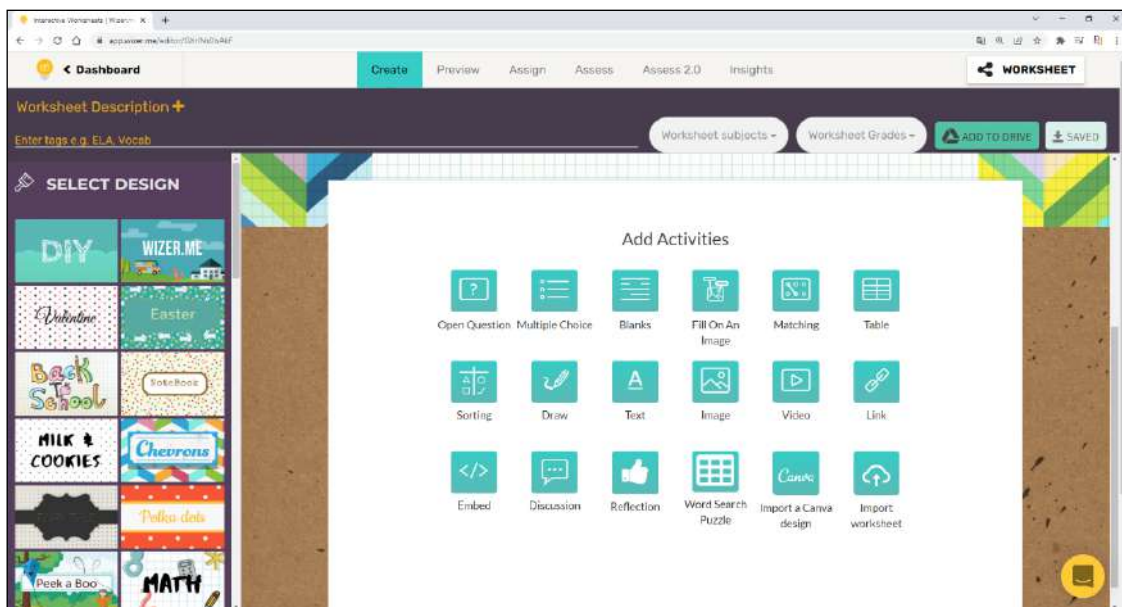


Figure –143. Wizer.me types of services

Most types of questions are evaluated automatically, so the check will be less timely. However, the tasks for the postcard need to be manual.

The Wizard service allows the user to add multimedia files (video, audio clips) to work assignments. Answering the task with an open answer, the student can record his answer in an eternal, graphic format, and also send the answer as an audio file. Accordingly, the user who compiled the task can record in the form of an audio file: a loud reading of the task or work, can ask question, the proportion of pronunciation.

Questions for testing and evaluating knowledge:

1. Discover the features of the Nearpod.
2. Explore the main features of the online test builder Onlinetestpad.com .
3. Analyze the features of the constructor Onlinetestpad.com .
4. Explore the possibilities of an online quiz tool Quizizz.com .
5. Learn the constructor Quizizz.com .
6. Consider the types of tasks LearningApps.org .
7. Specify the features of the exercise editor.
8. Consider the service of sending a link to the material LearningApps.org .
9. Expand the possibilities of the interactive online Jam board.
10. Learn the Jam board toolbar function.
11. Consider the platform service for creating online boards Padlet
12. Consider the types of content Padlet.com
13. Study the types of activity issues Wizer.me

Recommended literature

1. Helen Beetham, Rona Sharp. Pedagogy in the digital age. Educational design of the XXI century. –Almaty: Public bureau «National Translation Bureau», 2019. - 328 P.
2. Petrova E.V. Digital didactics: designing the educational process and its support // Modern pedagogical education. – 2018. – No. 4. –PP. 37–42.
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4. Zhusubalieva D.M. Formation of the foundations of information culture of students in the conditions of distance learning. –Almaty: Nauka. –199. –222 p.
5. Buzaubakova K.D., Nurmanalieva U.T. Distance education for future teachers-technology for creating creative guards and aspects of justice// Bulletin of the Al-Farabi Kazakh National University. Series «Pedagogical sciences». – №3(68). - 2021. - pp. 71-82.
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7. The Digital Competence Framework [Electronic Resource]. –2018. Update date: 12.2018. URL: <https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework> (accessed: 03/10/2022).

3.4 Creating and editing visual content

Today, education has completely moved to the digital environment: there are hundreds of thousands of video courses on the Internet. The video format affects visual, audio, logical and associative memory, which ensures maximum quality of learning: it is more convenient for users to watch a video lesson than to read a book or instruction. According to the research of the famous American educator E. Dale, learning is improved with the help of various teaching methods. In particular, two main memory channels are used to improve cognitive load – auditory and visual. This means that by combining video and conversational methods, students can learn more material than one or the other. Thus, video clips can be used to improve the effectiveness of student learning or as an addition to traditional teaching methods in the form of distance learning.

In the educational sample called «flipped classroom», students view home videos in advance, and in the classroom they hold a discussion on incomprehensible things. This is useful, allowing students to concentrate on learning as part of a collaborative effort and, if necessary, revise the original images.

Video tutorials allow you to logically, systematically, comprehensively organize the educational process, while maintaining a high level of motivation of students to study technology. Such a methodical technique as the use of videos and video tutorials in teaching allows you to make the studied material visual and can become a leading means of independent training of students.

Good instructional videos start with careful planning. Pre-production is often an important element of any shooting process, and it starts with sketches, storyboards and a clear strategy.

The plan can be as simple as a series of consecutive entries describing what types of content you want to see in the video, what the goals of the video are. A five-paragraph essay can become a solid and familiar basis for the image of quality education:

- 1) Introduction.
- 2) Information block-1.
- 3) Information block-2.
- 4) Information block-3.
- 5) Conclusion.

This may seem basic, but a good structure of introduction, information and conclusion can be the basis for clarifying sections of your video.

The length of your video is also important. The recommended duration of the first video is from 7 to 12 minutes. This is the average length of a presentation-style video. But if you choose a complex topic or want to do a brief overview of the audience, don't feel too limited. You can always shorten or increase the duration, but estimate the approximate time before you start. This helps to keep your content targeted and informative.

Power Point

Interactive videos can be created with the help of all your friends, as simple as Microsoft PowerPoint. The built-in Microsoft Mix plugin is responsible for creating the video. This feature has been available since Office 2010. With each subsequent version, the functions of the plugin have been changed, so in the 2010 version you can save your presentation as a video with a maximum extension of 280X720, in other words, HD quality, and since 2016 you can save it in the maximum form, Ultra HD (4K) quality with an extension of 3840x2160.

Exporting a presentation as a video to PowerPoint is shown in Figure 144.

Videos created in PowerPoint are a combination of a video sequence showing slides, which may also include previously posted videos.

YouTube and recording of the voice indicating the audio track. In addition to the simplicity of creating video lectures in PowerPoint, there is a significant drawback, this is the storage time of a local file, each slide is stored separately, and since "correction" of the audio recording is required, the saving process is quite lengthy. The storage time depends on the number of slides and their contents, as well as the technical characteristics of the personal computer.

When creating a video in this way, it should be understood that visual accompaniment is necessary before saving the presentation in video format so that it meets modern aesthetic parameters:

- Set the field ratio to 16:9, the default is 4:3;
- Add transitions between slides;
- Insert view, fade and highlight animations into blocks with text information and illustration.
- Turn on the necessary video information.

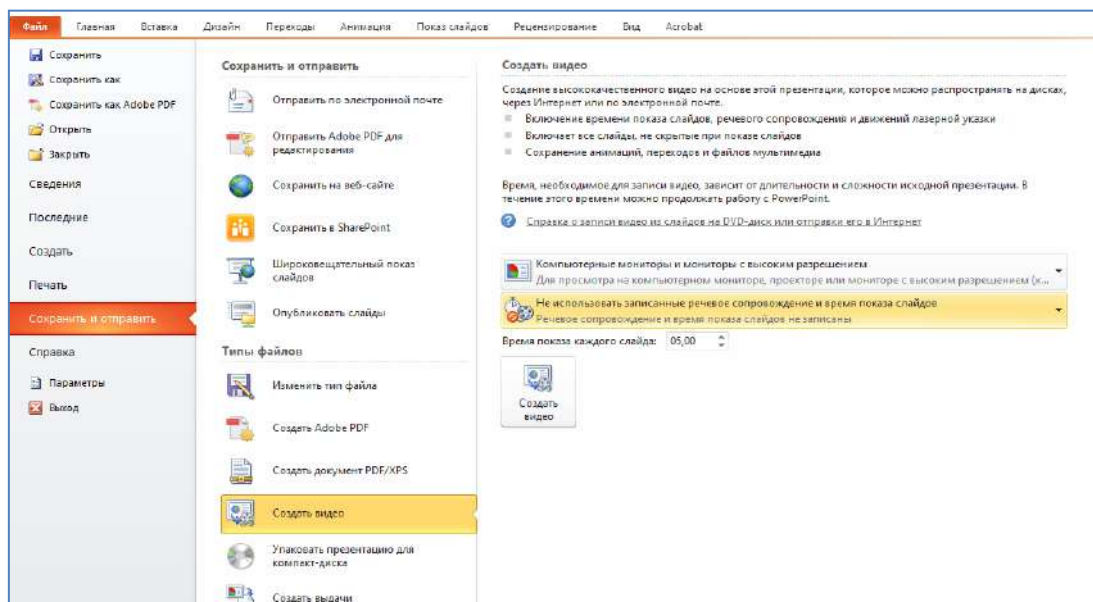


Figure –144. Creating a video from a Power Point presentation

Fulfilling these simple requirements will not only benefit you, but will also create a visually excellent training image.

The Animation tab is shown in Figure 145.

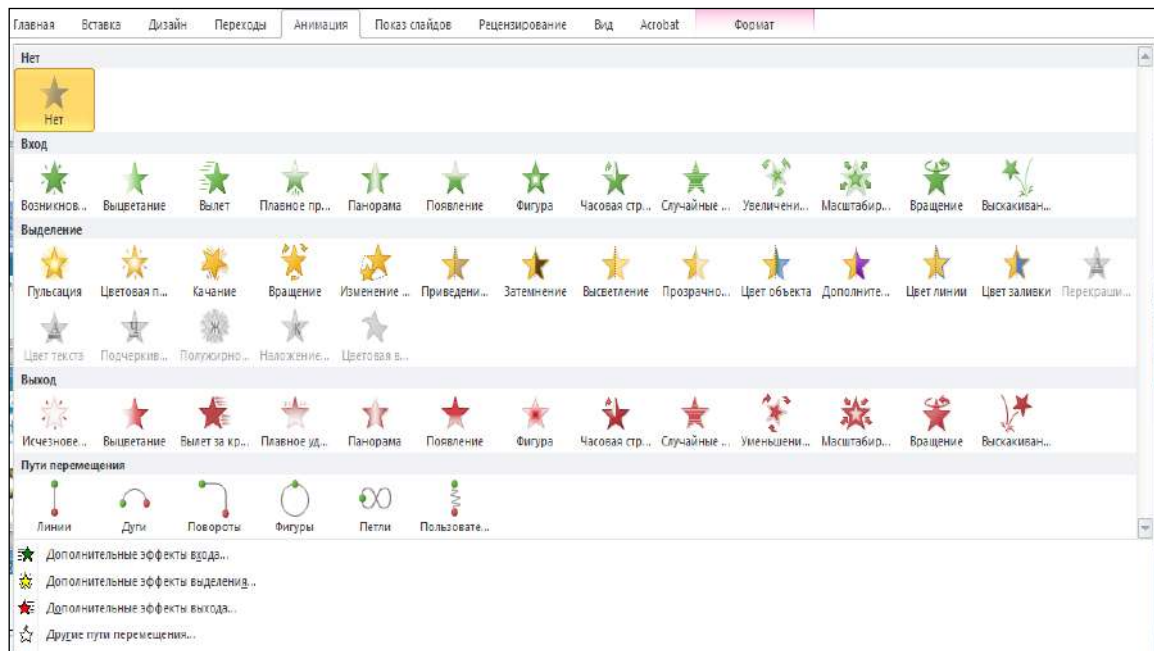


Figure –145. PowerPoint Animation tab

Screencasting - Camtasia Studio

The video editing process starts with choosing the software. There are many options on the market that differ in availability and, accordingly, tools. Software that provides free use may have a limited number of functions.

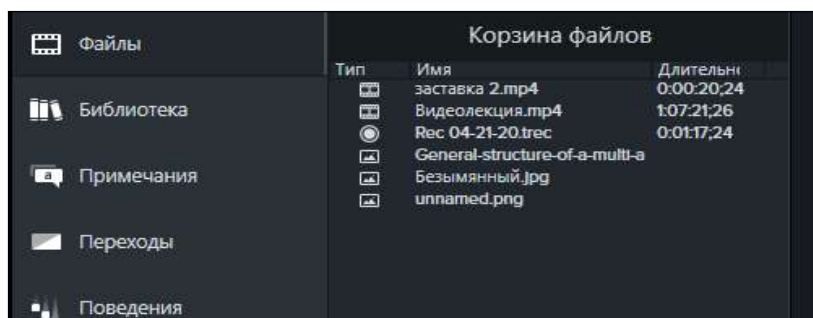
In 2002, TechSmith Corporation developed the Camtasia Studio screencasting and video editing software.

Camtasia Studio is a screencasting program with post-industrial processing. The program does not have a wide range of capabilities of professional video processing programs, such as Adobe Premiere Pro and Pinnacle Studio, but its tools are enough to create training videos. In addition, despite the fact that Camtasia Studio is paid, developers allow you to use the trial version with full access to the tools for 30 days after its installation. In addition, the videos in the free version are stored without a watermark (watermark), which is also an important achievement. The cost of the commercial version for January 2022 is 130,000 tenge.

So, after choosing a video editing program, regardless of the selected program, the first step is to add all the materials to the project.

The window for adding materials is shown in Fig. 146.

Starting with the Camtasia Studio 2019 version, it allows you to add not only audio, video materials and images, but also PowerPoint presentations, while the entire presentation is divided into slide images, which simplifies the editing process.



Figure–146. Adding materials to the project

After all the materials are connected, they must be arranged in the desired sequence in the tracks on the plot board, and the video sequence of materials located in the upper tracks overlaps the lower one. The line in which the materials are placed is shown in Fig.147.

The above fact must be taken into account when creating a picture-in-picture image or when processing a video with a chrome key effect.

The process of working with materials begins with the removal of unsuccessful fragments of the recording, for this you can use the toolbars located on the left side of the window above the storyboard tracks.

After removing all the "failed" fragments, it can be assumed that the simplest video sequence has been created, but in order for it to become "attractive" to future listeners, it needs to be refined with the help of existing chips.

For example, to eliminate annoying sounds (noises, mouse clicks), you can add video transitions, animation, and put muted music on the background.

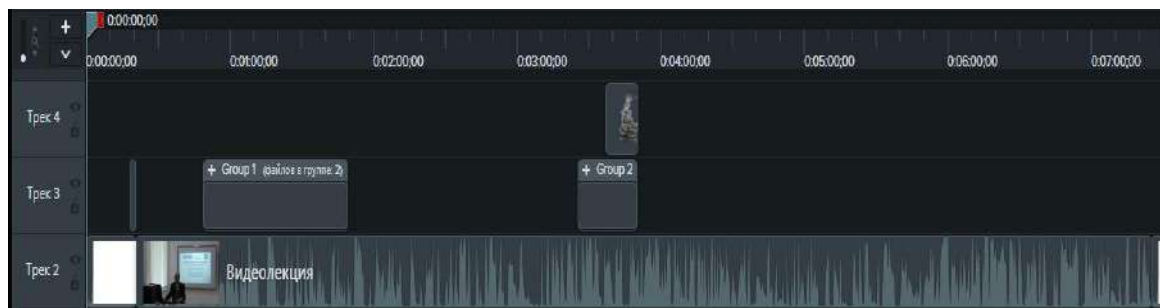


Figure –147. Placement of materials on the mounting tracks

After completing the video editing process, save the resulting file in mp4 format.

After clicking the «Next» button, the rendering process begins, the duration of which depends on the duration of the video lecture and the technical characteristics of the computer. In addition, the process of storing video on a computer with the largest amount of RAM and a video card is much higher, on the contrary, rendering on weak computers may be accompanied by error messages indicating insufficient system memory, storage is impossible. Additional tools are shown in Figure 148.

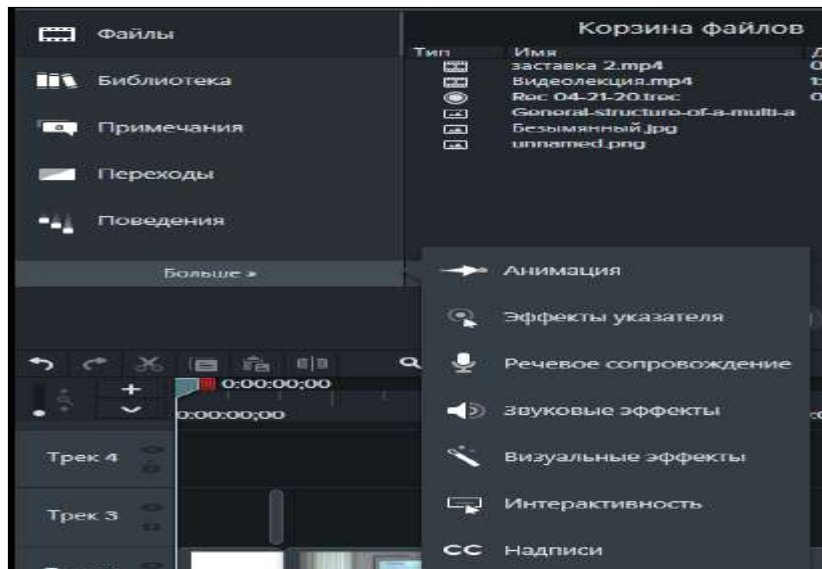


Figure –148. Additional video editing options

It is worth noting that the program allows you to save a video file in any format, but this function is only available when saving in user settings mode. It is worth admitting that mp4 is currently the most popular because of the small amount of video, just for its subsequent integration on any platform.

Adobe Premiere Pro

In September 2003, Adobe Inc. developed a video editing program based on Adobe Premiere Pro timekeeping.

Premiere Pro is the leading professional video processing software. Creative tools and integration with other applications and services will help you turn your frames into perfect video frames.

The Adobe Premiere Pro workspace is shown in Figure 149.

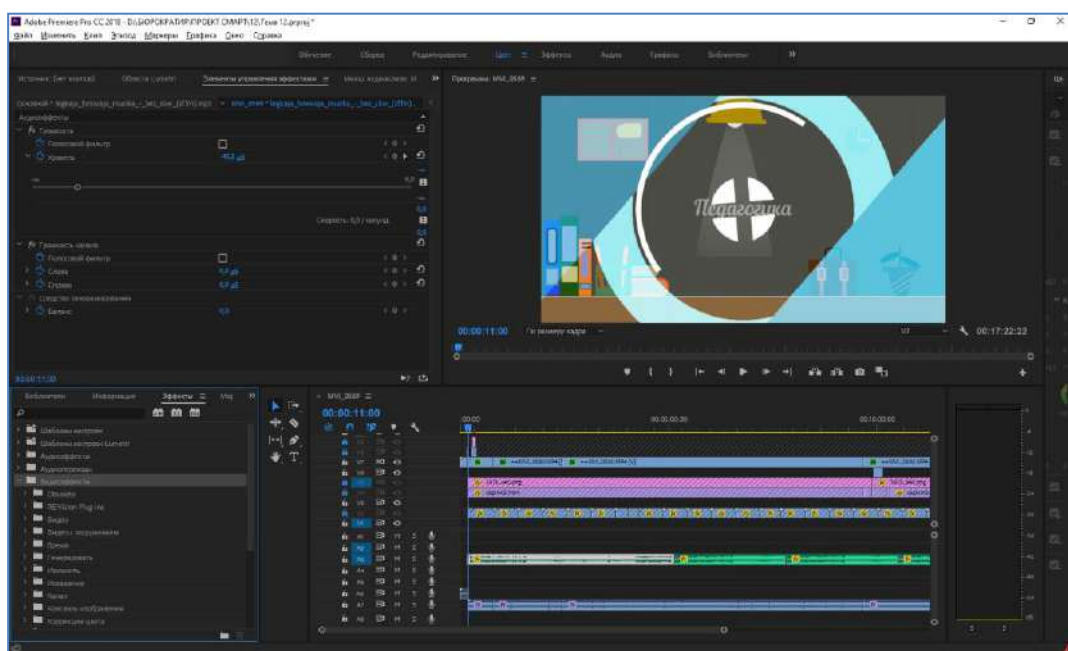


Figure –149. Adobe Premiere Pro work program

Features and Benefits:

- 1) Processing frames from any camera in any format from 8K to virtual reality.
- 2) Premiere Pro integration with other applications, including Adobe Photoshop, After Effects and Audition.
- 3) Reformatting the video.
- 4) Auto-save.
- 5) Access to thousands of high-quality audio files.
- 6) You can create high-quality tutorial videos with Premiere Pro. There are many ways Premiere Pro can be used by employees and teachers.
- 7) Import videos and edit recorded lectures.
- 8) Edit and customize clips to remove unnecessary frames, improve educational material or create instructional videos.
- 9) Combine short images and turn them into a comprehensive training.
- 10) Adding text, image and video transitions.

Unlike other Premiere Pro video processing programs, it allows you to adjust colors, has a built-in equalizer that allows you to adjust sound parameters.

The Adobe Premiere Pro equalizer is shown in Figure 150.

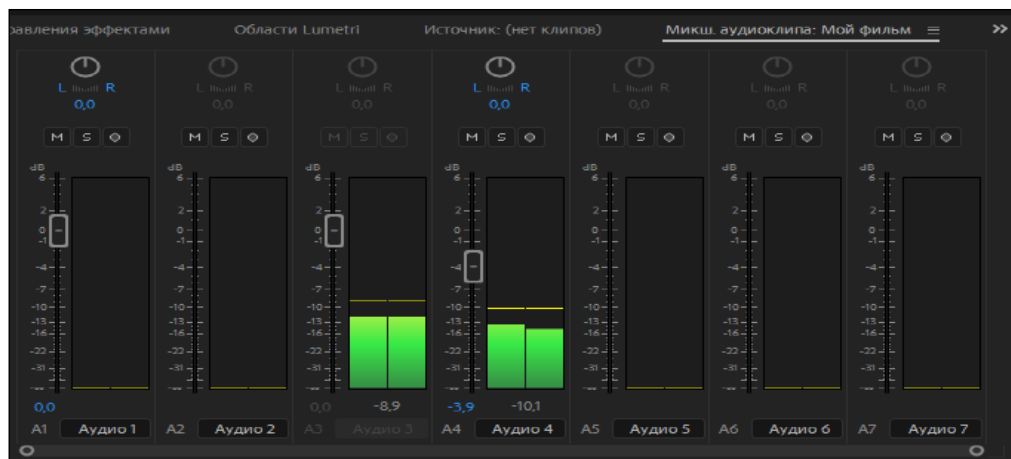


Figure – 150. Adobe Premiere Pro Equalizer

Premiere Pro offers various editing tools that you can use on your desktop or mobile device (Premiere Rush app) to integrate frames. In addition, you can add themes, transitions and color presets to your videos.

The color change window is shown in Fig. 151.

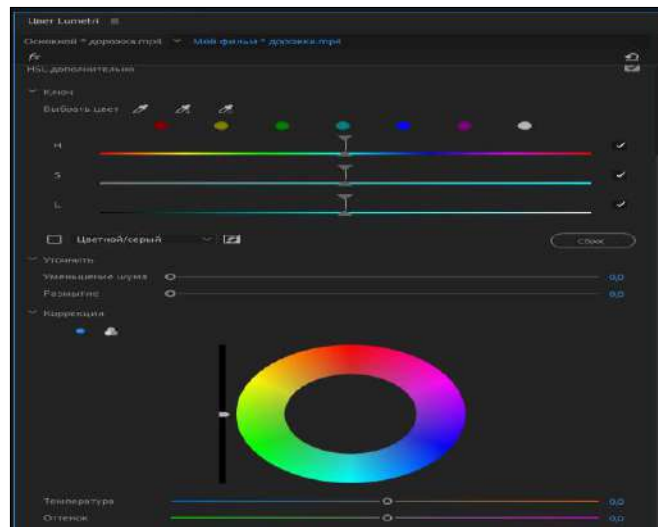


Figure – 151. Adobe Premiere Pro color change

Autoplay media studio

AutoPlay Media Studio is designed to create multimedia projects. With AutoPlay Media Studio, you can create electronic textbooks, CD/DVD covers, presentations, simple games, electronic photo albums, video collections for viewing, simple audio and video players.

There are many ready-made templates in the AutoPlay Media Studio program. For example, you can create a menu with various buttons to launch programs, play sounds, print files, open Internet sites. The project can be decorated with music, video, flash animation, text.

The project may include graphic, video, audio and animation objects prepared with the help of special software tools. If you have skills working with programming languages C, C ++, Java, Visual Basic, then the capabilities of this program will increase significantly.

Any project object can be assigned a specific action. The program offers a wide range of different actions that can be associated with objects. Using transparency masks, you can create windows of automatic launch of any shape. As such a mask .x .jpg, .bmp, .png image files can be used.

The application created using AutoPlay Media Studio is presented as an object template at the final stage. This model consists of a group of individual pages on which you can place any objects (graphics, text, video, Flash, HTML, etc.).

The capabilities of AutoPlay Media Studio can be expanded with the help of additional plug-ins. With their help, you can automate some frequently performed tasks.

The finished project can be presented as a self-extracting archive, saved as a separate folder on the hard disk or recorded directly from the program on CD/DVD/BLu-Ray. The program creates a graphical shell of the disk and all the necessary files for its automatic launch. In addition, it is not necessary to have AutoPlay Media Studio installed on the computer to launch the project.

Questions for testing and evaluating knowledge:

1. Expand the features of PowerPoint.
2. Consider the possibilities of creating a video from a PowerPoint presentation.
3. Analyze the features of Camtasia Studio.
4. Study the placement of materials on the mounting tracks.
5. Explore additional video editing options.
6. Consider the interface of the Adobe Premiere Pro workspace.
7. Learn the Adobe Premiere Pro equalizer.

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2. Petrova E.V. Digital didactics: designing the educational process and its support // Modern pedagogical education. – 2018. – No. 4. – PP. 37–42.
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3.5 Mass open online courses

Modern high-tech life requires constant and continuous, personal and professional development of each member of society, in which new tasks constantly arise in all spheres of human activity.

The development of information technologies presented in accordance with Figure 152 contributes to the modernization of educational technologies and the general education system. In this regard, the most promising direction is self-education within the framework of mass educational online courses.

A massive open online course is an online course that can be taught by an unlimited number of participants. MOOC-includes both traditional materials and theoretical text materials, such as video lectures, although most of them provide interactive forms of presentation and consolidation of the material, and also include means of communication between students and teachers. MOOC is a relatively new approach to education, highlighted in 2008 as a separate concept, which became popular in 2012.



Figure – 152. Development of educational technologies

Let's analyze the concept of a "massive open online course". A massive open course means that it is not intended for certain people, it can be read by any users. The most popular courses are viewed by millions of students.

Coursera

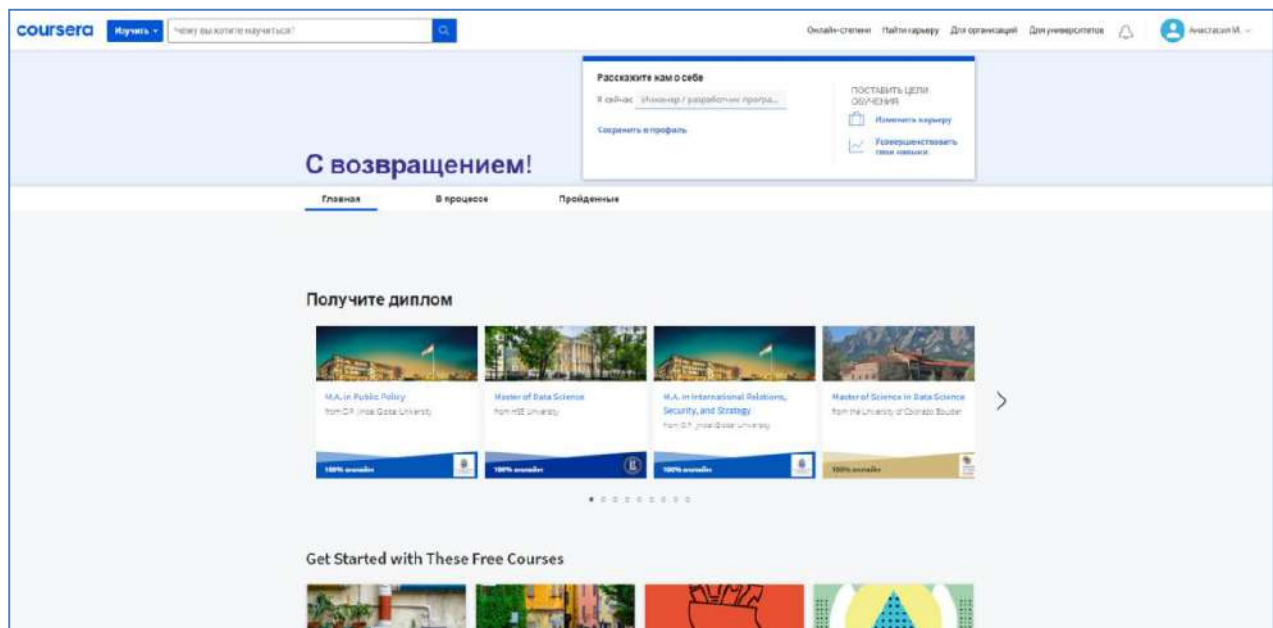
Coursera is an online learning platform founded by two computer science professors at Stanford University. In 2012, Coursera began working at Stanford, Princeton, Michigan and Pennsylvania. In July 2012, 12 partner educational institutions were added and 17 more institutions in September 2012. In February 2013, the project announced 29 more partner universities. The number of partners as of 2014 is 108. Among the universities cooperating with the project are Johns Hopkins University, the California Institute of Technology, the University of Edinburgh, the University of Toronto, Columbia University, the University of Pennsylvania, the Moscow Institute of Physics and Technology, the Higher School of Economics of the Vyatka State Agricultural Academy. The platform has over a thousand online courses in partnership with more than 200 leading universities and companies around the world, including Yale, Princeton, UPenn, Google, IBM, Amazon, Facebook, etc.

Coursera offers both individual courses and bachelor's and master's degree programs that reduce barriers to higher education. There are also professional

certificate programs for employees that are designed for placement in new jobs or career growth, in other words, for advanced training courses.

Coursera's courses range from well-known personal development courses such as the Yale Wellness Science Course to employee development programs at companies such as Google and IBM. Coursera also offers online degrees in fields such as healthcare and computer science. The programs of courses or degrees are mainly focused on academic sciences.

The course catalog window on the Coursera platform is shown in Fig. 153.



Figure–153. Catalogue of courses on the Coursera platform

Most courses are presented in English, but most video tutorials have subtitles in other languages, including Russian. The main form of the courses is video tutorials, text information is not always provided, third-party platforms and applications of leading companies, such as Microsoft, are mainly used to perform practical work.

The structure of courses on the Coursera platform is shown in Fig. 154.

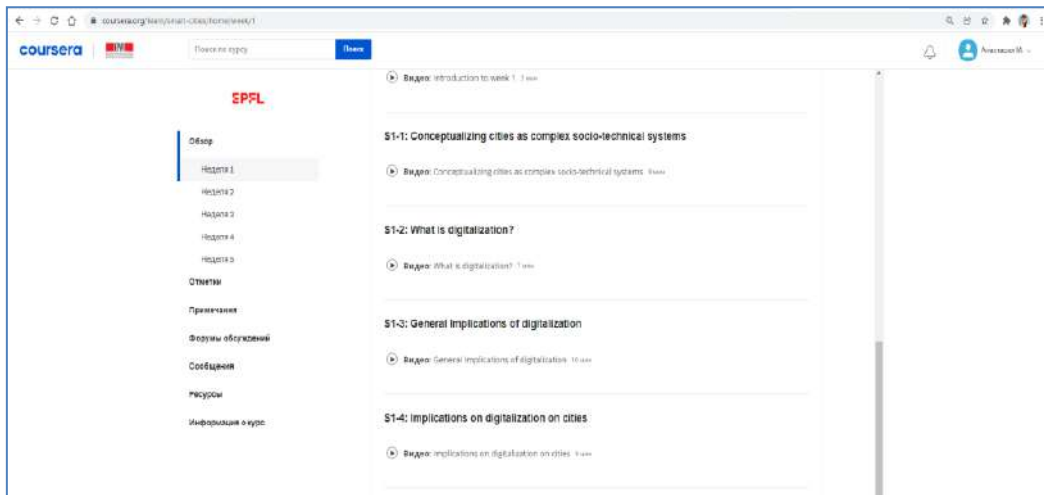


Figure – 154. The structure of courses on the Coursera platform

The cost of courses usually ranges from 3,39 or 4,49 per month, but depending on the type and topic for individual courses, it can reach hundreds of dollars. The site also offers a 399-year Coursera Plus subscription, which gives users unlimited access to more than 90% of eLearning's online courses (over 3,000 lessons).

Edx provider of massive open online courses

EdX is an American provider of massive online courses developed by Harvard and Massachusetts Institute of Technology. In 2012 edX.org For the first time, a course on circuits and electronics by Professor Agarwal at MIT was opened on the site. More than 155,000 students from 162 countries are registered. The Open edX platform was later released in 2013 as open source software. To date, the Open edX platform provides more than 2,400 educational sites around the world.

The edx platform is shown in Figure 155.

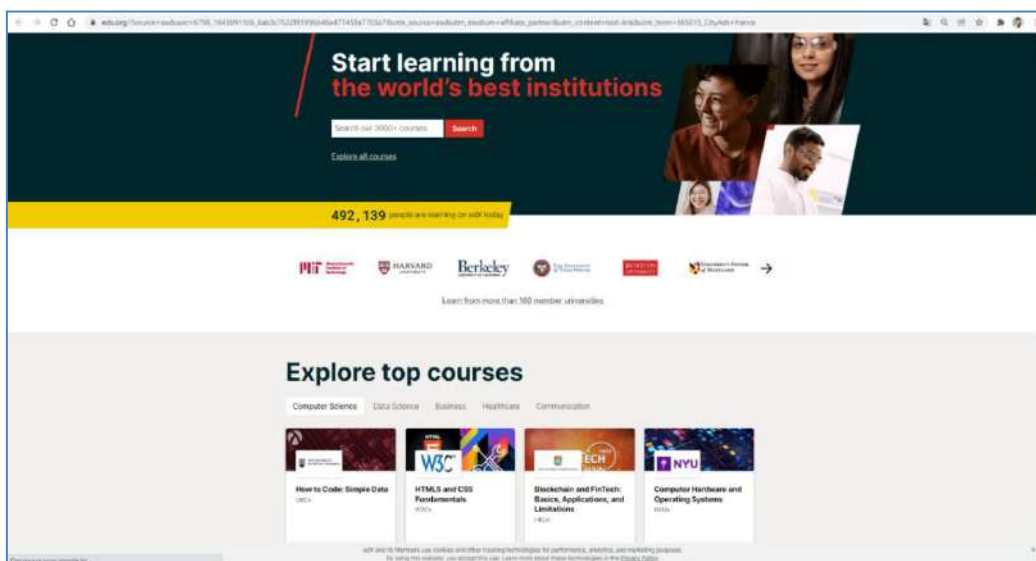


Figure –155. Edx platform

The Edx platform offers online university-level courses in a wide range of disciplines to students from all over the world. EdX covers topics from public speaking to game development. The courses are designed for all students, including those who want to enter the labor market, get a promotion or master new topics.

Classes are delivered directly from leading universities and institutions such as Harvard, MIT, UC Berkeley, Microsoft, IBM and The Smithsonian. edX also has programs consisting of several related courses, professional certificates, and even full online master's degree programs.

EdX courses usually consist of weekly modules with pre-recorded videos that can be viewed on a schedule or at your own pace.

There are additional study materials and forums for students to discuss, as well as assessments such as homework assignments and short tests or exams.

Access to the materials is free, but the procedure for checking the final exam, which allows you to get a certificate, will be paid.

EdX runs on an open source free software platform.

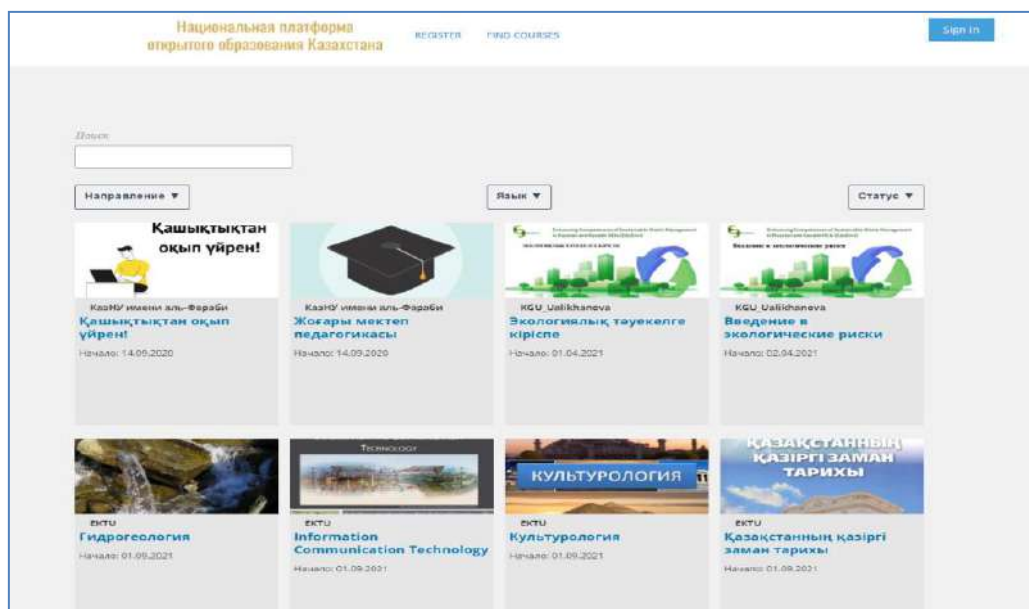
National Open Educational Platform moocs.kz

Moocs.kz -National Open Educational Platform of Kazakhstan (NEP) –

The platform has online courses in the main bachelor's degree disciplines taught in higher educational institutions.

The NIPP consists of 12 universities participating in the consortium and 13 partner universities. More than 25 courses are presented on the platform, more than 3,500 students are registered, lectures are given by 50 teachers of leading educational institutions of the country.

Moocs.kz the catalog of courses on the platform is shown in Fig. 156.



Figure–156. Moocs.kz course catalog on the platform

There are various topics of online courses in physics, computing, conversational Korean, ecology and even bread production technology. The course materials are presented with video materials, as well as auxiliary text data, knowledge is tested using quizzes.

Open University of Kazakhstan openu.kz

The Open University of Kazakhstan is an educational platform that provides free of charge the best textbooks of the world's leading universities on history, philosophy, sociology, psychology, anthropology, cultural studies, religious studies, linguistics, innovation, media, economics, management and business.

Open University of Kazakhstan openu.kz is shown in Fig. 157.

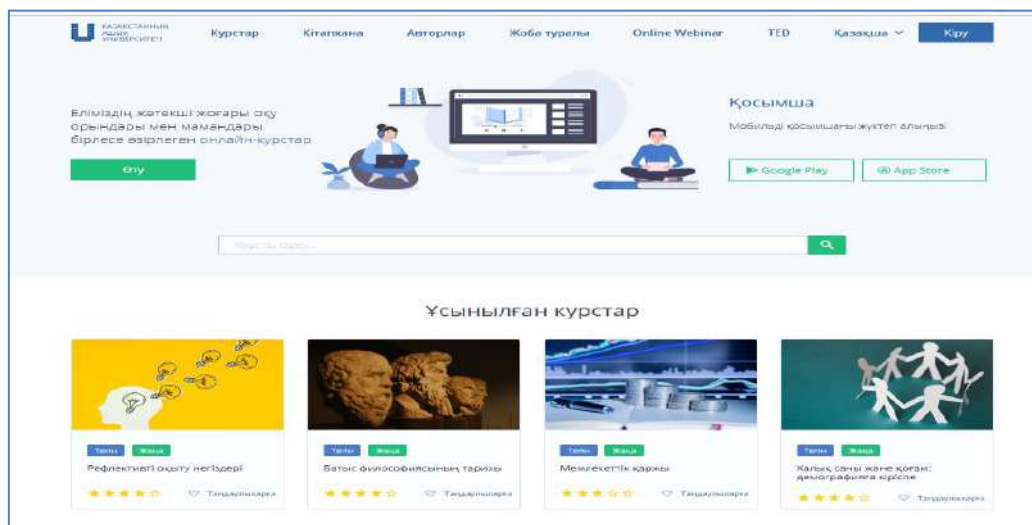


Figure –157. Open University of Kazakhstan openu.kz

According to the new textbooks translated into Kazakh, students can study online through the educational platform «Open University of Kazakhstan». Every student has access to online courses from leading universities and the best teachers not only in Kazakhstan, but also in Europe, Asia and America.

Unlike other platforms built on proprietary development code, it is not open (opened), so openu.kz courses located on the open university platform differ in the interface. This fact is an advantage of the platform, since it provides developers with unlimited opportunities for innovation, and is a disadvantage of the platforms, since it restricts exports and imports between platforms.

Openu.kz the interface of the course on the website is shown in Fig. 158.

The courses are a structural demonstration of the author's images and text information. The total number of video tutorials developed is more than 560. Innovative video tools are used in the development of video tutorials. For example: screencast, chrome key and neon panel. Different types of test questions are used to test knowledge: there are one or more correct (answers), a drop-down list, drag-and-drop questions, matching questions, etc.

In figure 160 moocs.dulaty.kz the «drop-down list» question type is set on the platform.

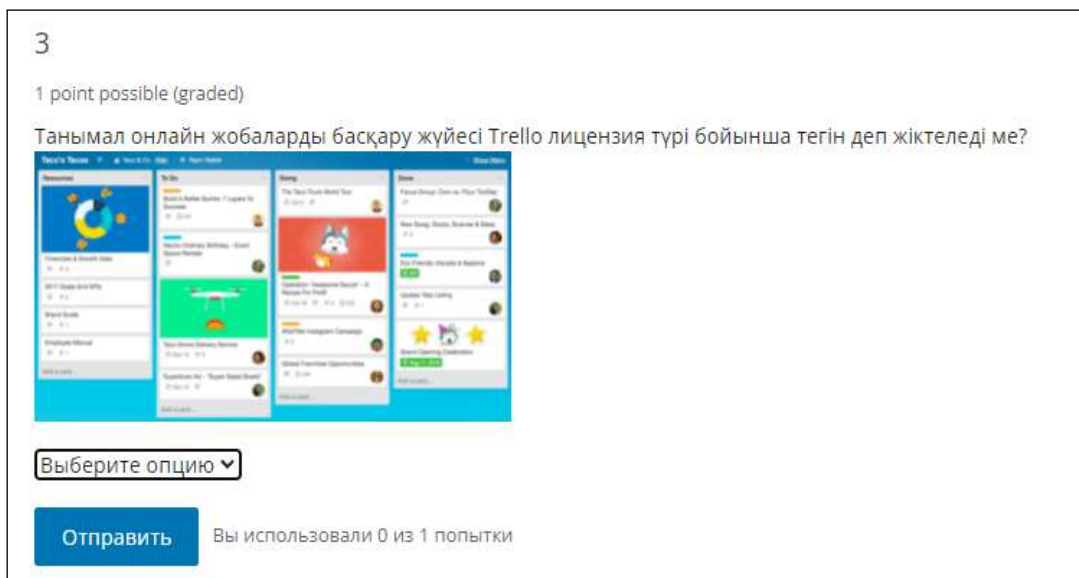


Figure –160. Question type «drop-down list» on the platform moocs.dulaty.kz

The platform is built on the basis of open source Edx, which allows you to import the created courses into the National Open Education Platform.

The «export» page of Online courses is shown in Fig. 161.

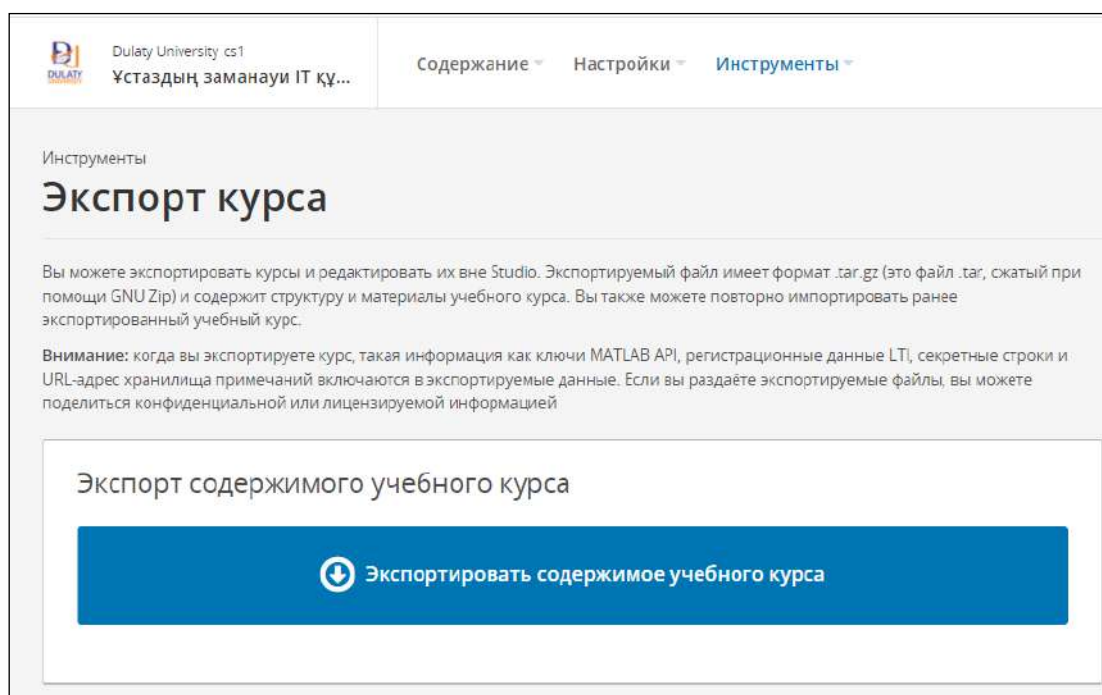


Figure –161. Export page

Questions for testing and evaluating knowledge:

1. Educational development technologies are being studied.
2. Coursera platform to open the structure of courses.
3. The eternal hunger of the EDX platform.
4. Moocs.kz explore membership in the National Open Education Platform.
5. Openu.kz features of the Open University of Kazakhstan
6. Open it.
7. Dulaty University moocs.dulaty.kz eternal hunger of the platform.

Recommended literature

1. Helen Beetham, Rona Sharp. Pedagogy in the digital age. Educational design of the XXI century. – Almaty: Public bureau «National Translation Bureau», 2019. – 328 p.
2. Petrova E.V. Digital didactics: designing the educational process and its support // Modern pedagogical education. – 2018. – No. 4. –PP. 37–42.
3. Nurbekov B.Zh. Theoretical and methodological foundations of a student's professional activity in distance learning. Diss. abstracts prepared for the degree of D.P.S. – Almaty, 2010. –51 p.
4. Zhusubalieva D.M. Formation of the foundations of information culture of students in the conditions of distance learning. –Almaty: Nauka. –199. –222 p.
5. Buzaubakova K.D., Nurmanalieva U.T. Distance education for future teachers-technology for creating creative guards and aspects of justice// Bulletin of

the Al-Farabi Kazakh National University. Series "Pedagogical sciences". – №3(68). - 2021. - pp. 71-82.

6. Aimaletdinov T.A., Baymuratova L.R., Zaitseva O.A., Imaeva G.R., Spiridonova L.V. Digital Literacy of Russian Teachers. Readiness to use digital technologies in the educational process. –M.: Publisher of NAFI, 2019. – 84 P.

7. The Digital Competence Framework [Electronic Resource]. -2018. Update date: 12.2018. URL: <https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework> (accessed: 03/10/2022).

3.6 Electronic textbook: features and capabilities

The use of digital technologies, electronic textbooks in the educational process of the university helps the future teacher to improve himself, and also contributes to the formation of his creativity, allows him to more fully and deeply assimilate the material.

At the preparatory stage of using an electronic textbook in the educational process:

- the system of diagnostics of knowledge, skills, acquired by the future teacher is provided;
- educational and informational data will be collected, which will help to fully reveal the essence of the topic chosen by the future teacher, an innovative and information bank is being created.

At the main stage of using an electronic textbook:

- the teacher can capture his material on the on-screen display;
- the teacher has the opportunity to provide feedback to students: to advise and monitor the future teacher in accordance with the level of knowledge;
- the lesson opens up the possibility of controlling all the activities of the future teacher; there is an opportunity for self-control of the student's knowledge.

At the final stage of using an electronic textbook in the educational process:

- it will be possible to identify and fix gaps and shortcomings in the future teacher's activities in a timely manner;
- to reveal the reason for the omission in the activities of the future teacher, to analyze the educational activity as a whole;
- there will be a full opportunity to provide preventive measures and prevent deficiencies in the educational activities of the future teacher.

The professional competence of the future teacher is characterized by his professional and individual qualities. The professional competence of the future teacher is the unity of his theoretical and practical training, achieving high results for the implementation of pedagogical activity.

In higher educational institutions that train teaching staff, electronic textbooks play a special role in the formation of information and communication competencies of future teachers.

According to the research of the author of this textbook, the scientist K.D.Buzaubakova, the electronic textbook introduces future teachers to the subtleties

of the pedagogical process, forms a systematic approach and professionally significant personal qualities of future teachers to pedagogical activity; the future teacher gets acquainted with the structure of pedagogical science, the object of research, the functions and methods of teaching, the school management system; possesses new knowledge on theoretical-methodological foundations, theory and methodology of education, theory and methodology of teaching, pedagogical management system; owns the methods of implementation of the pedagogical process and innovative pedagogical technologies.

The purpose of using digital technologies in teaching and learning is to arouse the interest of the future teacher; to increase the activity of the future teacher.

The most important thing is that when using an electronic textbook in teaching and learning, the teacher becomes not an interpreter, an observer, an appraiser of ready-made knowledge, but the core of collective affairs that organize cognitive activity. Only such training opens the eyes and develops the creativity of the future teacher.

It is advantageous to use an electronic textbook in the educational process of the university, which will allow the future teacher to independently master new knowledge and conduct a creative search.

Thus, the main feature of the electronic textbook «Pedagogy» for students of the pedagogical university of the scientist K.D. Buzaubakova is that the theoretical material is grouped in such a way as to form the creative competence of the future teacher.

When using the electronic textbook «Pedagogy», future teachers master the collection of new information as a result of constructive thinking; critical analysis and evaluation of factual evidence; guaranteed solutions and generalized conclusions; making forecasts and rational proposals based on extensive experience.

The future teacher, taking into account the given context, forms skills such as collecting arguments and applying adequate criteria for decision-making through observation and listening.

The formation of digital competencies of future teachers using K.D. Buzaubakova's electronic textbook «Pedagogy» has the following advantages:

- future teachers work independently: the future teacher independently searches for and timely finds in the material under consideration the material he needs, new information;

- the cognitive activity of future teachers increases: in the process of cognition at different levels, the future teacher activates tasks to effectively solve problems arising from his interests and needs.

- the creative thinking of future teachers is formed: the future teacher has the opportunity to find answers to the most difficult questions, make decisions, think constructively; the future teacher learns to evaluate his own, someone else's point of view and thereby think critically; the future teacher learns to compare, identify logical connections between previously passed material and new knowledge;

- the creative search of future teachers is formed: the ability to pose a problem, look for answers to questions, sort the result, etc.; as a result of critical thinking,

future teachers find the optimal solution to the problem and justify it with arguments; look for other ways to solve the problem; comprehensively in-depth study, observation, analysis of the pedagogical process creates; tries to prove their thoughts, their conclusions; the main thing is that the future teacher independently assimilates knowledge; develops himself.

Of particular importance is the use of electronic textbooks in universities, since the digital competencies of future teachers are formed only through their practical skills of critical thinking, searching, processing and sorting new information.

The peculiarity of the electronic textbook is that the drawing, tables contained in the theoretical material are based on the creative thinking of students, creative search.

When using digital technologies in teaching and learning, a computer as a working tool serves as a means of preparing and memorizing text; a text editor; a drawing tool, a table, a graphic editor; a computer; a sketching tool.

The use of digital technologies in teaching and learning is a method used to understand, evaluate, analyze and synthesize information obtained as a result of control, experience, reflection and reasoning.

The use of digital technologies in teaching and learning includes the collection of relevant information; critical analysis and evaluation of evidence; guaranteed solutions and generalized conclusions; revision of forecasts and proposals based on extensive experience.

The electronic textbook «Pedagogy» introduces future teachers the subtleties of the holistic pedagogical process, equips the theory of pedagogical activity; forms a systematic approach and professionally significant personal qualities of future teachers to their professional activities; forms a systematic approach of future teachers to their professional activities; forms the readiness of future teachers for creative research, self-education; allows future teachers effectively apply innovative technologies in the educational process; assumes an activity orientation in teaching; promotes the cognitive activity of students; promotes the use of interactive teaching methods and techniques; develops digital-creative competencies of future teachers.

When using the electronic textbook «Pedagogy» in the educational process, future teachers comprehensively improve their knowledge using various information and video materials, the ability to constructive thinking increases, interest in the subject increases, creative search is formed, the opportunity opens up again and again to study the misunderstanding of the topic.

The electronic textbook is intended for students of higher pedagogical educational institutions studying in pedagogical specialties.

Functionality: the electronic textbook introduces future teachers the subtleties of the pedagogical process, forms a systematic approach to pedagogical activity and professionally significant personal qualities in future teachers; the future teacher gets acquainted with the structure of pedagogical science, the object of research, the functions and methods of teaching, the school management system; gets acquainted with the theoretical and methodological foundations of pedagogy, theory and methodology educating, mastering new knowledge on the theory and

methodology of teaching, the system of pedagogical management; owns the methods of implementation of the pedagogical process and innovative pedagogical technologies.

Main technical characteristics:

- Processor-Intel III-500 MHz;
- RAM-64 Mb;
- HDD-2 Gb open space;
- Vega-8 Mb;
- CD-ROM-20x;
- Operating System-Windows '98 and Windows ME and Windows XP

Processor: Microsoft®Windows®. Intel® Pentium® II or a typical processor with a clock frequency of at least 450 MHz, AMD Athlon® or a typical processor with a clock frequency of at least 600 MHz.

Zerde: 128 MB of Mac OS X RAM. Intel Core™ Processor Duo with a clock frequency of at least 1.33 GHz, PowerPC® G3 processor with a clock frequency of at least 500 MHz, 1 with a clock frequency of at least 128 MB of RAM.

Programming language: Action Script 2.0.

The purpose of the electronic textbook: formation of a systematic approach of future teachers to their professional activities; improvement of the readiness of future teachers for self-education; training of future teachers in the effective use of information technologies in the educational process; formation of information, creative competence, digital and creative competencies of future teachers.

The main menu of the electronic textbook

The main menu of the electronic textbook consists of 6 blocks:

- 1) Theory;
- 2) «Bilgenge marzhan»;
- 3) Heritage from the Great;
- 4) Glossary;
- 5) Photo Gallery;
- 6) Literature (fig.162).

By the end of the main menu of the electronic textbook in the center there is a click «Exit», and on the right there is a click «Instruction» and «Copyright».

I. The block of the electronic textbook «Theory» consists of 12 cells – 12, i.e. 12 lectures:

- 1) «The priority role of education in modern conditions».
- 2) «General characteristics of the teaching profession and activity».
- 3) «Pedagogy in the system of human sciences. Methodological foundations and methods of pedagogical research».
- 4) «Personality as an object, subject of education and a factor of its development and formation».
- 5) «The essence and structure of the holistic pedagogical process (CCI)».
- 6) «Scientific worldview is the basis of intellectual development of a student».



Figure – 162. The main menu of the electronic textbook

- 7) «The essence and content of education in a holistic pedagogical process, the basics of family education».
- 8) «Forms and means of education».
- 9) «The value of the learning process».
- 10) «Scientific foundations of the content of education in a modern school».
- 11) «Forms, methods and means of teaching as a driving mechanism of a holistic pedagogical process».
- 12) «Diagnostics and control in teaching, teaching technologies in the professional activity of a teacher» (Fig.163).



Figure –163. The «Theory»block of the electronic textbook

If you click on the «Topic 1» cell, the content of topic 1 will open (Fig.164).

In the upper left edge of heading 1 there are 2 small cells:

a home-shaped cell; a rectangular cell separated by 3 dashes arranged parallel to each other.

If you click on the cell of the home form, you will return to the Main Menu. And if you click on a rectangular cell divided by 3 dashes parallel to each other, the main menu of theme 1 opens, in which the following cells are located: «Test»; «Blitz tour»; «Video tutorial»; «Pedagogical crossword puzzle»; «Pedagogical situation»; «Creative task».



Figure – 164. The «Theme» part of the «Theory» blog of the electronic textbook

The «Test» blog of the electronic textbook contains 10 test tasks for monitoring and evaluating knowledge on each topic. If the answer is correct, a green sign, and if incorrect, a red one; at the end of the test, it is indicated how many questions were answered correctly and how much time it took (Fig.165).

You can improve the result by clicking the «again» button. This time, the sequence or number of times the test tasks arrive is reversed.

It is possible to click on a rectangular cell separated by 3 dashes located parallel to each other and go to the main menu of theme 1.

In the block of the electronic textbook «Blitz tour» there are 5 clicks indicated by numbers 1, 2, 3, 4, 5. Who is faster, who is smarter in the «Blitz Tour» cell? The game will feature questions from the blitz tour. 5 questions of the blitz tour are given in each topic (Fig.166).

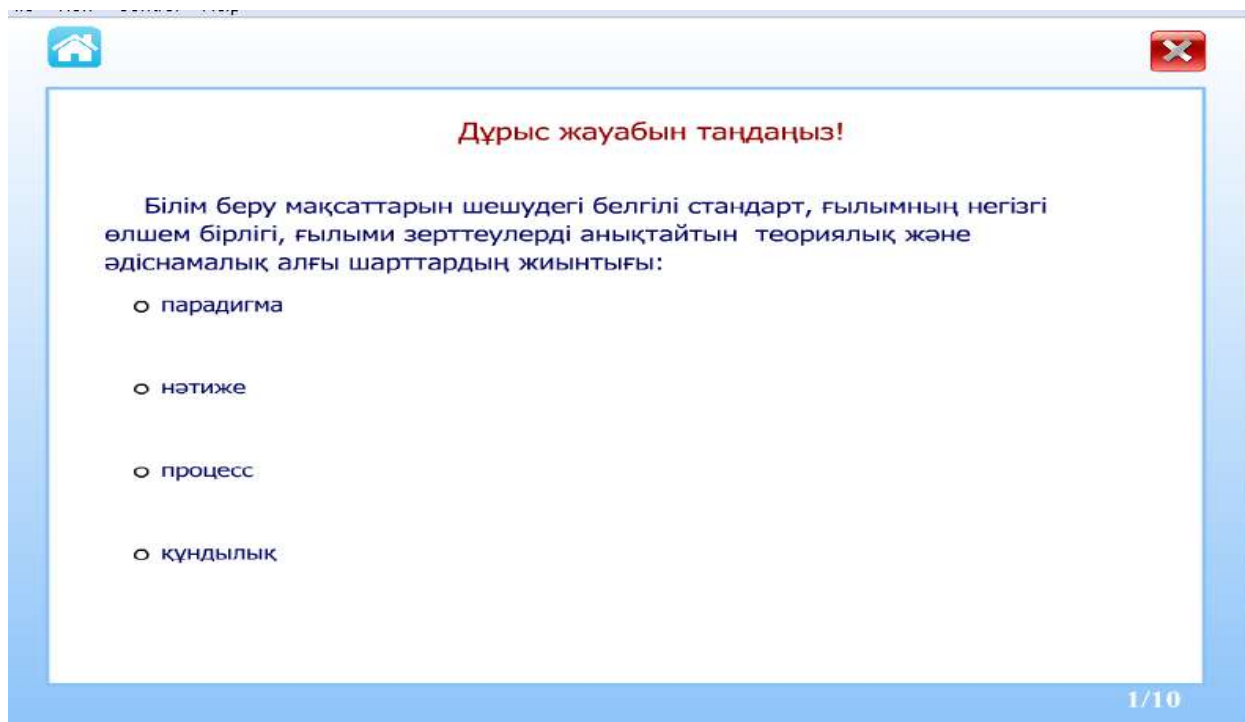


Figure –165. The «Test» blog of the electronic textbook

When opening the selected cell, the text of the question, the set time is 20 seconds, after 20 seconds the correct answer opens.

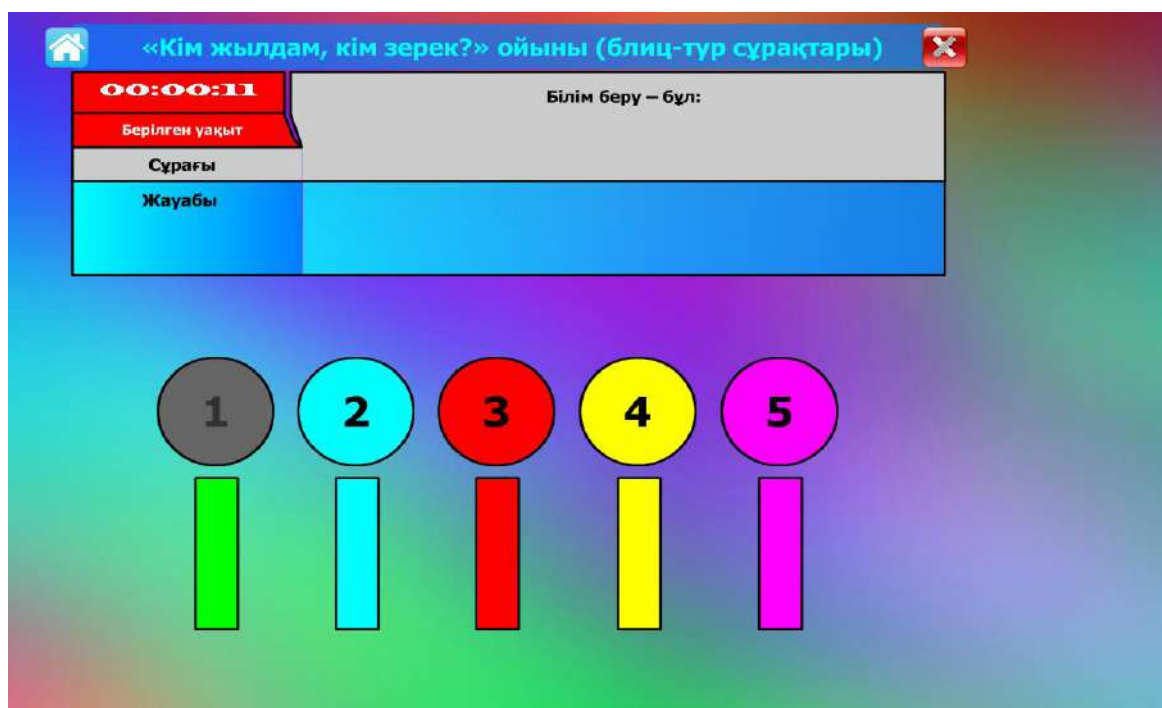


Figure – 166. «Blitz tour» blog of the electronic textbook

By clicking on the «**video tutorial**» button of the electronic textbook, you can view the author's video tutorial revealing the content of the topic 1. Each video tutorial is selected in such a way as to reveal the content of the topic (Fig.167).



Figure –167. The «video tutorial» blog of the electronic textbook

You can go to the Main menu of topic 1 by clicking on the «Home page» button in the upper right corner of the «video tutorial» menu.

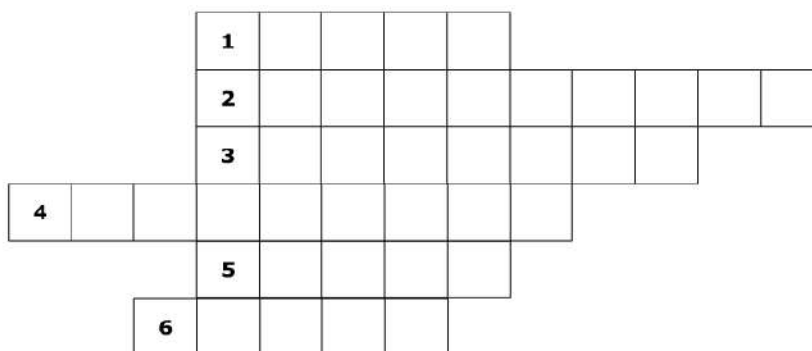
By clicking on the «pedagogical situation» button of the electronic textbook, it is proposed to get acquainted with 5 pedagogical situations that reveal the content of topic 1 and solve it.

In the upper right corner of the «pedagogical situation» menu, by clicking on the button «Home», you can go back to the Main Menu of topic 1.

It is proposed to solve a pedagogical crossword that reveals the content of each topic by clicking the «pedagogical crossword» button of the electronic textbook (Fig.168).

In the upper right corner of the «pedagogical crossword» menu, by clicking on the button «Home», you can again go to the Main menu of topic 1.

«БІЛІМ» СӨЗЖҰМБАҒЫ

**Сұрақтары:**

1. Білім берудің баламалы нысаны; негізгі және қосымша жалпы білім беру бағдарламалары мен жоғары басқыштағы оқушылар үшін кәсіби бағдары бар оқытуды жүзеге асыратын орта жалпы білім беретін оқу орны.
2. Толықтыру, жеке тұлға мен топтардың әлеуметтік бірлестікке бірігуі.
3. Негізгі және қосымша жалпы білім беру бағдарламаларын іске асыратын, оқушыларды олардың бейімділігі мен қабілетіне сәйкес тереңдетіп, салаға бөліп, саралап оқытуды көздейтін жалпы орта білім беретін оқу орны.

Figure – 168. The «Pedagogical crossword puzzle» blog of the electronic textbook

You can get acquainted with the creative task by clicking on the «**creative task**» button of **the electronic textbook** to reveal the content of topic 1 (Fig.169).

You can go back to the Main Menu of topic 1 by clicking on the «Home page» tab in the upper right corner of the «creative task» menu.



Figure –169. «Creative task» blog of the electronic textbook

II. The electronic reading block «Bilgenge marzhan» contains didactic materials that form the cognitive and creative activity of future teachers.

You can go back to the main menu of Theme 1 by clicking on the "Home Page" button at the top right of the «**Bilgenge marzhan**» menu.

Questions for testing and evaluating knowledge:

1. Study the main stages of using the Electronic textbook.
2. Discover the service features of the Electronic textbook.
3. Describe the main menu of the Electronic textbook.
4. Reveal the structure of the Electronic textbook «Pedagogy» by the scientist K.D. Buzaubakova.
5. Reveal the features and advantages of the Electronic textbook «Pedagogy» by the scientist K.D. Buzaubakova.

Recommended literature

1. Helen Beetham, Rona Sharp. Pedagogy in the digital age. Educational design of the XXI century. –Almaty: Public bureau «National Translation Bureau», 2019. – 328 p.
2. Petrova E.V. Digital didactics: designing the educational process and its support // Modern pedagogical education. – 2018. –No. 4. –PP. 37–42.

3. Nurbekov B.Zh. Theoretical and methodological foundations of a student's professional activity in distance learning. Diss. abstracts prepared for the degree of D.P.S. – Almaty, 2010. – 51 p.

4. Zhusubalieva D.M. Formation of the foundations of information culture of students in the conditions of distance learning. – Almaty: Nauka. –199. – 222 p.

5. Buzaubakova K.D., Nurmanalieva U.T. Distance education for future teachers-technology for creating creative guards and aspects of justice// Bulletin of the Al-Farabi Kazakh National University. Series «Pedagogical sciences». – №3(68). – 2021. –PP. 71–82.

6. Aimaletdinov T.A., Baymuratova L.R., Zaitseva O.A., Imaeva G.R., Spiridonova L.V. Digital Literacy of Russian Teachers. Readiness to use digital technologies in the educational process. – M.: Publisher of NAFI, 2019. – 84 P.

7. The Digital Competence Framework [Electronic Resource]. –2018. Update date: 12.2018. URL: <https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework> (accessed: 03/10/2022).

3.7 Portfolio-a means of evaluating students' academic achievements

Among the significant disadvantages of the traditional assessment system in universities is neglect of the psychological capabilities of students, incompleteness. This is especially true of students for whom the evaluation of work by traditional methods is ineffective. In this regard, it would be more correct to develop and introduce into educational practice modern forms of assessment that meet new educational goals and values. The portfolio is widely used abroad, the scope of its application is constantly expanding: from primary to higher education and the labor market.

The Portfolio method (from Italian: portfolio – «portfolio», English – folder for documents) is a modern educational technology based on the method of reliable evaluation of the results of educational and professional activities.

Portfolio technology as an assessment tool is a system for organizing a teacher's assessment of a student's progress, the difficulties he faced, and ways to overcome them. In this case, self-esteem plays a special role. It can also be argued that the Portfolio is a means of self-organization, self-knowledge, self-esteem, self-development and self-presentation of the student.

The purpose of the portfolio is to generalize, systematize and take into account the results of the student's development, his efforts, academic performance and achievements in each area, a comprehensive demonstration of his abilities, interests, inclinations, knowledge and skills in completing the task.

Figure 170 reveals the features of the portfolio.

Diagnostic	<ul style="list-style-type: none"> • Removes changes and growth over a certain period of time
Goal setting	<ul style="list-style-type: none"> • Supports learning goals
Information	<ul style="list-style-type: none"> • Reveals the full range of work performed
Evaluation	<ul style="list-style-type: none"> • Shows the range of abilities and skills
Motivational	<ul style="list-style-type: none"> • Encourages the results of students, teachers and parents

Figure –170. Portfolio features

New portfolio forms based on the use of modern information technologies – «Electronic portfolio», as well as forms focused on new educational goals – «Passport of competence and qualifications» are actively used.

The Portfolio, as a selection of certified achievements, the most important works and reviews to them, has the following types:

- 1) individual (portfolio of a student, graduate student, university graduate);
- 2) group (portfolio of an educational student group (portfolio of a department, faculty, specialty, university);
- 3) professional (university teacher, administration employee).

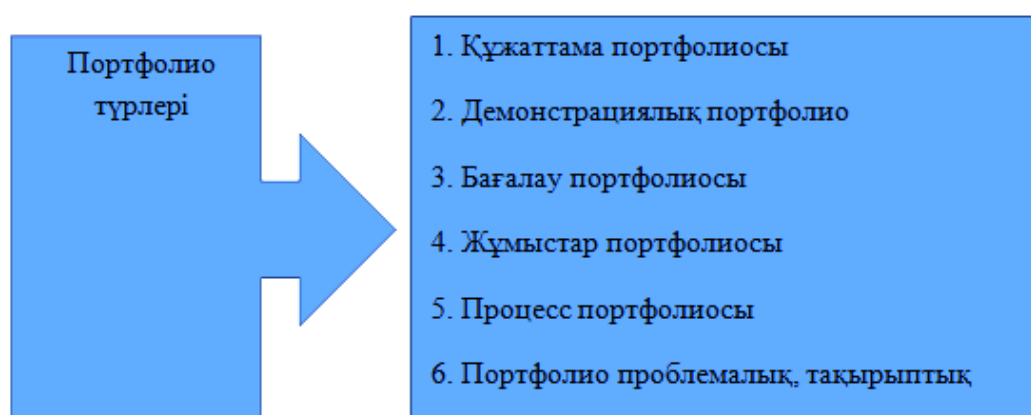


Figure – 171.Types of Portfolio

The organization of the technology of using the portfolio in the educational process is an important pedagogical task. This technology consists of 4 main stages (Fig.172).

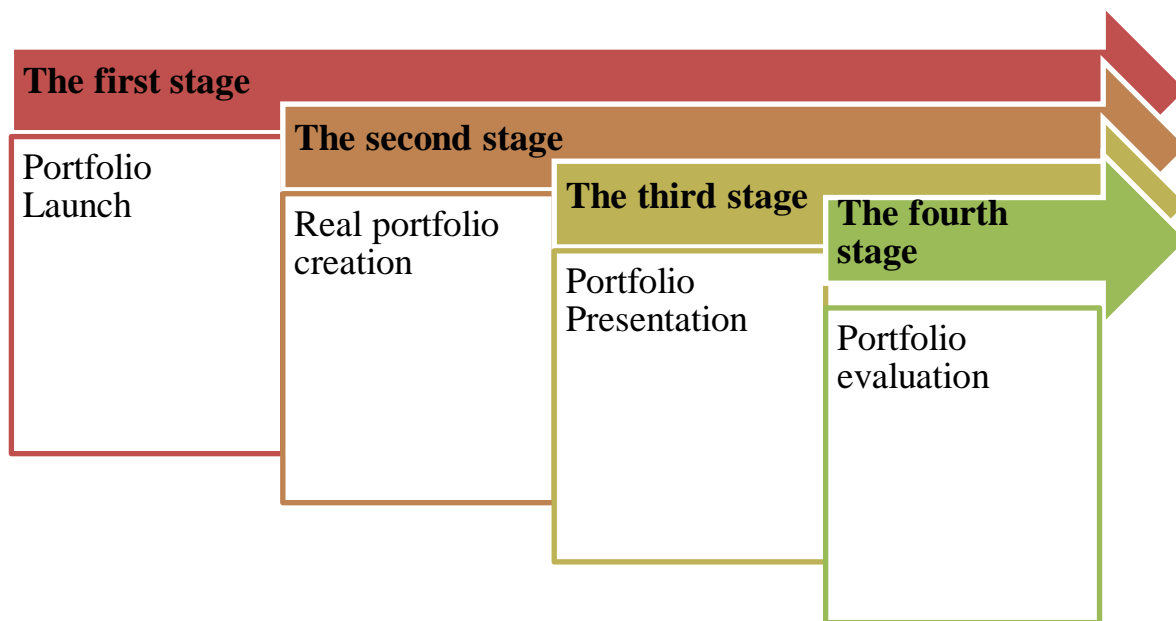


Figure – 172. The technology of Portfolio usage

General requirements for Portfolio design:

- the presence of a creatively designed cover reflecting the personality and interests of the student;
- the presence of clearly formulated content (page numbers, etc.);
- compliance of the content with sections;
- a written introduction to each chapter included in the portfolio (explains why the student decided to work on this topic and describes his thoughts and feelings in this regard);
- evaluation of the student's own portfolio;
- a list of learning objectives formulated based on the interests, needs and self-assessment of the student.

The main elements of the portfolio are presented in Table 10.

Along with the results of the Unified State Exam, being an individual summative assessment, which is an integral part of the student's rating, the use of a portfolio stimulates the following results:

- Improving the quality of the educational process and its variability
- Expansion of learning and self-learning opportunities.
- Filling personal portfolios of project participants in the form of electronic products.
- Development of media competence and information culture of students and teachers.
- Increase of motivation and social activity of the student.

Table 10 - Portfolio structure

Sections			
Portrait	Collector	Working materials	Progress
Characterize yourself and your «Relationships» on the topic of «Portfolio», set goals. Materials reflecting accumulated social experience, interest, purpose, etc.	Materials used by students in their work, textbooks, a list of additional literature, examples of works by other students, other sources of information	Grouping of the student's independent work by task	Demonstration of the student's achievements in accordance with the set goal and task

Eportfolio – electronic portfolio

The teacher as a subject of the pedagogical process is the main character of any school transformations that require the reorientation of his activities to new pedagogical values. This reflects one of the main issues in the work to improve the professional skills of teachers – the formation of a research culture.

Learning has always been viewed as a complex set of approaches and methods. The interaction of a teacher and a student in the educational process consists of skill and art, therefore it is very important to determine the methods of certification of the teacher's work.

One of the latest achievements of professional certification of teachers abroad is called an electronic portfolio (EP). Such a portfolio provides two special advantages over standardized testing. Firstly, the EP is more creative than the bureaucratic control model, which allows the teacher to manage the process of evaluating their work. Secondly, despite the fact that teachers find the process of preparing a portfolio time-consuming, they recognize that the time spent on preparing an EP can give invaluable experience of professional development.

The main components of the EP are the documentation of pedagogical activity and the analysis of one's own professional activity. The teacher's portfolio contains methodological developments of lessons and extracurricular work, visual and handouts, control papers, reports and abstracts reflecting the knowledge, skills and experience of the teacher. Each document is attached with the teacher's comments. In the process of reflexive thinking, the teacher shows the strengths and objective weaknesses of his work, turning ideas into concrete concepts. The main task of creating an EP is to involve in understanding the learning outcomes and determining the goals of further professional development. This corresponds to the principle of educating a thoughtful intern.

A teacher can start collecting EP from different levels of his professional biography—from the student period to becoming a professional. A portfolio is usually organized around central learning components, including planning, learning strategies, supervision, classroom organization, parenting, and professional development.

Thus, an EP is a set of samples of professional work organized in a certain way. Features of this collection:

- has a specific purpose;
- for a specific audience;
- contains samples of professional work that make up the main content of the portfolio;
- contains analysis and reflections on his professional work.

The EP can perform the functions of primary assessment of the level of achievements, intermediate and final control. According to one of the generally accepted foreign classifications, several types of a teacher's professional portfolio can be distinguished:

- development portfolio (developing) - accumulates during the employment process to assess progress in work and gain experience over a certain period of time;
- reporting portfolio (product) - shows the achievement of a certain result after the completion of work on the project;
- demonstration portfolio (showcase) - a collection of the best works of the teacher. It is used to prepare a resume for employment or participation in a professional competition.

All three types of EP are a targeted package of documents that self-evaluate their work. The difference lies in the purpose and organization of these collections. For example, the purpose of a developing portfolio is to demonstrate progress in the development of teacher skills. The reporting portfolio reflects the use of a specific pedagogical strategy. The demonstration portfolio is aimed at demonstrating the experience and professional achievements of the teacher.

An Electronic Portfolio portal for teachers has been developed for the informatization of Kazakh education eportfolio.kz. The EP has the following advantages compared to the traditional version on paper: a large volume of material, interactivity, provision of online access, including remote access. Creating a portfolio in electronic form allows you to save, edit and demonstrate samples of professional activity in visual form using texts, graphics, audio and video. Unlike printed portfolios, which have a linear structure, the EP uses a system of hyperlinks that allow connecting individual links of the pedagogical process, set in electronic form, into a single whole. So, in the scanned lesson plan, at a separate stage, you can insert a video with feedback on the effectiveness of this type of activity. Another hyperlink can link the lesson step to the student's work samples.

Eportfolio.kz the registration window on the portal is shown in Fig. 173.

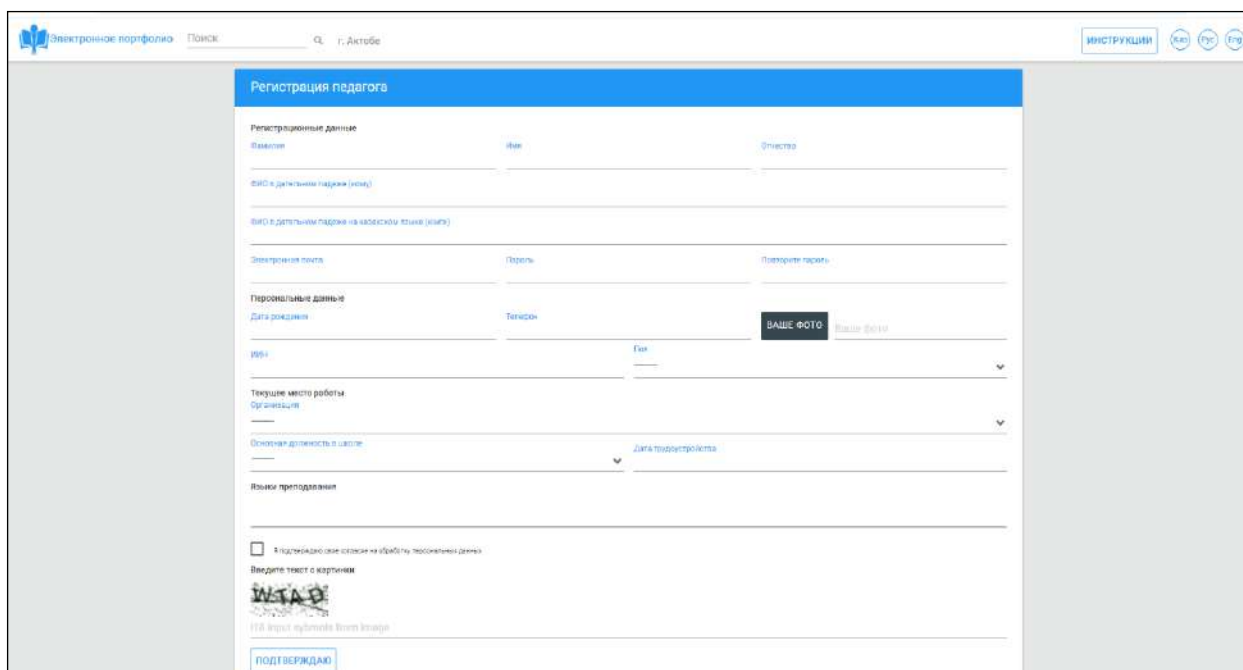


Figure – 173. Eportfolio.kz registration window on the website

Making an EP is always very difficult due to the quantity and variety of materials, therefore it requires technical skills. However, the quality of an electronic portfolio depends on a thorough solution of content problems and the results of content analysis. Reflection is the main component of building professional EP, which allows evaluators to see the conclusions made in the process of evaluating information. Thus, the portfolio becomes the main tool for assessing the professional readiness of future teachers and certifying working teachers.

Professional development of teaching staff in the conditions of informatization of education is one of the main tasks of today.

In the context of informatization of education, the formation of such abilities as information literacy, information culture and information competence among pedagogical specialists becomes an urgent issue today. In the conditions of informatization of society, one of the main tasks is to increase the competence of educational workers in the field of information and communication technologies. For this reason, an electronic portfolio is one of the tools for information exchange.

An electronic portfolio (also digital portfolio, network portfolio, electronic portfolio, electronic folio, or Folio) is an electronic set of electronic proofs. Such electronic evidence includes text, electronic files, images, multimedia, blog entries and links. Electronic portfolio is a platform for demonstrating the abilities and self-expression of the user. If they are online, users can use them dynamically over time.

An electronic portfolio can be considered as a form of a study note, which is a real proof of success. Learning records are used by the curriculum, individuals, teams, interested communities and organizations to manage learning.

Traditional electronic portfolio-facilitates students' reflection on themselves, which leads to greater awareness of learning strategies and needs. According to a comparative study by M. Van Vesel and A. Prop suggests that the difference between

a paper portfolio and an electronic portfolio is that an electronic portfolio can be used more.

There are three main types of electronic portfolios, although they can also be called using different terms: developing (for example, working); evaluation; showcase.

Developing an electronic portfolio - can demonstrate an increase in skill over a certain period of time, for example, headings. The main goal is to provide a communication space between the student and the teacher.

Assessment Portfolio - demonstrates skill and qualifications in a particular field or area.

Showcase Portfolio - shows stellar works of a certain direction, which are usually shown to employers for employment. When it is used for employment, it is sometimes referred to as a career portfolio.

Most e-portfolios consist of three main types of hybrid portfolios. Popular types of electronic portfolios today:

- 1) Schools.
- 2) Higher education.
- 3) Continuous professional development.
- 4) Job requests/professional announcements.
- 5) Therapy groups.
- 6) Evaluation.
- 7) Accreditation.
- 8) Recognition of previous learning (RPL).

In education, an electronic portfolio is a collection of students' works that can promote learning by giving them the opportunity to organize, archive and reflect its work. The electronic format allows the instructor to evaluate the student's portfolio via the Internet, CD-ROM, DVD or zip disk.

Electronic portfolios have become a popular alternative to paper portfolios, as they provide an opportunity for asynchronous viewing, exchange of opinions and feedback. In addition, students can reflect on their work, which makes the experience of creating a portfolio meaningful.

The student's electronic portfolio can be shared with a future employer, i.e. used to register the achievements of certain learning outcomes of a program or course.

The use of an electronic portfolio is often found in courses where there are departments of education. Many teachers are asked to create an electronic portfolio to demonstrate the competencies required for certification or obtaining a license. The student electronic portfolio is increasingly being used in other specialties such as communications, mathematics, business and architecture. In education, the electronic portfolio performs six main functions:

- Knowledge and reading of documents;
- Writing and tracking within the program;
- Planning of educational programs;
- Performance evaluation and monitoring;

- Course assessment;
- Find a job.

Electronic portfolio is a means of forming the information and communication competence of students:

- 1) identification and dissemination of original ideas and pedagogical achievements on the introduction of information and communication technologies;
- 2) improving the professional competence of teachers;
- 3) stimulating the creative search of teachers.
- 4) basic principles of creating an electronic portfolio:
- 5) regularity;
- 6) data accuracy and scalability;
- 7) objectivity of information;
- 8) visibility.

In general, the electronic portfolio promotes critical thinking and promotes the development of technological literacy. Teachers use an electronic portfolio at the faculty to write coursework or subject projects that can be shared with colleagues to promote learning and teaching. An electronic portfolio is used to demonstrate career achievements. You can add various files here, mark them and other works easily for both the student and the teacher.

The electronic portfolio, according to Stevens, helps to develop an independent and autonomous system of thinking. This means that in most cases people should focus on their collective work and think about how she is portrayed and what they say about her as a creative person. Then the individual is responsible for their training and for where they demonstrate their qualifications. People should also think about their knowledge and how they plan to create and improve it in the future. It helps people think critically better and helps them develop their writing and multimedia skills. Today, many students use multimedia such as Facebook, Twitter and messengers – all of them are unofficial settings.

An electronic portfolio, on the other hand, is a formal case of knowledge in which students must use both their knowledge of how the web works and the message they want to convey. From this point of view, if students are not taught how to use an electronic portfolio correctly, sometimes the use and comfort of the Internet can be a hindrance.

Currently, many universities and schools are working to ensure that students can accumulate a comfortable experience working with electronic portfolios and make the most of them. For example, in places like Michigan, students can receive an MCOATT (Michigan Certificate with Outstanding Achievements in Learning Technology) for providing their electronic portfolio, which is proof of the use of technology in the classroom. This consortium is an organization aimed at turning Michigan into one of the leaders in the introduction of technology in the training of young professionals. For other purposes, some e-portfolio programs allow you to reach an audience of different levels, so the same portfolio can be used for several purposes. According to Anderson, an electronic portfolio can go viral and many people can easily see it online.

Requirements for the structure of an electronic portfolio:

- 1) compliance of students with pedagogical laws when compiling a portfolio;
- 2) the concept of a portfolio and the range of its use are considered;
- 3) the level of training of students in the development of information and communication technologies;
- 4) application of the idea of the evolutionary development of an electronic portfolio;

Necessary documents for completing the electronic portfolio:

Document portfolio is a certified portfolio of individual educational level. The corresponding requirement for this component is the authenticity of the document. Certificates and diplomas are filled out in accordance with the rules, i.e. they are sealed with the signature of the responsible person and the seal of the organization. All these documents are typed on a computer and written to a specific file.

Portfolio of independent work - contains information about the acquisition of creative, research, project work of the student, as well as about the directions at the stages of training and creativity, about training at scientific conferences and contests, individual courses. This type of electronic portfolio is no different from the type of paper portfolio. Any paper document can be easily converted into electronic form. If the portfolio work consists of text, then it is easy to insert it into the computer by scanning. If there are images and pictures at work, then they can be scanned or even taken with a digital camera.

Other documents of the university (labor works, projects, creative works) are recorded with appropriate indicators. They are very easy to translate into electronic form.

Entering an electronic document of the creative work index on the website is easy. In order for creative works to be easily readable, evaluated, balanced, a single indicator structure should be shown. This requirement is the basis of the technology for creating an information system.

Portfolio of reviews - summarizes the achievements of the student, achievements in the academic and extracurricular periods, resumes, as well as reviews of the student teacher, parents and employer.

Considering the technique of translating documents, we do not find any differences in the structure of the portfolio of reviews. Only the case of which opinions should be signed or should not be signed is considered. If the portfolio has a special document signature, then the authenticity of this document is an element of the portfolio documents discussed above.

Electronic portfolio in most cases occurs in the form of a web portfolio. And with the help of the AutoPlay program, with which you can work in a simple interface, it is easy to create electronic portfolios for teachers, students, etc. employees.

AutoPlay Media Studio is a program that creates an automatic disk download. This is one of the common functions of the **AutoPlay Media Studio** program. With this program, you can create electronic textbooks, portfolios, CD/DVD business cards, presentations, simple games, electronic photo album, high-quality video files,

simple audio and video players. All this can be done without a knowledge of a special programmer. And thanks to the capabilities of C++, Java, Visual Basic programs, the result of work becomes higher. On the toolbar of the AutoPlay Media Studio program there are elements for simple and easy work with objects. This orientation is present on the toolbar on buttons designed to work with images, videos and sounds.

Requirements for installing **AutoPlay Media Studio** on a computer:

- 1) computer operating system Windows 2000, Windows XP, Windows Vista, Windows 7 and newer;
- 2) Pentium 4 processor and newer;
- 3) The amount of RAM is not less than 256 MB;
- 4) Screen extension at least 1024x768;
- 5) Color depth of 16 bits and above;
- 6) Free hard disk space of at least 100 MB;
- 7) Mouse;
- 8) DirectX 7 and newer;
- 9) Internet Explorer 4.0 and Internet Explorer;
- 10) Adobe Flash Player 8, etc.;
- 11) Adobe Reader 8, etc.

Features of the AutoPlay Media Studio program: (Figure 174).

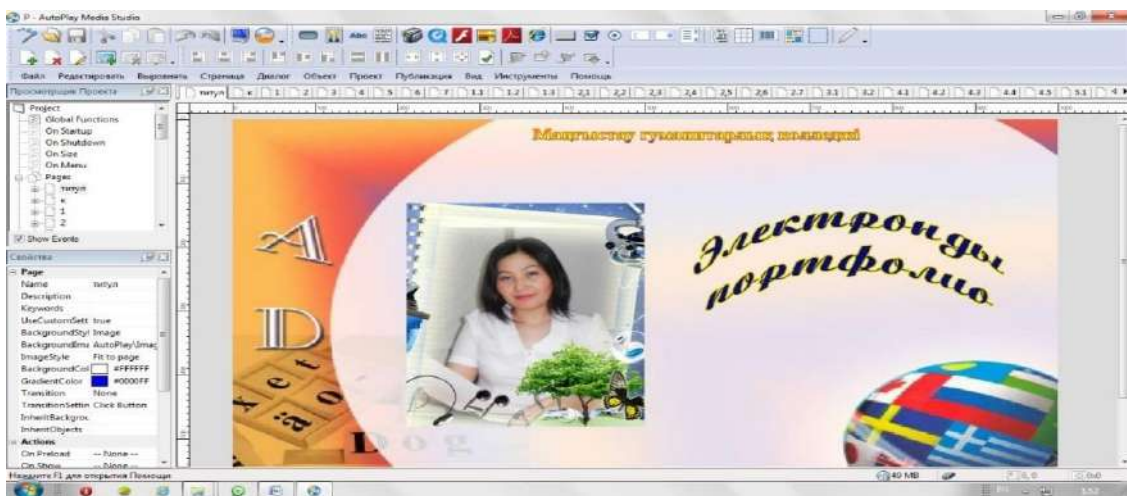


Figure – 174. AutoPlay Media Studio program

Working with the AutoPlay program

Program Description: Installation (autoplay-media-studio-trial. exe) on the icon (fig.175).



Figure –175. Program Execution Diagram

Open the Next button on the Next button that opens and run the program.



• **In the application settings icon.**

By clicking on the «Next» button, the Overview – C:/Program Files/AutoPlay Media Studio 8 Trial installing the program with the execution of the action (Fig.176).

Start-All Programs-Indigo Rose Corporation - AutoPlay Media Studio 8 Trial-autoplay Media Studio 8 Trial.

The menu bar of the AutoPlay program

The menu displays the buttons in the menu:

- 1) File.
- 2) Editing.
- 3) Correction.
- 4) The page.
- 5) Dialogue.
- 6) The object.
- 7) The project.
- 8) Journalism.
- 9) View.
- 10) Tools.
- 11) Help.

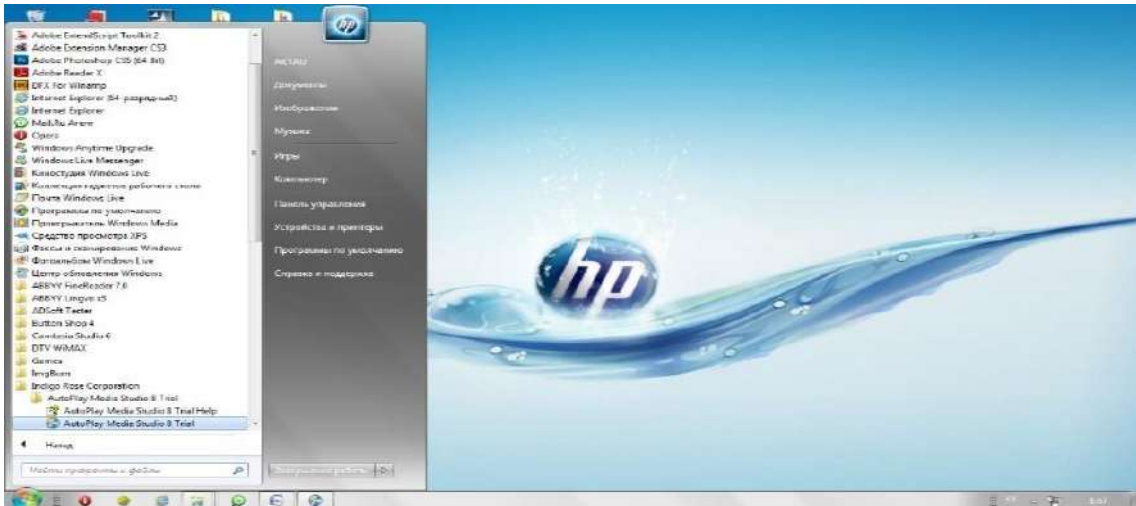


Figure – 176. Opening the program

File menu. Saving a series, creating a new project, and opening a saved project. As a project file (*.APT) and a project archive (*.APZ) can be used.

In the process of **saving the project** in the template, you can enter the author's name, feedback, as well as the site. Storage in an archived sample is used for the purpose of using an additional copy (Fig.177).

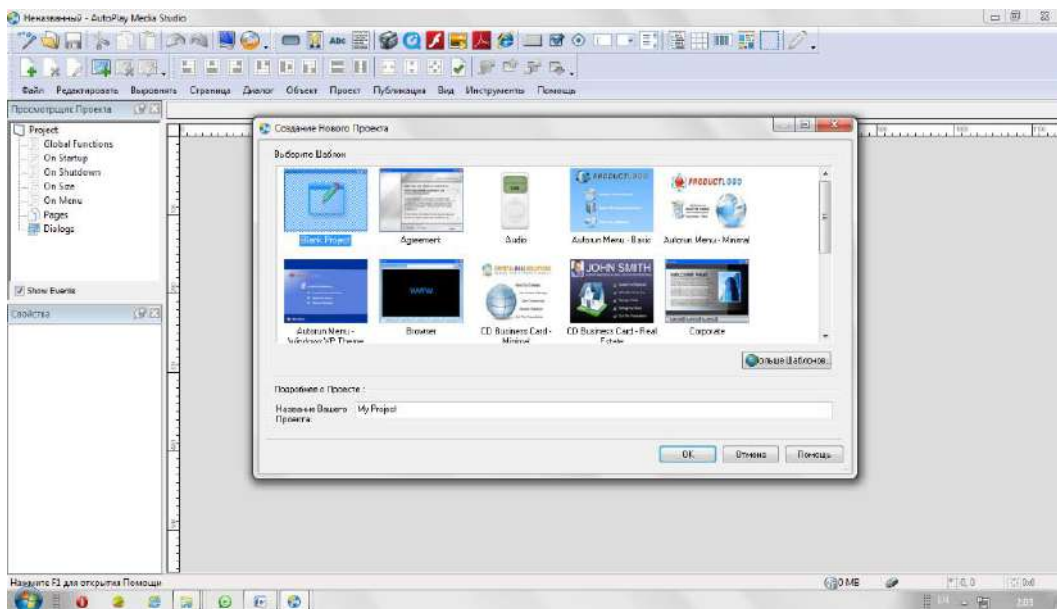


Figure –177. Opening the program

When you try to **open it**, the saved project and the archive file and the project open.

Creating a new project allows you to select one of the templates and create a new one.

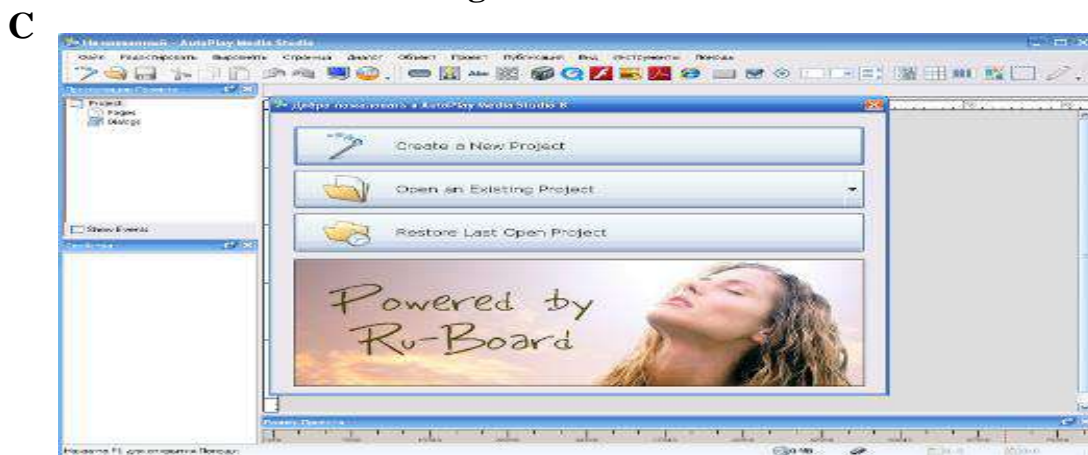
The debugging menu usually includes buttons: cut, paste, copy, etc. This menu contains the program settings.

The page menu includes actions for creating a page, deleting a page, renaming and copying a page. When copying, you can create copies of pages in the project. You can put elements, background (Fig.178).

In the type menu, you can turn on and off the toolbar, turn on the grid, attach to the grid, put additional tools (Fig.179, 160).



Figure –178. Toolbar



**Figure –179. Creating an electronic portfolio in the AutoPlay program
Creating a New Project action.**

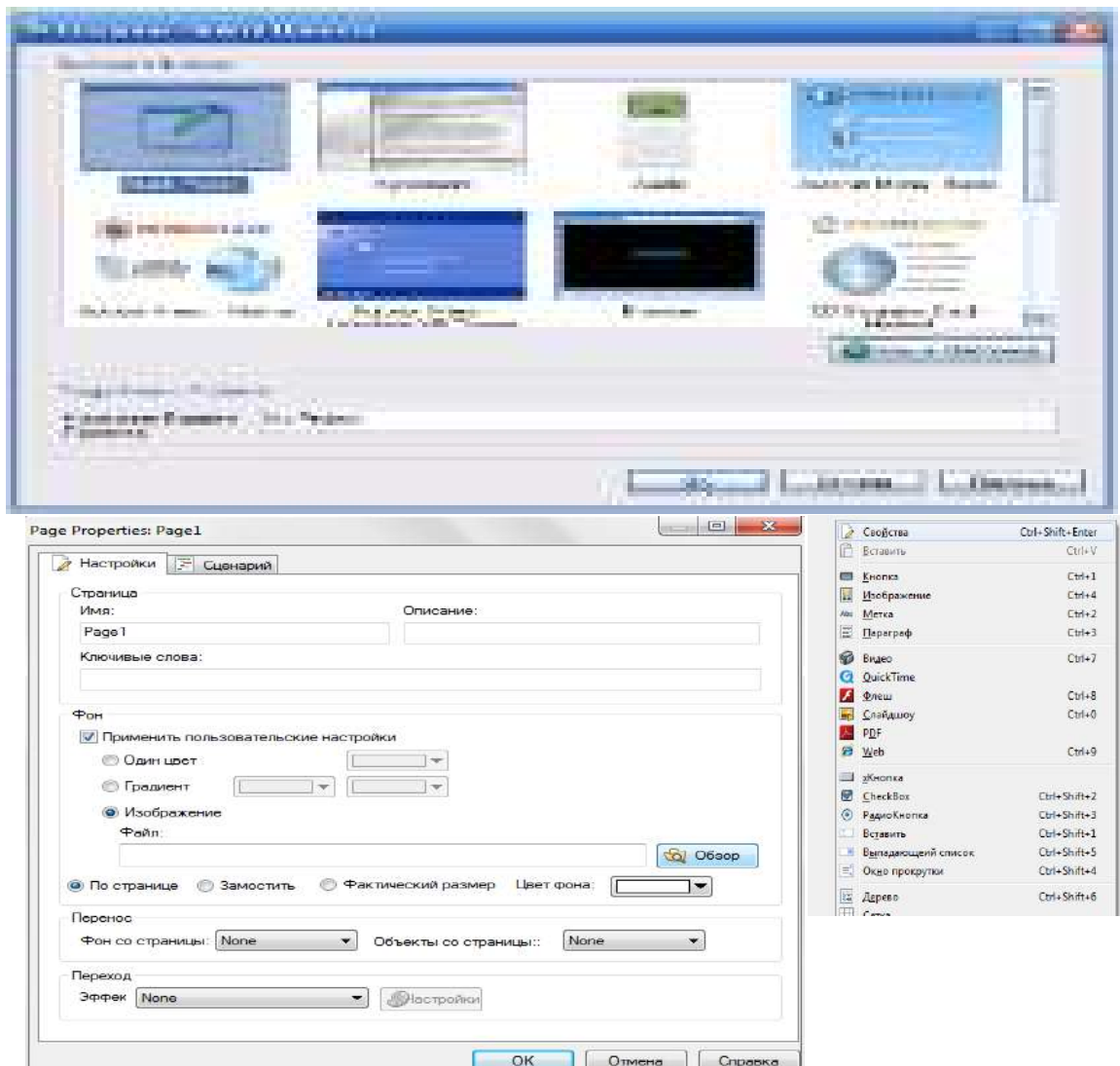



Figure – 180. Selecting the «Create a New Project» action

From these samples, select the one you like and click on the «OK» button.

Right-click on the workspace and select the action «**Properties (description)**»

In the «**description**» window, click on the «**Overview**» icon, in the window that opens, select an image from the location of the image and click «**OK**».

After the background image is exposed, you can click on the icon of  the new image and insert a photo or other object.

Inserting them into the project, emphasizing each object (image, button, melody, animated video (Flash):



- Insert a picture.



- Introduction of the Flash object.



– Slide show implementation.



– Create a PDF document.



– Text input.

Since the program does not accept Kazakh letters, buttons are created in the Button Shop. In addition, you can use the Photoshop program (Fig.181).

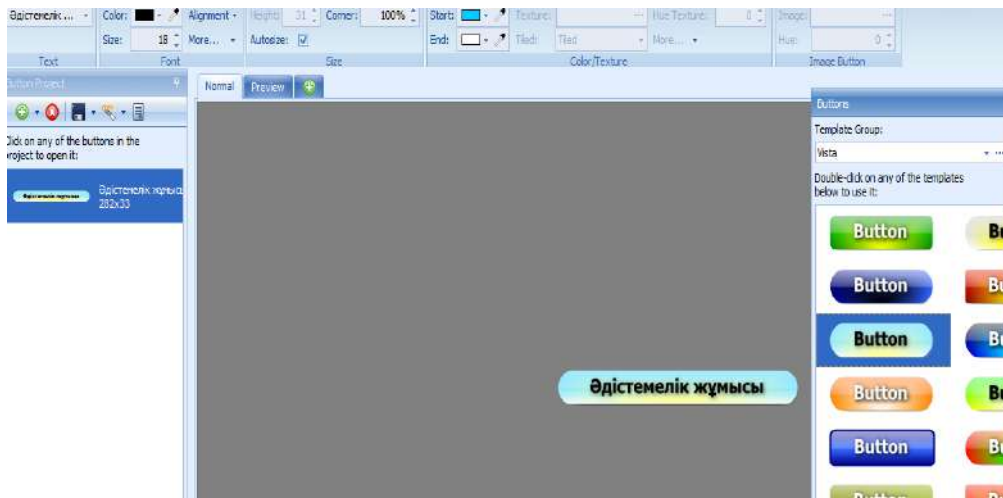


Figure –181.Button Shop program selection

Hyperlink (hyperlink) to the entered object, i.e. to set the possibility of going to the next page, right-click on the left object and click on the action **description** (properties) in the window that opens. In the description window that opens, in the **Quick Action** section, perform the following sequence of actions (Fig.182).

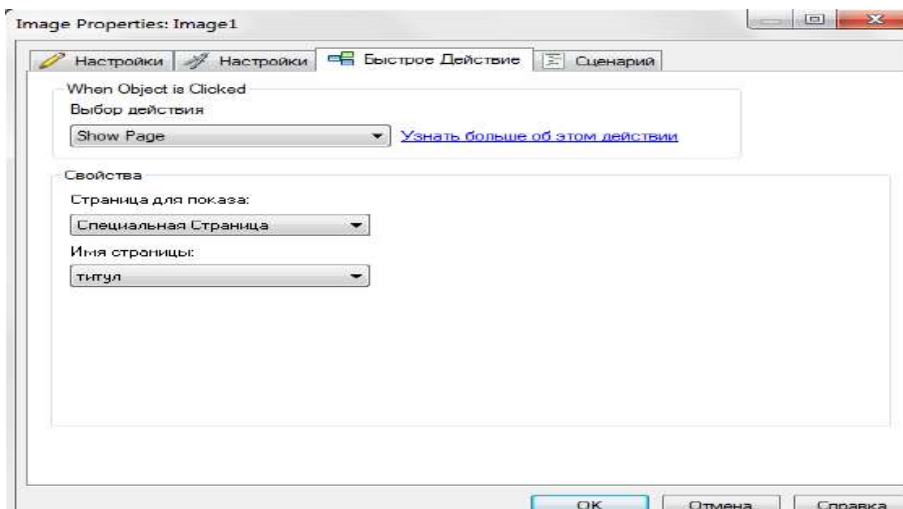


Figure –182.Click on the «Description (properties)» button

To go to any page, select the action-Show Page, the page to show-A special page, the page name – specify the page name.

To open a document, select the action – Open Document, the document to open–click on the «**Browse**» icon, in the window that opens, select the document from the document location and click «**OK**» (Fig.183).

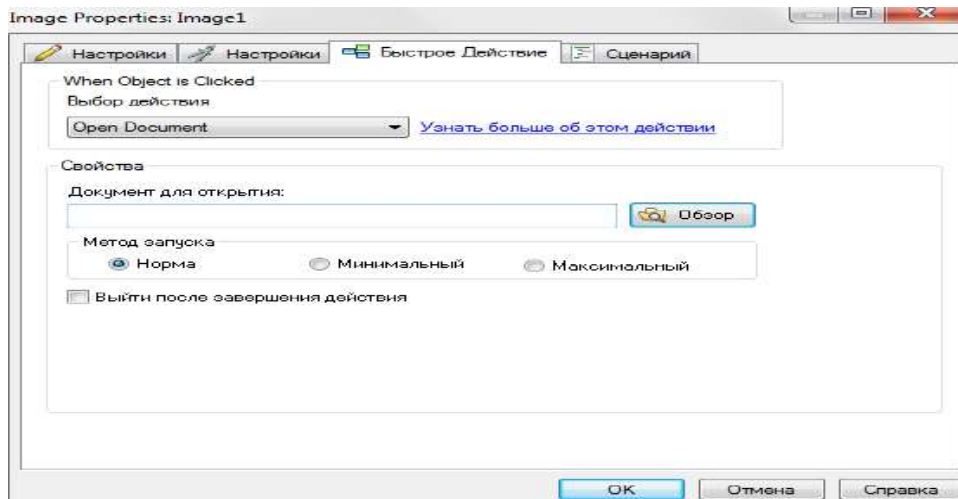


Figure –183. Clicking the «Overview» button

Documents in the Word text editor must be saved in PDF format. The creation of a new page is carried out by performing the action Face-Add (*Page-Add*) (Fig.184).

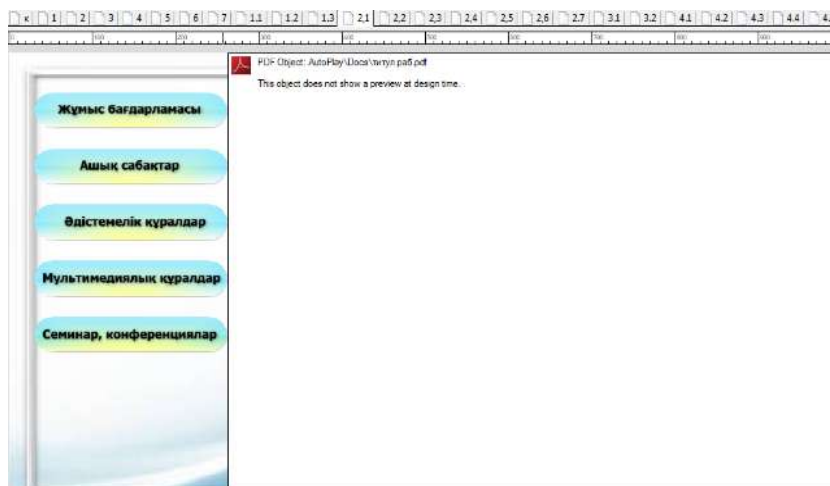



Figure –184. Clicking the «Add a new page» button

To view the result of creating a project between jobs, you need to press the *Preview button*  or the F5 key.

After creating a portfolio in the **AutoPlay** program, the save template is executed as follows:

Publish-Create (or press F7)+ click on the «Next» button (Fig.185).

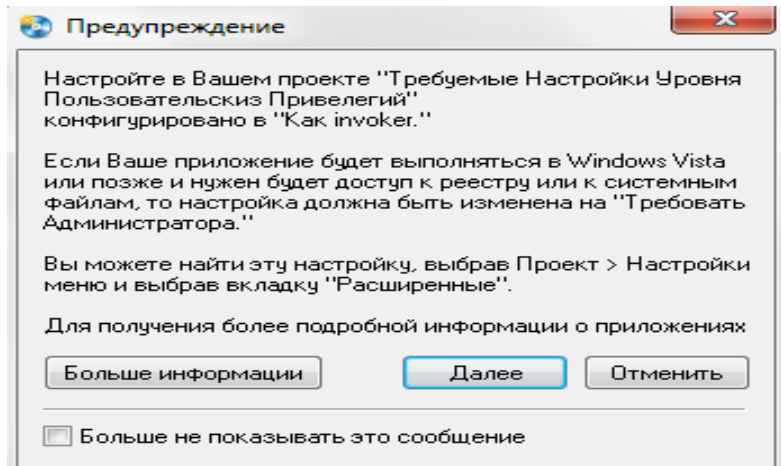


Figure –185. Click on the «Next» button

Immediately to the disc for recording «**Burn to CD/DVD/Blu-Ray**» To 16 in the computer memory to save «**Burn to a folder on the hard disk**» (Fig.186,187).

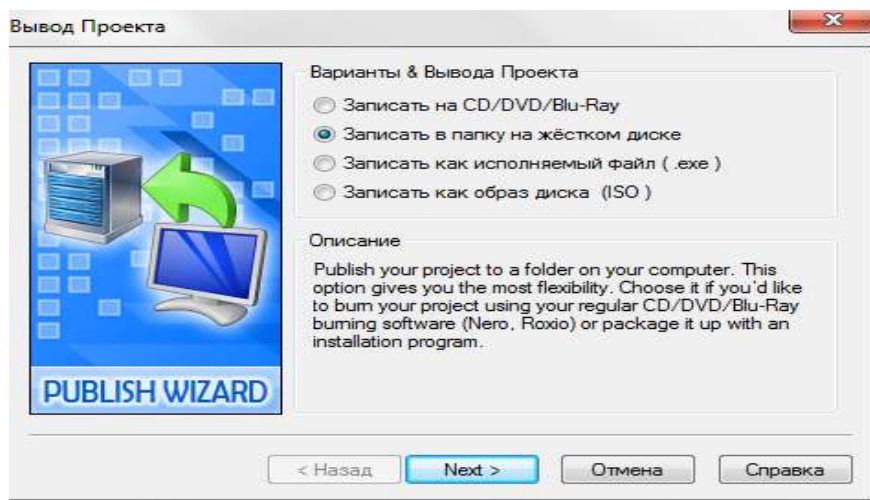


Figure –186. Clicking the «Next» button

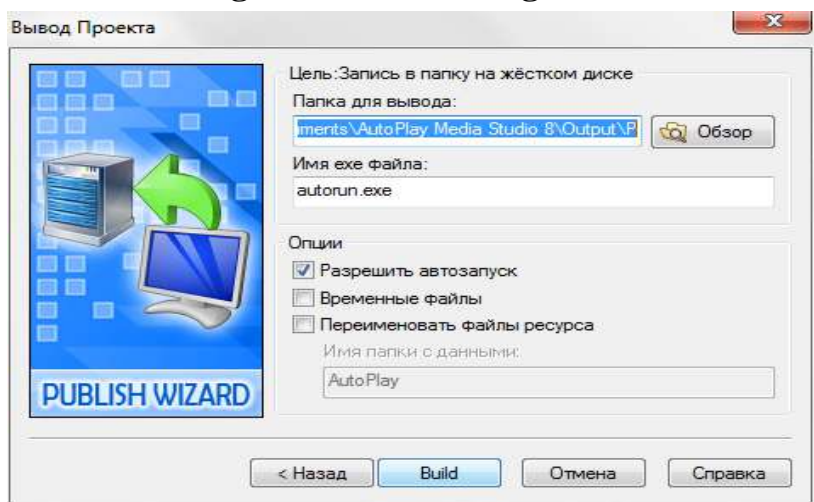


Figure –187. Click on the «Record» button

In the «File name» section **Autorun.exe** the exe name can be changed, but in the process of changing. Be sure to write an extension. The folder that will be saved in the «folder» section can be placed at the user's request by clicking on the «Browse» button and selecting the folder or if it has not been changed: *C:\Documents and Settings\Admin\My documents\autoplay Media Studio 8\ Output * electronic portfolio is stored in a folder.

Click on the «**Build**» button, wait for the work to be fully saved, then click on the «**Close**» button.

In the folder that opens, the inscription «**autorun.exe**» you can click on the button and view the electronic portfolio. Reference help for the AutoPlay Media Studio 8 Trial program (translation) (Fig. 188).

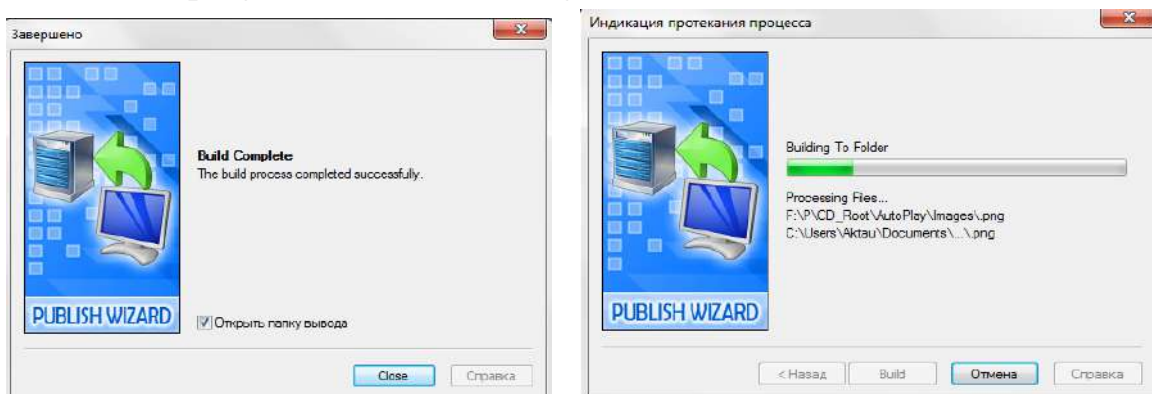


Figure –188. Opening an electronic portfolio

The compiled portfolio develops the creative abilities of each teacher, as well as increases the level of his professional formation.

Questions for testing and evaluating knowledge:

1. Comment on digital educational platforms.
2. Characteristics of the types of digital educational platforms.
3. Prove by the example of your use of digital educational platforms.
4. In your opinion, is it profitable to work with the reincarnation of digital educational platforms?
5. Which platform is most often used in universities in Kazakhstan?
6. Explain your approach to performing independent tasks for students.
7. Use the example of the platform used when performing group and pair work.
8. Analysis of types of Kazakhstan digital platforms.

Recommended literature

1. <http://edunews.kz/lentnews/1093-azastanda-bilimland-platformasyny-cifrlly-blm-beru-resurstary-tegn-olzhetmd-boldy.html>

2. Meirambek A., Tokpanov E. A., Bilibayeva Zh. T., Mukhitdinova R. A. Methods of using modern electronic educational resources to control the results of knowledge obtained by students in a natural science subject in distance learning //Materials of the Republican conference dedicated to the 1150th anniversary of the great thought of the East «the second teacher of the world», Abu Nasir Al-Farabi.- Almaty, 2020. – pp. 117–122.

3. Tanabayeva A.M., Zheksembayeva R. Zh. The role of technologies: the creation of electronic training courses using the open Moodle platform for distance learning and how to support full-time education in teaching computer science and other disciplines//Republican scientific and practical conference «Zhana Alemdegizhastarzhaniqilik», April 7-8, Part 2. – Taldykorgan, 2016. – pp. 314–317.

4. Creation of digital educational resources of the platformalari. <https://melimde.com/cifrli-bilim-resurstarin-jasau-platfomalari.html>

5. Theoretical justification of the electronic portfolio <https://melimde.com/elektrondi-portfolioni-teoriyali-negizdemesi-elektrondi-portfo.html><https://bilimdiler.kz/ustaz/161-malm-portfoliosyny-rylymy.html>

6. The program for creating an electronic portfolio. <http://vkmonline.com/blogs/post/984559>

7. Creating an electronic portfolio in the Google Sites application. <https://212.154.226.147/uploads/850814400612/f616a5954792530.pdf>

TESTS

1. What is the digital educational process?

A) one of the components of the e-learning system that determines the content of education

B) state documents defining the content of Kazakh education

C) smoothing the spread of innovation activity in the Republic of Kazakhstan

D) teaching university students the basics of entrepreneurship

E) introduction of the discipline «information and communication technologies»

2. The program adopted for the entry of the education system of Kazakhstan into the information society:

A) «Entry into the number of 30 developed countries»

B) «Strategy Kazakhstan-2050»

C) «Digital Kazakhstan»

D) «Nurly Zhol»

E) National project «Quality education «Educated Nation»

3. Features of the digital generation:

A) defines the principles, approaches to the formation of the content, form, methods of digital didactics in setting goals

B) owns information and communication technologies

C) striving for constant innovation and self-improvement, creativity, the ability to generalize different types of thinking

D) the ability to process different streams of information in parallel (multitasking)

E) propensity to use various sources of information, high speed of information processing and decision-making

4. One of the external priority factors in the informatization of education in the country is:

A) socio-cultural factors

B) political factors

C) external factors

D) internal factor

E) technological factors

5. Digital technologies have a didactic (important in education) quality:

A) hypertext-freedom of navigation through the text, abbreviated presentation of information, modularity of the text and cross-references

B) providing students with equal access to high-quality open digital educational resources and educational and methodological resources, experts

C) improvement of materials and organization of distance learning using distance learning technologies

D) advice and assistance in choosing a place to continue education via the Internet

E) dissemination of a personalized model of the organization of the educational process

6. Digital technology, which is not one of the digital technologies of educational significance:

A) telecommunication technologies

B) artificial intelligence

C) electronic identification and authentication technologies

D) FashionNet (FashionNet)

E) cloud technologies

7. The possibilities of applying the principle of personalization in education:

A) creation of multi-level monitoring of the effectiveness of the educational process as a management decision support system

B) is considered as an organization of the principle of teaching and learning and has an auxiliary, supportive character in relation to this process

C) implements the achievement of educational goals using digital tools

D) the resource reserve can be implemented on the basis of a network educational resource and a unified information educational environment

E) orientation of the student to his/her educational activity in the digital educational environment

8. The principle using the technology of "inverted learning":

A) the principles of flexibility and adaptation

B) the principle of expediency

C) principles of learning in cooperation and interaction

D) the principle of success in learning

E) the principle of personalization

9. The field of pedagogy, a scientific discipline about the organization of the educational process in a digital society:

A) digital didactics

B) pedagogical didactics

C) defectology

D) digital developmental learning

E) general didactics

10. Since when did the concept of «digital didactics» first appear in domestic scientific publications?

A) in the early 2009's

- B) at the end of 2012
- C) in the late 2010s**
- D) in the mid-2007's
- E) in the early 2015's

11. The digital educational environment is a complex of opportunities for learning, development, socialization and upbringing of a person:

- A) E.S.Larina
- B) V.A.Pleshakov
- C) V. I.Blinov, I. S. Sergeev, E.Y.Yesenina
- D) N.A. Slyadneva**
- E) N.A.Obydenkova

12. The teacher notes that in the learning process it is customary to use information educational resources of the Internet, sources of information:

- A) I. S. Sergeev
- B) V.A.Pleshakov
- C) V.I.Blinov
- D) A. E. Abylkasymova**
- E) N.A.Obydenkova

13. The main goal of informatization of education in the republic today is:

- A) education through training in socio-cultural factors
- B) improving the quality of education through the use of political factors, the use of traditional technologies and teaching methods
- C) improving the quality of national education by creating a unified educational information environment based on the use of modern digital technologies**
- D) improving the quality of knowledge using internal
- E) provide for improving the quality of education as a result of technological factors

14. The involvement of highly qualified specialists in the preparation of educational material, regardless of the place of residence and the language of communication, is:

- A) adaptation
- B) the individuality of learning
- C) parallelism
- D) asynchronous
- E) quality of training**

15. Digital literacy is:

- A) promoting the development of a country, region or municipality

B) improving the required training and the level of information culture and information literacy of graduates

C) a set of knowledge and skills necessary for the safe and effective use of digital technologies and Internet resources

D) availability and quality of applied digital technologies and digital educational resources

E) meeting the requirements for the effectiveness of the education system as socially necessary

16. The term «distance learning» is first used in absentia at the University of Wisconsin:

A) 1890

B) 1893

C) 1892

D) 1895

E) 1889

17. The name of integrated learning for innovations that have come and are keeping up with the times in traditionally studied sciences:

A) m-learning

B) the STEAM learning method

C) distance learning

D) the Kahoot program

E) mobile learning technology

18. Show the benefits of STEAM education:

A) implementation of creative and innovative approaches in projects

B) weak communication skills

C) the disappearance of creative skills

D) the emergence of difficulties in solving «life problems»

E) the formation of students only as a fragment of the educational result

19. The main objectives of mobile learning:

A) participants in the educational process: students interact with each other and with the usual, convenient means of the teacher

B) it is more compact and faster to use the available mobile means than to put several computers in the classroom

C) there is an opportunity to study at any time, anywhere

D) a flexible tool for learning knowledge, quick access makes the student's work productive

E) communication at a convenient time and in any place, which expands the possibilities of group work

20. The main goal of informatization of education in the Republic:

- A) education through training in socio-cultural factors
- B) the use of political factors
- C) improving the quality of national education by creating a unified educational information environment based on digital technologies**
- D) improving the quality of knowledge using internal
- E) education as a result of technological factors

21. The goal of digital transformation:

- A) education of children with disabilities
- B) their adaptation to the effective solution of pedagogical tasks**
- C) distance learning
- D) mastering correct understanding, expressive and fast reading
- E) explain the mastery of Kazakh spiritual treasures through teaching literary works of art

22. A number of digital pedagogical technologies and teaching methods:

- A) distance learning
- B) virtual tour
- C) online testing
- D) mobile learning
- E) working with the dictionary**

23. The purpose of distance learning in the field of education:

- A) improvement of innovative technologies
- B) control over education
- C) inventing new textbooks
- D) improving the level of knowledge of students and students through the creation of a unified information system of education**
- E) some simplification of the teacher's work

24. Mailing is carried out on the basis of mailing lists using e-mail:

- A) electronic libraries
- B) teleconferences**
- C) web lessons
- D) web forums
- E) online seminars

25. Student's interaction with other webinar participants through software:

- A) teleconferences
- B) webinar
- C) remote communication
- D) interactive communication**
- E) zoom platform

26. A way to arouse practical or theoretical interest based on the consideration of complex cognitive tasks:

- A) project method
- B) research method of teaching
- C) individualized learning method
- D) problem-based learning method**
- E) narrative method

27. 4C basic skills formed through:

- A) creativity, communication
- B) knowledge, skills and abilities
- C) parallel transfer of science and art, critical thinking
- D) communication, cooperation, creativity, critical thinking**
- E) creativity, sociability, cooperativeness

28. The ability to think critically is:

- A) the study of soft skills
- B) the ability to speak clearly
- C) know how to apply the acquired knowledge**
- D) creative approach
- E) achieving results in group work

29. A tool that promotes critical thinking and supports the development of technological literacy is:

- A) Kundelik.kz platform
- B) distance learning method
- C) mobile learning technology
- D) electronic portfolio**
- E) ZOOM conferences

30. Name of digital education:

- A) Edunet**
- B) Safenet
- C) Foodnet
- D) Fashionnet
- E) Internet

31. E-school-educational platform for schools:

- A) spiral learning system
- B) the diary platform
- C) EDUS system**
- D) Bologna training system
- E) Daryn Online

32. The task of a teacher in the period of Digital Kazakhstan:
- A) teaching a child by «Joining the top 30 developed countries»
 - B) knowledge of the «Strategy Kazakhstan-2050»
 - C) learning through «Digital Kazakhstan»
 - D) speed, ability to choose the most interesting and fascinating educational material**
 - E) explanation of the program
- 33) A digital footprint is:
- A) a data set created by a user while in outer space
 - B) a set of data created by the User while being in the ecological space
 - C) a data set created by the User while in the economic space
 - D) a data set created by the User when he is in the digital space**
 - E) a data set created by the user during his stay in the space of fairy tales
34. Smart education is:
- A) joint educational activities of students and teachers
 - B) the environment of teachers and students in development centers
 - C) joint environment of coaches and children in sports clubs
 - D) the ultimate educational environment that unites the efforts of teachers, specialists**
 - E) joint environment of children and parents in song and dance clubs
35. Three main elements of SMART learning:
- A) classes, clubs, parents
 - B) director, parents, children
 - C) university, students, parents
 - D) SMART environment, SMART pedagogy and SMART student**
 - E) deputy for academic affairs, student, head of the circle
36. SMART-refers to the competencies of:
- A) professional, didactic, informational
 - B) solving problems, subject, personal
 - C) creative, educational, informational
 - D) information, digital, smart**
 - E) creativity, cognition, digital
37. Principles of Smart Learning implementation:
- A) skill, thrift, stupidity, indecision of the problem
 - B) indecision of the problem, stubbornness, periodicity, inexpediency
 - C) creative, uneducated, uneducated, research
 - D) compatibility, reasonableness, economy, periodicity, creativity**
 - E) without creativity, without stupidity, without economy, without periodicity, without education

38. Artificial intelligence (machine intelligence, AI):

A) technology that allows a computer to learn from its own experience, adapt to the set parameters

B) technology that allows history to learn from its own experience, adapt to the established parameters

C) technology that allows mathematics to learn from their own experience, adapt to the established parameters

D) technology that allows the economy to learn from its own experience, adapt to the established parameters

E) technology that allows you to learn natural science from your own experience, adapt to the established parameters

39. Leading professional video processing software:

A) Premiere Pro

B) Camtasia Studio

C) Power Point

D) Wizer.me

E) LearningApps.org

40. Screencasting program with Post-production processing

A) Camtasia Studio

B) Premiere Pro

C) Power Point

D) Wizer.me

E) LearningApps.org

41. This is a community of teachers who create innovative educational resources for classes in an open information educational environment:

A) Wizer.me

B) Premiere Pro

C) Power Point

D) Camtasia Studio

E) LearningApps.org

42. An online quiz tool that works on the entertainment principle is:

A) Quizizz

B) Wizer.me

C) Power Point

D) Google Forms

E) LearningApps.org

43. A digital tool based on a website and applications that allows teachers to create interactive learning slide resources with which students can interact and learn is:

- A) **Nearpod**
- B) Wizer.me
- C) Power Point
- D) Google Forms
- E) Quizizz

44. Multifunctional constructor with which you can create tests, surveys, crosswords, interactive simulators, etc.:

- A) **Onlinetestpad.com**
- B) Google Jamboard
- C) Power Point
- D) Google Forms
- E) Quizizz

45. A free web-based communication tool that allows people to hold video conferences, make calls and exchange instant messages is:

- A) **Skype**
- B) Zoom
- C) Whatsapp
- D) Telegram
- E) Quizizz

46. A service in the form of an interactive whiteboard that will help you easily convey your ideas by working on a regular whiteboard and performing interesting creative solutions together and in real time is:

- A) **Google Jamboard**
- B) Onlinetestpad.com
- C) Power Point
- D) Google Forms
- E) Padlet

47. National Open Educational Platform of Kazakhstan:

- A) **moocs.kz**
- B) openu.kz
- C) courser.org
- D) edg.org
- E) moocs.dulaty.kz

48. Full-fledged collaborative software for agencies and startups:

- A) **WizIQ Virtual Classroom**
- B) Onlinetestpad.com

- C) Google Jamboard
- D) Google Classroom
- E) LearningApps.org

49. Video conference service that supports desktop demonstration for users and conference participants:

- A) Google Meet**
- B) Zoom
- C) Whatsapp
- D) Telegram
- E) Skype

50. The online learning platform, founded by two computer science professors at Stanford University, is:

- A) coursera.org**
- B) openu.kz
- C) moocs.kz
- D) edg.org
- E) moocs.dulaty.kz

51. A platform for the exchange of experience, communication with colleagues from other cities and even countries, participation in partner programs within the framework of state and foreign educational programs for the exchange of methodological materials, ready-made lessons and pedagogical experience is:

- A) website**
- B) case
- C) platform
- D) catalog
- E) content

52. A digital platform where the Internet is provided to the user as an online service using computer resources is:

- A) Cloud technologies**
- B) WizIQ Virtual Classroom
- C) Google Jamboard
- D) Google Classroom
- E) LearningApps.org

53. Competence based on continuous mastery of the ability to choose and apply information and communication technologies (knowledge, skills, motivation, responsibility) in various spheres of life:

- A) digital competence**
- B) professional competence
- C) pedagogical competence

- D) communication competence
- E) social competence

54. The use of digital tools and innovative technologies in teaching and learning, teaching them mainly with advanced types of technologies or e-learning:

- A) digital education**
- B) vocational education
- C) teacher education
- D) communication education
- E) social education

55. The process of understanding and sharing information, in which listening plays an important role:

- A) communication**
- B) correspondence
- C) platform
- D) catalog
- E) content

56. The cloud platform for video conferences, webinars and other similar online events is:

- A) Zoom**
- B) Kahoot
- C) Whatsapp
- D) Telegram
- E) Quizizz

57. «The pace of learning, the process of obtaining a subject is determined by the teacher himself. The teacher is responsible for the development of the student» who is the author of the lines of words?

- A) J.Yarbrough
- B) M.V. Lomonosov
- C) Chelsea Quinn
- D) J.Darrell
- E) W. Earls

58. In what year did John McCarthy once suggest that 8 computer calculations are performed using «national utilities»?

- A) 1960
- B) 1959
- C) 1958
- D) 1961
- E) 1965

59. The first interactive whiteboards were created in 1990?

- A) USA
- B) Japan
- C) Korea
- D) UAE
- E) Germany

60. In what year were the first interactive whiteboards created in the USA?

- A) 1990
- B) 1980
- C) 1970
- D) 1960
- E) 1950

61. An online conference tool specially designed for Online classes:

- A) Virtual classroom**
- B) Digital class
- C) Professional class
- D) communication class
- E) Social class

GLOSSARY

A digital footprint is a set of data created by a user while in a digital space. In a close context, the term «digital shadow» is also used - information that a person leaves, even if he does not understand the digital space.

A factor in the development of digital didactics is the demand of the economy and society for digital education – and the contradictions between the state's desire to monitor the goals, content and results of education in its sector as much as possible.

A massive open online course is an online course that can be taught by an unlimited number of participants.

A poster (German: Plakat) is a type of visual drawing, graphics on a large sheet with a brief explanatory text, performed for propaganda, advertising, informational or educational purposes.

Activtablet is a type of A5 mini-board that connects directly to a computer.

An electronic portfolio is a presentation by a teacher or student of all information about the work performed by him in the form of a file on a magnetic disk.

An interactive poster is an information presentation tool that can actively and differently respond to user actions.

An interactive wall (I-wall) is a vertical projection that has various multimedia properties and provides high image quality.

An interactive whiteboard is one of the additional devices of a computer, as well as a tool that combines two different tools for a lecturer or speaker: an image of information and a simple marker board.

Artificial intelligence (machine intelligence, AI) is a technology that allows a computer to learn from its own experience, adapt to set parameters.

Authentication is a procedure for verifying the identity of a declared user, process, or device.

Bilimland is a digital educational system based on the best practices of e-learning leaders around the world.

Blockchain is a digital analogue of an independent notary, whose role is to register certain events, preserve the authenticity of these events, which guarantees the correct identification of events and their slides.

Camtasia Studio is a screencasting program with post-industrial processing.

Case technology is a distance learning technology based on providing students with information educational resources in the form of a specialized set of educational and methodological complexes for independent learning using various types of information carriers.

Chatbot technology is the creation of meaningful, operational feedback with students in the process of distance learning.

Cisco Webex Classrooms is a secure solution that provides intuitive online learning for students, teachers and parents.

Cloud technologies are digital services provided to the Internet user as an online service using computer resources.

Cloud technologies are software, applications and services hosted on the Internet not on local servers, but in remote data centers.

Cloud technologies – providing remote access to data processing or storage.

Communication is a process of understanding and sharing information, in which listening plays an important role.

Coursera is an online learning platform founded by two computer science professors at Stanford University.

Cyber – (English Cyber) is a global network root used to denote various network resources, information objects and events related to computer electronic and digital technologies.

Demo portfolio (showcase) – a collection of the best works of the teacher. It is used to prepare a resume for employment or participation in a professional competition.

Development portfolio (developing) – accumulates during the employment process to assess progress in work and gain experience over a certain period of time.

Digital competence is a competence based on continuous mastery of the ability to choose and apply information and communication technologies (knowledge, skills, motivation, responsibility) in various spheres of life

Digital competence is a high-level meta-subjects that allow you to work with information, possess motivated, understandable, secure, critical digital technologies using the Internet.

Digital competence of a teacher is a set of skills for using information and communication technologies and digital media in the process of setting and solving tasks related to obtaining the knowledge necessary for processing and working with information, learning, socialization and expanding existing opportunities.

Digital didactics is a branch, a scientific direction of pedagogy, the subject of which is the digital transformation of the educational process, the organization of the learning process in the transition to a digital economy and a network society.

Digital education is the use of digital tools and innovative technologies in teaching and learning, which is often referred to as advanced technology learning or e-learning.

Digital educational content includes digital didactic materials, photographs, audio and video clips, statistical and dynamic models, virtual reality and interactive modeling objects, etc. Materials on the subjects studied, providing training in an interactive form.

Digital technology is a technology based on the display of signals in discrete bands of analog levels, and not in the form of a continuous spectrum.

Digital transformation is the transformation of a management system by revising strategies, models, operations, products, marketing approaches and goals, which is ensured by the adoption of digital technologies.

Distance learning is a type of education carried out with the help of telecommunication technologies and Internet resources, based on the educational interaction of teachers and students who are at a distance from each other.

Edapp Mobile LMS is a new standard of corporate e-learning LMS.

Educational technologies are a set of didactic methods used to transfer educational information from its source to the consumer and depend on the form of its presentation.

Edunet (edunet) – digital education.

edX is an American provider of massive online courses developed by Harvard and Massachusetts Institute of Technology.

Electronic identification-automatic identification technologies maximally meet the requirements of computer systems and control systems, which require clear recognition of objects in real time.

External factors have a direct impact on the process of informatization of the education system and depend on the processes that develop outside the education system.

FashionNet (fashionnet) is a market of fashion industry products.

Filling in the blanks is a type of question in which you need to enter a number or text in a field located inside the text. There is a separation of allowed characters into number input by means of control and text input.

Foodnet (foodnet) – production, storage and processing of digital market products.

Google Jamboard is an interactive whiteboard service that helps you easily communicate your ideas by demonstrating them on Jamboard and working on a simple whiteboard and making interesting creative decisions together and in real time.

Google Meet is a video conference service that supports desktop display for users and conference participants.

Google Sites (sites.google.com) is a Google service that provides its users with the service of free creation of websites and their placement on the Internet.

Hypertext is the freedom to navigate through the text, an abbreviated presentation of information.

Independence-the choice of the method of presentation of the material, the level of complexity, the pace of work, the number of fixing repetitions, the nature of educational assistance, partner, game environment.

Infographics are a graphical way of presenting information, data and knowledge.

Information competence is a meta-subject competence consisting of the following components: cognitive (knowledge and understanding of the basics of computer science), motivational (satisfaction with the level of self-development of an information company), service (working with information, knowledge of ICT).

Information technology is hardware and software based on the use of computer technology, providing storage and processing of educational information, its delivery to the student, interactive interaction of the student with the teacher or pedagogical software, as well as testing of students' knowledge.

Interactive communication is the interaction of a student with other webinar participants through software.

Interactive table – several multi-level information blocks, thematically combined, located one after the other on the slide.

Interactivity is the ability to provide greater subjectivity in the process of communication and interaction.

Interactivity is the ability to provide multi-personality in the course of educational communication and educational activities among themselves.

Internal factors are associated with pressing problems within the education system, with the processes of adopting and mastering new tools for working with information to solve new and previous educational tasks, ignoring changing expectations and requests of society as a whole.

Kundelik.kz system is an education management system in terms of academic performance in secondary education in Kazakhstan (the so-called LMS-Learning management system), which can automatically perform all the necessary educational processes and much more online.

LearningApps.org – a free online service founded in Germany in 2012, which allows you to conduct interactive training sessions to test your knowledge.

Matching is a type of question to which the user must link the answer options to each other.

Mobile learning is a new way to access educational content via a mobile phone.

Moocs.kz – national open educational platform of Kazakhstan – Multimedia (polymodality) is the ability to comprehensively launch various channels of perception (auditory, visual, motor) in the educational process.

Moodle is a free, open source LMS written in PHP and distributed under the GNU General Public License.

Multilevel didactic games are an active form of educational activities organized in the form of educational games that implement a number of principles of the game, active learning and differ in the presence of rules, a fixed structure of gaming activities and the presence of an assessment system.

Multiple choice is a type of question in which the user selects one or more answer options from a suggested list. The number of correct answers in such tasks is unlimited.

Nearpod is a digital website and app-based tool that allows teachers to create interactive slide-reading resources through which students can interact and learn.

Network or Internet technologies are remote educational technologies based on the use of global and local computer networks to provide students with access to information educational resources and the formation of a set of methodological, organizational, technical and software tools for the implementation and management of the educational process, regardless of the location of its subjects.

Onlinetestpad. com is a multifunctional constructor with which you can create tests, surveys, crosswords, dialogue simulators, etc.

Padlet is a platform for creating boards for posting content.

Portable – allows you to read anywhere, anytime.

Portal of pedagogical education www.smart-pedagog.kz is an intelligent innovative virtual educational platform that provides access to all educational resources to provide distance learning and advanced training.

Premiere Pro is the leading professional video processing software.

Profitability-the cost of distance learning system services the absence of a large number of buildings (for the organization of the educational process, libraries and laboratories and other educational activities) and the provision of more consolidated and unified content of educational materials and orientation to the number of students and other factors.

Quizizz is, first of all, an online quiz tool that works on the entertainment principle.

Reporting portfolio (product) – reflects the achievement of a certain result after the completion of work on the project;

Safenet is information security related to the digital services market.

Skype is a free web communication tool that allows people to hold video conferences, make calls and exchange instant messages.

SMART competence is a competence that allows you to work with information, use SMART technologies based on motivated, meaningful, secure, critical, innovations using the Internet, mobile, continuous, autonomous, intelligent, professional network communities

Smart education is a direction that includes a complex connection of all educational processes.

Smart education is the latest educational environment that unites the efforts of teachers and specialists.

Smart learning methods are self-oriented, motivated, personality-oriented learning using modern technologies, free access to resources.

Smart-learning is a differentiated approach that meets the framework of existing teaching methods and the needs of students in personalization, integration, integration and knowledge exchange of P.I.C.K. promoting market expansion through a training platform.

Steam is a new educational technology that includes several subject areas as a means of developing critical thinking, research competencies and group work skills.

STEAM is an educational subject aimed at instilling in children from an early age an interest in art and science and love for life.

Subculture – compliance with the usual picture of the world for the digital generation, recognition, emotional and psychological closeness, provision, a state of comfort contrasting with the negative environment of traditional learning, compliance with the usual traditions of the world for the digital generation.

Telecommunication technologies – in a narrow sense, telecommunication technologies are understood as a set of software and hardware that allow you to establish communication without the use of wires and transmit information packets, including audio and video information.

Teleconference is carried out on the basis of mailing lists using e-mail.

The digital educational environment is an open complex of resources, conditions and opportunities for learning, development, and socialization of the individual.

The individuality of learning is the possibility of creating an informational learning environment with a TV program that allows the use of dedicated teaching methods to enhance the individualization of learning and increase the effectiveness of learning.

The only choice is the type of question to which the user selects only one answer option from the suggested list. (This type of question is the simplest and most common).

The Portfolio method (ital. portfolio 'portfolio (English - folder for documents) is a modern educational technology based on the method of reliable evaluation of the results of educational and professional activities.

The principle of digitalization - when presenting educational material and guided by the didactic principle, new qualitative opportunities generate new types of activities that are real in the conditions of socialization in a digital society.

The principle of expediency is the differentiated application of digital technologies and learning tools that ensure the achievement of the goals of the principle of education in combination with didactic principles.

The principle of personalization is the basic principle of digital didactics -in setting the learning goals of the student (taking into account the degree of his maturity and independence), in designing an individual educational route, in determining the pace and level of mastering certain elements of the educational program, effective technologies, forms and methods of teaching, the composition of the study group, in determining his educational needs, individual freedom of choice, taking into account inclinations and preferences, ethno-cultural and other features.

The purpose of the portfolio is to generalize, systematize and take into account the results of the student's development, his efforts, academic performance and achievements in each area, a comprehensive demonstration of his abilities, interests, inclinations, knowledge and skills in completing the task.

The quality of training is the involvement of highly qualified specialists in the preparation of educational material regardless of the place of residence and language of communication, and for students the opportunity to independently choose priorities for participation in group work through seminars and teleconferences, performing exercises and practical tasks for a certain period, passing various tests, obtaining the necessary final competencies.

The transformation of the principle of education in the process of digitalization is the implementation of methods and complex forms of education in accordance with the complexity of the teaching tools used in the principle of education.

The website for teachers is a platform for the exchange of experience, communication with colleagues from other cities and even countries, participation in partner programs within the framework of state and foreign educational programs for

the exchange of methodological materials, ready-made lessons and pedagogical experience.

University venture studios are a space and teams for the development of startups in educational organizations.

Virtual Classroom is an online conference tool specially designed for online lessons.

Virtual reality technologies are a motivational game and the creation of a real environment at the stages of mastering, consolidating and controlling educational material.

Web classes are distance classes, conferences, seminars, business games, laboratory work, workshops and other forms of training sessions conducted through telecommunications and other Internet capabilities.

Webinar is an IT company specializing in the development and delivery of web and video conferencing services.

Wizer.me is a community of educators who create innovative educational resources for classes in an open informational educational environment.

WizIQ Virtual Classroom is a full-fledged collaborative software for agencies and startups.

ZOOM is a cloud platform for video conferences, webinars and other similar online events.

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