

# Digital technologies in art education: problems, solutions

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**Abstract.** Digital technologies, which entered education at the beginning of the 21st century, are actively developing in connection with the prevailing conditions in society throughout the planet in 2020-2021. They have influenced both the education system in general and the artistic direction, especially in distance learning. The developments of scientists and teachers presented at the last congress of sociologists ROS and psychological and pedagogical concepts of humanistic, personality-oriented education contain a discussion of the existing digital space and proposals for the organization of digital education in higher education, including the artistic students' specialization. Based on this and the didactic concept of teaching, we continued the author's methods of optimizing the artistic activity of students in distance learning at a university, described in previous articles, reflecting its specificity, results of the application, and outlined prospects for this direction of creative activity that develops personality in modern conditions.

## 1 Introduction

The technology of modern education increasingly includes a digital component in connection with the transformations taking place in society and the next restrictions, justified by the increase in the number of diseases since the fall of 2021. Digitalization is no longer only a natural component of modern life, but also a necessary condition for the preservation of the educational process in the current conditions. To scientifically substantiate the transformations taking place in the countries of the formation of digitalization and the pandemic, we turned to the materials of the VI All-Russian Sociological Congress of the ROS, revealing the theoretical foundations of the problem of society in education, identified by sociologists, teachers, psychologists at the forum in October 2020 and discussed in the framework of the reports in early November 2021. The congress was attended by teachers of various specialties from the leading universities of the capital and the country.

The articles and messages on the digitalization of education touched upon topical issues and gaps in professional knowledge that developed during the pandemic on the problems of society and higher education, which are relevant for understanding by specialists. At the sections of the direction of digitalization of education, scientific theoretical and

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methodological studies on general methodological and specific topics of the indicated problem were presented.

We were interested in an article with fundamental material devoted to the study of the theory and methodology of organizing the system of science and education in 4.0 format based on human and artificial intellectual capital, where human intelligence may not prevail, artificial intelligence is used 4 times more. Implemented within the framework of the President's grant on the topic "State policy in the field of higher education and the development of the innovative potential of youth: economic and non-economic determinants and mechanisms in the context of the regionalization of social space and the emergence of Industry 4.0." Referring to the studies of Barra, C., Zotti, R., on the modernization of science and education "in the context of the fourth industrial revolution, which is gradually becoming mandatory and tightening - this process can be called the institutionalization of the practice of continuous digital modernization of the system of science and higher education [1]", and research by other leading scientists, the author formulates his position. A concept based on the new digital economy and the prospects for organizing the system of science and education in the 4.0 format. He concludes that despite the introduction of artificial intelligence in these industries, human intelligence will be in demand, as before [2].

The article "Digitalization of Education: Risks of Dehumanization" examines the hidden risks to humanism in digital education, despite the emerging positive reflections in the new learning environment, both among teachers and students. Fears are expressed that "digitalization of education in its current form carries with it complex risks - it develops side effects in the form of centrifugal tendencies, frees young people from the context of social and cultural ties [3]".

To eliminate these negative tendencies, a concept has been developed, "to minimize the risks of dehumanization, it is necessary to make a transition from digital education based on pragmatic values to humanistic ally oriented education within the framework of the "humanistic turn "justified by us"", revealing the position of the formation of a humanistic direction in modern conditions of digitalization. Consisting in the freedom of search, the use of the potential of creative and intellectual development, in general - the formation of a base of opportunities for creating and achieving the benefits of society. At the same time, the hope is expressed for the preservation of the categories "status, social identity, collectivity and individualization" of traditional society. These positions correspond to our understanding of the problems and objectives of digital learning.

The author's methodology of our research was developed based on the use of digital technologies with all the possibilities of using scientific, educational, and methodological information, the possibilities of visualizing auxiliary material, psychological and pedagogical concepts of personality-oriented, individually directed education, the creative development of the student in the main and independent work based on didactic principles of scientific character, clarity, connection between theory and practice, activity, problem learning system, from simple to complex. We believe that the problem of the digital society is a tendency that is beginning to form - clip-like thinking from an excess of information and the absence of one's reflection, which does not allow young people to develop harmoniously. Such a clear organization of the educational process is necessary as a theoretical, practical, and methodological basis for a system of approach to digital art education, contributing to the personal and professional orientation of the young generation for professional and creative development. The requirements for digital distance artistic activity in the interaction of teacher↔student and student↔teacher are considered.

## 2 Materials and methods

Along with sociological studies of the processes of digitalization of society and education, leading teachers analyze and study the process of digitalization of vocational education. Various models of digital competencies are put forward to design professional and pedagogical activities in the context of the digital transformation of education. In the context of the main methodological approaches and specifically the formulation of the concepts of digital education, a “didactic framework for the concepts of advanced digital education for teachers” was formed.

Representatives of the activity-technological approach proposed the concept of “pedagogical/educational technologies of digital education”, based on the priority of that digital didactics, where the main attention is directed precisely to pedagogical learning technologies built on publicly available digital technologies with their educational potential, and not on the content or result [4].

At the same time, one of the leading directions in the formation of digital didactics is the proposed “pedagogical and creative design of teaching technologies based on the opening possibilities of using new digital tools” [5].

Representatives of the cultural-anthropological approach consider it as the main concepts: “person of the digital age” and “personal professional development” and designate the center of education - a person who is the beginning and the result. In modern conditions of digitalization, in their opinion, digital technologies should be an auxiliary component of the main concept, that is, work for education and obey pedagogy [6].

Foreign studies of modern trends in education are now tending to the consequences and risks of digitalization for people, especially the younger generation. The main idea is the importance of developing the humanistic potential of education in pedagogical activity in the presence of a digital environment [7].

Russian developments in the field of modern trends in education with the use of digital technologies in full-time and distance learning touch on three problems. First, the problem of the value of a person in the socio-cultural and personality-developing space. Secondly, the problem of preserving spirituality and individuality. Thirdly, the problem of the importance of the professional development of students, and the provision of scientific and methodological equipment for the learning process, as well as professional training and retraining of teachers in the digital environment [8].

The designated developing human potential concepts of the humanistic direction of pedagogy in modern conditions of digitalization of education fully correspond to the idea, methodology, and technology of art education, which contains personality-oriented education in a personality-developing artistic space, which allows developing the humanistic potential of youth, while students master professional competencies.

The study of the values and functions of art in society, the formation of individual emotions and self-development in the private sphere is carried out [9].

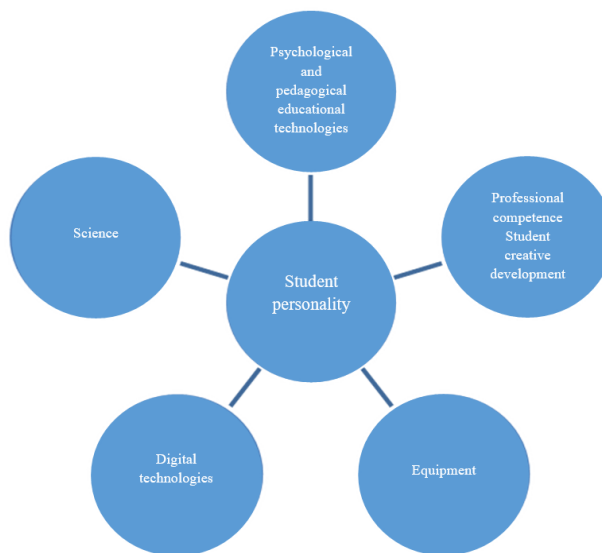
To develop the culture-forming components of the personality, a method has been developed for teaching students the ability to give the studied works of art an aesthetic valuation, based on the formed professional competencies. The method is universal, it was developed for students of art directions of various specialties, studying the basics of “architecture, all types of visual design, painting, graphics, sculpture, as well as specialists in the field of art and correctional pedagogy, art therapy” [10]. It is important for the development of outlook, personal professional, cultural and creative improvement.

The results of a socio-pedagogical study designed to identify motivation and incentives, “risks and problems of modern students in connection with the digital aspects of learning” can be used as a tool to improve the effectiveness of the educational process in the framework of pedagogical innovations of higher education [11]. Innovative approaches in

distance learning with the direction of the vector "methodological assistance and ways of realizing the creative potential of students in visual activity" in independent extracurricular work based on self-development and self-realization in the creation of art products under the patronage and tutoring using digital, media and information technologies [12]. This concept contributes to professional self-realization, creative and professional development, harmonious formation of the student's personality.

The problem of personality development technologies is based on a comparative analysis of approaches (personal, individual, cultural, axiological, activity, competence, and contextual), which are the methodological basis of individual and personal development and professional training in the field of architecture and construction, can be solved in information and digital conditions education based on internally motivated activity [13].

The technologies of support in visual activity in distance learning of design students creating a visual environment have been developed [14].



**Fig. 1.** Formation of the student's personality in the digital learning system.

### 3 Equations and mathematics

Figure 1 shows a scheme for the formation of a student's personality in the digital learning system: Psychological and pedagogical educational technologies (top) as the basis of the training system; Professional competencies, creative development (right side of the diagram) - artistic technologies; Science (left side - logical thinking); Digital technologies and equipment (lower part) - the basic foundation of modern digital education.

There is an active interaction and organization of an uninterrupted intensive educational process. As educational and methodological support for distance learning, the access of the teaching staff to electronic resources is organized on the website [do.skif.donstu.ru](http://do.skif.donstu.ru) in the My Courses section. Using modern teaching methods and tools, teachers can also create and demonstrate a video with their master class or a recording of a professionally performed stage of artistic activity, necessary to explain the technology and methods of working on the topic of the lesson. To successfully organize the training session, the teacher can post a photo of the training set on the topic of the lesson from several angles, so that the group of students has the opportunity for variable individual work. In independent

studies, students consolidate their work skills in the material in the studied techniques and methods of doing work.

Despite the change or correction of traditional forms and methods of teaching, there is a digital transformation of the educational process of competencies. For the assimilation of material in artistic disciplines, it is important to interact between the teacher and the student at all stages of work. Comments can be presented in text or voice messages to convey to the student the place of the error and the essence of the remark clearly. For independent work of students, forums, chats, and social networks are also used.

The educational process is monitored for the conducting classes and the quality of conducting classes when using educational technologies is checked. Intermediate certification - Rating 1 is also organized using remote sensing technologies. The whole process is clearly organized and carried out exactly on schedule, which creates the possibility of full-fledged classes that contribute to the successful assimilation of knowledge and the acquisition of professional competencies by students.

In art educational disciplines: drawing, pictorial art, composition, sculpture, the teacher taught on the example of pedagogical drawing, a master class, methods of working in material, drawing techniques, observing the phased conduct of work. The digital environment made it possible to demonstrate the professional achievements of artists, worthy of attention in the pedagogical process.

In the next studies, we plan to identify the difference in the effectiveness of artistic and educational activities according to certain criteria of professional competencies in educational work on platforms and group chat and to determine the optimal results.

In distance learning, it becomes necessary to convey all the important components for the successful mastering of art educational subjects:

1. Electronic equipment (computers / tablets, smartphones), the availability of electricity in the room, the Internet and the ability to use electronic media;
2. An introductory part with the topic of the lesson and the requirements for completing the assignment, the organization of step-by-step work on the assignment, control over the implementation of the steps after a certain time, in the techniques for performing the assignments defined by the RPD;
3. Demonstration of visual materials, such as photos of assignments, samples of work, thematic presentations, videos with elements of technological techniques, video masterclasses, sending links to textbooks, materials for independent work, etc.
4. Theoretical descriptions with the rules for the use of art materials and technologies for working with them.
5. Organization of feedback with students: sending photos of works with the results of educational activities in sheet format or volumetric form by stages of implementation.

**Table 1.** The probability of the digital technologies impact on the distance learning effectiveness in the fine arts disciplines for 2020 and 2021.

Professional requirements	Academic subjects										Mistakes (%)		Distortions (%)		Equipment	
	Drawing		Technical Drawing		Composition		Pictorial art		Sculpture and modeling		2020	2021	2020	2021	0	2
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021						
Composition: characteristic	+	+	+	+	+	+	+	+	+	+						
Linear constructive plotting	+-	+-	+-	+-	+	+	+-	+	+	+	Up to 50	Up to 30	Up to 30	Up to 30		
Shape	+	+	+	+	+	+	+	+	-	+	Up to 50	Up to 30	Up to 30	Up to 20		
Light-tone solution	+	+	+	+	-	+	-	+			Up to 30	Up to 20	Up to 20	Up to 10		
Texture	+	+	+	+	+	+	+	+	-	+						
Environment	+	+	+	+	+	+	+	+	+	+						
Colour		+			-	+	-	+			Up to 70	Up to 30	Up to 70	Up to 30		
	Personal computer/mobile phone/tablet															

In 2020, we developed a table based on the results of distance work with students in artistic disciplines: Drawing, Technical Drawing, Composition, Pictorial art, Sculpture and Modeling.

In this article, we have presented the result of the successful application of the author's method. We also conducted a comparative analysis of the impact of digital technologies on the effectiveness of distance learning in the fine arts disciplines for 2020 and 2021. Conventions used in Table 1: + is a positive result, - is a negative result, an empty cell means the absence of this criterion in the academic subject. The number of + and - show the difference in the assimilation of the material in distance learning classes (using digital technologies) and full-time education in classrooms: "Up to 50, 70 -% are mistakes according to certain professional requirements for the volume of the educational task. Mistakes occur as a result of the perception of the photo of the received task. Distortions of shapes and lines occur as a result of photographing the completed task and its stages [15]".

The comparative analysis of the frequency of mistakes showed that, with the use of methods of monitoring and preventing defects in the work of students, the indicators of 2020 changed in 2021 towards a decrease in inaccuracies. Where there were 50, 70% of mistakes, they decreased to 30, 20%. Personal computer/mobile phone/tablet is the presence of equipment at the student's home, which allows a clearer examination of the task (the larger the screen, the less mistakes and distortions).

The conclusions that can be drawn from this table: the training system allowed us to obtain a result that turned out to be positive when using a greater number and variety of

digital materials (provided by the teacher) for training. This made it possible to improve the competence indicators of the result of mastering art technologies.

In the future, it is planned to control more the independent work of students in working with digital materials. It is also planned to develop possibilities for optimizing this type of independent work of students from 1 to 3 courses.

According to the research for 2020, students received methodological recommendations on the requirements for conducting work in a distance learning format. This made it possible to obtain a positive result, a decrease in negative factors in the process of completing the assignment, preparing and sending educational material.

## **4 Discussion**

The university has developed digital databases and activities for the timely use of all electronic support for students and teachers for the successful training of students remotely.

The education of students is organized using distance educational technologies and e-learning, including based on the electronic information and educational environment of the university, as well as the means of other educational platforms that are not included in the University's EIEE, as well as tools of other applications for remote work with students; websites, blogs, chats, posts. The University has provided teachers with access to the educational-methodological and control-measuring materials developed by them on the website with resources of educational materials via the Internet.

We have described and brought to the attention of students an algorithm for working on an assignment, which includes and describes the stages of actions in the classroom: laboratory work, practical work and consultations on the independent work of students of the art field. The learning process can be conducted in two educational digital resources: the Meet platform (or another) and a group of students in WhatsApp or Telegram to control the successful completion of the educational and creative task, the accuracy of the lines (Drawing), plastic (Sculpture, Modeling), color scheme (Pictorial art). In order to organize an optimally structured educational process, first of all, all students should send their names to the group chat after the teacher greets the students and announces the beginning of classes and its topic. As the work progresses, the student sends a drawing/sketch according to the stages:

- Composition of still life.
- Linear constructive plotting.
- Filling the work with watercolors, filling the bouquet and background with color.
- Detailing the shape of the still life elements.
- Checking the color and light-tone relationship of objects and the background. We check the own color of each object, glare, light, half shade, reflexes from surrounding objects. Checking the warmth and coldness of light and shadow (in cold light, the shadow is always warm, in warm light, the shadow is cold).
- Clarification of color and light-tone relationships in the light and in the shade of objects. Intensification of the dropping shadows.

Remote lesson is performed according to the established algorithm. Each student must clearly know the structure of the organization of the educational process. The student must not violate it to the detriment of the learning outcome. A clear organization of distance learning and discipline of students is the key to a successful result, namely the assimilation of techniques in a technological sequence. For clarity, the teacher uploads samples of work, videos with the implementation of a similar task or its stages, links to an educational video or presentation. Various digital technologies of photo and video information are used. Equipment is necessary to equip and fully support the educational process.

Feedback also includes step-by-step control in the form of a photo or video of the assignment. In the drawing, pictorial art, sculpture, the correct composition of the format of the work performed is especially important when photographing or filming. The vertical and horizontal lines must be positioned without distortion. This is the key to correct perception of the image by the teacher. These seemingly insignificant requirements are the most important requirement in the perception of the student's work. The teacher can comment on the correctness of the work only with strict adherence to all requirements in the educational process, a timely detailed examination of the drawing, painterly sketch, sculpture for a careful study of the techniques for performing the work. All aspects of this technology carry the foundations of professional knowledge and competencies.

Digital equipment is necessary to equip and fully support the educational process. When working on a composition of a graphic or decorative nature, graphic programs can be used. It is not advisable to use them for academic drawing.

## **5 Conclusions**

The article examines the socio-pedagogical problems and prospects of digitalization of public life and education, scientifically grounded and tested during two periods of changing conditions: the inception and formation of digital technologies in society and education (from the beginning of the 20th century), the period of a pandemic and distance education (2020-2021). We identified the psychological and pedagogical fundamental directions, theories and practices, concepts and methods of partial reorganization of the educational processes of high education in digital and distance learning, which are successfully working in new conditions.

The specificity of psychological and pedagogical concepts, methodological techniques and promising solutions for optimizing art education in digital conditions has been studied.

The scientific and methodological base of the system of teaching creative specialties, aimed at improving the personality-oriented approach and at the individual development of the student, has been formed.

The system of innovations in the art fields of specialization of higher education, which is formed in the process of distance learning based on digital technologies, is aimed not only at mastering the skills of working in digital systems, but also at the formation of a new type of personality. This is aimed at the formation of a humane personality, developing creatively, who is capable of self-improvement in a digital and professional artistic environment.

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