INNOVATIVE APPROACHES TO TRAINING FINE ARTS SPECIALISTS IN DIGITAL ART

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Abstract. This article thoroughly examines the significance of digital technologies in contemporary art education and their influence on the educational process. New opportunities created by digital art in education are analyzed; innovative approaches used in the training of creative professionals are systematically examined; and the practice of applying interactive methods and modern digital tools integrated into the process of art education is discussed. Specialists in the field of art education will also be provided with methodological foundations for developing interdisciplinary connections in accordance with the content of digital art. A comprehensive analysis of scientific data has been conducted, examining the pedagogical conditions for the effective integration of digital technologies into the educational process, as well as the methods of their application in the professional training of future art teachers.

Accordingly, an in-depth analysis was conducted on the application of modern teaching methods that utilize digital tools to enhance students' creative potential and develop their professional skills within the context of mastering contemporary trends in art. In addition, works by contemporary artists created using virtual and augmented reality (VR/AR), artificial intelligence (AI), and digital painting technologies are presented. The relevance of this article is grounded in the use of interactive teaching methods, modern digital platforms, and the emerging prospects of digital art. In the empirical analysis of innovative digital art approaches in training visual arts specialists, a diagnostic questionnaire based on Harrison Gough's Creative Personality Scale was administered to identify the respondents' creative abilities and personal qualities. The results are visualized in the form of diagrams. The results indicated that students successfully integrate digital art into their activities. Concurrently, potential was identified for the further deepening of knowledge and professional growth, both in the field of visual arts and in working with modern technologies.

Keywords*: digital art, innovative approaches, fine arts, digital tools, art innovations, creative education.*

Introduction

The rapid development of modern technologies brings significant changes to the field of fine arts, paving the way for the expansion of digital opportunities alongside traditional art forms. The use of digital tools and modern methods necessitates the enhancement of creative processes and the advancement of professional training for future fine art specialists to a new level. In this regard, studying innovative approaches to training fine arts specialists based on digital art is an urgent issue. The article discusses ways to demonstrate the impact of digital technologies on the educational process in the field of fine arts and to enhance the creative potential of future specialists. In accordance with modern requirements, the integration of art and technology is one of the key factors that enables the development of professional skills. Accordingly, the training of fine arts specialists based on digital art is becoming a necessity to meet new requirements, as innovative methods and technologies contribute to improving the educational process, fostering new artistic approaches, and enhancing the quality of professional training

Overall, the main idea of this article is to enhance students' adaptability to the digital environment and foster their creative thinking through innovative methods in digital art education. The article, published in the information outlet *Aikyn*, highlights Kazakhstan's potential in the development of innovations and advanced technologies, stressing that the widespread adoption of digitalization and artificial intelligence should be the key to the country's rapid progress. The President stated that our country has the potential to achieve ambitious goals in this area and emphasized the need to approach digital development with a fresh, innovative perspective [1].

In this regard, strengthening the integration of interactive teaching methods with academic subjects and the widespread use of digital resources are important priorities for our country. This issue will contribute to the development of students' creative thinking, the effective use of digital technologies, and the acquisition of professional skills in accordance with the requirements of the

contemporary art industry. Therefore, the widespread use of digital tools combined with innovative methods in the educational process will help improve the efficiency and quality of each lesson. So, what are innovative approaches in fine arts? According to the scientist N.N. Nurakhmetov, the innovative process in educational institutions of Kazakhstan is a phenomenon associated with the development, management, implementation, and dissemination of innovations [2]. The author notes that innovation is closely related to the content, methodology, and technology of education, as well as to the organization of the educational process and the management of the school system. He proposes to classify innovations into the following types: individual, modular, and systemic [2]. So, what changes can an innovative classification bring to the field of art education?

In the implementation of innovative classification approaches in the field of art, the value of digital pedagogy is particularly significant, as it allows students to unleash their creative potential, develop their personal style, foster creative and critical thinking, and explore new directions in art. Digitalization will make a significant contribution to the successful implementation of these processes. Thus, digitalization in creative and artistic disciplines has its own unique characteristics. While in traditional disciplines digital technologies are primarily used to automate processes and expand access to knowledge, in fine arts, they require direct interaction with creative tools [3].

Digitalization is especially important in the field of fine arts, where traditional teaching methods are transformed by new technologies. The use of tools such as graphic tablets, digital drawing programs, 3D modeling, and augmented and virtual reality makes the learning process interactive and engaging, expanding creative possibilities. Therefore, the training of future fine arts teachers requires a rethinking of traditional approaches, involving the integration of modern digital tools into the educational process [3].

These needs are driven by modern technological changes and the rapid development of digital transformations in the training of specialists in the field of fine arts. In addition, the growing demand for new forms of art education plays a significant role. Therefore, when training future fine arts teachers, special attention should be given to mastering modern digital tools, using multimedia technologies, and adopting interactive teaching methods. In general, as a result of the development of new processes involving digital technologies, the effective use of digital tools has become increasingly important in the modern era, especially for digitally assessing requirements in accordance with market demand [4]. The transition to interactive teaching methods and the use of real-time technologies requires telecommunication resources that can facilitate interaction among participants in the educational process, as well as significantly speed up the search and transmission of information [5].

Mario Costa has developed a broad aesthetic and philosophical concept for the foundation of new digital media, which he refers to as «technological transcendence» [6]. "Technological transcendence' is a concept that reflects the rapid development of digital resources, meaning that new technologies influence the formation of art and aesthetics, contributing to a fundamental change in creative processes [6]. These changes challenge traditional understandings of art and create new aesthetic dimensions." In recent years, a new term has emerged in the field of pedagogical education: 'digital art pedagogy' (I.M. Krasilnikov), which encompasses a theoretical concept, pedagogical categories, and principles based on the integration of art and digital technology [7].

This is an effective direction for developing the creative thinking of future specialists, fostering artistic skills in a digital environment, and using innovative teaching methods in the modern educational process. Currently, with the advent of personal computers, fine arts teachers are increasingly incorporating new digital technologies into their lessons. However, its implementation has been very slow (Black, 2002; Browning, 2006; Degenarro & Mak, 2002–2003; Flood & Bamford, 2007; Gude, 2007; Leonard & Leonard, 2006; Lu, 2005; Mayo, 2007), and many teachers rarely use technology in art lessons – or do not use new teaching technologies at all (Degenarro & Mak, 2002–2003; Gregory, 2009). Why is this the case? [8]. This issue is particularly significant, as some educational institutions–especially those in rural areas–lack adequate internet access. As a result, teachers in these regions rarely use new technologies.

Overall, the ongoing rapid development of digital technologies may also offer new opportunities for collecting data on students' learning and their (co-) affective learning processes [9].

However, although classical pedagogical concepts such as Vygotsky's learning theory (Daniels, 2001) have contributed to improving certain aspects of teaching and learning, they were originally developed without consideration of modern technologies such as artificial intelligence (AI) and generative artificial intelligence (GenAI). For the digital transformation of education to be successful, specific recommendations for integrating digital technologies into the learning process are essential [10]. Therefore, educators must develop an effective digital strategy for integrating technology into the educational process [10].

This will help teachers enhance their digital literacy and effectively apply interactive teaching methods, thereby contributing to the improvement of the overall quality of the educational process. In general, the purpose of this article is to determine the place and role of digital art within the field of fine arts, as well as to explore the potential of digital technologies in the education of future fine arts specialists. This article presents an analysis of innovative teaching methods based on digital art. Therefore, it is essential to explore effective strategies for integrating digital technologies into the art education system. Particular attention should be given to teaching methods that foster students' creative abilities and enhance their competitiveness in the labor market through the use of digital tools. In addition, one of the key tasks is to enhance the pedagogical competence of art teachers, improve their digital literacy, and implement innovative strategies in creative education. These measures will not only raise the professional level of future fine art teachers but also open up new opportunities for students' self-development through digital art.

Materials and methods

The central method employed in the research described in this article was a diagnostic procedure. This methodological framework is aimed at cultivating the systematic acquisition of cognitive competencies among future artist-educators, leading to the simultaneous refinement of creative and critical thinking. Based on the data yielded by the diagnostic study, this context necessitated an in-depth examination of the respondents' creative resources, alongside an assessment of their capacity for self-improvement when integrating digital art technologies

The analysis of development trends in digital art necessitates a comparative examination of its primary methodological approaches and the construction of diverse conceptual models. In the current era of artificial intelligence, the emergence of a new model of teaching and learning within the digital context – one that promotes autonomous and in-depth learning – has become a critical and timely concern [10].

In this regard, educators must create conditions that enable students to freely explore digital tools and experiment with various methods. Consequently, the comparative examination of approaches to integrating digital technologies – designed to foster creative ideation within contemporary visual art – constitutes the core methodological technique of this research.

If a particular approach proves ineffective, it is equally important to reassess it and identify alternative solutions. Additionally, students should dedicate more time to mastering digital technologies and gaining a deeper understanding of their capabilities, rather than merely completing assignments. Therefore, as in traditional art, educators can design open-ended tasks that encourage students to solve problems and express themselves. (Black, 2009a, 2009b; Browning, 2006, 2011; Gregory, 2009) [8]. This raises the question: "What do I aim to achieve in a digital art assignment, and how can I accomplish it?" [8].

If we examine the core of this question, it becomes clear that, for students studying art, it is a rational and relevant concern. It reflects a contemporary challenge faced by many art students. In E. Gabel's analytical review, attention is given not only to the outcomes of digital transformation in schools across various countries, but also to the integration of modern pedagogical approaches into digital solutions – particularly student-centered learning (personalized education), as well as experimental and phenomenon-based methods. These approaches demonstrate learning outcomes at a new qualitative level [11].

According to digital artist Mario Klingemann, intelligent neural networks and computers should not be regarded as artists in their own right, but rather as tools that can support and enhance the creative process [12]. Artists are harnessing the power of artificial intelligence as a technological tool – much like new brushes or canvases. In the future, unique works of art may be created with the help of algorithms and intelligent machines. However, masterpieces are rare in any artistic field, and it takes time and experience to master new technologies and apply them creatively [12]. Consequently, many contemporary artists produce innovative installations grounded in digital technologies, treating artificial intelligence as a creative instrument. This approach aligns with the concept of generative art, which relies on algorithmic and computational processes. As an example, one may consider the work "Machine Hallucinations" by the Turkish-American media artist Refik Anadol. This work is aimed at investigating the phenomenon of "machine dreaming" through visual representations generated by artificial intelligence (AI) algorithms (Figure 1).

Figure 1 – Refik Anadol's project "Machine Hallucinations"

Among contemporary generative artists, Refik Anadol occupies a special place, as his works serve as vivid examples of interactive and engaging digital art installations created with artificial intelligence and data. If future artist-teachers adopt the generative method with the aid of artificial intelligence, this approach will enable them to develop their own algorithms for creating diverse creative works and utilize them as visual material in the learning process. For example, 'Blue Morph' by Victoria Vesna – a metamorphosis of a butterfly, presented through interactive digital tools (Figure 2). Virtual and immersive installations play a significant role in developing students' creative skills. The use of interactive media and installation methods in this process is particularly effective, as it stimulates students to develop artistic thinking and engage in creative exploration.

Figure 2 – "Blue Morph" by Victoria Vesna

Digital art is divided into *true digital* art and *traditional digital* art. True digital art is created, stored, and distributed exclusively using digital technologies, while traditional art employs digital technologies solely as an auxiliary tool [13]. Here, for *true digital* art.:
    – Computer graphics;
    – Algorithmic generation;
    – Virtual and augmented reality;
as well as interactive installations, while traditional digital art includes the creation, processing, and distribution of classical art forms such as drawing, painting, sculpture, and graphic arts. The interaction between these two areas contributes to the development of contemporary art and facilitates the formation of new forms and methods of creativity.

The artistic outputs of these practitioners, generated through the application of generative techniques and Artificial Intelligence (AI) tools, represent a crucial wellspring of methodological insights for prospective artist-educators. This serves to prompt the integration of diverse creative and pedagogical frameworks into their professional practice. The principal methods are outlined below:
    – *Experimental methodologies for working with diverse visual images;*
    – *Digital collage techniques for processing and combining images;*
    – *Various forms of interactive visualization of data and artistic objects;*
    – *Methods of digital modeling;*
    – *Principles and techniques of generative design;*
    – *Design and development of multimedia artistic compositions*

If every artist-teacher could combine these two approaches, utilizing digital technologies and applying modern innovative methods, it would significantly increase students' interest and enhance their creative abilities. These methods contribute to the effective organization of the learning process and foster the development of students' creative thinking skills in the digital environment.

Results and discussion

In the process of analyzing the digital art field, modern materials from scientific disciplines were studied, and important concepts and conclusions were drawn based on these materials. Therefore, it is advisable for teachers and students of any art discipline to use artificial intelligence (AI) tools and digital resources primarily as auxiliary tools, since art is a field that requires creativity, and digital art tools should be viewed as a supplement. Based on this, students should use it only as a supportive tool to clarify their ideas.

The goal is not to rely on AI tools for specific ideas for their work, but rather to draw inspiration for the creative development of their own thoughts. Thus, based on the findings above, it was concluded that the harmonious integration of digital transformation and modern pedagogical methods will contribute to the improvement of education quality and enable the creation of fresh and unique works of art in the future, provided that artificial intelligence and algorithms are used as the main tools in the creative process.

However, time and practice play a decisive role in achieving artistic mastery and deep creative insight. That is why it is important to teach students not only how to use these tools, but also how to use them effectively to enhance their creative abilities. An artist-teacher is, first and foremost, a creative educator. This is where the effectiveness of digital platforms comes into play (Figure 3).
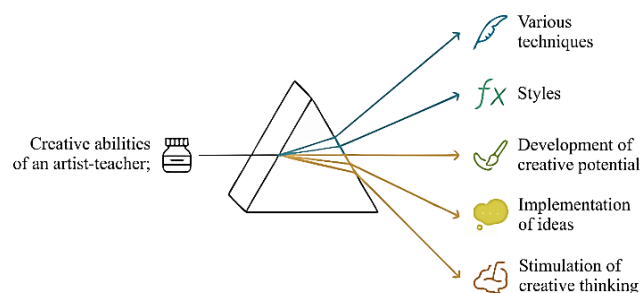
Figure 3 – Creative Connections in Learning

In general, the rapid development of digital technologies opens up opportunities for introducing interactive teaching methods into the educational process, accelerating the exchange of various information, and effectively using digital tools in artistic disciplines. Accordingly, this contributes to the development of students' digital competence, the enhancement of their personal creative abilities, and the adaptation of the educational process to modern requirements (Figure 4).
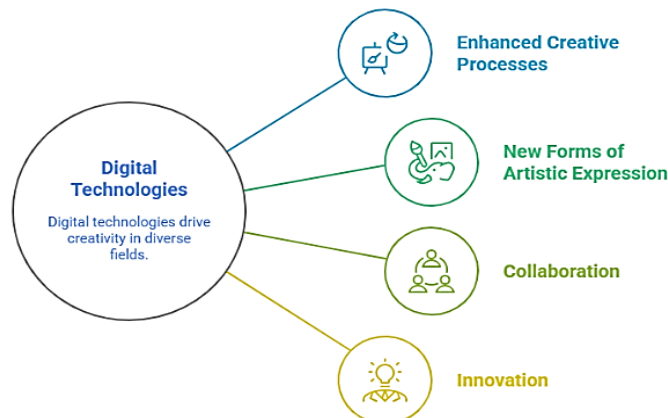

Figure 4 – The Creative Role of Digital Technologies

However, for the effective implementation of new technologies in art education, it is important to update the curricula and provide access to the necessary digital resources. This, in turn, will enhance the quality of education and ensure that the learning process is adapted to modern requirements. Thus, in order to comprehensively analyze the creative abilities of future art teachers and the individual characteristics involved in working with digital media, a diagnostic survey was conducted based on the Harrison-Gow Creative Personality Scale [14].

The survey questions were grouped into four main psychological characteristics: introversion, thinking, intuitiveness, and receptivity. These characteristics allowed us to identify the peculiarities of students' thinking as they manifest in their creative work within the digital environment. In total, respondents from three higher education institutions participated in the empirical analysis. These included students majoring in art education and design at the Kazakh National University named after Abai, students majoring in art education at the National Women's University, and students majoring in design at Almaty Technological University (Figure 5).
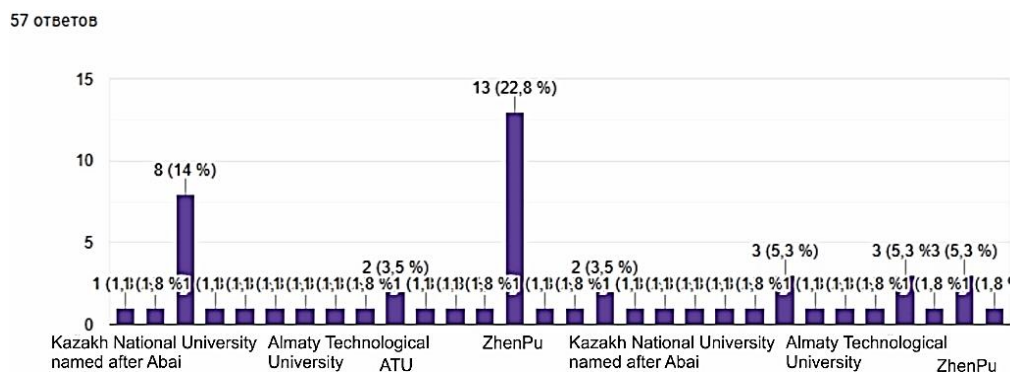

Figure 5 – Educational institutions

The survey results were analyzed, and conclusions were drawn based on the data obtained. A total of 66 respondents participated in the survey, and the results are presented in Table 1 below.

Table 1 – Processed Results of the Conducted Survey

Key questions	Answers			
	Yes	No	different	neutral
Introversion Do you prefer to work on digital projects alone?	21,5%	10%	29%	1%
Do you need a quiet environment to focus on the details of your digital composition?	45,5%	8%	13.5%	3,5%
Do you prefer to analyze other artists' work before starting your own	33%	8.5%	25%	2%
Is it easier to convey your ideas through visualization than through verbal explanation?	35%	7.1%	25%	2%
Thinking Do you try to maintain a logical structure and compositional integrity when creating your digital works?	42,1%	4,5%	18,3%	4,5%
Do you prefer to first learn the technical aspects of digital art (such as digital tools and the use of AI) before implementing a new idea in your work?	29%	11,8%	28%	2%
Is it important for you to have a vision and rationale to guide your work with digital assets?	45%	3.5%	22,2%	3%
Do you spend time working with new digital tools?	33,6%	7,2%	27%	2,3%
Intuitiveness Do you rely on unexpected ideas and inspiration when creating digital art?	43%	8.6%	14,5%	3%
Can you easily visualize the end result before you start working?	30%	4,5%	22%	2,5%
Do you enjoy experimenting with colors, textures, and shapes using digital (AI) tools, even if you deviate from traditional methods?	34%	12,2%	20,3%	4,1%
Are you interested in creating abstract ideas using artificial intelligence (AI)?	40%	6,2%	17.2%	4%
Perception: Ready to quickly master new digital technologies and implement them in your work	50%	4.6%	17,5%	1%
Do you enjoy combining traditional and digital art techniques?	29,6%	12,2%	23%	1,2%
How do you handle criticism? Do you use it to improve your work	35,2%	6%	25%	2,1%
Keep up with new trends in digital art and try to incorporate them into your work	35,3%	8%	19,6%	4,5%

As a result of analyzing the responses of 66 students, it can be concluded that the majority of them are capable of quickly mastering new digital technologies and are confident in applying these technologies to creative processes. The results of the student survey, based on the empirical study, are presented below (Figure 6).
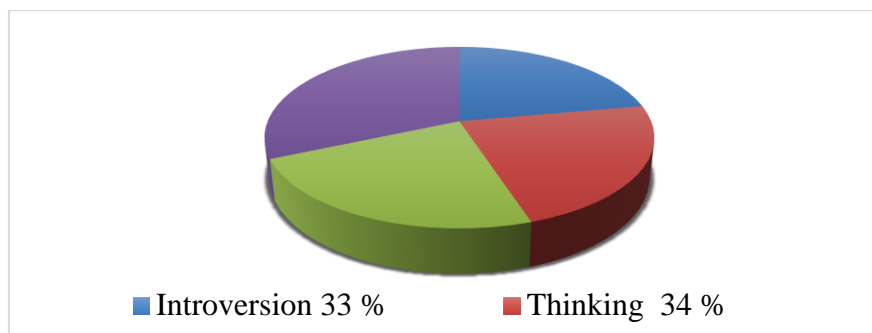
Figure 6 – Results of the Harrison-Gow Diagnostic

Based on the collected research data, students' perceptions of digital art, as well as their views on its possibilities and applications in the creative field, were systematized. The main directions in the development of digital art were identified through content analysis. A key trend was the students' tendency to view digital technologies primarily as tools for realizing creative ideas, along with a desire to enhance the compatibility between visual language and digital tools. These indicators show that students are adapting to modern educational requirements and developing skills for the digital environment. In addition, they demonstrate a desire to use digital tools effectively to enhance their creative potential. Over the last five stages of development, the system of higher education governance has undergone significant transformations, becoming multi-actor, multi-level, and multi-dimensional in nature [15]. Thus, digital tools not only create new forms of visual culture but also make learning more accessible, foster students' creative potential, and enhance their professional skills. In this regard, when preparing future art teachers, it is important to consider the following: digital art is not limited to the use of new media platforms, but also contributes to a new level of creative learning through the integration of art and technology.

Conclusion

In general, the training of specialists in the field of fine arts through digital art represents a modern and innovative educational process. Therefore, the integration of new technologies into fine arts curricula will enhance the professional potential of future artist-teachers and designers. Thus, the use of modern innovative approaches based on digital technologies in the field of art will help increase students' competitiveness in the labor market, enhance their professional skills, and expand their creative capabilities. In addition, this process fosters artistic thinking and enables students to work confidently in a digital environment. Therefore, an empirical study was carried out, utilizing G.Harrison Gough's proprietary methodology, for the express purpose of evaluating the evolution of critical thinking capabilities among future educators in the visual arts field. The findings of the survey underscore that a primary strategic objective of art education involves the cultivation of students' media literacy, technical competencies, and cognitive skills via interdisciplinary integration, consequently facilitating their optimal efficacy within the digital environment.

In conclusion, it should be noted that the effective use of digital art technologies requires comprehensive and in-depth research aimed at developing art students in accordance with contemporary demands.

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ЦИФРЛЫҚ ӨНЕР НЕГІЗІНДЕ КӨРКЕМ ӨНЕР МАМАНДАРЫН ДАЯРЛАУДЫҢ ИННОВАЦИЯЛЫҚ ТӘСІЛДЕРІ

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Аңдатпа. Мақалада қазіргі көркем өнер біліміндегі цифрлық технологиялардың маңыздылығы мен олардың оқу үдерісіне ықпалы жан-жақты сипатталады. Цифрлық өнердің білім беруде қалыптасқан жаңа мүмкіндіктері сараланып, шығармашылық мамандарды даярлауда қолданылатын инновациялық бағыттар жүйелі түрде зерделеніп, көркемдік білім беру үдерісіне енгізіліп жатқан интерактивті тәсілдер мен заманауи цифрлық құралдарды қолдану практикасы талқыланады. Көркем білім беру мамандарына цифрлық өнердің мазмұнына сәйкес пәнаралық байланысты қалыптастырудың әдіснамалық негіздері де қарастырылады. Цифрлық технологияларды оқу үрдісіне тиімді енгізудің педагогикалық шарттары мен оларды болашақ суретші педагогтарын кәсіби даярлауда қолданудың әдістері туралы ғылыми деректерге талдау жасалынды. Сонымен қатар, цифрлық құралдармен заманауи оқыту әдістерін қолдану студенттердің шығармашылық әлеуетін арттыруға және кәсіби шеберліктерін қалыптастыруда қазіргі өнер бағыттарын меңгеру мәселелері қарастырылды. Заманауи суретшілердің виртуалды және кеңейтілген шындық (VR/AR), жасанды интеллект (AI), цифрлық кескіндеме түріндегі инновациялық технологиялармен жасалған туындылары да қамтылды. Интерактивті оқыту әдістері, заманауи платформалар және цифрлық өнерді оқытудың болашағы – мақаланың негізгі өзектілігі болып табылады. Көркем өнер мамандарын даярлаудағы цифрлық өнер негізінде инновациялық тәсілдерді эмпирикалық талдаулар бойынша респонденттердің креативті қабілеттері мен тұлғалық ерекшеліктерін анықтау мақсатында Харрисон Гоудың шығармашылық тұлға шкаласына негізделген диагностикалық сауалнама әдістемесі қолданылып, алынған нәтижелер диограмалар түрінде көрнекі көрсетілді. Нәтижесінде, студенттердің цифрлық өнерді өз практикаларында тиімді ұштастыра білетіндері айқындалды. Алайда, көркем өнер саласында жаңа технологиялармен жұмыс жасау үдерісін одан әрі жетілдіріп кәсіби деңгейде шыңдау байқалады.

Кілт сөздер: *цифрлық өнер, инновациялық тәсілдер, көркем өнер, цифрлық құралдар, өнер инновациясы, шығармашылық білім беру.*

ИННОВАЦИОННЫЕ ПОДХОДЫ К ПОДГОТОВКЕ СПЕЦИАЛИСТОВ В ОБЛАСТИ ИЗОБРАЗИТЕЛЬНОГО ИСКУССТВА НА ОСНОВЕ ЦИФРОВОГО ИСКУССТВА

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Аннотация. В статье подробно анализируется значение цифровых технологий в современном художественном образовании, а также их влияние на образовательный процесс. Анализируются новые возможности, которые цифровое искусство создало в образовании; системно изучаются инновационные направления, используемые в подготовке творческих специалистов; обсуждается практика применения интерактивных подходов и современных цифровых инструментов, внедряемых в процесс художественного образования.

Рассматриваются также методологические основы формирования междисциплинарных связей путём интеграции различных аспектов цифрового искусства в подготовку специалистов художественного образования. Анализируются научные данные, отражающие педагогические условия эффективного внедрения цифровых технологий, а также методы их использования в процессе профессиональной подготовки будущих педагогов-художников.

Соответственно был проведён глубокий анализ применения современных методов обучения с использованием цифровых инструментов, направленных на повышение творческого потенциала студентов и развитие их профессиональных навыков в контексте освоения современных тенденций в искусстве. Кроме того, были представлены работы актуальных художников, созданные с применением технологий виртуальной и дополненной реальности (VR/AR), искусственного интеллекта (AI) и цифровой живописи. Интерактивные методы обучения, современные платформы и перспективы цифрового искусства составляют основу актуальности данной статьи. Для оценки творческого потенциала и личностных характеристик респондентов в рамках эмпирического исследования инновационных подходов цифрового искусства в обучении специалистов изобразительного искусство была использована диагностическая методика, основанная на шкале творческой личности Харрисона Гоу. Результаты исследования представлены в диаграммах. Результаты показали, что студенты успешно интегрируют цифровое искусство в свою деятельность. Вместе с тем, выявлен потенциал для дальнейшего углубления знаний и профессионального роста как в сфере изобразительного искусства, так и в работе с современными технологиями.

***Ключевые слова:** цифровое искусство, инновационные подходы, изобразительное искусство, цифровые инструменты, инновации в искусстве, творческое образование.*