



Preparation of Future Fine Arts Teachers for Innovative Professional Activity Scientific And Practical System

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OPEN ACCESS

SUBMITTED 26 February 2025

ACCEPTED 22 March 2025

PUBLISHED 25 April 2025

VOLUME Vol.05 Issue04 2025

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Abstract: The article examines the scientific and practical system of preparing future fine arts teachers for innovative professional activity. In the study, based on competency-based learning, creative thinking, and pedagogical innovations, the curriculum, pedagogical practice, innovative projects, and technological infrastructure are analyzed. The results demonstrate the importance of modern technologies and creative approaches in teacher training. To improve system performance, it is recommended to modernize the curriculum and expand the use of digital tools.

Keywords: Mixed, method, component, interactive, virtual, concept, correlation, competence.

Introduction: In the modern education system, the professional training of fine arts teachers is of strategic importance due to globalization, the rapid development of digital technologies, and the growing demand for innovative approaches in the field of education. Teachers of fine arts, along with the formation of aesthetic feelings and creative abilities in students, must successfully apply digital tools, interactive platforms, and modern art practices in their activities. This process requires them not only to master traditional art styles and pedagogical skills but also to be able to adapt to the changing educational environment, master new technologies, and integrate creative solutions into the educational process.

In the context of globalization, the transformations taking place in the education system require a review of the content, methods, and technological tools of

education. These changes are particularly important in the field of fine arts education, as art is essentially based on the synthesis of creativity, aesthetic perception, and technological innovations. In the modern educational environment, art teachers, in addition to teaching traditional art techniques, should have the opportunity to introduce virtual reality, 3D modeling, digital design, interactive media, and other advanced technologies into the educational process. This places high demands on the professional training of future teachers and further strengthens the need to ensure the effective functioning of the system for preparing them for innovative professional activity.

The system of training future teachers of fine arts for innovative professional activity serves their independent creative activity, organization of the educational process in accordance with modern educational standards, and rapid adaptation to the changing educational environment. This system is based on the principle of combining theoretical knowledge with practical skills and is aimed at developing the creative, pedagogical, and technological competencies of teachers. The main goal of the system is to develop teachers as highly qualified specialists who meet modern educational requirements and can apply creative and innovative approaches. In this case, teachers should not only convey to students the aesthetic and cultural values of art but also encourage their creative thinking and help them realize their potential using modern technological tools.

The relevance of the research is due to a number of factors. Firstly, the expansion of digital technologies in education opens up new opportunities in fine arts education, but sufficient teacher training is required to fully utilize these opportunities. Secondly, there is a growing need for the integration of modern art directions, in particular digital art and interactive media, into the educational process, which requires a review of curricula and pedagogical practice. Thirdly, the issue of introducing innovative approaches in fine arts education in Uzbekistan has not yet been fully resolved. Many curricula are based on traditional art styles, and digital technologies and contemporary art practices are not sufficiently reflected. This situation creates a number of problems in the professional training of future teachers, in particular, their lack of technological and creative skills necessary for effective work in a modern educational environment. In this regard, this article is devoted to a deep study of the scientific and practical foundations of the system for training future fine arts teachers for innovative professional activity. The main goal of the article is to analyze the theoretical and practical aspects of this

system, thoroughly review its main components (curriculum, pedagogical practice, innovative projects), and evaluate the effectiveness of the mechanisms for implementing the system. The research aims to connect the scientific foundations of the system with modern pedagogical and psychological concepts, determine the place of practical components in the educational process, as well as identify existing problems and develop scientifically based proposals for their elimination. The research results will serve the widespread introduction of innovative approaches in fine arts education, increasing the professional competencies of future teachers, and ensuring the adaptability of the education system to modern requirements.

METHODOLOGY

In this study, a mixed-method approach was used, which ensured the synthesis of theoretical and practical analysis, allowing for the collection and in-depth analysis of multifaceted data. The mixed method approach played an important role in strengthening the scientific basis of the research, systematically studying empirical data, and drawing practical conclusions. This approach served to increase the objectivity of the research and ensure the reliability of the results by combining qualitative and quantitative methods. The research process consists of the following stages, each of which has a clear methodological basis and aligns with the research objectives:

Literature review

To form the theoretical foundations of the research, international and domestic scientific sources in the field of fine arts education, pedagogical innovations, creative thinking, and competency-based education were extensively studied. In particular, the structure of creative thinking developed by J.P. Guilford (1967) and the theories of creative abilities developed by E.P. Torrance (1974) were analyzed. These theories served as a fundamental basis for the development of the creative potential of teachers and the introduction of innovative educational approaches. Also, UNESCO (2020) global reports on innovations in education, OECD (2021) analyses of modern trends in the field of education, as well as regulatory documents on pedagogical education (2023) of the Ministry of Higher Education of the Republic of Uzbekistan and domestic scientific research were carefully reviewed. Analysis of the literature made it possible to compare foreign and domestic experience, identify current problems and promising directions in fine arts education. This stage played an important role in forming the scientific basis of the research, defining the methodological approach, and identifying existing gaps in the field of research.

Curriculum Analysis

The curricula used in training fine arts teachers in Uzbekistan were studied using systematic and comparative analysis methods. In the process of analysis, the compliance of educational programs with modern educational requirements, the level of integration of innovative components (for example, digital art, 3D modeling, virtual reality), and the level of inclusion of technological tools were assessed. The educational programs at the bachelor's and master's levels of 12 higher educational institutions were analyzed. The content and structure of curricula, the distribution of subjects, and the level of reflection of contemporary art trends in them were considered based on specially developed criteria. The analysis results showed that curricula are often based on traditional art styles, and there are certain limitations in the coverage of digital technologies and innovative approaches. This stage provided important information for developing scientifically based proposals for the modernization of curricula.

Study of pedagogical practice

The processes of pedagogical practice of future teachers in general education schools were analyzed through in-depth observation methods. Within the framework of the study, the practical processes conducted with the participation of 100 students were systematically studied. Observations were focused on students' skills in organizing the educational process, establishing effective pedagogical relationships with students, managing creative projects, and using digital tools. Observations were conducted based on semi-structured protocols, and the practical activities of each student were documented and analyzed based on special assessment criteria. During the analysis, the level of students' mastery of practical skills, the possibilities of using digital technologies in the school environment, and the overall effectiveness of pedagogical practice were assessed. The results showed the importance of pedagogical practice in teacher training, but there are limitations due to the lack of infrastructure and technological resources.

Evaluation of innovative projects

The effectiveness of innovative projects implemented by future teachers was analyzed based on specially developed evaluation criteria. The studied projects included virtual art exhibitions, digital design projects, interactive media projects, and works based on 3D modeling. A total of 20 projects were thoroughly analyzed, their creative content, technological quality, impact on the educational process, and the level of encouragement for active student participation were assessed. In the assessment process, the role of

projects in the development of students' creative and technological competencies, as well as their compliance with modern educational requirements, was studied. This stage served to determine the effectiveness of the project-based learning approach in preparing for innovative activity and to develop proposals for its further development.

Questionnaire and Interview

Within the framework of the study, a large-scale survey and in-depth semi-structured interviews were conducted with the participation of 250 future teachers and 50 education specialists. The questionnaire was aimed at assessing the effectiveness of curricula, problems in the process of pedagogical practice, the possibilities of using digital technologies, and the level of readiness for innovative activity. The questionnaire questions were developed based on a 5-point Likert scale, which allowed for the collection of participants' feedback in a systematic and quantitative form. The interviews were aimed at an in-depth study of the proposals of educational specialists on improving the system. The interviews were documented through audio recording, transcribed, and then prepared for analysis. Interview data were processed using qualitative analysis methods, and key topics and suggestions were systematically grouped.

Data analysis

The collected data were extensively processed using qualitative and quantitative analysis methods. The survey results were statistically analyzed using the SPSS program, in which mean values, standard deviation, correlation analysis, and other statistical indicators were calculated. Statistical analysis served to ensure the reliability and objectivity of the data. The interview data were processed using the content analysis method, and the main topics, problems, and suggestions were systematically identified. The integration of qualitative and quantitative analysis ensured a deep, comprehensive, and scientifically based interpretation of the research results. A specially developed coding system was used in the analysis process, ensuring systematic and logical grouping of data.

This methodological approach made it possible to ensure the scientific validity of the research, a comprehensive study of the current state of the system of training future teachers of fine arts for innovative professional activity, and the development of scientifically based proposals for its improvement. Each method was aimed at specific goals and served to increase the overall objectivity of the research and the practical significance of the results.

RESULTS

Qualitative and quantitative analysis of the data collected in the study made it possible to comprehensively assess the current state of the system of training future teachers of fine arts for innovative professional activity. Below, the research results are presented in text form, based on scientific facts, statistical data, simplified formulas, and a table. Formulas are given in single-layer form.

Analysis of curricula

Analysis of the curricula for training fine arts teachers in 12 higher educational institutions of Uzbekistan showed that most of the programs are based on traditional art styles (drawing, painting, sculpture), and modern areas (digital art, 3D modeling, virtual reality) are covered only in limited quantities. The survey results showed that a large number of students emphasized the need for broader inclusion of digital technologies and innovative art in the curriculum. To assess the effectiveness of training programs, the Performance Index (PI) was calculated using the following formula:

$$SI = (R_i * W_i) / (W_i)$$

Here R_i is the respondent's grade (5-point scale), W_i is the respondent's weight, $\Delta (R_i * W_i)$ is the sum of the product of grades and weights, ΔW_i is the sum of weights. Calculations showed that the SI is at an average level ($SI=3.2$). Modules for teaching the use of software such as Adobe Photoshop, Illustrator, and Blender were found to be available in a small number of programs, confirming that the educational programs do not fully meet modern educational requirements.

Effectiveness of pedagogical practice

Observation of the processes of pedagogical practice showed that students have achieved certain successes in such skills as establishing effective relationships with students, organizing educational activities, and managing creative projects. However, the possibilities of using digital tools are significantly limited. Many students noted that schools do not have access to resources such as graphic tablets and digital design software. To assess the effectiveness of pedagogical practice, the Competency Development Index (KRI) was calculated using the following formula:

$$KRI = (C_j * P_j) / m$$

Here, C_j is the average assessment of the competence, P_j is the weight of the competence, and m is the number of competencies. Calculations showed

that the KRI was at an average level ($KRI=3.4$). Observations confirmed that students mainly rely on traditional art methods (paper, paint, pencil), which reduces their ability to adapt to the modern educational environment. Correlation analysis revealed a positive correlation between the use of digital tools and preparation for innovative activity ($r=0.65$, $p<0.05$).

Impact of innovative projects

Analysis of innovative projects confirmed the high effectiveness of project-based learning in the development of students' creative and technological competencies. Virtual art exhibitions, digital design projects, interactive media, and 3D modeling projects significantly enhanced students' creative thinking and technological skills. To assess project effectiveness, the Project Quality Index (PQI) was calculated using the following formula:

$$LSI = (Q_k * V_k) / (V_k)$$

Here Q_k is the assessment of the project quality, V_k is the weight of the project significance, $\Delta (Q_k * V_k)$ is the sum of the product of quality and weights, ΔV_k is the sum of weights. Calculations showed that the LSI was at a high level ($LSI=4.2$). Projects using Blender and Adobe Creative Suite programs allowed students to create high-quality digital products (3D models, virtual galleries). The survey results confirmed that the majority of students consider project-based learning the most effective form of preparation for innovative activity.

Feedback from students and specialists

The results of the survey and interviews provided important information in identifying the system's strengths and weaknesses. Students assessed the mastery of modern technologies as the most important aspect of professional training, but noted the lack of opportunities to use digital tools in the curriculum and practical training process. Educational specialists noted the need for wider introduction of digital art and innovative methods into curricula, as well as the development of technological infrastructure in schools. The results of the interviews showed that most specialists consider the modernization of curricula and the extension of the internship period as the main direction for improving the system. Content analysis confirmed the importance of expanding technological resources and implementing international best practices through public-private partnerships.

RESULTS

Results of statistical and qualitative analysis.

The table below summarizes the overall survey and interview results:

Table 1

Component	Efficiency level	Key issues	Suggestions
Curricula	Average	Limited coverage of contemporary art trends, lack of digital modules	Add digital art and 3D modules
Pedagogical practice	Satisfactory	Lack of digital resources, short-term practice	Extension of the internship period, organization of digital laboratories
Innovative projects	High	Limited resources, lack of extensive coverage	Expansion of project-based education, increasing technological resources

Statistical analysis showed that the effectiveness of training programs in preparing for innovative activity is at an average level. The effectiveness of pedagogical practice was assessed as satisfactory, but the lack of digital resources was identified as a factor reducing its effectiveness. Innovative projects have the highest effectiveness and are evaluated as an important tool for increasing the creative and technological potential of students. Qualitative analysis of the interview data revealed that the weaknesses of the system are insufficient coverage of modern art directions in curricula, limited digital infrastructure in schools, and short-term pedagogical practice. Experts proposed adapting curricula to digital art, expanding internship processes, and establishing digital laboratories.

The research results showed that significant progress has been made in the current state of the system, but the curricula and practical processes do not fully meet modern requirements. The limited possibilities of using digital technologies were identified as the main factor reducing students' readiness for innovative activity. Innovative projects were assessed as the most effective means of increasing the creative and technological potential of students. These results emphasize the need to modernize curricula, develop technological infrastructure, and expand project-based education to improve the system.

Results analysis:The research results showed that the system of training future fine arts teachers for innovative professional activity has achieved certain successes in traditional art education, but there are significant limitations in its full adaptation to modern educational requirements. Curricula and pedagogical practice processes mainly rely on traditional methods

such as drawing, painting, and sculpture, and do not sufficiently cover modern areas such as digital art, 3D modeling, and virtual reality. This situation limits students' opportunities to master digital technologies and develop innovative competencies, reducing their adaptability to the global educational environment.

Innovative projects stand out as the most effective component of the system. Works such as virtual art exhibitions, digital design projects, and 3D modeling significantly enhance students' creative thinking, problem-solving abilities, and technological skills. These projects allow students to create modern art products using software such as Adobe Illustrator, Photoshop, and Blender, bringing their professional training closer to global standards. However, the large-scale implementation of projects is stalled due to limited resources and infrastructure problems.

Several main directions for improving the system have been identified. First, it is necessary to adapt the curricula to digital art and modern methods, for example, to include modules of digital design and 3D modeling. Secondly, the duration of pedagogical practice should be extended, and digital laboratories should be created in schools. Thirdly, project-based learning should be expanded and students should be provided with more practical opportunities. In addition, the development of technological infrastructure through public-private partnerships and the introduction of international experience are important for increasing the efficiency of the system. These measures serve to effectively prepare students for innovative professional activity and adapt the system to modern educational standards.

DISCUSSION

The results obtained in the study comprehensively illuminated the current state of the system of training future teachers of fine arts for innovative professional activity, its effectiveness and possibilities for improvement. These results are inextricably linked with the main questions and objectives of the study and are important in identifying the strengths and weaknesses of the system, as well as in determining ways to adapt it to modern educational requirements. The obtained results are discussed below in connection with the research questions and objectives.

The main goal of the research was to assess the effectiveness of the system of training fine arts teachers for innovative professional activity in Uzbekistan and to develop scientifically based proposals for its improvement. The first research question - "How well do educational programs and pedagogical practice processes prepare students for innovative activity?" - was highlighted through the results of the analysis. Analysis of the curricula showed that most of the programs are based on traditional art styles and do not sufficiently cover such modern areas as digital art, 3D modeling, and virtual reality. The Performance Index (PI=3.2) showed the average effectiveness of the curricula, which confirms that they do not fully meet modern requirements. Although the Competency Development Index of pedagogical practice (KRI=3.4) showed satisfactory effectiveness, the lack of digital resources and the short duration of the internship (on average 8 weeks) create limitations in the development of students' innovative skills. These results indicate that, in accordance with the research goal, there are significant shortcomings in the preparation of the system for innovative activity in the current state.

The second research question - "What role do innovative projects play in the development of students' creative and technological competencies?" - confirmed the high effectiveness of project-based learning. The Project Quality Index (LSI=4.2) showed that innovative projects are an important tool for improving students' creative thinking and technological skills. Virtual art exhibitions and 3D modeling projects allowed students to create modern art products using programs such as Adobe Creative Suite and Blender. The survey results showed that 92% of students consider these projects the most effective form of preparation for innovative activity. This result became the basis for identifying the effective components of the system and developing proposals for their expansion, which is one of the research objectives. Innovative projects, as the most successful area of the system, play an important role in the development of practical skills that meet global

educational standards.

The third research question - "What areas are important for improving the system?" - received a clear answer through the results of a survey and an interview. Students and specialists noted the limited coverage of contemporary art programs, the lack of digital infrastructure in schools, and the short duration of internships as the main problems. 85% of specialists proposed adapting training programs to digital art and extending the internship period to 14 weeks. Content analysis showed the importance of public-private partnership and the introduction of international experience. These proposals fully correspond to the development of scientifically based approaches to improving the system, which is one of the main goals of the research.

Compared to global educational trends highlighted in UNESCO (2020) and OECD (2021) reports, Uzbekistan's system lags behind in implementing digital transformation and innovative educational methods. In particular, while digital laboratories and project-based education are widely used in foreign practice, in Uzbekistan these areas are developing slowly due to limited resources. At the same time, the high effectiveness of innovative projects in the study shows a similarity with foreign experience, which emphasizes the possibilities of expanding this approach. Based on the theories of creative thinking of Guilford (1967) and Torrance (1974), innovative projects have been confirmed as an important tool in developing students' divergent thinking and problem-solving abilities.

The research results showed that the system has a stable foundation in traditional education, but there are problems with the integration of digital technologies and trends in contemporary art. Insufficient preparation of curricula and practice processes for innovative activity limits the competitiveness of students in the global educational environment. Therefore, the following areas were deemed important for improving the system: including digital arts modules in curricula, extending internship periods, establishing digital laboratories in schools, and expanding project-based education. These measures will adapt the system to modern educational standards and effectively prepare students for innovative professional activity.

CONCLUSION

The study comprehensively studied the current state of the system of training future fine arts teachers for innovative professional activity in Uzbekistan, identified its effectiveness, problems, and opportunities for improvement. Although curricula and pedagogical practice processes have certain achievements in traditional art education, there are limitations in the full

preparation of students for innovative activity due to insufficient coverage of such modern areas as digital art, 3D modeling, and virtual reality. Innovative projects, as the most effective component of the system, play an important role in the development of students' creative thinking and technological skills, but the limited resources prevent their widespread implementation.

To improve the system, it is necessary to adapt curricula to digital technologies and modern art methods, extend the duration of pedagogical practice, create digital laboratories in schools, and expand project-based education. The development of technological infrastructure through public-private partnerships and the introduction of international experience will increase the system's adaptability to global educational standards. These measures serve to effectively prepare students for innovative professional activity and raise the quality and competitiveness of fine arts education to a high level.

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