
ПРОБЛЕМИ, НАДБАННЯ І ПЕРСПЕКТИВИ ВІТЧИЗНЯНОЇ ТА ЗАРУБІЖНОЇ ПРОФЕСІЙНОЇ ОСВІТИ

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ОРГАНІЗАЦІЯ НАУКОВО-ДОСЛІДНОЇ ДІЯЛЬНОСТІ СТУДЕНТІВ З ДИЗАЙН-ПРОЄКТУВАННЯ

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У дослідженні основну увагу приділено особливостям організації науково-дослідної діяльності студентів різних творчих спеціальностей як унормованої навчальними планами та освітніми програмами професійної підготовки майбутніх фахівців, так і довільної добровільної у позанавчальний час. Визначено характерні риси обов'язкової (унормованої) науково-дослідної діяльності студентів, яка пов'язана з виконанням курсових, кваліфікаційних дипломних робіт. а також розкрито ряд методів та засобів добровільного, але вмотивованого або зацікавленого залучення студентської молоді до науково-дослідної діяльності через виконання студентами наукових, технічних та проєктних завдань у період виробничих практик, участь у роботі навчально-наукових лабораторій, студентських дизайнерських бюро, дизайнерських об'єднань та творчих спілок, виконання замовлень виробництв.

Виконання науково-дослідних проєктів спонукає студентів до вивчення та використання інноваційних рішень, технологій, обладнання тощо. Таким чином доведено взаємозв'язок науково-дослідної та інноваційної діяльності студентів у процесі професійної підготовки майбутніх фахівців творчих спеціальностей, зокрема наведено приклади експериментальної науково-дослідної діяльності майбутніх інженерів та проєктно-технологічної художньо-творчої наукової роботи майбутніх дизайнерів.

У процесі наукового пошуку визначено сутність та значення науково-дослідної та інноваційної діяльності студентів творчих спеціальностей для професійного саморозвитку майбутніх фахівців та формування особистісних якостей, компетентностей, знань умінь та навичок з окремих галузей знань. Окреслено форми педагогічного керівництва науково-дослідною та інноваційною діяльністю студентів,

методи й засоби залучення студентів до участі у науково-практичних конференціях, круглих столах, виставках, професійних конкурсах, а також публікації результатів науково-дослідної роботи у збірниках студентських наукових праць та каталогах творчих робіт.

***Ключові слова:** науково-дослідна діяльність студентів та її види; особливості організації науково-дослідної діяльності студентів творчих спеціальностей; мета, функції та значення науково-дослідної діяльності студентів; мотивація й стимулювання студентів до науково-дослідної діяльності в процесі професійної підготовки.*

Formulation of the problem. Professional training of students of creative specialties in a higher education institution involves the creation of certain conditions under which the creative and intellectual growth of future specialists will occur most intensively. One of these conditions is the inclusion of students in active research and innovation activities using the pedagogical potential of its various forms.

Research activity of students is one of the most important forms of the educational process. The organization of scientific research activity in a higher education institution allows solving a number of tasks related to the professional development of future specialists of various technical specialties:

- deeper and stronger assimilation of educational material, expansion of the general outlook of education seekers;
- development of analytical and prognostic thinking, the ability to compare, generalize, classify the studied material and scientific literature on the research problem;
- familiarity with research methods, acquiring the ability to choose specific methods and techniques necessary for such work;
- mastering the experimental technique and methods of analyzing its results;
- obtaining ideas about scientific research;
- acquisition of skills to formulate a problem, hypothesis and research goal;
- mastering various forms of organization of research work, forms of concluding one's own research and forms of evaluating its results.

During the implementation of professional training, it is necessary to use all types of scientific and research activity. aimed at training future specialists for productive professional activity.

In this case, the independent research activity of students of creative specialties contributes to the formation of the ability to navigate in a large amount of diverse information, both historical and modern; creative attitude to solving professional tasks; development of the ability to synthesize and analyze information, mobility and critical thinking; systematization of scientific and technical, material science and other types of knowledge acquired in the process of professional training; mastering modern methods and technologies of research, experimental and project activities; formation of professional competence; acquisition of knowledge and experience in various fields of professional activity; stimulation of the internal development of the personality of the future specialist; mastering the model of professional activity.

The analysis of the latest researches and publications. The practice of organizing research activity in institutions of higher education shows that it is advisable to start this process at the initial stage of professional training on a voluntary basis by preparing independent reports on specific issues of educational disciplines. Further, the work becomes more difficult, students begin to prepare and defend larger and more complex works on various issues. Completion of the work takes place at the end of the academic year – on the Day of Science and Creativity, along with which collection shows, exhibitions and conferences can take place. Students get the opportunity to present their work and demonstrate its results to a wide audience. This forces students to prepare more thoroughly,

sharpens his oratorical and creative abilities. In addition, everyone can compare how their work looks at the general level and analyze the results. Thus, participation in research work becomes a student's everyday activity.

Organization, content and general foundations of research activity of students as a mean of ensuring the quality of education considered by such scientists: O. Moroz, I. Romaschenko, I. Stepanets and other. According to L. Dudikova, O. Dubaseniuk, L. Nikolayeva and R. Shyshka, students' scientific research activity contributes to the individualization of the educational process. Scientific research is considered as a type of independent work of students V. Ushkarenko, N. Smolienko, I. Osadchuk and T. Vynogradova.

The purpose of the article. Organization of scientific research activity in the process of professional training of students in technical specialties

Presenting main material. In recent years, the trend of training specialists in creative specialties using both traditional and innovative educational, scientific and technical, information and digital technologies has become increasingly noticeable in the domestic system of secondary, vocational and higher education. This is especially relevant when training students of technical specialties, each of whom must have professional competencies in one or another field, as well as deep knowledge, skills, and abilities in related fields of activity (Дубасенюк, 2011).

Moreover, the study of technical disciplines in professional lyceums, colleges, and universities is based on the study of a number of physical phenomena, technological processes, improvement of the operation of individual mechanisms, etc., with the aim of obtaining visual (most often demonstration) educational material in physical laws previously discovered by scientists. Here clarity, demonstration, experiment, their analysis makes it possible to learn the material being studied more deeply, quickly, and most importantly, better quality, contributing, at the same time, to increasing interest in the subject being studied. This helps to understand more complex issues of any science, experience of theoretical and practical solutions of interesting experimental tasks. In addition, the physical experiment often acts as a foundation for obtaining and consolidating new knowledge, abilities and skills, forming and developing creative, technical, and research abilities of a person, including the field of development of modern energy.

It has been proven that the organization of a demonstrational (individual, group or mass) physical experiment presented to students in an accessible, visual, high-tech form introduces them to the scientific approach to learning about physical phenomena from the surrounding world. This also includes the study of the operation of modern equipment and mechanisms, the organization of technological processes in the field of production, the consideration of design and ergonomic requirements for the design process of certain objects, the organization of people's daily activities, the maintenance of their health and well-being in society. Here it is important to note the fact that the demonstration experiment is essentially a proof of the validity of various theoretical propositions of a number of exact sciences and related disciplines. For example, this concerns the electric power industry, the field of development of microelectronics, radio engineering, information and computer technologies.

On the other hand, there is a personal interest of a teacher himself. It consists in the fact that in order to increase the interest of students in the study of rather complex subject areas, and therefore to achieve a high result in mastering laws and regularities, the teacher is also forced to widely use experiments, as well as demonstrational classical and modern laboratory equipment.

All this, in the end, prepares students for the organization of independent types of experimental research, and when repeating the educational material, referring to the analysis of the results of experiments, students can more vividly reproduce the previously studied material in their memory, delve deeper into the essence of physical phenomena and laws. A

deep, multifaceted analysis of the performed work also allows one to notice features, features and properties of objects that had previously escaped attention (Дудікова, 2012).

The organization of scientific research experiments in the training of students of creative specialties may be related to regional features and the deepening of informatization of society and the translation of the sphere of education into digital technologies (Мороз, 2001).

In the modern conditions of science and technology transformation, it is necessary to provide the country's economy with personnel, however, at this stage, there is a shortage of highly qualified specialists in many key fields, capable of offering a new scientific result, taking into account the prospects for its application. Electric power and electrical engineering are the basic branches of the economy and the basis of the functioning of the country's life support systems. When training specialists in these fields, it is necessary to take into account that the development and manufacture of technological equipment, production, transmission, distribution and consumption of electricity is an inseparable high-tech process with continuously changing parameters (Шишка, 2007).

In the modern period, engineering activity is characterized not only by the quantitative complication of engineering objects, the increase in the number of their components and connections, the expansion of the scope of scientific knowledge. It becomes creative, acquires a pronounced research character, through it a person interacts with the world as a subject who can change it (Моляко, & Музика, 2006).

Taking into account the above, we will define the scientific research activity of students of creative specialties as a process of purposeful, active interaction of a person with a real or simulated object, aimed at the development of new knowledge necessary for the creation of innovative technologies aimed at the development of production and the improvement of its technical and economic indicators. as well as promoting creative contributions to the profession.

Characterizing research activity, it is necessary to highlight its functions that contribute to the formation of research competence of students of technical specialties:

- personal development (development of the emotional and volitional sphere, cognitive processes, mastering methods of self-improvement and intellectual self-development of students);

- scientific and methodological (formation of a holistic scientific picture of the world; development of a scientific style of thinking, mastering the methods of scientific knowledge);

- cultural (involvement in the broad socio-cultural context of the development of science and technology; involvement in the culture of scientific schools);

- value orientation (awareness of the value of research as one of the conditions for the successful realization of the individual) (Ніколаєва, 2011).

Scientific research activity exists within the framework of a higher education institution in two types: 1st type – research activity provided for by current curricula; 2nd type – research activity beyond the requirements of the curriculum (Резван, 2012).

To one degree or another, all students participate in research activity of the first kind. Writing term papers and theses is impossible without conducting research of varying degrees of complexity. Coursework can be carried out both from disciplines that have a practical orientation depending on the specialization «Designing», «Construction», «Technology of artistic processing of materials», etc., and theoretical – «History of culture and arts», «History of design, science and technology», «History of costume and cut», «History of ornament» and others.

Completion of the coursework forms the student's skills of independent scientific project creativity, contributes to the improvement of his theoretical and professional training, as well as better assimilation of educational material. Completion of the course project

becomes part of the future diploma project, which completes the training of a specialist in a higher education institution. Therefore, the choice of the topic of the course work is usually related to the direction of diploma design.

In addition to coursework and diploma work, the implementation of scientific, technical and project tasks by students in the period of industrial practices, participation in the work of educational and scientific laboratories, student design bureaus, design offices are of great importance in the preparation of a bachelor for scientific, scientific and technical, design and innovation activities. associations and creative unions, fulfillment of production orders.

Nevertheless, thorough research activity, which the student is not obliged to do by the curriculum, covers far from all students of technical specialties. Therefore, the inclusion of future specialists in the work of various associations organized in extracurricular time is of such great importance.

Student educational and research groups, conferences, days of science and creativity – all these forms of research work of the second kind allow a student to start a full-fledged scientific and creative work, find like-minded people in the field of professional interests, with whom you can consult and share your thoughts, ideas and creative plans The participation of students in such work, the introduction of research elements into various forms of educational activities help to develop a number of useful qualities, such as independence and initiative, individual professional and creative handwriting, creative abilities (Ушкаренко, Смолієнко, Осадчук, & Виноградова, 2005). Conscious participation of students in the conduct of certain scientific researches is important – it is up to the student to choose the topic of the research, the deadlines for the work, as well as whether the work will be completed at all. After all, students spend their free time conducting such research. In this case, the process of self-improvement becomes continuous and does not stop outside the educational institution. As a result, the teacher no longer works with the student, but with his younger colleague, who is improving his professional skills and actively developing his creativity.

The practice of research and innovation activities of students in institutions of higher education shows that its effectiveness largely depends on a competent organization that takes into account the use of its various organizational forms. Such forms include student educational and research groups, student creative workshops, student design bureaus, mass scientific and educational and production laboratories. In addition, it is advisable to involve students in other forms of scientific research, artistic design, design and technological activities, as well as to involve them in participation in scientific conferences, seminars, round tables, exhibitions, which are held not only in the educational institution (at departments and faculties), and beyond (П'ятницька-Позднякова, 2003).

One of the important qualities of a modern specialist is the ability to innovate and experiment. Research activities within the framework of student educational and research groups allow future specialists to acquire the skills of conducting scientific research in theoretical branches of science and practically apply them in the products of their various activities in accordance with its specifics and the chosen direction of specialization (Рогальська, 2007).

As a result of such activities, experimental developments in the field of finding new painting and drawing techniques, competitive project options, promising collections of clothing models from various, including non-traditional non-woven materials, prepared messages and reports based on purposeful visits to museums and exhibitions with further analysis can be carried out. received information.

By analogy with a scientific or technical experiment, an experiment in the field of design has a projective and somewhat abstract character. This is explained by the fact that most often only the most significant design factors in each specific case are taken into account, for example, social, functional or formative.

When determining for students the directions and topics of experimental work, it is necessary to take into account the industry situation, which will allow to reach a new level in the processes of form formation. These directions can be divided into:

- experimental work at the junction of science and artistic spheres of creativity, which takes into account the achievements and level of development of scientific and technical progress and modern technologies;
- experimental work in the subject-abstract field of artistic creativity, close to decorative arts, taking into account modern style-forming processes;
- experimental work in the field of cultural adaptation of design products in the spheres of consumption, formation and development of modern ideas and cultural values (Степанець, 2011).

In contrast to technical areas of scientific research, artistic methods, methods and means of form formation are the least researched in domestic design theory, and the results of such research require the longest time for their implementation in professional practice. All this certainly complicates the process of organizing experimental research in institutions of higher education, but does not exclude it. The practice of professional training of designers shows that designer students can perform a variety of research and experimental developments both on the developed topics in educational institutions and on external orders from organizations and industries. Production of various objects, practical modeling, construction, technological research, as well as discussion of work results create for students a professional environment in which their active professional development takes place.

The organization of the integration connection between the educational process, scientific research and industrial associations allows to activate the scientific and research activity of students, thus ensuring its professional orientation (Ромашенко, 2014). Since the professional activity itself is related to design, that is, the creation of new ideas, objects, students need to acquire the skills of analysis and forecasting the development of certain branches of design, forms, materials, etc. Regardless of the implementation in practice, the project remains a project that carries a certain artistic and constructive idea and reflects the thought movement of its author. The ability to foresee ways of development of the material and spatial environment, ways of development of world art, to synthesize in one's creativity the achievements and accumulation of previous eras become an integral part of professional culture and contributes to successful professional work. Thus, we see that the task of improving the professional level of a modern designer and creating conditions for the emergence of innovative solutions in the field of form-making can be partially solved during the scientific research activities of students during the implementation of professional training of designers.

The main goal of organizing creative workshops and student design bureaus is to involve students in various forms of innovative activity, to activate creative search in the process of creating artistic works in various fields of decorative and applied art and design.

The participation of students in the activities of such associations solves a number of tasks related to the deepening of artistic and design training, the organization of creative practice of students in the field of future professional activity. Another opportunity for professional training outside of school hours is the work of students in educational and industrial laboratories.

The purpose of the work of such associations is to further strengthen the practical orientation of training designers, to improve the functional and aesthetic qualities of student works in the field of design. The main directions of the work of educational and production laboratories are the development of product design (execution of sketches of products, selection of color solutions and materials, its construction, execution of patterns and patterns) and technological practice (production of products in accordance with the developed design and stages of the technological process).

Of significant importance is the fact that classes in student research groups, creative workshops, student design bureaus, educational and production laboratories are held outside of school hours, which gives students the opportunity to improve their professional skills outside of the educational process.

Conclusions. Scientific research and innovation activities in the process of professional training of students of creative specialties in institutions of higher education are an important stage in the professional development of future specialists. The pedagogical significance of this activity lies in stimulating the creative and searching activity of students; formation of sustained interest in performing research and experimental developments; intensification of educational and cognitive activities to solve various tasks of future professional activity.

While studying at a higher education institution, a student acquires universal skills that will be useful throughout his life, no matter what type of activity he is engaged in: independence of judgment, the ability to concentrate, constantly enriching his own stock of knowledge, having a multifaceted view of emerging problems, being able to purposefully and to work thoughtfully, to be creative at work. As a result, society receives a worthy member who, having the qualities listed above, will be able to effectively solve the tasks set before him. It follows from this that every teacher should pay no less attention to the research work of students than to classroom work, despite the fact that it takes a lot of time and effort. The baggage of professional knowledge and skills that a person acquires in his youth remains with him for the rest of his life and certainly affects his development as a qualified and creative specialist. The variety of non-auditory forms of professional training and their implementation in practice allows to individualize the learning process, ensure the advancement of students on a personal educational trajectory and prepare high-quality and competitive specialists for the modern labor market.

Thus, in the process of forming the research competence of future specialists in technical specialties, special attention should be paid to the formation of sustainable motivation, clear definition of goals, and the formation of organizational, operational, and control-evaluation actions. Engineering activity has a pronounced research character, through its specialists of creative specialties interact with the world as subjects capable of changing it. The analysis of competencies and professional standards showed that in the activities of technical specialists, research principles are leading. They contribute to its effective implementation, act as the basis of self-development of the individual and determine the need for purposeful research training of students.

The professional activity of modern specialists in creative specialties is influenced by such factors as a high degree of uncertainty and risk, and includes tasks with missing and excessive data. The problem area, within which technical and technical-technological tasks are set and solved, has come much closer to the limit of what is known and still known by science. The share of typical professional tasks that are solved by an engineer or designer is rapidly decreasing due to the increase in tasks that require a creative solution. Solving such tasks is related to the readiness and ability of specialists in creative specialties for creative research activities.

The training of specialists in creative specialties capable of creative activity can be carried out only within the framework of the innovative pedagogical process. Pedagogical innovation is the final result of the introduction of pedagogical innovations with the aim of changing the educational environment or its individual components, which allow students to realize a fundamentally new level of professional development, which is expressed in sustainable professional competence. A pedagogical innovation is the educational environment of a higher education institution, which allows each student to form optimal sustainable professional competence in accordance with his abilities and capabilities.

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STUDENTS' SCIENTIFIC RESEARCH ACTIVITIES ORGANIZATION IN DESIGN AND PLANNING

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In our research, the main attention is paid to the peculiarities of scientific research activities organization of students of various creative specialties, both standardized by curricula and educational programs of future specialist professional training, and voluntary during extracurricular time. The characteristic features of students' mandatory (standardized) scientific research activity, which is related to the performance of coursework and qualification diploma theses, have been determined. We have also revealed a number of methods and means of voluntary, but motivated or interested involvement of student youth in scientific research activities through the performance of scientific, technical and project tasks by students during the period of industrial practices, participation in the work of educational and scientific laboratories, student design bureaus, design workshops associations and creative unions, fulfillment of production orders.

Carrying out research projects encourages students to study and use innovative solutions, technologies, equipment, etc. In this way, the relationship between students' scientific research and innovative activity in the process of professional training of future specialists in creative specialties is proven; in particular, examples of future engineers' experimental scientific research activity and future designers' project-technological artistic and creative scientific work are given.

In the process of scientific research, the essence and significance of research and innovation activities of students of creative specialties have been determined for future specialists' professional self-development and the formation of personal qualities, competencies, knowledge, abilities and skills in certain fields of knowledge.

Forms of pedagogical guidance of students' scientific research and innovative activities, methods and means of involving students to participate in scientific and practical conferences, round tables, exhibitions, professional competitions, as well as publication of the results of scientific research work in collections of student scientific works and catalogs of creative works are outlined.

Keywords: *students' scientific research activity and its types; peculiarities of research activities organization of students of creative specialties; the purpose, functions and significance of students' research activities; motivation and stimulation of students to research activities in the process of professional training.*

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