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The journal highlights the trends of transformational changes in vocational education in the days of Ukraine's independence, as well as new approaches to: formation of professional qualifications in Ukraine, development of professional standards, quality control of education, management of educational institutions as a project-oriented organization, professional development and self-education of teachers, the formation of digital, entrepreneurial, intercultural competencies of future professionals and methodological competence of teachers.

It is intended for researchers, academic and teaching staff from professional, pre-tertiary professional and higher education institutions, training centres of enterprises, institutes for graduate teacher education, educational (research)-methodical centres of vocational education, doctoral students.

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MODERNIZATION OF PROFESSIONAL (VOCATIONAL) EDUCATION IN ACCORDANCE WITH THE NEEDS OF SOCIETY AND THE REQUIREMENTS OF THE LABOUR MARKET

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Abstract.

Relevance: At the beginning of the third decade of Ukraine's independence the problem of compliance of professional training of skilled workers with modern labor market requirements, as well as European standards and principles of quality assurance of vocational education and training has become more relevant. In this regard, conceptual, legislative and organizational and pedagogical measures aimed at modernization of professional (vocational) education are of particular importance.

Aim: to analyze the features of modernization of professional (vocational) education in the third decade of independence of Ukraine and on this basis to make recommendations for its improvement at the national level.

Methods: theoretical (induction, synthesis, generalization); empirical (study and analysis of normative-legal documents in the field of professional education and labor market, professional training programs for skilled workers, results of professional (vocational) education institutions activity.

Results: have characterized the causes of inconsistency in the quality of vocational training of skilled workers with the requirements of the labor market. A number of concepts, normative-legal documents in the sphere of education and labor market and their focus on modernization of professional (vocational) education were analyzed. The directions of interaction between educational institutions and employers in improving the content and forms of professional training of skilled workers, the introduction of innovative management, production and teaching technologies were disclosed.

Conclusions: The results of the analysis of normative legal documents of educational programs for professional training of skilled workers give grounds to state that during the third decade of Ukraine's independence modernization of professional (vocational) education is expressed in: updating the content based on the competence approach and descriptors of the National Qualifications Framework in improving the network of professional (vocational) education institutions, taking into account the needs of national and regional labor markets; updating management and funding systems based on decentralization, the transfer of authority to the regional level; enhance public-private partnerships based on the involvement of social partners in the management and so on.

Keywords: *professional (vocational) education, modernization, labor market, social partners, educational legislation.*

Introduction. At the beginning of the third decade of Ukraine's independence (2011 – 2021) the issue of matching the qualification of graduates of vocational education and training institutions with current and prospective socio-economic needs became acute. In solving this issue Ukraine lagged far behind European countries (Radkevych V. O., 2021). The main reasons for the decrease in the quality of training in 2011 were the lack of a coherent science-based public policy on the development of vocational education system, the lag of the regulatory framework from the dynamic changes in the socio-economic development of society, which led to the deepening contradictions between: the requirements of society to improve the competitiveness and professional mobility of skilled workers and imperfect regulatory, scientific, methodological and staffing support by Equally important was the contradiction between the need for coordinated cooperation among central and local executive authorities, local governments and employers in resolving problems of the vocational training of workers and the lack of mechanisms for the development of social partnerships. There was also a low level of organizational, staffing, economic and financial autonomy granted to vocational training institutions and the like. The solution to these problems in the development of the State Target Programme for the Development of Technical and Vocational Education and Training for 2011 – 2015 (2010) has created the prerequisites for the establishment of a national vocational training system. (The prerequisites for a unified State policy on the development and productive employment of the country's labour resources were established in 2010. This refers to the introduction of European standards and principles of quality assurance of education with regard to labor market requirements for specialist competencies; harmonization of legislation in education and social and labor relations; promotion of national and international recognition of qualifications obtained in Ukraine; establishment of effective interaction between the sphere of educational services and labor market. For this purpose, the National Qualifications Framework (2011) was developed. In ensuring the quality of vocational education and training, an important role belonged to the development of interaction between enterprises and vocational education and training institutions towards the alignment of interests in the demand and supply of skilled labour.

Rapid technological re-equipment of economic sectors and the service sector in this period led to the lack of demand for a significant number of working professions and specialties, a decrease in demand for workers with low qualifications and, on the contrary, an increase in demand for qualified workers with tools, for maintenance, operation and control of technologically complex equipment and devices. There was a special demand for "universal workers". In view of this, the need to update the State List of Occupations for the training of skilled workers in vocational education institutions and to develop integrated occupations based on the enlargement of existing occupations and types of work in the National Classifier of Occupations and Jobs, taking into account modern and prospective qualification requirements and functions of labour activity has increased.

The transition of vocational education and training from the traditional principle of maximizing primary vocational training to the process of continuous and flexible mastery of new professional qualifications and competences by individuals has contributed to meeting modern labour market demands for skilled workers in the required volume and quality. In this regard, the importance of the competence approach to modeling the results of vocational education, their representation in the form of quality standards of skilled workers training was actualized. According to the competence approach, the creation of a new generation of state standards for vocational education was started. The competence-based framework for creating educational standards was a response to the globalization challenges of economic activities related to the development of the economy of the leading countries of the world based on "outsourcing", which requires transition to unified training standards for the world economy (Radkevych V. O., 2012).

At the same time the crisis phenomena in the economy were reflected in the decrease of the production rates and the need for qualified workers in almost all kinds of economic activities. Every fourth place was vacant at the enterprises of processing industry and every ninth - at the enterprises of trade, repair of cars, household appliances, manufacture of items of personal use. There was a sharp decrease in the need for workers of metallurgical and construction occupations (by 21.8%), sellers and demonstrators (by 32.3%), workers of mining and construction occupations (by 20.4%).

In 2011 – 2021, the downward trend in the number of students and trainees in vocational education institutions has continued. In particular, there are 708 vocational education institutions in Ukraine in 2021, with a population of 240,000 people. The network of vocational education institutions includes 165 higher vocational schools, 90 vocational education centres, 312 vocational lyceums, 65 vocational schools, 59 training centres in penitentiary institutions, 1 vocational school for social rehabilitation, 13 divisions of higher

education institutions and 3 professional colleges. Over the period 2011 – 2021, the number of vocational (technical and vocational education and training institutions) in the country will increase from 4 to 5,000. The number of vocational training institutions decreased by 268, while the number of students decreased by 169,400. This, in turn, has led to an increase in the number of small institutions (with a contingent of students of less than 300 people) (fig. 1).

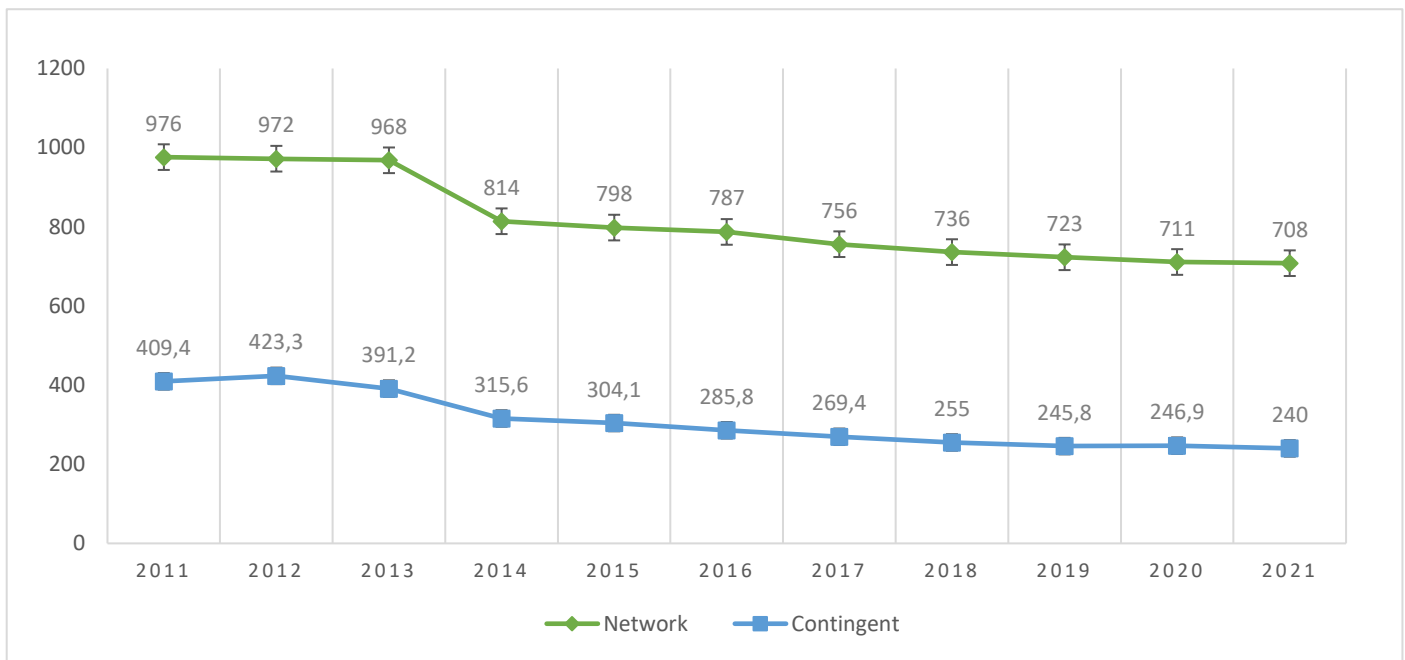


Fig. 1 Network and staffing of vocational education and training institutions (2011-2021)

Another manifestation of the problem of loss of prestige of vocational education is the growing shortage of workers in the Ukrainian labour market and the low socio-economic motivation of education applicants to obtain professional qualifications; an increasing proportion of young people who tried to get a higher education, including – abroad; low level of attractiveness of working professions among young people.

The purpose of the article is to analyze the peculiarities of modernization of professional (vocational) education institutions during the third decade of Ukraine's independence (2010 – 2021) and on this basis, the selection of recommendations at the national level.

Methods: theoretical (induction, synthesis, generalization); empirical (study and analysis of normative-legal documents in the field of professional education and labor market, professional training programs for skilled workers,

results of professional (vocational) education institutions activity.

Results and discussion. The quality of professional training of future skilled workers at the beginning of the third decade of Ukraine's independence required improvement in accordance with the demands of economic and social development. This was evidenced by insufficiently effective use for the needs of vocational education of the share of gross domestic product (0.4%). In this connection, the reforming of the vocational education system in order to ensure its quality was determined as an important direction of the state staff policy implementation. In particular, it was planned: to forecast the need for training of skilled workers in all spheres of life support of the state; to develop a national system of education quality assessment; to create modern methods of developing state standards of vocational education; to increase the prestige of working professions; to establish interaction between the state and business

entities to create a modern system of training skilled workers, engineers, technicians, etc.

The adoption of a number of laws of Ukraine was important; namely: "On amendments to some laws of Ukraine regarding improvement of vocational education management" (2012), which was aimed at creation of conditions for operative managerial decisions on vocational education and its financial provision, strengthening the role of local executive authorities and local self-government in formation of labor potential of the country with maximum consideration of needs of regions in qualified workers; "On professional development of workers" (2012), (2012), which regulated the formation of the state order, taking into account medium-term forecasts of demand for specialists and workers in the labour market and the approximate average cost of training one skilled worker, as well as defining the basis for the placement of the state order.

The provisions of the Law of Ukraine "On Social Dialogue in Ukraine" (2012) contributed to the regulation of interaction between employers and vocational educational institutions in the formation and development of labor potential. This allowed to start the creation of regional educational and production clusters on the basis of institutional forms of coordination of vocational education and training institutions, scientific institutions, enterprises and public organizations to ensure the quality of vocational education and training. The functioning of education and production clusters corresponded to the nature of modern competition, made it possible to optimally determine the requirements for the professional qualification of workers, to provide the implementation of modern production technologies more effectively promoted the unification of the subjects of the labor market and the social dialogue in order to equalize the balance between the supply and the demand of the labor force, improving the quality of vocational training for qualified specialists and upgrading the facilities of vocational training institutions, improving the professionalism of teaching staff, including taking into account the experience of professional development of teachers and trainers of vocational education institutions in the European Union countries (Radkevych, 2017).

During this period, the results of informal vocational training of workers begin to be recognized. For this purpose, relevant centers, including those on the basis of vocational educational institutions, in which training of qualified specialists in specific professions was

carried out, began to be created. This made it possible to determine the conformity of the professional knowledge, skills and abilities of workers, acquired by them in conditions, not regulated by the place, term, form to the requirements and job responsibilities, established by the legislation. The development of vocational education was facilitated by the placement of a state order on a competitive basis with the conclusion of a state contract with the state order performer.

A number of decisions of the Cabinet of Ministers of Ukraine have been adopted for the effective management of the vocational education system, namely "On amendments to the Order on provision of work places for on-the-job training and internships for pupils, trainees of vocational institutions" (No. 503 of June 26, 2013) "On amendments to Regulation on vocational education and training institution" (No. 505 of June 26, 2013) "On amendments to Regulation on step vocational education and training institution" (No. 456 of June 26, 2013). Especially, the amendments to Regulation on the professional competence of the teaching staff and appointment of directors of vocational education institutions (2013).

The work on the National Qualifications Framework Development Strategy aimed at supporting lifelong learning and linking the education system to the labour market in the context of the EU principles on education and competence development. In this regard, the methodology for the development of state standards of vocational education for specific working professions was approved (Order of the Ministry of Education and Science of Ukraine from May 15, 2013 No.511).

In accordance with the National Strategy for Education Development, the strategic areas of state policy in the field of vocational education and training are: development and implementation of state standards for vocational education and training in professions with broad qualifications; updating and approval of the optimal list of professions for training skilled workers (reducing their number through integration); optimization of the network of vocational educational institutions of different types, professional areas and professions; and the development of a system of vocational education and training for the people.

Scientific and methodological support for the development of vocational education during this period consisted of: updating the content of education through the development and

implementation of state standards for specific professions; information and training and methodological support of the educational process; coordination of activities of methodological and training institutions of vocational education on the training of workers; introduction of innovative educational technologies for vocational training of students pro In this context, importance has been attached to the measures of the National Action Plan for the implementation of the Programme of Economic Reforms for 2011 – 2014. "Rich Society, Competitive Economy, Effective State" (2011) on the development of the state standards of vocational education, namely: conducting unified state policy in the field of vocational education; formation of unified educational space in Ukraine; ensuring in all regions and in various sectors of economy equivalence of vocational education and recognition of qualifications and documents on vocational education; elimination of diver

The training of workers competitive in the labor market depended on their mastery of advanced production technologies and the ability to perform work using the latest materials, tools, equipment and devices. A network of training centers was working for this purpose.

In order to improve methodological work, the new Statute on Education and Methodical (Scientific and Methodical) Centre (Cabinet) of Professional and Technical Education was developed and approved (Order of the Ministry of Education and Science of Ukraine № 856 dated 27.06.2013, registered at the Ministry of Justice of Ukraine on July 16, 2013 at № 1189/23721). External independent evaluation of learning achievements was introduced.

The participation of vocational education and training institutions in international projects has increased. In 2013 one of the aspects of international cooperation was the participation of Ukraine in the Torino Process, in the European Training Foundation project "Improving Vocational Education and Training Systems through Skills Anticipation and Adaptation, Social Partnerships and Resource Optimization"; in the Ukrainian-Canadian project "Skills for Employment".

Personnel training in vocational educational institutions was carried out with more than 400 of the most demanded working professions in the labour market. Changes also took place in the sectoral direction of vocational educational institutions, which corresponded to the economic priorities of the country's development – a decrease

in the need for working professions in the industrial sector, the construction sector and an increase in professions in the service sector, the agro-industrial complex. During these years, there was a significant reduction in the number of such institutions as vocational technical schools and professional lyceums, and an increase in the number of TVET centres. This was caused, first of all, by: demographic situation; subsequent shutdown of production; decrease in the prestige of working professions among young people; underestimation of requirements for those entering higher education institutions; lack of a development strategy for vocational education and training in Ukraine. In 2015, a new type of vocational education institution – vocational college – was established.

During 2011 – 2015 the negative trend of reduction in the number of students of vocational educational institutions continued. A negative factor in the decrease in this indicator was the temporary loss of the territories of the Autonomous Republic of Crimea and parts of Donetsk and Luhansk oblasts since 2014. This trend is characteristic both for enrolment and graduation of future skilled workers.

Most of the problems that existed in the system of vocational education were related, among other problems, as well as the poor staffing of teachers and vocational educators, as well as their level of development of legal culture (Radkevych, 2019).

In recent years, the number of institutions of higher education that started training specialists in vocational education has increased to 33 universities, 12 colleges and technical colleges, where students have studied in 27 profiles of this specialty.

In order to ensure quality training of workers, compliance with the unified requirements for the implementation of the International Standard Classification of Education in Ukraine, in 2016 310 state standards for specific working professions were developed and tested in the educational and production process, 80% of which were in the field of production. The state standards were obligatory and uniform for all vocational educational institutions, enterprises, institutions, organizations engaged in training of qualified workers, regardless of their subordination and forms of ownership. Representatives of sectoral ministries and departments, the joint representative body of the employers' side at the national level, and employers' organizations, scientific and scientific-methodological institutions, as well as employees,

specialists of enterprises-customers of the workforce were involved in their development. During 2016, 25 more state standards of vocational education for specific professions were developed and approved.

In 2016, the Cabinet of Ministers of Ukraine adopted Resolution No. 818 of 16.11.2016 "On approval of the List of professions of national importance, training in which was carried out at the expense of the state budget", which included 19 professions. On the basis of 25 vocational educational institutions the training centers for the following professions started their work: "Tractor operator of agricultural production", "Installer of sanitary and technical systems and equipment", "Dressmaker. Tailor. Tailor. UAH 50 million has been allocated for the purchase of modern equipment, tools to ensure the operation of these training centers. At the same time, financial investments of the state in vocational education were not comparable with higher education. Over the years of independence the gap between the amount of their funding has grown dramatically – from 4 to 13 times. This trend persists even now.

By the beginning of 2016, the training of workers and junior specialists in vocational schools was more than 98% financed at the expense of the state budget (less than 2% of students studied on a contractual basis), cadres necessary for the national economic development without their linkage to the regional needs of state target programs (which is economically uninteresting for local budgets). Also at risk were certain areas of training (in particular, culture, arts, crafts, etc.), often unprofitable to finance locally, but without state support it is difficult to imagine the socio-cultural aspect of public life and regional development.

The consequences of an improperly prepared initiative of the Cabinet of Ministers of Ukraine were problems with financing vocational education and public indignation. Therefore, the Government was forced to adopt a resolution to subsidize UAH 500 million from the state budget to local budgets to finance them. However, this subsidy did not solve the problem adequately, because the annual financing of the system through the state order required significantly more funds. The deficit in expenditures for the financing of vocational schools in 2016 amounted to 15 million UAH.

A serious challenge to the development of vocational education was the decision to transfer from January 1, 2016 the financing of the costs of training of workers in vocational educational institutions by the state to local budgets, and from

January 2018 the management of professional (vocational) education institutions became the responsibility of the regional state administrations according to the order of the Cabinet of Ministers of Ukraine from 25.10.2017 № 831-r.

In 2017, there was a lack of coherence between local policies on socio-economic development; provision of labor resources with the real needs of the region. The contingent of students tended to decrease, which, in turn, led to an increase in the number of small institutions, resulting in increased costs per student. The material and technical base of vocational (technical and vocational) education institutions in recent years was practically not renewed, the organization of the educational process was complicated by the lack of modern workshops, outdated equipment, unsatisfactory provision of teaching tools, visual aids and educational literature.

The task of forming and developing the competences of individuals required for professional activity in a particular profession in the relevant industry, ensuring their competitiveness in the labour market and mobility, and the prospects for career development during their lifetime has arisen. This was noted in the Law of Ukraine "On Education" (2017). This law introduced the terms "professional (vocational) education, "institution of professional (vocational) education, applicant of professional (vocational) education, as well as the level of professional (vocational) education: first (primary), second (basic), third (higher). In the implementation of these tasks were important provisions of the Copenhagen Declaration, the Bruges Communiqué and the Riga conclusions. In particular, in the framework of the Copenhagen Process, a European Guide for Vocational Education and Training Quality Assessment was first developed for vocational education providers, which revealed the relevant criteria, procedures and processes of involving vocational education and training providers in this activity (2002). In the Bruges Communiqué, the emphasis was shifted to the mastery of additional educational programmes that provide the individual with the opportunity to achieve a high level of qualification in their chosen field, deepening their own competence (2010).

To implement the state policy in the field of qualifications in Ukraine, the National Qualifications Agency was established on a parity basis from representatives of the central executive authorities in the field of education and science, social policy, economic development, employers,

trade unions - to ensure interaction, coordination and enhance the efficiency of stakeholders in the field of qualifications, developed on the basis of relevant legal and regulatory acts. The assignment of qualifications began to be carried out in accordance with the qualification level discriminators of the National Qualifications Framework and taking into account the requirements of the modern labor market to the competences of specialists (2011).

In 2017, the optimization of the network of vocational education and training institutions began by joining small institutions to more powerful ones. The problems that needed to be solved were: disordered division of powers in the sphere of management and provision of financing of professional (vocational) education development; insufficient level of managerial culture in the sphere of professional (vocational) education of heads of executive authorities, local self-government and educational institutions; lack of motivational incentives for social partnership development; inconsistency of quality and directions of professional (vocational) education and training in the sphere of professional (vocational) education. This required: meeting the needs of the individual in professional implementation and lifelong learning; defining the legal powers of subjects of professional (vocational) education; systematic monitoring of the labor market and prompt response to its needs; multi-channel financing and attracting investment in the development of professional (vocational) education institutions; creating a system of diverse mutually beneficial social partnership; ensuring quality and accessibility of Taking this into consideration, the following important conceptual principles of professional (vocational) education reforms were identified: decentralization of management and financing of professional (vocational) education, including introduction of new management model to empower regional authorities and professional (vocational) education boards, heads of educational institutions, implementation of interaction mechanisms between central and local bodies

Effective interaction between stakeholders in the field of professional (vocational) education was aimed at the development of partnership interaction in the course of labor market monitoring, taking into account national, regional and sectoral priorities, formation of labor market needs in qualified personnel for the medium term; flexible trajectories of professional qualifications

implemented by recognizing non-formal and informal forms of education, introduction of full and partial qualifications, introduction of indi

Quality assurance of professional (vocational) education included: formation of modern content of vocational education based on competence approach (key – competences required for self-realization, development of active citizenship, social inclusion and adaptation in the labor market; general professional - competences that form ideas, basic knowledge in a certain professional field, creating the necessary basis for a person to obtain a professional

A promising direction of modernization of the content and organization of the educational process in vocational (technical and vocational) education institutions was the introduction of the dual form of education (Concept, 2018). This form appeared in the legislation for the first time with the adoption of the Law of Ukraine "On Education" (2017), although elements of the dual form of education were introduced even earlier. For employers, dual education became a way to provide vacancies with qualified personnel, training such workers for their needs, who are ready to work at a particular workplace using appropriate production technologies. For educational institutions, including teaching staff, it is an opportunity to get an internship on modern equipment, learn new technologies, management systems, acquire new professional and key competences or improve them. A total of 262 educational institutions, 1,160 employers and 1,244 applicants for professional qualifications joined the implementation of the dual form of education. Training was provided in 190 professions (including integration with technologically related professions). The most popular occupations for receiving professional (vocational) education in the dual form were welding, metalworking, electrical engineering technology, agricultural production and processing, light industry, hotel and restaurant services, IT technology, trade and accounting.

One of the key issues in the modernization of vocational (technical and vocational) education was the professional development of teachers and masters of industrial training, both in terms of psychological and pedagogical and methodological training, as well as in terms of professional areas. Teachers began to actively use effective forms and methods of training: project method; trainings; case technology; group work; modelling; developmental learning technology focused on the development of creative, entrepreneurial and business qualities.

At the same time, the COVID-19 pandemic actualized the need to raise the level of ICT-competence of pedagogical staff of vocational (technical and vocational) education institutions. After all, during the quarantine they had to be able to organize distance vocational training for future skilled workers. In addition, they had an increased interest in studying software (Radkevych, 2019) technologies of self-management, self-education activity of students, development of electronic educational resources, teaching aids and the like.

The modernization of vocational (technical and vocational) education was also facilitated by the approval of the Concept of State Policy Implementation in the field of vocational (technical and vocational) education "Modern vocational (technical and vocational) education" for the period until 2027. (2019). Its goal was to reform vocational (technical and vocational) education, aimed at achieving the following basic objectives: decentralization of management and financing in the field of vocational (technical and vocational) education, gradual transfer of authority on management of vocational (technical and vocational) education institutions and their financing to the regional level; expansion of autonomy of institutions; optimization of the network of institutions; creation of conditions for obtaining face professional qualifications.

In accordance with the Law of Ukraine "On Professional Pre-Higher Education" (2019), the training of vocational (vocational and technical) education institutions has been launched to train professional junior bachelors. Among the priority tasks of the Ministry of Education and Science of Ukraine during this period were: formation of a unified network of vocational (technical and vocational) education institutions and their optimal financing and management mechanism; modernization of educational institutions infrastructure; updating of education content; creation of quality assessment tools for professional (vocational) education; creation of preconditions for improvement of teachers' work quality; attraction of business representatives to educational.

The preparation of educational programmes of specialized secondary education, including professional direction in the dual form of education, has started. According to the Law of Ukraine "On Secondary Education" (2020), specialized secondary education implies that students meet the requirements for learning

outcomes defined by the state standard of specialized secondary education.

In order to promote modernization of the system of professional (vocational) education in accordance with the modern and prospective needs of the labor market, the best international standards and practices to ensure the implementation of the right of citizens to quality and accessible vocational (professional) education, the creation of conditions for the formation and development of relevant professional competencies necessary for its successful professional activities and self-realization, as well as the development of labor resources.

Of no less importance was the national decision to increase the size of academic scholarships, including for students at vocational education institutions, as well as the creation and operation of supervisory (board of trusteeship) boards at vocational education and training institutions based on the principles of public-private partnership, accessibility, openness and a focus on the needs of applicants for education and the labour market.

Conclusions. The functioning of the system of professional (vocational) education during the third decade of independence of our state is conditioned by socio-economic and cultural transformations, adoption of a number of legislative and regulatory documents in the field of education and labor market. In particular, the Laws of Ukraine "On Education" (2017), "On amendments to some laws of Ukraine concerning the improvement of management of vocational education" (2012), "On formation and placement of the state order for training specialists, scientific, scientific-pedagogical and working personnel, professional development and retraining of personnel" were adopted (2012), "On Professional Pre-Higher Education" (2019), "On Secondary Education" (2020).

The modernization of professional (vocational) education in this period is related to the implementation of the Decrees of the President of Ukraine "On Sustainable Development Strategy of Ukraine – 2020" (2015), "On priority measures for the development of professional (vocational) education" (2021), the State target program for the development of vocational education for 2011 – 2015. (2010), National Strategy for Education Development until 2021 (2013); concepts: training of specialists in dual form of education (2018), implementation of state policy in the field of professional (vocational) education "Modern

vocational (technical) education" until 2027. (2019).

Modernization of professional (vocational) education in modern socio-economic conditions was facilitated by the adoption of the Laws of Ukraine "On Professional Development of Employees" (2012), "On Employment" (2012), "On Organization of Employers, Their Associations, Rights, Guarantees of their Activities" (2012), "On Social Dialogue (2012); approval of National Classifier of Occupations DK 003: 2010 (2010), National Action Plan for the implementation of the Economic Reform Program for 2011-2014. The National Classification of Occupations DK 003: 2010 (2010); the National Action Plan for the implementation of the Economic Reform Programme for 2011-2014 "Rich Society, Competitive Economy, Effective State" (2010), the National Classification Framework (2011), the Strategy of State Personnel Policy for 2012 – 2020 (2012), etc. (2012), etc.

No less important was the harmonization of the legal framework of professional (vocational) education in accordance with the needs of the economy in conditions of Ukraine's integration into the international economic and educational space, based on the consideration of progressive experience of the functioning of vocational education and training systems in the EU, as well as the main findings of the Brussels Communiqué (2010), the European Quality Assurance Framework for vocational education and training (EQAVET) (2011), Strategy.

The modernization changes in the professional (vocational) education during the third decade of Ukraine's independence (2011 – 2021) are expressed, *firstly*, by updating the content of vocational education, ensuring its forward-looking character, taking into account the dynamic technical and technological changes in the sectors of economy and labor market, combining the content of general education and vocational training, expanding the socio-cultural component of the content of national conscious successful personality development with active.

Secondly, continuous improvement of the network of professional (vocational) education institutions, taking into account the needs of national and regional labor markets for qualified workers. Therefore, various types of institutions are being created, namely vocational lyceums, higher vocational schools, and vocational education centers. Recently, the opening of vocational and professional colleges, training and practical centers

of industry orientation with the use of the latest production technologies, the introduction of innovative forms of education (dual, distance, mixed) has begun, using in the educational process the latest technological tools and information resources of online platforms with educational and methodical materials, SMART complexes of academic disciplines; software for project management and communication of the subjects of the educational process; simulations of real production environment based on the program-supported principle of learning; digital profiles of professional (vocational) education to record the acquired competencies; expanding the opportunities for validation of non-formal and informal education results, including adults; creation of educational environments that are open, accessible, developing, inclusive, gender-sensitive in terms of career development and motivating to acquire knowledge and skills independently.

Thirdly, the updating of the management system for the development of vocational (vocational and technical) education through decentralization by: transferring the authority to manage educational institutions to the regional level; expanding cooperation with local executive authorities, local governments and employers; introducing new mechanisms for linking with economic structures and the labour market on issues of training, retraining and professional development of workers; and establishing regional vocational councils.

Fourth, the activation of public-private partnership based on the involvement of social partners in the management and modernization of professional (vocational) education, improving its network of material and technical base and training of skilled workers in the conditions of educational and production clusters, vocational guidance and popularization of professional (vocational) education among students and adults, the introduction of qualification centers for the recognition of results of formal, non-formal and informal education, full and partial professional qualifications and the other.

However, to accelerate the processes of modernization of the national system of professional (vocational) education in modern socio-economic conditions requires the solution at the national level of the following tasks: adoption of the Law of Ukraine "On vocational education" and updating the regulatory framework in accordance with modern legislation; introduction of multi-channel and multi-level funding

mechanisms and subventions for the professional training of future skilled workers; development of standard regulations for the activities of the newest educational institutions created on the basis of public-private partnership (educational-production clusters, technology parks, business incubators, etc.); introduction of tax benefits and economic incentives for businesses that invest in the development of professional (vocational) education institutions; development of educational programs for training specialists based on universal competencies, civic values, and respect for cultural diversity; increasing the amount of salaries of teaching staff; initiation of various mechanisms of payment for educational services and training incentives (educational vouchers, grants, personal scholarships, etc.); development of special educational programs for the transition of graduates of vocational (vocational) education institutions to the academic educational trajectory; development of short-term (modular) educational programs of professional direction, which make the accumulation of credits and the transition to higher levels of education in accordance with the National Qualifications Framework (6 – 7 levels); creation of conditions for the development of dual form of

professional (vocational) education, bringing it in line with the criteria and requirements of the modern European practice; conducting regular joint research with employers to identify professions and qualifications that are relevant on the labor market creating strong vocational colleges based on the association of small educational institutions on territorial or sectoral principals; granting the leading vocational education institutions the status of centers of professional excellence; creation of a national automated system for internal monitoring of the quality of professional (vocational) education; introduction of quality management systems (TQM) in the management of educational institutions with subsequent certification for compliance with international standards (ISO); creation of a national online platform for communication, experience exchange and professional development of teaching staff.

Solution of these tasks will contribute to the strengthening of modernization processes in the sphere of professional (vocational) education for its transformation into an innovative, inclusive, flexible, accessible, prestigious and attractive to young people and adult's educational subsystem, integrated into socio-economic processes.

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МОДЕРНІЗАЦІЯ ПРОФЕСІЙНОЇ (ПРОФЕСІЙНО-ТЕХНІЧНОЇ) ОСВІТИ ВІДПОВІДНО ДО ПОТРЕБ СУСПІЛЬСТВА ТА ВИМОГ РИНКУ ПРАЦІ

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Реферат.

Актуальність: на початку третього десятиліття незалежності України актуалізувалася проблема щодо відповідності професійної підготовки кваліфікованих робітників сучасним вимогам ринку праці, а також європейським стандартам і принципам забезпечення якості професійної освіти і навчання; у

цьому зв'язку особливе значення мають концептуальні, законодавчі та організаційно-педагогічні заходи, спрямовані на модернізацію професійної (професійно-технічної) освіти.

Мета: здійснення аналізу особливостей модернізації професійної (професійно-технічної) освіти впродовж третього десятиліття незалежності України та на цій основі виокремити рекомендації для її вдосконалення на загальнодержавному рівні.

Методи: теоретичні (індукція, синтез, узагальнення); емпіричні (вивчення та аналіз нормативно-правових документів у сфері професійної освіти і ринку праці, програм професійної підготовки кваліфікованих робітників, результатів діяльності закладів професійної (професійно-технічної) освіти).

Результати: охарактеризовано причини невідповідності якості професійної підготовки кваліфікованих робітників вимогам ринку праці; проаналізовано низку концепцій, нормативно-правових документів у сфері освіти і ринку праці та їх спрямованість на модернізацію професійної (професійно-технічної) освіти; розкрито напрями взаємодії закладів освіти та роботодавців у вдосконаленні змісту і форм професійного навчання кваліфікованих робітників, запровадженні інноваційних управлінських, виробничих і педагогічних технологій тощо.

Висновки: результати аналізу нормативно-правових документів освітніх програм професійної підготовки кваліфікованих робітників дають підстави стверджувати, що впродовж третього десятиліття незалежності України модернізація професійної (професійно-технічної) освіти увиразнюється: в оновленні змісту на основі компетентнісного підходу та дескрипторів Національної рамки кваліфікацій; у вдосконаленні мережі закладів професійної (професійно-технічної) освіти з урахуванням потреб національного та регіональних ринків праці; оновленні систем управління та фінансування на засадах децентралізації, передачі повноважень на регіональний рівень; активізації державно-приватного партнерства на основі залучення до управління соціальних партнерів тощо.

Ключові слова: професійна (професійно-технічної) освіта, модернізація, ринок праці, соціальні партнери, освітнє законодавство.

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PEDAGOGICAL CONDITIONS OF PROFESSIONAL TRAINING OF SKILLED MACHINE-BUILDING INDUSTRY WORKERS BY THE DUAL FORM OF EDUCATION

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Abstract.

The relevance of the study is determined by the need to bring the level of professional training of skilled machine-building industry workers in line with the requirements of the modern labor market.

Purpose: substantiation of pedagogical conditions of professional training of skilled machine-building industry workers by the dual form of education.

Methods: theoretical analysis of scientific sources – to determine the level of the problem research; comparison – in order to study the scientific approaches to solving the problem; systematization – to substantiate its structural components.

Results: pedagogical conditions of professional training of future skilled machine-building industry workers by the dual form of education are considered to be a set of circumstances related to the organization of the educational process in the institution of vocational education and training (VET) and the external educational environment in which cognitive, educational and production activities of applicants for education occur and which are aimed at the formation of the professional knowledge, skills and abilities and the development of professional competence; the following pedagogical conditions are determined (formation of positive motivation for practice-oriented professional training; updating the content of professional and practical training, taking into account the requirements of partner companies; use of active methods and innovative educational technologies; conducting seminars and trainings for production mentors).

Conclusions: the proposed pedagogical conditions of professional training of skilled machine-building industry workers by the dual form of education contribute to the formation of professional competence of skilled machine-building industry workers; the introduction of elements of the dual form of education in the training of future skilled workers is of strategic importance for the development of the country.

Keywords: *condition, pedagogical condition, dual form of education, professional education, competence.*

Introduction. The relevance of the study is determined by the need to bring the level of professional training of skilled machine-building industry workers in line with the requirements of the modern labor market. The best way to solve this problem is to introduce a dual form of education. Substantiation of pedagogical conditions of professional training of skilled machine-building industry workers by the dual form of education

involves providing such requirements for the educational process that would promote better learning of educational material, take into account the most important didactic principles, help to harmoniously develop students' hard and soft skills demanded by the machine-building industry.

Sources: The paper took into account the ideas on the theoretical justification of organizational and pedagogical conditions for the formation of

professional competence of students in institutions of vocational education and training (hereinafter – VET) (A. Aleksyuk (2001), Yu. Babanskiy (2005), V. Semychenko (2010), V. Slastenin (2002), features of professional training of future skilled workers in various industries (E. Zeer (2000), I. Zimnyaya (2004), P. Sikorskyi (1998), D. Zakatnov (2012)), L. Petrenko (2013), O. Pometun (2004), J. Raven (2012), competence approach in vocational education and finding ways to form the professional competence of future professionals (G. Dehtiarova (2012), R. Hurevich (2009), M. Artiushyna (2000), N. Bibik (2004), A. Verbytskyi (2004), S. Lisova (2011), V. Luhovyi (2014), N. Nychkalo (2013), O. Ovcharuk (2004), V. Radkevich (2012 a; 2012 b).

The article aims to substantiate the pedagogical conditions of professional training of skilled machine-building industry workers by the dual form of education.

Methods – theoretical analysis of scientific sources – to determine the level of the problem research; comparison – in order to study the scientific approaches to solving the problem; systematization – to substantiate its structural components.

Results and discussion. Pedagogical conditions of professional training of future skilled machine-building industry workers by the dual form of education are considered to be a set of circumstances related to the organization of the educational process in the institution of vocational education and training (VET) and the external educational environment in which cognitive, educational and production activities of applicants for education occur and which are aimed at the formation of the professional knowledge, skills and abilities and the development of professional competence.

The first pedagogical condition is the formation of positive motivation for practice-oriented professional training. Practice-oriented professional education is characterized by: fulfillment of a specific goal, which is based on the preparation of the student in accordance with the requirements of a specific customer-employer; synergy of VET institutions and direct customers-employers; priority of professional and practical training.

The success of the implementation of practice-oriented professional education largely depends on the professional motivation of students as a means of forming their professional competence.

The educational process with the use of high-tech equipment, the novelty of the subjects of the professional cycle, applied professional programs, etc., help to increase the motivation of students. If

the working educational program is focused on the competencies demanded by employers (the formation of which will take place during theoretical training by solving educational and professional tasks modeled with the inclusion of technological processes of enterprises) and production of the products necessary for the enterprise in a real production situation on all kinds of practice, then not only the quality of training will increase, but also the motivation of students to further employment in the acquired profession will increase.

The motivation of students is also influenced by the implementation of joint interdisciplinary practical work and a comprehensive qualification task in the workplace using the acquired professional knowledge, skills and abilities.

The second pedagogical condition is the updating of the content of educational programs of professional and practical training taking into account technical and technological changes in the machine-building industry. The implementation of this condition is carried out through the development and implementation of educational program, didactic, program-methodical and technical means of training in the profession, focused on the development of technical intelligence and the formation of professional competencies, in conditions of a dual form of education.

Activities to develop the curricula for dual education include the following steps:

1. Analysis of the list of required labor functions and their significant labor actions, additional requirements of the employer (based on the report on the results of expert assessment of qualification requirements of the employer) for their grouping into generalized labor functions;

2. Correlation of the state educational standard on the profession and the report on the results of expert assessment of qualification requirements identified by employers to determine training cycles, sections, modules in the structure of the educational plan, the curriculum to include additional educational outcomes.

3. Formation of additional educational results of mastering the educational material on the basis of qualification requirements of employers in the format of dual training.

Qualification requirements of employers must be translated into educational outcomes. The changes, additions and their substantiation made in the program can be described in the explanatory note to the educational plan and specified in the curriculum, carried out by meeting of the corresponding methodical commission.

Conceptually, the implementation of this pedagogical condition is through the active involvement of employers in the development and implementation of the educational program for training skilled workers for their own production through motivational, technological and material support of the enterprise.

It is important to follow the algorithm: from determining the results of mastering the educational program to the evaluation procedure and the correct selection of assessment tools, and only then – to the formation of the actual content and structure of the program.

Understanding the goals and the ways to test them makes it possible to build the curriculum in an optimal way. The formation of the structure of the curriculum (composition of professional modules, disciplines) and its content is carried out on the principle of "reverse": first, determine the types of work included in the modules, the content of subjects, then the composition and content of modules / topics, and finally – composition and content of subjects.

The content of the professional module / subject should take into account the synchronization of theory and practice. It is important to take into account that the content of the program is aimed at achieving the goal of education – the development of professional and general professional competencies that determine the qualifications of graduates. Adherence to the algorithm involves the development of an educational program to discuss with a joint creative group the conditions of program implementation, the distribution of responsibilities for the implementation of the program components, which provide a reasonable construction of the educational plan and schedule of the educational process.

Priority in the construction of updated software using elements of the dual form of education is the achievement by graduates of the qualifications required by employers. This is the purpose of cooperation between the parties, to ensure which (taking into account the peculiarities of production), it is determined what pedagogical staff, equipment, infrastructure are needed for conducting the industrial training and practice in production conditions, which schedule of the educational process, educational plan and list of components of its subjects and modules should be.

The third pedagogical condition is the use of active methods and innovative educational technologies. In the formation of professional competence of the future skilled worker, the

educational process should be aimed at individualization of educational interaction, integrative learning and the development of technical thinking. In the conditions of dual model of training, there is always a choice of pedagogical technologies, which (in the conditions of reduction of duration of theoretical preparation, increase of hours of professional and practical training in the conditions of production) could provide the creation of a strong basis of future professional activity and which would have innovative character. Innovative transformational approaches to learning involve the formation of a modern model of the graduate who would be ready for the requirements of production due to high professional competence and ability to communicate with other people.

Such technologies can be: design, personality development, case studies, interactive, integrated.

Project-based learning technologies involve the use of active methods of independent work of students, which stimulate their creative thinking, increase the level of mastery of research methods, the ability to work in a group and use different sources of information. The teacher (when using the project technology) determines the timing, scope of tasks, criteria for evaluating the results of work and coordinates the following stages of the project: exploratory, analytical, practical and final.

Personality-development technologies are based on the partnership between the teacher and the student, with high educational, exploratory, research activity of the latter. The peculiarity of this technology is the constant emphasis on the content of education to the requirements of modern enterprise, integrative approaches to modeling lessons, the use of activating teaching aids, including information and communication, as well as modernization of material and technical base.

Case study is a learning technology based on the analysis, solution and discussion of real or simulated professional situations. The strength of this technology is that in solving a certain production situation, the learner integrates knowledge of theory (with acquired skills) in practice, working on the predicted result, through the analysis of a specific production problem, formulating its cause and identifying ways to solve it. When solving production situations, the learner develops skills: analytical (information analysis), practical (application of theoretical knowledge in a practical situation), communicative (ability to work in a group, establish partnerships, present and argue own point of view).

The introduction of integrated learning technology is relevant because the content of vocational education in accordance with the standards of vocational (professional) education in the profession "Turner" has a subject approach. However, the professional activity of the future skilled worker is an integral part of the application of professional competence (subject of activity, equipment, technology, materials science, etc.).

Integrated technology is based on a metasytem combination of similar elements from different subjects through the cyclical interaction of teachers and students. The positives of this system are: the implementation of interdisciplinary links, integration of content, the formation of students' professional competencies based on the consolidation of knowledge gained through differentiated learning, the focus on the development of system thinking. In view of this, interdisciplinary connections, development and students' implementation of complex tasks and projects that require knowledge in various subjects become relevant and practically significant.

Interactive technologies provide a system of joint, controlled, active interaction of all participants in the educational process, which is designed (through individual and group activities) to develop professional competencies and soft skills of students. Built on interactive technologies, training is based on the minimum knowledge of students on the topic, their production experience, cooperation and communication, rapid systematization of knowledge and reflection.

The fourth pedagogical condition is the conducting of seminars and trainings for mentors, which are necessary in the organization of the dual form of education. With the introduction of the system of dual form of education, the main teacher in the workplace should be a mentor, and the

institution of mentoring in the system of modern education, unfortunately, is almost lost. Fixed mentors have problems working with students. Mentors, mostly experienced highly qualified workers, perform high-quality technological operations, but have no training in Pedagogy and Psychology, do not always know the requirements of educational programs, the standard of vocational (professional) education when working with students who undergo industrial training and internships in the enterprise conditions. According to the results of the survey, mentors are practically not ready to implement their functions in the training of future skilled workers, including in terms of pedagogical competence.

Conclusions. The pedagogical conditions influencing the formation of the necessary professional competencies of skilled machine-building industry workers include: the formation of positive motivation for practice-oriented vocational training (training of students on high-tech equipment that allows them to perform most of practical, laboratory and diploma work in real production conditions and to form the professional competencies of the turner demanded at work on the high-tech equipment of the enterprises of machine-building industry); updating the content of professional and practical training taking into account the requirements of partner companies (adjusting the list of professional competencies by type of activity due to the active involvement of employers in the development and implementation of an educational program for training skilled workers); use of active methods and innovative educational technologies (individualization of educational interaction, integrative learning, development of technical thinking); conducting seminars and trainings for production mentors (restoration of the mentoring institute).

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ПЕДАГОГІЧНІ УМОВИ ПРОФЕСІЙНОЇ ПІДГОТОВКИ КВАЛІФІКОВАНИХ РОБІТНИКІВ МАШИНОБУДІВНОЇ ГАЛУЗІ ЗА ДУАЛЬНОЮ ФОРМОЮ ОСВІТИ

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Реферат.

Актуальність дослідження визначається необхідністю приведення рівня професійної підготовки кваліфікованих робітників машинобудівної галузі у відповідність до вимог сучасного ринку праці.

Мета: обґрунтування педагогічних умов професійної підготовки кваліфікованих робітників машинобудівної галузі за дуальною формою здобуття освіти.

Методи: теоретичний аналіз наукових джерел – для з'ясування рівня дослідженості проблеми; порівняння – з метою вивчення наукових підходів до розв'язання проблеми; систематизація – для обґрунтування його структурних компонентів.

Результати: педагогічні умови професійної підготовки майбутніх кваліфікованих робітників машинобудівної галузі за дуальною формою освіти розглядаємо як сукупність обставин, пов'язаних із організацією освітнього процесу в закладі П(ПТ)О і тим зовнішнім освітнім середовищем, у якому відбувається пізнавальна, навчальна й виробнича діяльність здобувачів освіти, спрямована на формування в них професійних знань, умінь і навичок та розвиток професійної компетентності; визначено такі педагогічні умови (формування позитивної мотивації до практико-орієнтованого професійного навчання; оновлення змісту професійно-практичної підготовки з урахуванням вимог підприємств-партнерів; використання активних методів та інноваційних освітніх технологій; проведення семінарів і тренінгів для наставників з виробництва).

Висновки: запропоновані педагогічні умови професійної підготовки кваліфікованих робітників машинобудівної галузі за дуальною формою освіти сприяють формуванню професійної компетентності кваліфікованих робітників машинобудівної галузі; впровадження елементів дуальної форми навчання у професійну підготовку майбутніх кваліфікованих робітників має стратегічне значення для розвитку країни.

Ключові слова: умова, педагогічна умова, дуальна форма освіти, професійна освіта, компетентність.

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USE OF TECHNICAL TRAINING TOOLS FOR ACQUISITION OF FUTURE QUALIFIED WORKERS-PAINTERS WITH THE TECHNOLOGY OF PERFORMANCE OF VARNISH PAINTING

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Abstract.

The *relevance* of the article is due, on the one hand, to the need to organize the educational process in the professional (vocational) education school (hereinafter – P(V)E school) at a level capable of meeting the requirements of the State standard of vocational education for training (advanced training) of workers in the profession of «painter» (a graduate of the P(V)E school with the qualification «painter of the 4th category» must, among other things, know the technology of varnishing), and on the other – the importance of using computer programs and technical training tools (hereinafter – TTT) in the educational process to increase the effectiveness of the formation of students' skills and abilities to work on the technique of «varnish painting».

Aim: to develop an algorithm for preparing and conducting a lesson to acquaint future qualified workers-painters with the technology of varnish painting.

Methods: illustrations and demonstrations to visualize the process of varnishing in order to increase attention, increase interest, improve memorization and assimilation of educational material by students.

Results: an algorithm for preparing and conducting a lesson on varnish painting has been developed, which has three successive stages: design of a wooden plate in the technique of «Dot painting»; using computer programs Windows Movie Maker, KMPlayer, MS Office PowerPoint, MS Office Word to edit video, defragment it into individual images, prepare a presentation and lesson plan; direct lesson.

Conclusions: subject to the previous change of sub-stages and their content, the developed algorithm is effective for painting lessons on other topics and can be used in mastering such disciplines as «Technology of art», «Fundamentals of composition», «Drawing».

Keywords: *professional training, professional (vocational) education school, technology of varnish painting.*

Introduction. According to the State standard of vocational education for training (advanced training) of workers in the profession «painter of the 2, 3, 4, 5, 6th categories» (Ministry of Education and Science of Ukraine, 2015), a graduate of P(V)E school for qualification «painter

of the 4th category» must, among other things, know the technology of varnishing; normative documents and requirements of labor protection, fire protection, industrial sanitation and personal hygiene for employees of this profession. In addition, he must be able to: analyze works of art

by genre; to develop compositions on the basis of works of fine and decorative-applied art; eliminate defects during execution; correctly perform work with the technique of «varnish painting»; comply with the rules and regulations of labor protection, fire protection, industrial sanitation and personal hygiene. General professional requirements for the future qualified worker-painter are: rationally organize and effectively use the workplace; adhere to the norms of the technological process; to prevent defects in work; adhere to the norms, methods and techniques of safe work. Future painters have the opportunity to acquire the above knowledge, skills and abilities during industrial training on the topic «Varnish painting».

In turn, in the Concept of implementation of state policy in the field of P(V)E «Modern professional (vocational) education» for the period up to 2027 (Cabinet of Ministers of Ukraine, 2019) one of the basic tasks of the reform of P(V)E defined quality assurance by:

- formation of the content of P(V)E on the basis of competencies;
- creation of external and internal system of quality assurance of education;
- modernization of the educational environment, which promotes innovation, accessibility, transparency, flexibility and openness of the educational process;
- improvement of the system of training of pedagogical workers in the field of P(V)E with the involvement of highly qualified workers of production and services in the educational process;
- introduction of motivational mechanisms to stimulate professional activity and development of pedagogical workers.

In this context, in our opinion, one of the areas of modernization of the educational environment is the use of technical training tools.

Sources. A number of publications by domestic and foreign authors have been devoted to various aspects of the use of information technologies and TTT in vocational and higher education in the field of art. Authors have studied: problems of integration of computer-oriented technologies into artistic and creative practice (Blyzniuk, 2008); computer technologies in the educational process of art educational institutions (Blyzniuk and Andreikanych, 2014); computer graphics as a component of art education of future specialists in fine arts (Kovalenko, 2019); the use of TTT in the educational and production process of vocational schools in Ukraine in 1960–1991 of the twentieth century (Smoliana, 2011); the essence and features

of the use of computer learning technologies in art education (Cherniavskiy, 2014); interactive methods and media-educational elements in the artistic and aesthetic training of students of creative specialties at the university (Shelupakhina and Shelupakhina, 2014); problems and trends in sensitization and articulation of the computer for teaching art (Milbradt, Habowski and Conte, 2020); the needs of art painting and its educational reform in the context of virtual reality technology (Pan and Deng, 2020); digital technologies in art and design education (Radclyffe-Thomas, 2008); use of iPad among art and design students (Souleles et al., 2014).

The purpose of the article is to develop an algorithm for preparing and conducting a lesson on acquainting future qualified workers-painters with the technology of varnishing

Methods: illustrations and demonstrations to visualize the process of varnishing in order to increase attention, increase interest, improve memorization and assimilation of educational material by students.

Results and discussion. *Varnish painting* is a work of fine art made on a specially prepared surface (wood, canvas, fabric, etc.), which is covered with a thin layer of varnish after painting.

The technique of «Dot painting», or «Point to point», is a type of art that appeared relatively recently, although it has a long prejudice. The technique itself seems to repeat the ancient mosaics, embroidery, tapestries, embossed products. It can be used to decorate clothes, shoes, interior items. The technique of dot painting has the following types: geometric; intuitive; imitation of different styles. *Geometric painting* consists of simple shapes: squares, triangles, circles and various intersections of lines. Painting is called intuitive when the author draws what he wants: any lines, folds, shapes. Such images are not like anything, they are difficult to repeat. *Imitating different styles* is the creation of an ornament that resembles the motifs of Indian or Arab culture – everything that the author liked.

There are several ways to transfer an image to a work surface, such as a wooden surface. One of them is the transfer of the image using a stencil. The most popular paints that can be used to work on wood, stone, etc. are acrylic, oil, latex, water-based.

The algorithm for preparing and conducting a lesson on industrial training for painters in P(V)E schools using computer programs and TTT will be divided into three successive stages:

- 1) execution of painting;

- 2) use of computer programs in preparation for the lesson;
- 3) preparatory, basic and final sub-stages of the

lesson with the use of TTT in the classroom.

The algorithm of painting in preparation for a lesson on industrial training for painters is shown in Fig. 1

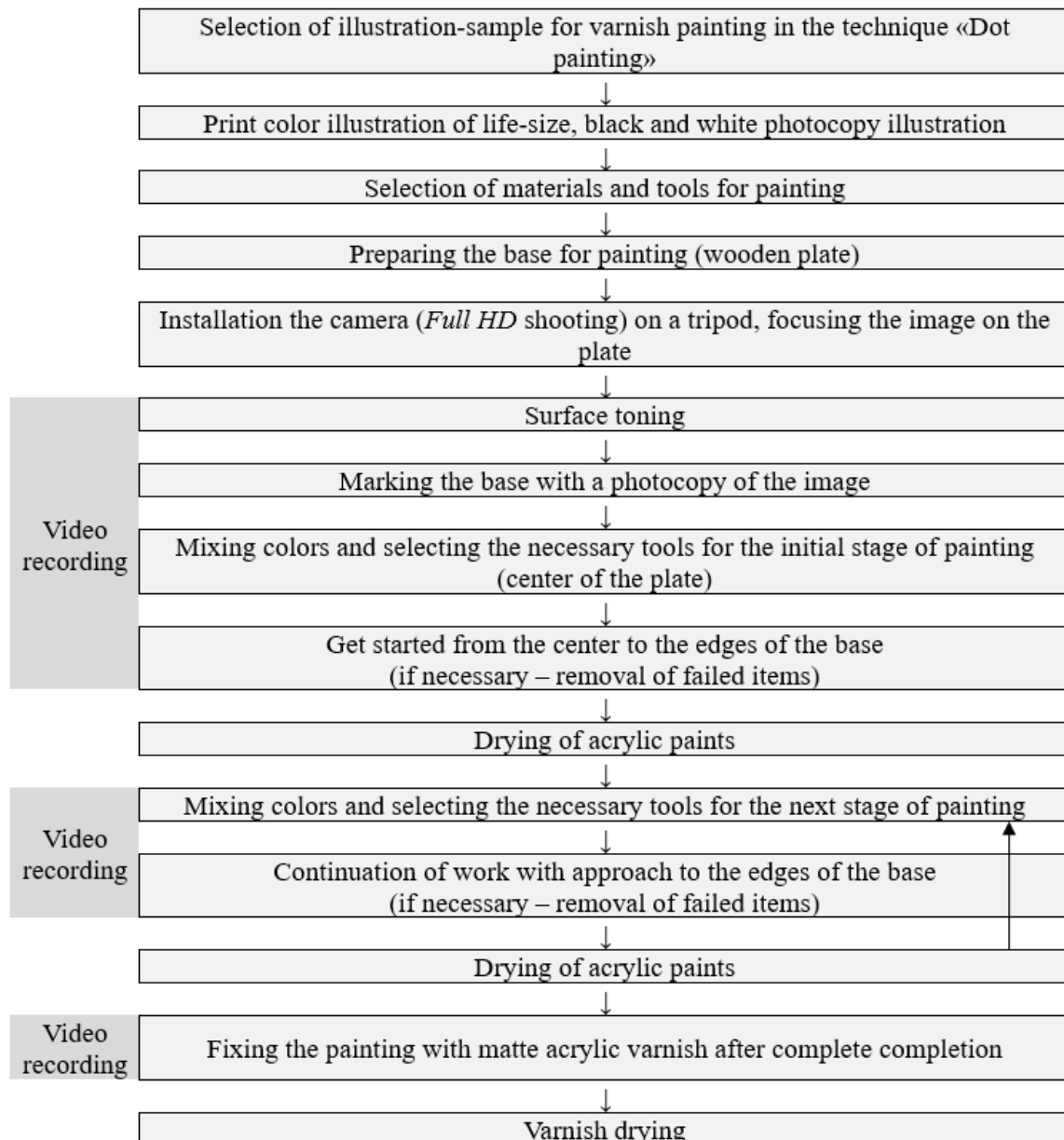


Fig. 1. Algorithm for painting

Therefore, before starting work, you need to print a sample illustration; spread paints and wooden base on the table.

The following equipment is required for the lesson: table (pupil's), base for painting (in our case – a wooden plate), white pencil for different surfaces, ruler, compass, palette with recesses, paints (acrylic), water, round brushes, dots, plastic caps and drills of different diameters, cotton swabs, wet wipes, alcohol or liquid for washing dishes or windows, pins, pipette (Fig. 2).



Fig. 2. Equipment for the lesson

Note that dots is a two-sided tool for dot painting (Fig. 3).



Fig. 3. Dots

As acrylic for painting is diluted and washed off with water, solvents are not required. Related materials for acrylic painting: phosphorescent and iridescent gels (shimmering), drying retardant for acrylic, solvent to give transparency to acrylic, gel to give volume, acrylic varnishes (glossy, matte, satin), brush cleaner from acrylic paints, acrylic contour in tubes.

Preparation of the base for painting is its gluing and covering with soil. In Fig. 4 shows a plate covered with evenly distributed acrylic soil and two layers of black acrylic.



Fig. 4. Toning the surface

After drying of each layer of acrylic the marking of a surface by the «powder» technique is carried out. Then, with the help of a white pencil and a ruler, the main axes are marked on the formed points, which will serve as landmarks: horizontal, vertical, center of the drawing (see Fig. 5).

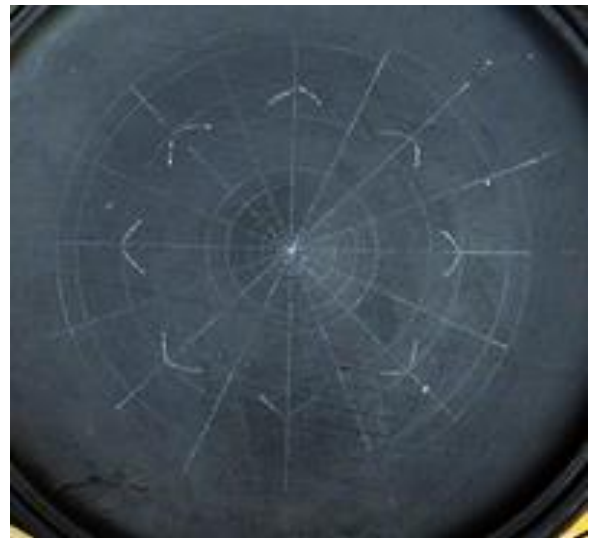


Fig. 5. Marking the surface

It is better to start drawing ornaments from the central point to the parties that will allow to keep symmetry and to follow a pattern. It is expedient to deduce round or figured motives from the center of drawing to the parties, filling with sectors. It is important to allow each color and a number of dots to dry, otherwise the picture may smudge or merge into unattractive spots.

The peculiarity of dot painting is the size of the dots, the distance between them, the color combination. After stirring the appropriate paint, you need to put a dot in the center. Then others of smaller size are placed around it (see Fig. 6).



Fig. 6. The beginning of painting

For our example, the first circle is surrounded by a chain of yellow dots, the second – blue. Around the blue «sharpened» small white dots (see Fig. 7).



Fig. 7. Continuation of painting

To get a dot, not a stain, you need to properly place the dots (or brush) on the surface. This should be done vertically (see Fig. 8).



Fig. 8. Working with dots

If it works out, another point is placed next to it. The dots should try to make the same size, adjusting the pressure on the dots, as well as put them as close as possible to each other, but so that they do not merge.

After applying purple dots (one large and three medium), petals of yellow dots are formed around them. Then a yellow dot is placed in the center, and then another five dots on each side of it with a gradual decrease in the size of the dots (see Fig. 9).

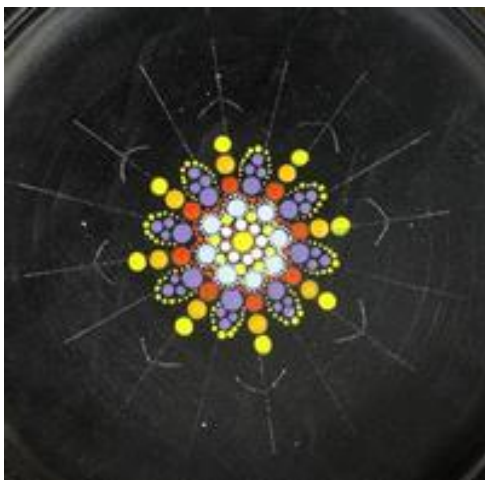


Fig. 9. Formation of petals

Unsuccessful points are removed with a cotton swab dipped in alcohol. When the chain is close to perfection, the next circle is formed (see Fig. 10–11). The paintings are allowed to dry for at least a day, making the acrylic strong and durable.



Fig. 10. Continuation of painting



Fig. 11. Completion of painting

Finally, the finished, well-dried work in the technique of point-to-point is fixed with acrylic varnish to prevent mechanical damage (Fig. 12).



Fig. 12. Varnish coating

The algorithm for using computer programs in preparation for an open lesson is shown in Fig. 13.

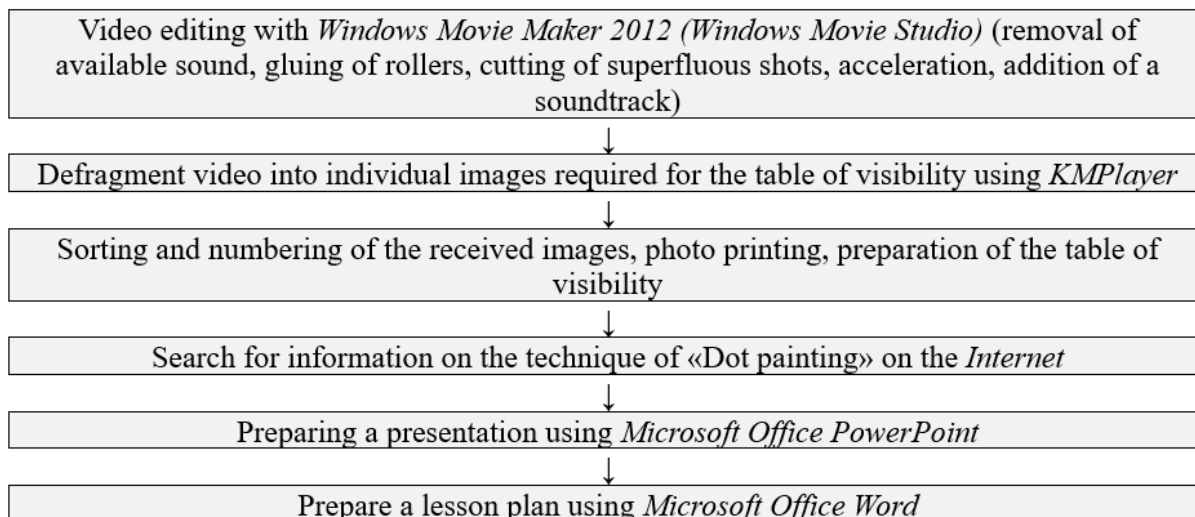


Fig. 13. Algorithm for using computer programs in preparation for an open lesson

As you can see, the following programs were used during the preparation:

Windows Movie Maker 2012 is a free video editor that has a simple and intuitive interface that allows you to edit videos from a variety of media files.

KMPlayer is a media player for audio and video files that supports a large number of media formats.

Microsoft Office PowerPoint is the world's most

common program for creating and viewing presentations, which is part of the Microsoft Office suite.

Microsoft Office Word is a software editor for creating, editing, and saving text, which is also part of the Microsoft Office suite.

The algorithm of the preparatory, basic and final sub-stages of the open lesson (in class) is shown in Fig. 14.

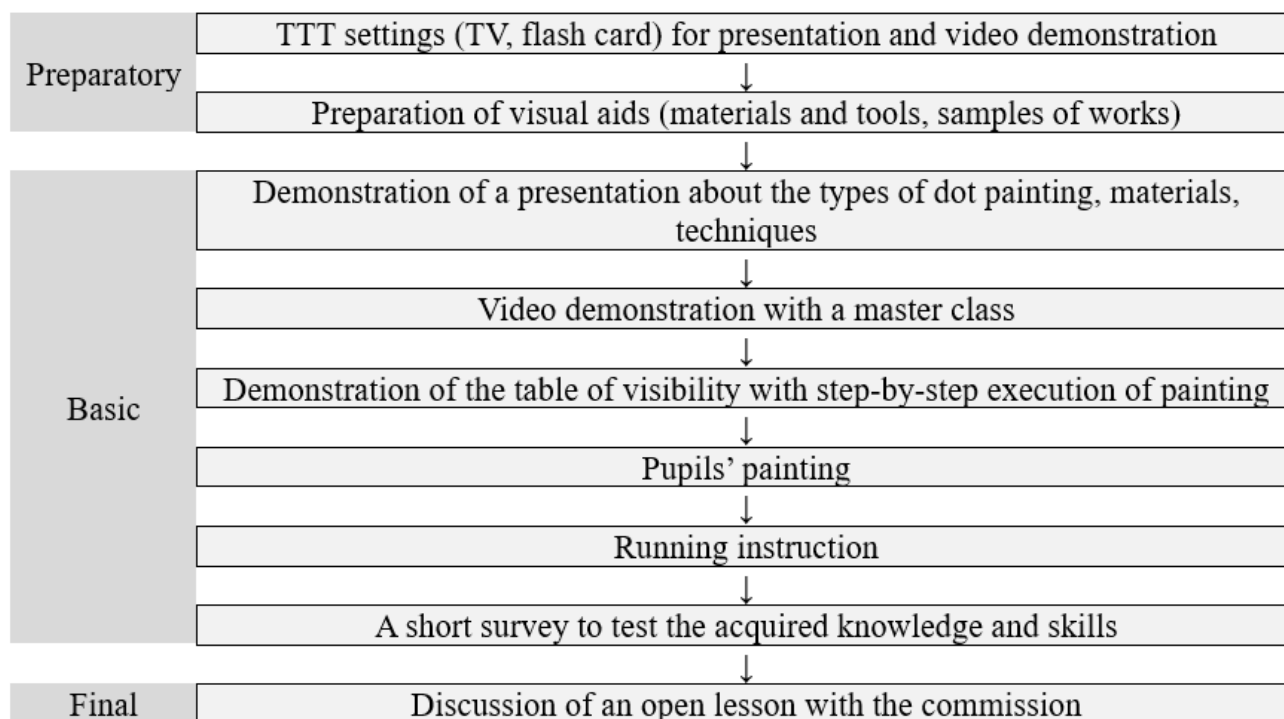


Fig. 14. Preparatory, basic and final sub-stages of an open lesson using TTT (in class)

Note that for illustration we used the table «Varnish painting», made on cardboard size 100×70

cm with pasted 24 photographs of the gradual execution of the painting (format 10×15 cm).

Conclusions. The developed algorithm for preparing and conducting in professional (vocational) education schools of a lesson on industrial training for painters on a subject «Varnish painting» with use of TTT allows to qualitatively visualize process of execution of varnish painting that leads to improvement of concentration of pupils, growth of their interest, improvement of memorization and assimilation of educational material. At the same time, provided that the substages are changed and their content is changed,

this algorithm can also be used for painting lessons on other topics, as well as for art disciplines («Technology of art», «Fundamentals of composition», «Drawing»). It is advisable to use Windows Movie Maker 2012 (Windows Movie Studio), KMPlayer, Microsoft Office PowerPoint, Microsoft Office Word for preparing and conducting the lesson, but does not exclude the possibility of using other computer programs with similar or larger functionality for preparing and conducting lessons.

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ВИКОРИСТАННЯ ТЕХНІЧНИХ ЗАСОБІВ НАВЧАННЯ ДЛЯ ОЗНАЙОМЛЕННЯ МАЙБУТНІХ КВАЛІФІКОВАНИХ РОБІТНИКІВ-ЖИВОПИСЦІВ З ТЕХНОЛОГІЄЮ ВИКОНАННЯ ПІДЛАКОВОГО ЖИВОПИСУ

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Реферат.

Актуальність статті зумовлена, з одного боку, необхідністю організації освітнього процесу в закладі професійної (професійно-технічної) освіти (далі – П(ПТ)О) на рівні, здатному задовольнити вимоги Державного стандарту професійно-технічної освіти для підготовки (підвищення кваліфікацій) робітників з професії «живописець» (випускник закладу П(ПТ)О за кваліфікацією «живописець 4-го розряду» серед іншого повинен знати технологію виконання підлакового живопису), а з іншого, – важливістю використання в освітньому процесі комп'ютерних програм і технічних засобів навчання (далі – ТЗН) для підвищення ефективності формування у здобувачів освіти умінь і навичок роботи за технікою «підлаковий живопис».

Мета: розробити алгоритм підготовки та проведення уроку з ознайомлення майбутніх кваліфікованих робітників-живописців з технологією виконання підлакового живопису.

Методи: ілюстрування та демонстрації для наочного відображення процесу виконання підлакового живопису з метою підвищення уваги, збільшення зацікавленості, покращення запам'ятовування й засвоювання здобувачами освіти навчального матеріалу.

Результати: розроблено алгоритм підготовки та проведення уроку з підлакового живопису, що має три послідовні етапи: оформлення дерев'яної тарілки в техніці «Крапковий розпис»; за допомогою комп'ютерних програм Windows Movie Maker, KMPlayer, MS Office PowerPoint, MS Office Word здійснення монтажу відео, його дефрагментація на окремі зображення, підготовка презентації та плану уроку; безпосереднє проведення уроку.

Висновки: за умови попередньої зміни підетапів та їх змістового наповнення розроблений алгоритм ефективний для проведення уроків з живопису на інші теми та може використовуватися при опануванні таких дисциплін як «Технологія виконання художніх робіт», «Основи композиції», «Рисунок».

Ключові слова: професійна підготовка, заклад професійної (професійно-технічної) освіти, технологія підлакового живопису.

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PEDAGOGICAL CONDITIONS FOR THE DEVELOPMENT OF INDUSTRIAL TRAINING MASTERS' PROFESSIONAL COMPETENCE IN INSTITUTIONS OF VOCATIONAL EDUCATION SERVICES

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Abstract.

Relevance: the development of professional competence of masters of industrial training in institutions of vocational education services is the basis for ensuring the quality training in the system of vocational education. The main feature of the master of industrial training in comparison with other pedagogical workers is that his/her actions and tasks have an applied, professional and production character, a clear professional orientation and proximity to the conditions of modern production, and are subject to the main goal – purposeful formation of conscious, professionally competent, patriotic, well-developed personalities of skilled workers, in particular for the service sector. Therefore, in the modern institution of vocational education services such conditions should be created. They will ensure the teachers' creative professional self-realization and purposeful mastery of modern innovative pedagogical and production technologies.

Purpose: to determine and substantiate the pedagogical conditions for the development of professional competence of masters of industrial training in institutions of vocational education services.

Methods: theoretical: analysis, synthesis – for the study of scientific research, educational and methodological literature, modern educational practices to determine the pedagogical conditions for the development of professional competence of masters of industrial training in institutions of VE services; generalization, comparison, comparison – to compare the approaches of researchers to solve the problem; empirical: observation of professional and pedagogical activity of masters of industrial training, questionnaires, online surveys of pedagogical workers, conversations with pedagogical workers of vocational education institutions, expert evaluation – to determine the basic pedagogical conditions for the development of professional competence of masters of industrial training.

Results: the basic pedagogical conditions of purposeful development of professional competence of masters of industrial training in institutions of vocational education services are defined and substantiated, in particular: purposeful formation of positive motivation of masters of industrial training to master innovative industrial and pedagogical technologies; the dominance of effective self-educational activities in the personal and professional development of masters of industrial training; creation (in the institution of vocational education) of a favorable information and educational environment for the professional and pedagogical development of masters of industrial training; organization of innovative methodical work in the institution of vocational (professional) education

Conclusions: it is substantiated that certain pedagogical conditions for the development of professional competence of masters of industrial training in the institutions of vocational (professional) education services operate when appropriate professional methods, pedagogical technologies are provided.

Keywords: *development of professional competence, masters of industrial training, pedagogical conditions, institutions of vocational (professional) education education services.*

Introduction. Modernization of the system of professional training, the emergence of changes in technology and production technologies, the development of the information society, require an increase in the level of professional and pedagogical competence of teachers of vocational training (Tsareva, 2021, p.115). The development of professional competence of masters of industrial training in institutions of vocational (vocational) education (hereinafter – VET) services is the basis for providing quality training in the system of vocational (professional) education. Modern educational realities determine the new requirements for the master of industrial training as the main translator of skills and abilities to applicants for vocational education. A modern master of industrial training is a professional who is perfectly oriented in the legal framework and adequately uses the requirements of conceptual educational documents in his daily activities; builds and embodies own pragmatic trajectory of activity, self-development and self-improvement taking into account the basic tendencies of development of techniques and technologies; (within the limits of realization of the professional functions) enters into effective communications with employers of branch; is constantly improving through long-term and short-term training, as well as in the course of non-formal education and training; uses digital tools and virtual resources to convey educational and production content to students and to measure and adjust their learning outcomes.

In modern pedagogical research, which is related to the problems of improving pedagogical systems, increasing the efficiency of the educational process, one of the aspects is to identify, justify and verify the pedagogical conditions necessary to ensure the success of the activities.

Sources. Speaking of the concept of “pedagogical conditions”, it should be noted that there are a large number of interpretations of this definition. The multifaceted nature of pedagogical conditions for the organization and management of the process of improving professional and pedagogical activities is considered in the research of P. Gurevich, I. Ziaziun, I. Isayev, P. Luzan, N. Nychkalo, N. Kuzmina, I. Podlasyiy, V. Slastenin, V. Radkevych, L. Shevchuk and others.

According to I. Podlasyiy (1996, p. 280), “pedagogical conditions contribute to the implementation of the content of education, optimize the forms, methods, approaches, technology of the educational process as a holistic

system”. P. Luzan (2004, p. 134) understands pedagogical conditions as “circumstances that provide a number of factors and allow the teacher to organize active educational and cognitive activities of students”, N. Ypolytova (2012, p. 10) – as a component of the pedagogical system, reflecting the set of internal (ensure the development of the personal aspect of the subjects of the educational process) and external (contribute to the implementation of the procedural aspect of the system) elements that ensure its effective functioning and further development.

Pedagogical conditions include those conditions that are consciously created in the educational process and the implementation of which ensures its most effective course. Thus, the definition of “pedagogical conditions” can be formulated as a set of measures “aimed at achieving goals, interacting and complementing each other, which prevents the penetration of the random, which does not contribute to the desired effectiveness” (Busel, 2009, p. 936).

Under pedagogical conditions we mean a set of objective and subjective factors necessary to ensure the effective functioning of all components of the relevant pedagogical system. This makes it possible to formulate pedagogical conditions for the development of professional competence of masters of industrial training of vocational education institutions in the field of services as circumstances that determine the masters’ purposeful development of professional knowledge and skills and provide training for students.

Highlighting the conditions for the development of professional competence of masters of industrial training of VET institutions in the field of services, we mean the environment in which this development is the most favorable.

The article aims to substantiate the pedagogical conditions for the development of professional competence of masters of industrial training in the field of services.

Methods: theoretical: analysis, synthesis – for the study of scientific research, educational and methodological literature, modern educational practices to determine the pedagogical conditions for the development of professional competence of masters of industrial training in institutions of VE services; generalization, comparison, comparison – to compare the approaches of researchers to solve the problem; empirical: observation of professional and pedagogical activity of masters of industrial training, questionnaires, online surveys of pedagogical workers, conversations with pedagogical workers of vocational education

institutions, expert evaluation – to determine the basic pedagogical conditions for the development of professional competence of masters of industrial training.

Results and discussion. The definition of pedagogical conditions was carried out in several stages. At the first stage of scientific research the task was set: to determine a set of pedagogical conditions that can influence (to the greatest extent) the process of development of professional competence of masters of industrial training, the development of their theoretical and practical training, readiness for teaching and innovation. For this purpose, an online pilot survey of teachers, masters of industrial training, methodologists, heads of vocational education institutions was conducted. According to the results of the survey, which was attended by 125 respondents, 12 most recurring pedagogical conditions were selected: purposeful formation of positive motivation of masters of industrial training to master innovative production and pedagogical technologies; implementation of the system of stimulation of professional and pedagogical development of masters of industrial training in the institution of vocational education; creation of effective methodological support for the process of increasing the level of competence of the master of industrial training with the use of IC technologies; the effectiveness of individual internships for masters of industrial training at enterprises in the service sector; systematic combination of content, methods, forms, technologies of course and inter-course advanced training of masters of industrial training; the dominance of self-educational activities in the personal and professional development of the master of industrial training; constant monitoring of the results of pedagogical activity of masters of industrial training in the institution of vocational education; involvement of masters of industrial training in the forms of advanced training in the system of methodical work of the vocational education institution; providing reflection of pedagogical activity of the master of industrial training; creation of a favorable information and educational environment for the professional and pedagogical development of the master of industrial training in the institution of vocational education; stimulating the process of conscious change of value orientations of the professional activity of the master of industrial training; organization of innovative methodical work in the institution of vocational education.

In the second stage of the study we used the method of expert evaluation to determine the importance of the

proposed pedagogical conditions; individual and collective expert evaluations were used. The main criterion for the selection of experts was their competence (education, work experience, duration of observation of the assessed phenomenon). Experts self-assessment was carried out, based on the clarification of the aggregate index, which is determined by the experts' assessment of their knowledge, experience and abilities on a ranking scale: "high" – 1 point; "average" – 0.5 points; "Low" – 0 points.

In addition, to staff a group of experts, we used recommendations for an "ideal expert" who must meet the following requirements (Bondar, 2005; Hrabovetskyi, 2010, pp. 76-78; Luzan, 2016, p. 144): "relatively independent administrative position; experience of active work in this system; health (lack of irritability, pessimism, insincerity); intellectual productivity; efficiency; confidence in judgments; balance of the realist; natural sincerity; strict observance of morals; sense of social responsibility; professional competence and availability of research and practical experience in the relevant field; creativity; scientific intuition; interest in the objective results of expert work; independence of judgment; objectivity; heuristics (ability to set and see non-obvious tasks)".

We also used ranking, i. e. the location of research data (pedagogical conditions) in a certain order, which is established in order to determine their relative importance. According to the ranking of pedagogical conditions for the development of professional competence of masters of industrial training in institutions of vocational education services, experts have determined (Fig. 1) that the pedagogical condition № 1 "Purposeful formation of positive motivation of masters of industrial training to master innovative production and pedagogical technologies" has the lowest rank - 18, so it ranks first in the rankings.

On the second and third places, experts put pedagogical condition № 6 "Dominance of effective self-educational activity in personal and professional development of the master of industrial training" and pedagogical condition № 10 "Creation of the favorable information and educational environment for professional and pedagogical development of masters of industrial training in the vocational education institution". The fourth place was given by the experts to the pedagogical condition № 12 "Organization of innovative methodical work in the vocational education institution". Thus, the most important pedagogical conditions of the researched process are determined by means of expert evaluation.

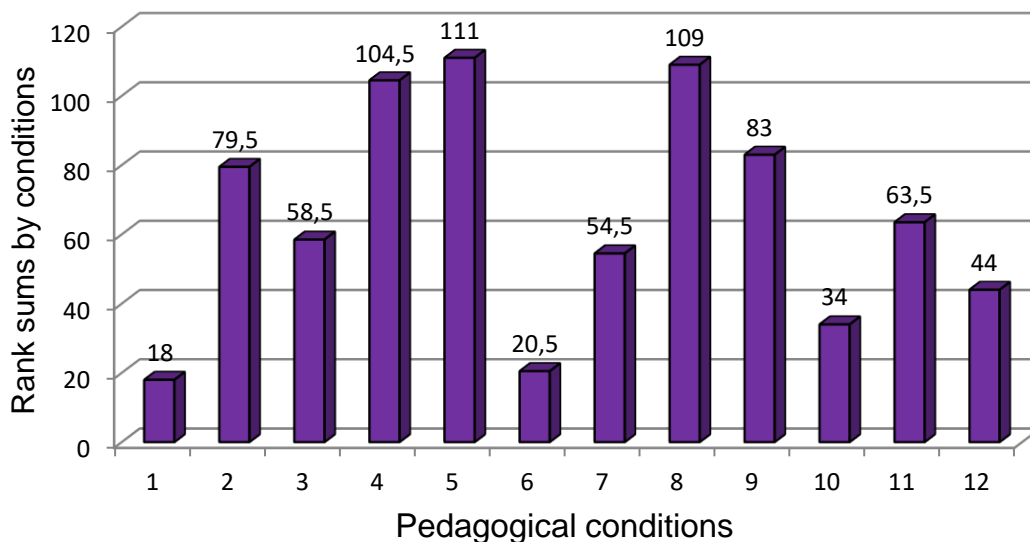


Fig.1. The results of ranking the pedagogical conditions for the development of professional competence of masters of industrial training of vocational education institutions in the field of services

Let's substantiate the pedagogical conditions for the development of professional competence of masters of industrial training in institutions of vocational education services. The first pedagogical condition is *the purposeful formation of positive motivation of masters of industrial training to master innovative production and pedagogical technologies*. Thus, the development of professional competence of masters of industrial training in institutions of vocational education services largely depends on the formation of positive motivation to master innovative production and pedagogical technologies. Motivation is the core of personality psychology and determines the characteristics of behavior and activities of the individual. Being the core of personality psychology, motivation sets the direction, character and abilities of the individual, exerting a decisive influence on them (Gubsky, 2005, p. 327). That is, motivation is one of the fundamental problems of human psychology in relation to his activity to a certain type of activity, which considers the quality of personality through such psychological mechanisms as: motives, needs, interests, motivational attitudes.

An important internal motive is also the motive of self-improvement and self-actualization. The latter of these motives are of particular importance at the present stage of development of education in connection with its focus on innovation, which places high demands on the psychological readiness of teachers to carry out their activities in new conditions. Psychological readiness for innovation involves motivational readiness, which is manifested in the desire for professional and personal self-improvement, to master new learning

technologies, restructuring the system of relationships with students, overcoming stereotypes in the activities of teachers, to their own creative growth (Ziaziun, 2003, p. 147).

In order to ensure a positive attitude to the mastery of innovative production and pedagogical technologies, it is necessary to form the following motives: public motive, which provides awareness of the needs of professional and pedagogical activities aimed at training mid-level professionals; the motive of achievement is the need to develop professional and personal qualities, creative abilities, the need to know both the content of psychological and pedagogical sciences, and the content of technologies in the field of services, ways to perform labor operations with modern equipment, mechanisms, devices; motive for the development of professional competence encourages masters of industrial training to update professional and methodological knowledge and skills, increase the level of professional and pedagogical skills.

The implementation of this pedagogical condition is possible due to:

- providing methodological assistance in assessing pedagogical difficulties for masters of industrial training of vocational education institutions in the field of services;
- implementation of the organization of methodical help to teachers taking into account their educational needs;
- inclusion of masters of industrial training in innovative activity which demands a high level of formation of psychological and pedagogical, methodical and special (technological) knowledge and abilities;

- the presence of a creative atmosphere in the teaching staff and stimulating creative search;
- stimulating the processes of professional and pedagogical improvement, self-improvement, personal development and self-development;
- ensuring the professional freedom and independence of teachers in choosing areas for improvement and self-improvement of professional and pedagogical activities;
- analysis of personal pedagogical and production experience as a source of development of professional competence of masters of industrial training of vocational education institutions in the field of services.

Thus, the formation of stable interests and motives for mastering innovative production and pedagogical technologies is one of the important periods of formation and development of the motivational sphere of the individual to creativity and is aimed at achieving a high level of his work culture.

The second pedagogical condition for the development of professional competence of masters of industrial training in institutions of vocational education services is *the dominance of effective self-educational activities in the personal and professional development of masters of industrial training*.

Today, the classical notion of the possibility of forming a "comprehensively developed personality" is replaced by an understanding of the fundamental incompleteness of human education. The flow of professional information is not only growing, but also qualitatively updated, so self-development is recognized as the leading value of education. The need for self-education as a special type of professional activity, as a way of life in a developed information space is constantly growing. It is not just enough for the professional activity of a master of industrial training today to work in an educational institution and know his subject. It is necessary for pedagogical activity at the modern level of society's requirements to constantly update and enrich the professional potential.

To remain a professional, you need a continuous process of self-education. Professional self-improvement and self-education of the master of industrial training in principle are impossible if he himself does not see gaps in general pedagogical knowledge, in knowledge of the basics of the disciplines taught, the inadequacy of his pedagogical tools. When starting work on self-education and professional self-improvement, the master of industrial training must have the data of the analysis

of his work for a certain period, their objective assessment and recommendations of colleagues to improve the activities. There are the following forms of self-education: course training in institutes of advanced training (the main advantage of this form of self-education – the ability to receive qualified assistance from a specialist teacher, as well as the ability to share experiences between colleagues); obtaining a second higher education or a second specialty; distance training courses, conferences, seminars, competitions and contests.

4. Individual self-educational activities may include: research work on a particular problem; study of scientific-methodical and educational literature; participation in pedagogical councils, scientific and methodical associations; attending lessons of colleagues, exchange of views on the organization of classes, learning content, teaching methods; theoretical development of various practical forms of lessons, extracurricular activities and teaching materials.

5. Network pedagogical communities – a new form of organization of self-education of the master of industrial training. The online pedagogical community is an Internet resource created for communication of like-minded people, teachers of different regions of our country, who want to share their experience, argue, tell about themselves, learn the necessary information. The online community opens the following opportunities for teachers: the use of open, free and open electronic resources; independent creation of network educational content; mastering information concepts, knowledge and skills; monitoring the activities of community members. The main advantages of this form of self-education: the exchange of experience between teachers-practitioners; methodical help is personal and targeted; you can ask for and get a consultation at a time convenient for the teacher.

Each master of industrial training, taking into account the internal and external motives, the demands of modern society, the influence of the moral and psychological climate in the team, and the requirements of the administration of vocational education, determines his trajectory of self-improvement and self-development.

Thus, the implementation of this pedagogical condition indicates that self-education of the master of industrial training is a necessary condition for professional activity.

The next pedagogical condition for the development of professional competence of masters of industrial training in institutions of vocational education services is *the creation of a favorable*

information and educational environment for professional and pedagogical development of masters of industrial training in the institution of vocational education.

The urgency of creating an information and educational environment (hereinafter – IEE) in an educational institution is dictated by modern realities and requirements of society, on the one hand, and new theoretical ideas about the system of vocational education in Ukraine. The educational environment is a set of conditions organized by the administration of the educational institution, the entire teaching staff with the mandatory participation of students in order to create optimal conditions for the comprehensive development of the personality of students and teachers.

The educational environment of VET institutions includes information, social and technological components, the set of which is a content-subject, as well as the subjective context of future professional activity.

The information component of the educational environment of VET institutions includes information resources necessary for the acquisition of socio-professional knowledge, as well as the formation of a system of social and professional values. The information component of the educational environment is represented by:

- library of VET institutions, which contains educational, methodical publications, periodicals, fiction; the library provides opportunities to search for information needed to solve professional problems;

- electronic library system, which contains educational materials for professional purposes and provides the ability to quickly search for information;

- electronic publications containing basic and additional information on disciplines and professional modules; electronic editions of the educational institution are presented by textbooks, lecture notes, reference books, methodical recommendations, sets of test tasks;

- Internet resources that allow for socio-professional communication on forums, in professional communities, etc.;

- sites of vocational education institutions that contain up-to-date information on scientific and practical conferences, competitions of professional skills, information fairs, social projects, etc.

The social component of the educational environment of a vocational education institution includes social and professional values, behavioral requirements; moral and psychological atmosphere;

system of socio-professional relations, as well as the experience of these relations, social roles in the context of professional activity. The social component is represented by:

- students who are in constant interaction; student interaction is both situational and purposeful; social interaction of students, organized to solve professional problems, is developmental in nature;

- teachers, administration – organizers of socio-professional interaction; members of the pedagogical council, which regulates the educational process; representatives of the professional community; representatives of the educational organization; carriers of social and professional values;

- social partners of vocational education institutions – enterprises and organizations, including educational ones; participate in the formation of content and evaluation of learning outcomes; provide bases of practice, internships, employment opportunities; provide support for talented students; provide openness and professional orientation of the educational process.

The technological component of the educational environment of a vocational education institution includes forms of interaction, ways of acquiring and applying professional competencies, as well as experience of social and professional relations. The technological component includes:

- the content of programs of academic disciplines and professional modules;

- applied educational technologies that ensure the development of competencies;

- forms of organization of educational and extracurricular activities based on the interaction of the subjects of the educational process;

- fund of control means that have an activity, practical nature and are aimed at assessing competencies.

The information and educational environment is an area of professionally regulated educational services, where the master of industrial training acts as their supplier. Adhering to the requirements of time and level of development of distance educational technologies, the master of industrial training must provide access not only to text and audiovisual didactic materials of the educational and methodical complex of the discipline, but also to tools of distance counseling and training, webinars, chats, forums, network projects. To do this, of course, it is necessary to have the appropriate competencies and professional skills, so IEE is the second zone, the zone of professional and personal

development of the master of industrial training, his individual educational and social activities.

In order to develop this area of IEE, conditions are created for interaction with colleagues, self-regulation, counseling, training, providing support and monitoring of the processes of formation, development and self-development of the master of industrial training.

The system-forming center of IEE for professional and pedagogical development of masters of industrial training, where links to all used resources are placed, can be a teacher's blog or a personal page on the website of the educational institution. The diverse structure of the individual information and educational environment is in a constant process of filling and development. The capabilities of IEE make it multidimensional, multi-vector and multifunctional, which allows the master of industrial training to find or form the educational "niche" in which he can most fully realize his professional needs and opportunities.

The main requirements for the formation and operation of individual IEE is to establish and take into account a set of stable links between the many elements of IEE, which ensure its integrity: the use of the master of industrial training (in their professional activities) of various tools and methods of educational interaction (Email, Skype, webinar, blog, personal website, etc.), open and licensed educational resources and Internet services, optimal for the achieved level of personal and professional development of forms, means and methods of educational (pedagogical) and cognitive activity; ensuring equal partnership of the teacher with other subjects of educational process in the organization and realization of tasks of educational and cognitive activity; building of pedagogical interaction on a personality-oriented basis and the transformation of subject-subject relations in the direction of providing informal joint activities. Taking into account these requirements, the selection of Internet services, software, means of communication is carried out.

Constant analysis of the professional achievements serves to identify difficulties and contradictions, determine the zone of their immediate personal and professional development, solve problems of professional self-determination, create conditions for personal and professional self-development through reliance on experience.

Thus, the creation of a favorable information and educational environment for the professional and pedagogical development of masters of industrial training (in VET institutions) provides a continuous

(initiated by the teacher) process of qualitative change of his personality, created on the basis of modern information technology.

The organization of innovative methodical work in VET institutions is the fourth pedagogical condition for the development of professional competence of masters of industrial training of vocational education institutions in the field of services.

The analysis of scientific literature and educational practice shows that the skill of the master of industrial training is formed through constant systematic work directly in the educational institution. Thus, methodical work is the most important part of the system of continuing education of a single master of industrial training and the whole teaching staff, which allows to create the necessary conditions for continuous replenishment of knowledge, creative development of teachers and promotes the transition from education to self-education and self-improvement.

Innovative pedagogical activity requires renewal of methodical work, which is dictated by the following factors:

- changing the values of modern education, which makes certain demands on the personality of the teacher, his professional competence and pedagogical skills;
- the need to create new technological support that makes significant changes in the content of methodological work;
- the growing role of managerial activity of the teacher in conducting classes, the manifestation of the professional skills such as prognostic, analytical, research, diagnostic, etc.;
- the problem of stimulating pedagogical workers to research and experimental work, etc.

The tasks facing the methodical service are realized through the use of various forms of work of the methodical service of the vocational education institution: reproductive (workshops, seminars-workshops, pedagogical workshops, trainings); reproductive-heuristic (pedagogical readings, scientific-practical conferences); heuristic (problem and problem-project seminars, organizational-activity games); heuristic-productive (festivals of pedagogical ideas, competitions of professional skill, competitions of methodical developments); productive (scientific conferences, theoretical and methodological and problem seminars, scientific internships, participation in the work of temporary research teams, temporary creative groups, scientific creative vacations).

Traditional forms of methodical work (in the vocational education institution) should be

combined with innovative ones: scientific-methodical council, humanitarian department, advisory, informational and expert advice, experimental laboratory, temporary scientific-creative microgroups, master class, business and role-playing games, experimental work. etc.

Thus, along with the scientific-methodical office, the main task of which is to create conditions for improving the professionalism of the master of industrial training within the educational institution, the idea of a virtual methodical office located on the information site of the vocational education institution can be developed and implemented. Virtual methodical cabinet is a multifaceted information and educational environment focused on creating conditions for independent cognitive and research activities of the master of industrial training. It allows to organize methodical space for the master of industrial training, create optimum access to the information. It provides the operative methodical help, gives the chance to take part in virtual methodical readings and scientific and practical conferences. The virtual office is designed to create real opportunities for building an open system of continuing education for teachers, and

optimal access to the necessary information (at any time) makes the cognitive activity of the master of industrial training more effective and rich.

Conclusions. In the course of work the basic pedagogical conditions of purposeful development of professional competence of masters of industrial training in the institution of vocational education services are defined and characterized, namely: purposeful formation of positive motivation of masters of industrial training to master innovative industrial and pedagogical technologies; the dominance of effective self-educational activities in the personal and professional development of masters of industrial training; creation of a favorable information and educational environment for the professional and pedagogical development of masters of industrial training in the institution of vocational education; organization of innovative methodical work in VET institutions. It is substantiated that the determined pedagogical conditions for the development of professional competence of masters of industrial training in the institution of vocational education services will be effective if they are provided with professional methods and pedagogical technologies.

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ПЕДАГОГІЧНІ УМОВИ РОЗВИТКУ ПРОФЕСІЙНОЇ КОМПЕТЕНТНОСТІ МАЙСТРІВ ВИРОБНИЧОГО НАВЧАННЯ ЗАКЛАДІВ ПРОФЕСІЙНОЇ ОСВІТИ СФЕРИ ПОСЛУГ

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Реферат.

Актуальність: розвиток професійної компетентності майстрів виробничого навчання у закладах професійної (професійно-технічної) освіти сфери послуг є основою забезпечення якісної підготовки кадрів у системі професійної (професійно-технічної) освіти. Головною особливістю діяльності майстра виробничого навчання у порівнянні з іншими педагогічними працівниками є те, що його дії і завдання мають прикладний, фахово-виробничий характер, вирізняються чіткою професійною спрямованістю й наближеністю до умов сучасного виробництва, та підпорядковуються основній меті – цілеспрямоване формування свідомих, професійно компетентних, патріотично налаштованих, різнобічно розвинених особистостей кваліфікованих робітників, зокрема для сфери послуг. Тому в сучасному закладі професійної (професійно-технічної) освіти сфери послуг мають бути створені такі умови, які забезпечать цілеспрямоване опанування цими педагогічними працівниками сучасними інноваційними педагогічними і виробничими технологіями, їх творчу професійну самореалізацію.

Мета: визначити та обґрунтувати педагогічні умови розвитку професійної компетентності майстрів виробничого навчання закладів професійної (професійно-технічної) освіти сфери послуг.

Методи: теоретичні: аналіз, синтез – для вивчення наукових досліджень, навчально-методичної літератури, сучасних освітніх практик для визначення педагогічних умов розвитку професійної компетентності майстрів

виробничого навчання ЗП(ПТ)О сфери послуг; узагальнення, порівняння, зіставлення, – для порівняння підходів дослідників до розв’язання проблеми; емпіричні: спостереження за професійно-педагогічною діяльністю майстрів виробничого навчання, анкетування, онлайн-опитування педагогічних працівників, бесіди з педагогічними працівниками закладів професійної освіти сфери послуг, експертне оцінювання – для визначення основних педагогічних умов розвитку професійної компетентності майстрів виробничого навчання.

Результати: визначено та обґрунтовано основні *педагогічні умови* цілеспрямованого розвитку професійної компетентності майстрів виробничого навчання закладів професійної (професійно-технічної) освіти сфери послуг, зокрема: цілеспрямоване формування позитивної мотивації майстрів виробничого навчання до опанування інноваційними виробничими і педагогічними технологіями; домінування дієвої самоосвітньої діяльності в особистісно-професійному розвитку майстрів виробничого навчання; створення у закладі професійної (професійно-технічної) освіти сприятливого інформаційно-освітнього середовища задля професійно-педагогічного розвитку майстрів виробничого навчання; організація інноваційної методичної роботи у закладі професійної (професійно-технічної) освіти

Висновки: обґрунтовано, що визначені педагогічні умови розвитку професійної компетентності майстрів виробничого навчання закладів професійної (професійно-технічної) освіти сфери послуг діють при забезпеченні їх відповідними професійними методиками, педагогічними технологіями.

Ключові слова: *розвиток професійної компетентності, майстри виробничого навчання, педагогічні умови, заклади професійної (професійно-технічної) освіти сфери послуг.*

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DEVELOPING ENVIRONMENTAL COMPETENCE IN FUTURE TEACHERS OF SPECIALIZED SUBJECTS FROM AGRICULTURAL VOCATIONAL EDUCATION INSTITUTIONS: RESULTS OF PEDAGOGICAL EXPERIMENT

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Abstract.

The relevance of the article lies in the lack of experimentally verified methods for developing environmental competence in future teachers of specialized subjects from agricultural vocational education institutions.

The article *aims* to experimentally verify the author's methods for developing environmental competence in future teachers of specialized subjects from agricultural vocational education institutions.

Research methods include the following: theoretical (analysis, synthesis, comparison – to clarify the concept of “environmental competence of future vocational agriculture teachers”; to describe its structure, criteria, indicators and levels of development); empirical (questionnaires, observation of participants in the educational process, pedagogical experiment, methods of mathematical statistics – to determine the status and levels of environmental competence in future teachers from vocational education institutions).

Results: The article presents the author's methods for developing environmental competence in future teachers of specialized subjects from agricultural vocational education institutions. These methods ensure continuing improvement of the necessary knowledge, skills and abilities. Next, they nurture future teachers' awareness of the physical environment and its impact on one's professional and daily activities, and vice versa. Finally, the author's methods increase future teachers' environmental literacy.

Conclusions: The results of the formative experiment indicate some positive dynamics in the levels of environmental competence in future teachers of specialized subjects from agricultural vocational education institutions. This proves the effectiveness of the author's methods. It has been experimentally confirmed that the differences between control and experimental groups are statistically significant by all criteria: the motivational criterion (a sufficient level – 0.18%, a high level – 15.75%), the cognitive criterion (0.14% and 6.21%, respectively), the activity-related criterion (1.2%, and 13.21%), the actor-related criterion (0.6% and 11.78%).

Keywords: *vocational education, environmental competence, future teachers, pedagogical experiment.*

Introduction. Nowadays, it is crucial to discover ways of solving the global environmental crisis. In the early 21st century, the civilized world witnessed and realized the scale and possible consequences of environmental neglect at all levels (planetary, national, personal). Despite the globality of environmental problems, the solution must begin with the personal level at which environmental awareness, values and culture are

formed. It must be noted that this strategy for raising environmental awareness among citizens is regulated by the state and is implemented by the education system. The key actor in this process is the teacher (mentor, coach, facilitator), namely, a person whose environmental competence affects the development of future specialists as citizens in the post-industrial era with all its environmental problems and prospects.

Sources. This research relies on scientific views on a) the goals, objectives and principles of environmental education (N. Avramenko, N. Bakhmat, P. Bachynskyi, M. Bauer, O. Mitriasova, N. Ridei); the ways of developing environmental culture in pupils and pedagogy students (N. Kulalaieva, L. Pavliuk, H. Ponomarova, M. Shved); environmental views of agriculture students (N. Nehrtsa); environmental competence of pupils and students (O. Horenkova, L. Lukianova, V. Marshytska, S. Tytarenko); environmental competence in the context of 21st-century skills and values (H. Odnoroh, O. Radkevych, V. Radkevych, M. Yershov). The standard procedure for conducting a pedagogical experiment (P. Luzan, I. Sopivnyk, S. Vyhovska) has determined an algorithm for experimental verification of the effectiveness of the author's methods.

The article aims to experimentally verify the author's methods for developing environmental competence in future teachers of specialized subjects from agricultural vocational education institutions.

Research methods include the following: theoretical (analysis, synthesis, comparison – to clarify the concept of “environmental competence of future vocational agriculture teachers”; to describe its structure, criteria, indicators and levels of development); empirical (questionnaires, observation of participants in the educational process, pedagogical experiment, methods of mathematical statistics – to determine the status and levels of environmental competence in future teachers from vocational education institutions; to evaluate the accuracy, reliability and effectiveness of the selected empirical tools).

Results and discussion. As required by the education standard, future teachers should acquire generic and discipline-specific competences. Concerning vocational agriculture teachers, environmental competence is viewed as one of the main competences. The very concept of environmental competence as a psycho-pedagogical phenomenon is constantly optimized. It, as well as its structure, depends on the development of environmental studies as a field of scientific knowledge.

In pedagogy, there are several approaches to defining the concept of “environmental competence”. V. Marshytska (2005) claims that “environmental competence is one's ability to act accordingly in everyday life and towards the natural environment, to use the acquired knowledge, skills and experience to make concrete decisions in full awareness of their consequences for nature”. S. Aleksieiev (2006) views environmental competence as “one's ability to solve

different problems that may occur in life and work with the help of values and motives, knowledge, learning and life experience, individual characteristics”. L. Rudenko (2008) believes that “environmental competence consists of one's readiness and ability to practically solve environmental problems, personal qualities combined with the necessary stock of knowledge and skills to act effectively and expediently in problematic situations in different areas and discover the right ways to solve them”. According to L. Tytarenko (2007), environmental competence is “one's ability to apply environmental knowledge and experience in professional situations by prioritizing environmental values and non-pragmatic motivation of interaction with the environment and realizing the responsibility for environmental consequences of one's professional or other activities”. At the same time, some researchers state that environmental competence is “a set of abilities to solve various problems in everyday life and at work based on the respect for nature, learning and life experience, as well as individual needs and motives” (Lukianova and Horenkova, 2008).

Given the aim of this research, a detailed analysis of approaches to defining the specified concept allows one to interpret environmental competence as *one's quality that systematically combines the acquired environmental knowledge, skills, abilities, patterns of environmentally friendly behaviour, environmental values and readiness to act accordingly in professional, pedagogical and life situations, adhering to non-pragmatic motivation to interact with the environment.*

Environmental competence serves as the basis for developing environmental culture in future vocational agriculture teachers. It consists of the following components: motivational, cognitive, practical, self-evaluative.

Concerning the specifics of research objectives, it has been agreed to assess environmental knowledge of future vocational agriculture teachers through a parallel pedagogical experiment. The experiment was conducted at Mykolayiv National Agrarian University, Lviv National Agrarian University, Rivne State University of Humanities, the National University of Water and Environmental Engineering, Polissia National University.

The experiment aimed to verify the effectiveness of the author's methods for developing environmental competence in future teachers of specialized subjects from agricultural vocational education institutions. If there are appropriate pedagogical conditions in educational institutions, as the research hypothesis assumed, then one can

achieve positive dynamics in all the components of future teachers' environmental competence. These pedagogical conditions should be as follows: motivating future teachers to gain environmental knowledge; updating professional teacher training with the latest environmentally friendly technologies; promoting the use of interactive pedagogical technologies in professional-environmental training of future teachers.

A total of 384 respondents was determined as the required number for the conduct of the experiment. In fact, 397 university students (future vocational agriculture teachers) participated in the experiment. The typical selection method was employed to ensure the representativeness of experimental and control groups. The respondents were randomly divided into groups. The control group (CG) involved 199 students ($n_1 = 199$) and the experimental one (EG) 198 ($n_2 = 198$). The ascertaining stage of the experiment indicated that both EG and CG did not show any significant differences in the levels of students' discipline-specific training, as well as in the motivation for learning. The latter is seen as the basis for obtaining objective results on environmental competence levels in future teachers.

The experiment has allowed one to identify levels of environmental competence in future vocational agriculture teachers by certain criteria and corresponding indicators: the motivational criterion (one's attitude towards nature as an indisputable value; one's responsibility for preserving the environment; awareness of oneself as part of nature; the need for energy and resource conservation; the presence of environmental values and incentives in life and work); the cognitive criterion (a system of environmental knowledge (in the framework of

natural sciences); knowledge about protection of the natural environment, energy and resource conservation; the ability to apply this knowledge in environmental management and naturalist projects); the activity-related criterion (the ability to practically apply the acquired knowledge; the ability to act effectively in problematic situations related to health preservation; the ability to find alternative solutions for energy and resource conservation; readiness to organize environmental activities for young people); the actor-related criterion (the tendency towards environmentally friendly behaviour and activities; the ability to predict the consequences of one's behaviour and take responsibility for it due to the knowledge of environmental norms, laws and rules; self-motivation, reflection and awareness of healthy living and its role in self-development, self-fulfilment and self-regulation). Also, it was important to justify the levels (high, sufficient, basic) of environmental competence in future teachers of specialized subjects from agricultural vocational education institutions.

According to all the criteria, no statistically significant differences in the levels of EG and CG students' environmental competence have been found. Pearson's chi-squared test was applied to examine the significance of students' distribution by levels of environmental competence. Differences in EG and CG indicators under the specified criteria are at the level of $p \leq 0.05$, which confirms the homogeneity of the sample in both groups. At the beginning of the experiment, the levels of environmental competence in EG and CG students do not differ statistically significantly. The results of the ascertaining pedagogical experiment are presented in Table 1.

Table 1

Levels of Environmental Competence in Future Vocational Agriculture Teachers by Criteria (the Ascertaining Experiment)

| Criteria | Levels | | | | | | |
|------------------|-----------------------|-------------|-----------------------|-------------|-----------------------|-------------|-------|
| | Basic | | Sufficient | | High | | |
| | Number of students | | Number of students | | Number of students | | |
| | abstract, respondents | relative, % | abstract, respondents | relative, % | abstract, respondents | relative, % | |
| Motivational | CG | 100 | 50.25 | 73 | 36.68 | 26 | 13.07 |
| | EG | 99 | 50.00 | 73 | 36.87 | 26 | 13.13 |
| Cognitive | CG | 87 | 43.72 | 74 | 37.19 | 38 | 19.09 |
| | EG | 88 | 44.44 | 73 | 36.87 | 37 | 18.69 |
| Activity-related | CG | 102 | 51.26 | 63 | 31.66 | 34 | 17.08 |
| | EG | 103 | 52.02 | 65 | 32.83 | 30 | 15.15 |
| Actor-related | CG | 85 | 42.71 | 79 | 39.70 | 35 | 17.59 |
| | EG | 88 | 44.44 | 73 | 39.90 | 31 | 15.66 |

To achieve positive dynamics in levels of future teachers' environmental competence and confirm the hypothesis of the research, the author's methods have been incorporated into professional teacher training in the above-mentioned institutions participating in the experiment. These methods have aimed a) to motivate future teachers to gain and consolidate environmental knowledge, b) update

professional teacher training with the latest environmentally friendly technologies and c) introduce interactive pedagogical technologies in professional-environmental training.

At the formative stage, the author's methods have been experimentally verified based on the analysis, generalization, statistical evaluation and comparison of the results obtained from experimental work (Table 2).

Table 2

Levels of Environmental Competence in Future Vocational Agriculture Teachers by Criteria (the Formative Experiment)

| Criteria | | Levels | | | | | |
|------------------|----|-----------------------|-------------|-----------------------|-------------|-----------------------|-------------|
| | | Basic | | Sufficient | | High | |
| | | Number of students | | Number of students | | Number of students | |
| | | abstract, respondents | relative, % | abstract, respondents | relative, % | abstract, respondents | relative, % |
| Motivational | CG | 95 | 47.74 | 74 | 37.19 | 30 | 15.07 |
| | EG | 63 | 31.82 | 74 | 37.37 | 61 | 30.82 |
| Cognitive | CG | 86 | 43.22 | 56 | 28.14 | 57 | 28.64 |
| | EG | 73 | 36.87 | 56 | 28.28 | 69 | 34.85 |
| Activity-related | CG | 95 | 47.74 | 73 | 36.68 | 31 | 15.58 |
| | EG | 66 | 33.33 | 75 | 37.88 | 57 | 28.79 |
| Actor-related | CG | 80 | 40.20 | 79 | 39.70 | 40 | 20.10 |
| | EG | 57 | 27.82 | 66 | 40.30 | 75 | 31.88 |

The obtained results prove that the author's methods have improved the indicators of sufficient and high levels under all criteria for future teachers' environmental competence. According to the motivational criterion, CG indicators of sufficient and high levels have increased by 0.6% and almost 15%, respectively, in contrast to EG (see Fig. 1). At the cognitive criterion, there are the following changes: indicators of sufficient and high levels have increased by 0.54% and 11.35%, respectively (see Fig. 2). The activity-related criterion also shows some positive dynamics in environmental competence levels at the sufficient level (by 0.82%) and the high level (by 12%) (see Fig. 3).

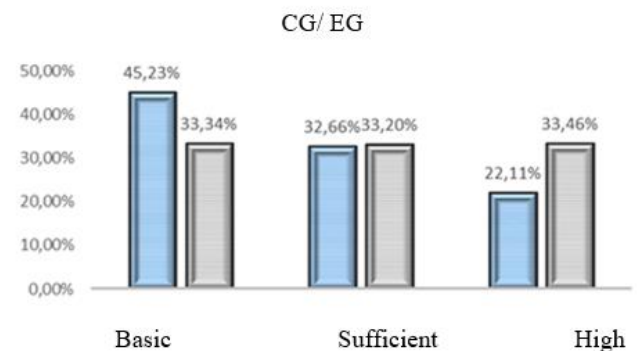


Fig. 2. Indicators of environmental competence levels in EG and CG at the formative stage (the cognitive criterion)

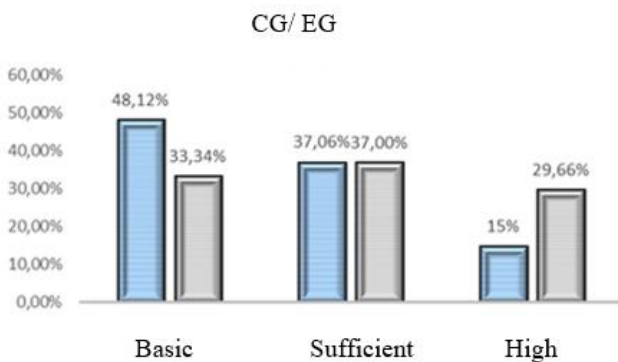


Fig. 1. Indicators of environmental competence levels in EG and CG at the formative stage (the motivational criterion)

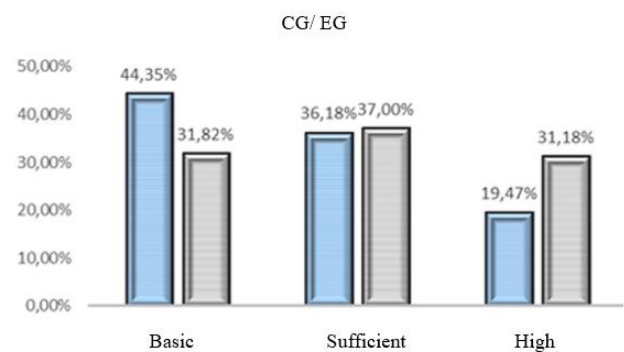


Fig. 3. Indicators of environmental competence levels in EG and CG at the formative stage (the activity-related criterion)

Concerning the actor-related criterion, indicators of environmental competence levels have increased by almost 1% and 17.3%, respectively (see Fig. 4).

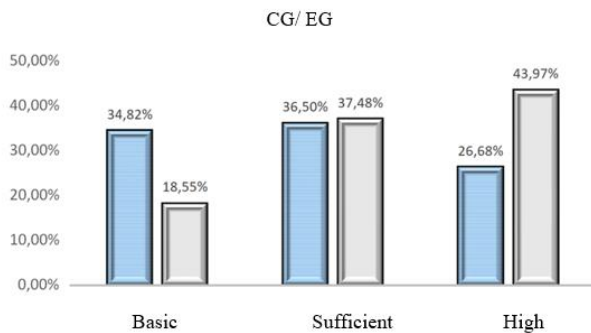


Fig. 4. Indicators of environmental competence levels in EG and CG at the formative stage (the actor-related criterion)

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РОЗВИТОК ЕКОЛОГІЧНОЇ КОМПЕТЕНТНОСТІ МАЙБУТНІХ ВИКЛАДАЧІВ СПЕЦІАЛЬНИХ ДИСЦИПЛІН ЗАКЛАДІВ ПРОФЕСІЙНОЇ ОСВІТИ АГРАРНОЇ ГАЛУЗІ: ПІДСУМКИ ПЕДАГОГІЧНОГО ЕКСПЕРИМЕНТУ

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Реферат.

Актуальність зумовлена браком експериментально перевірених методик розвитку екологічної компетентності майбутніх викладачів спеціальних дисциплін закладів професійної освіти аграрної галузі.

Мета: експериментальна перевірка розробленої авторської методики розвитку екологічної компетентності майбутніх викладачів спеціальних дисциплін закладів професійної освіти аграрної галузі.

Методи: теоретичні (аналіз і синтез, порівняння й зіставлення – для з'ясування сутності поняття «екологічна компетентність майбутніх викладачів аграрного профілю»; визначення його структури, критеріїв, показників і рівнів розвитку); емпіричні (анкетування, спостереження за учасниками педагогічного процесу, педагогічний експеримент, математичної статистики – для з'ясування стану й результатів розвитку екологічної компетентності майбутніх викладачів закладів професійної освіти).

Результати: розроблено методику розвитку екологічної компетентності майбутніх викладачів спеціальних дисциплін закладів професійної освіти аграрної галузі, що забезпечує: безперервний процес удосконалення комплексу знань, умінь і навичок; розвиток професійно важливих якостей еколого-безпечної діяльності як у професійній діяльності, так і в повсякденному житті; покращення екологічної грамотності майбутніх викладачів спеціальних дисциплін закладів професійної освіти аграрної галузі.

Висновки: результати формувального етапу експерименту свідчать про позитивну динаміку у рівнях сформованості екологічної компетентності майбутніх викладачів спеціальних дисциплін закладів професійної освіти аграрної галузі, що підтверджує ефективність впровадженої авторської методики; експериментально доведено, що відмінності контрольних та експериментальних груп є статистично значущими за всіма критеріями: за мотиваційним (на достатньому рівні зростання становить 0,18%, на високому – 15,75%), за когнітивним (відповідно – 0,14% та 6,21%), за діяльнісним (1,2%, та 13,21%), за суб'єктивним (0,6% та 11,78%).

Ключові слова: професійна освіта, екологічна компетентність, майбутні викладачі, педагогічний експеримент.

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GLOBAL BACKGROUND OF EDUCATIONAL COMPARATIVE STUDIES (ON THE EXAMPLE OF HIGHER EDUCATION SYSTEMS OF UKRAINE AND UZBEKISTAN)

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Abstract.

The relevance is due to the rapid pace of development of higher education systems in the world and the formation of comparable and complementary interstate models. Conducting comparative research allows for effective forecasting and planning of educational activities in countries that are at a considerable distance from each other.

Objective: a comprehensive analysis of global comparative studies of educational systems, taking into account their high dynamics, deep transformation and selective identification of qualitative and quantitative country changes.

Methods: theoretical, system comparative analysis, statistical, graphical, forecasting, modeling, expert evaluation.

Results: the peculiarities of the development of higher education systems in the global economy are analyzed and the characteristic features of its singularity are determined. Based on current research, attention is focused on the contradictions that arise in the modern world between supporters of behaviorism and traditional "Economics"; situations of development of the market of educational services are projected (based on the currently prevalent neoliberal policies of governments of the leading countries and individual producers of specific products within the developed scenarios of dynamization of the production capacity curve); existing and perspective models of higher education development as well as directions of identification of the newest trends of improvement are substantiated; on the example of the development of higher education in Uzbekistan and Ukraine, specific ways of their convergence, synergy of the use of selective mechanisms and tools for development and large-scale cooperation are proposed.

Conclusions: it is empirically proven that in the context of increasing globalization, the implementation of the principle of complementarity is extremely important for the study of country education systems. It allows to conduct the comparative segmentation of the educational market of several countries simultaneously and justify its trend; it is proved that the educational systems of Ukraine and Uzbekistan have such international academic comparability and complementarity.

Keywords: *model of higher education, curve of production opportunities, educational comparative studies, Ukraine, Uzbekistan.*

Introduction. In the conditions of significant strengthening of globalization tendencies, the differentiation of variability of educational space, its character and content sharply increase. Naturally, this entails the transformation of models of educational management organization, ensuring the implementation of quality standards and, ultimately, mutual recognition of diplomas in education, qualifications, degrees, competencies of graduates and so on. However, educational policies implemented by the governments of different countries can be significantly differentiated from each other and may not always be successful and this fact has a corresponding impact on their economic and social spheres. At the same time, the active hybridization of educational systems allows to implement important principles of comparability and modularity. This leads to the avoidance (mitigation) of the consequences of large-scale miscalculations or to the rapid subsequent deformation of individual components of national economies. Therefore, an important assumption (or working hypothesis) may be the thesis that the integration of educational systems does not have to be based on their geographical proximity (neighborhood), because in conditions of high academic mobility an important element is the proportionality and complementarity of different models of higher education. Such characteristics determine the existence and possible mutually beneficial educational convergence of existing models of higher education in Uzbekistan and Ukraine.

Sources. Recently, in the global educational environment, the tendencies of multidimensional assessment of development trends have significantly intensified. On a singular basis, they define a kind of diffusion of national university systems, which are characterized by appropriate levels of identification (pedagogical, economic, managerial, philosophical, etc.). Therefore, the desire of many professionals to approach the understanding of higher education trends from their methodological settings seems quite justified. In particular, B. Saymon, N. Berdsoll, F. Raimertz and N. Mak-Hinn study this from the standpoint of systematic assessment of global transformations of society. In view of the well-established methodology of neoliberalism, now the traditional "Economics", T. Cleaver, H. Siebert and, in part, N. Kanklini defend their positions. M. Henson represents the breakthrough authorial positions of educational management (it is not necessary to agree with such an interpretation). However, from the point of view of modern

philosophers and political scientists, the overall area of discussion will look quite diverse, because (in the conditions of increasing globalization) cosmopolitanization (N. Kanklini), cultural memory (A. Assman) and the idea of three "and" (A. Banderdzhii, E. Duflo) (which will be discussed below) come to the fore. However, there are not many systematic comparative studies based on interdisciplinary basis in world practice. This has prompted the authors to study the phenomenology of the modularity of national educational systems, their comparability and complementarity.

The article aims to comprehensively analyze the global comparative studies of educational systems with maximum consideration of their high dynamics, deep transformation and selective identification of qualitative and quantitative country changes.

Results and discussion.

Global singularity of education. Over the past hundred years, views on the organization of education and its content in the global economic environment have changed radically several times, and this has usually polarized not only the views of researchers but also the strategic steps of governments around the world. In view of this, the point of view of the American psychologist and educator Dzh. Diui (2003, p. 7; 15; 25; 39), who in the early twentieth century defined education as: vital necessity, function of society, orientation, growth. This generally conditional identification of the methodological essence of education has provoked many researchers to a rather contradictory step in choosing the trajectory of its development, which Dzh. Diui (2003, p. 69) defined as both conservative and progressive trend of modernization, the basis of which, in his opinion, should be the democratization of the educational process.

For similar reasons, education was considered by the famous British researcher B. Saymon (1989, pp. 5-6), who in the late 1980s made a very important conclusion about the existence of the myth of the superiority of the Western education system. He argued that "the education system of Western countries can not be considered in isolation from the acute social, economic, political problems of modern capitalism". Many years have passed since then, the term "capitalism" from the light hand of the American researcher E. Luttwak received a new name – turbocapitalism. However, despite all the attempts of politicians and governments of the leading countries to alleviate the socio-economic contradictions of the past years, after a short pause

in the convergence of 1980-1990, they not only did not decrease, but, on the contrary, significantly increased.

Studies conducted by the American political scientist N. Berdsoll (2006) at the beginning of the new millennium have convincingly shown that the inequality of economic and social development is growing steadily, but society does not have sufficient resources to hamper this process. In view of this, a logical question arose about the formation of a more or less sustainable model of global education policy, which, according to F. Raimenz and N. Mak-Hinn (2004, p. 72) should be based on a comparative dialogue that should be conducted not only among the students, teachers, parents, involved in the educational process, but also among independent participants in the educational development – stakeholders, whose influence on the adoption of regulatory, creative, regional (national) decisions and their implementation in real educational environment is difficult to overestimate (Held and Mak-Hinn, 2004, p.72). Naturally, a significant increase in the number of so-called "actors" or actors in the field of global education required the application of a new system of governance, within which there was a local, national, supranational, global component taxonomy of management, each of which could be both hierarchical and deeply autonomous. Such a breakthrough system of modern educational management was proposed by M. Henson (2002, pp. 95-99). The author's model of professional-bureaucratic interaction became an important but not indisputable awareness of the concept developed by him. However, as in the past, we believe that higher education cannot be considered in isolation from other spheres (industries) of production of goods and services, the development of globalization trends and dependence on the numerous economic, financial, ideological and political reforms that prevail in modern society. D. Held and E. Mak Hinn (2004, pp. 123-124) draw attention to this pattern, identifying six groups of such influence: neoliberal, liberal-internationalist, institutional reformers, global transformers, extras/protectionists, radicals.

However, it is difficult to disagree with this, globalization is bringing many new changes to the system of providing university-level educational services, some of which are irreversible. However, the total effect of their production can be represented in different planes – both the expected positive changes and, unfortunately, rapid negative changes. According to H. Siebert (2002, p. 254), the really possible platform for interaction is firms of orderly

structures, the labor market, as well as product and capital markets, which naturally contribute to the formation of local competitiveness. Thus, it turns out that the modern market of educational services may differ in different levels of competencies, the real need for which is identified by the condition for a while, but does not guarantee compliance with the previously requested volume of students' enrollment in the near future. That is, there is a situation where a person must learn and improve throughout his life. Instead, the prospect of losing a job will constantly push the person to acquire additional competencies, the need for which will be, in our opinion, highly dynamic and, at the same time, impulsive.

A more complex graphical model of the singularity of education is proposed by T. Cleaver (2002, p. 65), who usually associates labor markets with the balance of prices for quality services, humanitarian capital, wages and traditional supply and demand for Economics fans, however with obligatory specification – global, instead of aggregate. In the past, apologists for neoliberalism have repeatedly referred to this, arguing that it is an unsurpassed philosophical definition and at the same time an effective tool for identifying the dynamics of education development, its structural changes and "revolution" of content.

The modern scientific literature describes in detail many of the latest processes of transformation, which fully characterize the modern parameters of change in education. German researcher Ulrich Bek (2015, p. 76), for example, believes that the qualitative content of such changes is cosmopolitanization. At the same time, the very phrase "cosmopolitan" is understood by the researcher in a new way – as a simultaneous citizen of space and the polis (city). However, if we take into account the contradictory but rather dynamic process of diffusion of cultures and their no less paradoxical mutual absorption, which takes place in the model of total Westernization and is called, according to N. Kanklini (2016, pp. 79-80), Manichaeic binary, it is easy to predict that cultural adsorption, by the way, is not always conflict-free and will also take place within the planetary model of development.

It is worth noting that certain bureaucratic and conservative features of modern education, which have manifested themselves most prominently in the process of conducting international comparative research, significantly affect the ability to identify existing global transformations that take place in modern society. That is why the role of cultural memory should be extremely important, and thus the

traditions that A. Assman (2012, pp. 40-41; 44) refers to the spaces of memories, or, as the scientist notes, to the secularization and identification of population memories, in the depopulated version. Thus, according to the author, in the modern world there is a formation of new values that can be considered extremely important within a fairly long range of educational activities, but they can not be considered lifelong, because new generations of citizens need modern education, new scales, new content, a new model of organization, new approaches and new teaching methods.

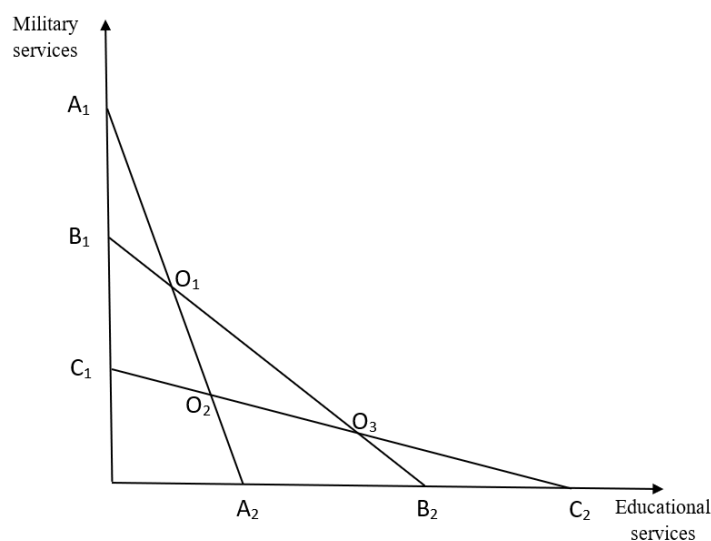
At the same time, modern educational models, in our deep conviction, are not exclusively altruistic. In almost all countries of the world, the profitability of educational business, the availability of educational products and the fairness of their distribution largely depend on national ideology, the real state of the economy, as well as the wealth of parents. Understanding this dependence well, A. Banderdzhi and E. Duflo (2018, pp. 276-277) decided to single out the previously mentioned problem of the three "and" – ideology, ignorance, inertia. These categories, according to the authors, determine the trend and sectoral perfection of education, as well as illustrate the attitude of society to the constant problem and purpose of didactics: why to teach, how to teach, for what to teach and the main thing (it is already economic), – how long to teach, because both budget and private expenditures on education will be extremely unbalanced in the future and, according to J. Holslakh (2016), will determine the growing Asian competitiveness of global higher education.

Therefore, it is not difficult to predict that in the near future there will be a new multistructural

polarity, covering the nature, processes, tools and mechanisms of knowledge, skills, and sublimated (within a short period of time) experience of previous generations. However, the resulting "added value" will vary significantly across countries, the central place of which is the prestige of the educational institution itself.

"Economics" against behaviorism. The neoliberal model of social development, no matter how much it has been criticized by Keynesian followers, continues to play an extremely important role in modern society. With this in mind, education is no exception, the end product of which is not significantly different from many other services that are produced in large quantities in the global economy. However, to identify the direct, indirect and hidden effects of educational services in the global economy is not so simple, and the problem here lies not only in many cases and not so much in tuition fees, but in the availability of material, desire/reluctance of students to make additional efforts to master important material, imaginary and real prestige of education, expected prospects for better employment in the future, arguments and expectations of parents.

The above factors are, in our opinion, quite important, and the ratio of the impact of each of them can change rapidly over time. That is why from the standpoint of "Economics" the curve of production opportunities within a neoliberal economy will be quite variable, caused by accelerated changes in perceptions of the educational process, its acceptance or ignorance by market participants, or blocking the proposed model and rejection of final results (*Fig. 1*).



*Fig. 1. Curves of production capacity of producers of educational and military services
Compiled by the authors*

The traditional approach of Economics to the allocation of resources may be quite paradoxical in our study. A clear example of this is the anthology dilemma of the government's choice of development strategy, known as "guns or oil". However, in the case of assessing the dominant market of educational services, such a graphical model does not always work, because the so-called differentiation of education itself (public, private, as well as primary, secondary, Bachelor's, Master's, Ph.D., postgraduate, etc.) prevents it. That is why, a variable distribution of the two types of services (military and educational) was imposed by the authors on the basis of the proposed scheme. The educational services to some extent illustrate the process of studying in public institutions of higher education at the expense of the budget.

As you know, in most countries of the world military services are financed from the national budget. Accordingly, the amount of expenditures on military services is identified by levels A1; B1; C1; educational – A2; B2; C2. So, it is not surprising that triangle Q1; Q2; Q3 will be a multivariate trend of numerous compromises in society, which largely illustrates the selective position atypical for Economics, for example, of a country like Ukraine – "guns, oil and education". Of course, this causes a significant imbalance in the budget.

However, many models of modern neo-, post-liberalism lack those approaches that can be an important feature of educational entrepreneurship: export/import of educational products and services, accelerated mobility of teachers and students, outsourcing of services, active collaboration of universities (combining cooperation with competition). However, it should be noted that the nature and structure of global higher education, despite all the dominant convergence trends, still remains quite differentiated due to different levels of funding, staffing, facilities, admission conditions and numerous preferences provided by governments, public and religious organizations, international, national, regional charitable foundations, individual patrons.

Models that we choose. Possible awareness of the prospects for the development of higher education always pushes governments to form a model that would: first, be sufficiently dynamic and capable of rapid conjunctural change; secondly, it would provide a sufficient degree of competence of the graduate, his demand in the labor market and the realization of his desire for further self-improvement; thirdly, the achievement (maintenance) of a certain competitive status should

be available, which is an important sign of the sustainability of higher education and opportunities for the development of a particular university. In view of this, modern research usually uses quite capacious, and at the same time quite illustrative (both in the recent past and now) indicators: the number of students per 1000 / 100,000 inhabitants, the number and proportion of foreign students, gender differences, total costs of higher education, etc. However, it is worth remembering that current trends in global education require a deeper rethinking, and thus the use of the latest statistical base, which is very successful, in our opinion, for the European Union, in particular, its analytical structure – Eurostat.

Among the important analytical achievements of this EU institution there is a systematic study of higher education of the integration group, which includes the following data:

- 1.3 million students were educated in 27 EU countries (2018);
- 23% (312 thousand people) from the EU – 27 studied at universities in Germany, 17% – in France, 8% – in Italy and the Netherlands (combined, they make up more than half of the total contingent);
- 44% of those who studied at EU-27 universities came from Europe, 25% – from Asia;
- 15% from Africa (Learning Mobility Statistics);
- in 2017, public expenditure on education among the participating countries (EU-27) was the highest in Denmark (7.3% of GDP) and Sweden (7.1%), and the lowest in Romania (2.7%);
- the share of public expenditure on education aimed at providing financial assistance to households and students ranged from 0.2% in Greece (2017) to 21.6% in Bulgaria (2016) (Education Expenditure Statistics).

Of course, this list could be extended, but it should be borne in mind that modern Eurostat uses not only these indicators, but also more complex ones, in particular: identification of the country – origin of students, their field of study and level of education (Bachelor, Master, Ph.D. student), direction of education, mobility loans, participation in EU programs, distribution of education expenditures, public expenditures, financial assistance to households, expert assessment of the quality of higher education.

Unfortunately, official statistics on the development of higher education in post-Soviet countries can not always be considered as comprehensive, because the quantitative data are sometimes not harmonized with qualitative

transformations, changes in the behavior of applicants, students, their parents and teaching staff, and, more recently, by the above-mentioned stakeholders. Therefore, it is important to substantiate one or another model of higher education development, which we present (by analogy with the economic strategies of the world) as follows:

– *export-oriented* – represented by a group of post-industrial countries (USA, UK, Switzerland, Australia, Singapore, Germany and other EU countries). The structure of higher education in these countries is dominated by foreign students. The GDP created in this area usually exceeds 1%. The universities of this group have an exemplary material base, highly qualified staff (some of them employ Nobel laureates and similar prizes), as well as a high degree of mobility of teachers and students;

– *import-oriented* – represented by a group of developing countries. Their educational system is unable to meet the growing demand for this type of service, and therefore the problem of imbalance is solved by sending citizens to study in other countries, inviting foreign professors to work, administrative restrictions on demand. The degree of mobility of teachers and students is low due to financial constraints. The existing barriers are usually language, religious, visa and other barriers.

– *hybrid* – is a kind of mix of the first and second models. It is represented by the states of the former USSR (except the Baltic states), as well as several newly industrialized states. Characteristic features of this model are its instability, multilevel fluctuations in the number of students, including foreign, the presence of both exports and imports of educational products, variability in mobility of students and teachers, which in its dynamics can have many quantitative and qualitative fluctuations in policy governments, etc.

Convergence of educational systems of Ukraine and Uzbekistan. The collapse of the Soviet Union more than thirty years ago and the collapse of its ideological system had a significant impact on the

nature, structure, and, in some cases, the ideology of higher education that existed at the time. However, this process can not be called painless, because, on the one hand, the new model lost political motivation, expanded opportunities for international cooperation, gained access to international grants, increased academic mobility of teachers, students and university staff, allowed to optimize the structure of training based not on all-Union, but now on national needs. On the other hand, state funding for education and its affordability for the general population has undergone significant negative changes. There were also insufficient funds to upgrade the material base. The dynamic expansion of the network of higher education and private educational institutions has led to the so-called "staff shortage". Not the best role was played by the governing bodies, which faced the dilemma of maintaining the existing network and scientific schools, or choosing new priorities that also required increased funding. Already in the 1990s, which proved to be the most tragic for higher education institutions, it became clear that in the face of a catastrophic decline in production, this area could not be exemplary.

Later, in the new century, the recovery and corresponding increase in macroeconomic indicators proved to be important for the IMF and favorable for education systems, in particular for Ukraine and Uzbekistan. However, in view of the conditions for determining official statistical indicators, the following should be taken into account: in these countries there is an underestimation of national currencies, including the Ukrainian hryvnia and the Uzbek sum; GDP can be calculated on the basis of purchasing power parity, purchasing standard, exchange rate, or satin methodology of the World Bank, and therefore countries will have different, and, in some cases, incomparable ratings. Sub-indices, including educational ones, may be extremely important. Such warnings are fully traced in the analysis of the Human Development Index (HDI) in Table. 1.

Table 1

Human Development Index (HDI) of Uzbekistan and Ukraine, 2020¹

| Rank | Country | HDI | Subindexes | | | |
|------|------------|-------|-----------------------|-----------------|--------------------------|--|
| | | | Life expectancy index | Education index | Education duration index | Gross National Income Index (PPP), USD |
| 74 | Ukraine | 0,779 | 72,1 | 15,1 | 11,4 | 13216 |
| 106 | Uzbekistan | 0,720 | 71,7 | 12,1 | 11,8 | 7142 |

¹ Source: United Nations Report. HDI, 2020, URL: www.hdr.undr.org/en/content/latest-human-development-index-vanking
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The analysis of the components of this indicator (officially approved by the UN) which characterizes global development trends, is extremely useful for comparative research, but not indisputable, as it embodies quite controversial issues of the importance of each of the sub-indices. According to the Table, the rather low HDI rankings for Ukraine (74th place) and Uzbekistan (106th place) are due to the fact that both countries have a low gross national income and, at the same time, a fairly high level of educational components, which naturally disorients

researchers of global comparative studies of educational systems. However, it should be noted that such a "borderline" ranking of both countries can be quite problematic in comparison, as some factors, invisible to the general public analysts, can illustrate only conditional progress/regression in the process of moving these countries within the general tabloid. However, the nature of the hybrid model of higher education is quite illustratively conveyed in Fig. 2.

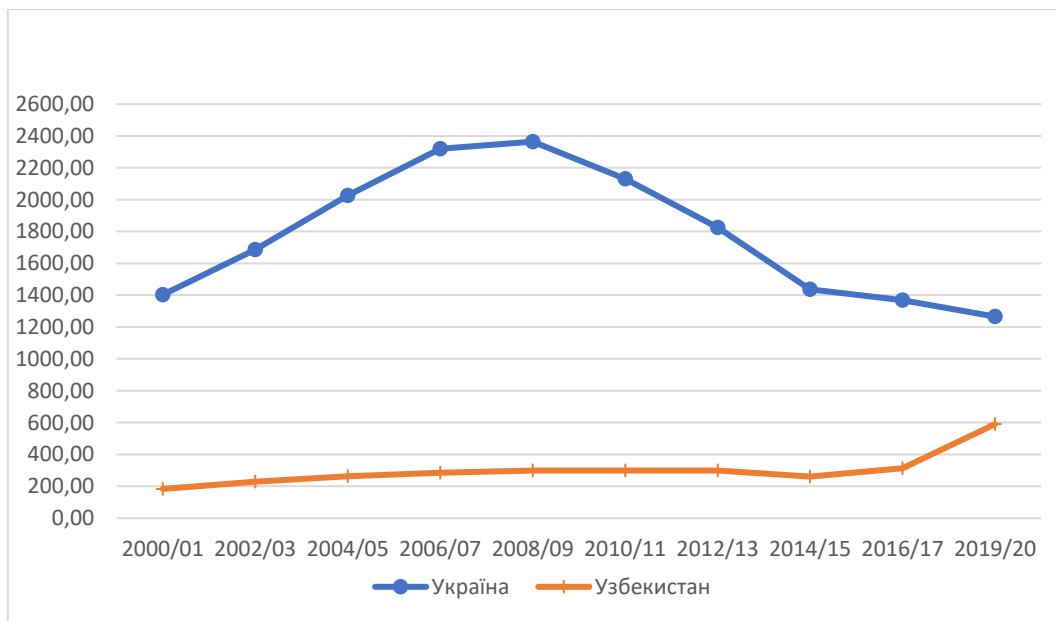


Fig. 2. Dynamics of the number of students majoring in higher education in Ukraine and Uzbekistan²

As can be seen from the figure, the increase in the number of university students took place during 2000-2008 in both countries. However, the larger scales and rates of growth of educational services were quite high in this period of time in Ukraine. For Uzbekistan, the growth in the number of students was slower and only at the turn of 2015-2020 the rates have increased significantly, but this process of increasing the qualitative changes in this country seemed more even than in Ukraine.

in higher educational institutions of Ukraine began in 2010 and, unfortunately, continues to this day. This is partly due to the fact that since 2014, the Autonomous Republic of Crimea, part of Donetsk and Luhansk regions have dropped out of static accounting. Military actions in eastern Ukraine and the relocation (although it was a forced action) of some universities to the center and west of the country (for example, the Vasyly Stus Donetsk National University was relocated to Vinnytsia) also

A significant reduction in the number of students

² Calculated by the authors according to the information:

1. State Statistics Service of Ukraine: institutions of higher education. URL: http://www.ukrstat.gov.ua/operativ/operativ2005/osv_rik/osv_u/vuz_u.html
2. International Bank for Reconstruction and Development Research / World Bank: Higher Education in Central Asia. Modernization tasks. URL: <https://documents1.worldbank.org/curated/en/427891468213004741/pdf/689260ESW0RUS0nization00200700russ.pdf>
3. National Survey on Housing and Land Use: Uzbekistan. New York-Geneva: United Nations, 2011. URL: https://unece.org/DAM/hlm/documents/Publications/CP_Uzbekistan_withCorr.EN.pdf
5. Statistical data of the Ministry of Higher and Secondary Education of the Republic of Uzbekistan: URL6 <https://www.edu.uz/ru/pages/sss>

Note. * Data for 2009-2014 for Uzbekistan were obtained by extrapolating previous indicators.

** Data on Ukraine, starting from 2014/2015 are given without taking into account data on the ARC and parts of Donetsk and Luhansk regions.

did not contribute to increasing the number of students.

Therefore, it is not difficult to predict that in the near future these two curves are likely to intersect. At the same time, Ukraine could seriously increase the percentage of Uzbek students studying at our country's universities. It would also be worthwhile to significantly increase the percentage of those who study remotely or part-time. For Ukraine, this could be (provided that its universities decide to open their branches) an invaluable experience of entering the educational market of Central Asia, awareness of national educational standards, exchange of experience, and for teachers – an additional opportunity to implement their ambitious methodological and scientific plans, as well as organizational programs, startups, etc., part of Donetsk and Luhansk regions.

It is worth noting that deeper comparisons of higher education systems in Ukraine and Uzbekistan require the transition to new statistical models, which include a largely integrated assessment of dynamics. In our opinion, the European Union has gone much further, proposing not only the identification of mobility tools, but also the tracking of the nature of changes. The QS-Higher Education rating also needs to be approved. Comparisons conducted by Uzbek researchers found that:

– according to the number of higher educational institutions per 1 million people for the 2017/2018 academic years, the numerical values of the

proportions in Ukraine were 6.8 people, and in Uzbekistan – 2.4;

– • in terms of the number of students per 10,000 people for the same period, Ukraine had 315.7 people, and Uzbekistan – 91.2;

– according to the QS-Higher Education index, Ukraine ranked only 44th out of 50 (Hurshi, 2018).

Conclusions. The analysis of educational systems proves that in the context of globalization of the world economy the use of traditional methods of identification has lost its relevance, both in economic and pedagogical terms, which significantly reduces the validity of any research. At the same time, substantiation of models of educational systems development, application of traditional and new methods of studying dynamics, changes in structure and opportunities of export / import of modern educational products allows using the idea of complementarity not only within the integration group, but also for multilevel cooperation between universities, including those that are at a considerable distance from each other. A clear example of this is the further diversification of scientific and educational cooperation between Ukraine and Uzbekistan in the process of establishing Uzbek branches of leading Ukrainian universities in this Central Asian country with its dynamic economy, as well as bilateral and multilateral activities within student and teacher academic mobility.

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ГЛОБАЛЬНИЙ БЕКГРАУНД ОСВІТНЬОЇ КОМПА-РАТИВІСТИКИ (НА ПРИКЛАДІ СИСТЕМ ВИЩОЇ ОСВІТИ УКРАЇНИ І УЗБЕКИСТАНУ)

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Реферат.

Актуальність: зумовлена швидкими темпами розвитку систем вищої освіти в світі та формуванням зіставних і доповнюючих міжкраїнових моделей. Проведення компаративних досліджень дає змогу здійснювати ефективне прогнозування і планування освітньої активності в державах, що знаходяться на значній відстані одна від одної.

Мета: комплексний аналіз глобальної компаративістики освітніх систем з урахуванням їх високої динаміки, глибинної трансформації та селективної ідентифікації якісних і кількісних країнових змін.

Методи: теоретичні, системного компаративного аналізу, статистичні, графічні, прогнозування, моделювання, експертного оцінювання.

Результати: проаналізовані особливості розвитку систем вищої освіти в глобальній економіці та визначені характерні риси її сингулярності; Спираючись на сучасні дослідження сфокусовано увагу на суперечностях, що виникають в сучасному світі між прихильниками біхевіоризму і традиційного «Економіксу»; спрогнозовані ситуації розвитку ринку освітніх послуг виходячи з домінуючої на цей час неоліберальної політики урядів країн-лідерів та окремих продуцентів специфічних продуктів у межах розроблених сценаріїв динамізації кривої виробничих можливостей; обґрунтовані існуючі і перспективні моделі розвитку вищої освіти, а також напрями ідентифікації новітніх трендів вдосконалення; на прикладі розвитку вищої освіти Узбекистану і України запропоновані конкретні шляхи їх конвергенції, синергії використання селективних механізмів і інструментів розвитку та широкомасштабного співробітництва.

Висновки: емпірично доведено, що в умовах посилення глобалізації надзвичайно важливою для дослідження країнових освітніх систем є імплементації принципу компліментарності, що дає змогу проводити компаративну сегментацію освітнього ринку декількох держав одночасно та обґрунтовувати його трендовість; доведено, що таку міжнародну академічну зіставність та доповнюваність мають освітні системи України та Узбекистану.

Ключові слова: модель вищої освіти, крива виробничих можливостей, освітня компаративістика, Україна, Узбекистан.

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DEVELOPMENT OF ENTREPRENEURIAL COMPETENCE IN EDUCATIONAL AND PROFESSIONAL PROGRAMS FOR TRAINING OF PERFORMING ARTISTS

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Abstract.

The relevance of the article is predetermined by the development of youth entrepreneurship in the field of cultural and creative industries and necessity to study the state of preparation of young students for entrepreneurship in institutions of professional pre-higher education in artistic direction.

Aim: to analyze active educational and professional programs (hereinafter – EPP) of professional pre-higher education institutions of the specialty 023 «Fine Arts, Decorative Arts, Restoration» to figure out how much they provide the development of entrepreneurial competence of Professional Junior Bachelors in the qualification «performing artist».

Methods: study of scientific sources and pedagogical documentation – for the analysis of scientific works and educational and professional programs.

Results: the paper indicates the degree of scientific development of the problem; it has been analyzed valid educational and professional programs (hereinafter – EPP) for training of future performing artists, which are published on the websites of professional pre-higher education institutions; it also describes their possibilities for the development of entrepreneurial competence in applicants for education.

Conclusions: It was proved the prospects of research issue of developing entrepreneurial competence in future performing artists; it indicates that the training of specialists for entrepreneurial activity have to be systematic (to develop legal, economic, psychological, pedagogical and digital skills, contain a comprehensive program of the development of entrepreneurial competence, which combines classroom and extracurricular, theoretical and practical activities, independent and group work); beside, it reveals a problem of access for students to information on program expected learning outcomes (only 70% of all existing EPP for training of future professional young bachelors in the qualification «performing artist» are published on the official websites of educational institutions); it was clarified that the development of program results which important for starting and running business, contribute such educational components as «Fundamentals of Entrepreneurship and Management», «Fundamentals of Economic Theory», «Theory of Economics», «Management of Socio-Cultural Activities», «Fundamentals of Socio-Cultural Management Activities», but mostly they are selective and therefore only partially ensure the development of entrepreneurial competence in future performing artists; this determines justification of certain organizational and pedagogical conditions that must be created in educational institutions for the development of entrepreneurial competence in future performing artists.

Keywords: *entrepreneurship, educational and professional program, entrepreneurial competence, Professional Junior Bachelor, performing artist.*

Introduction. Domestic professional education in artistic direction called to prepare competitive professionals who are able to independently control the development of their personality, life and career, have ability to work in the conditions of intensive

development of small business, which requires cultivated entrepreneurial competence. One of the goals of preparation for entrepreneurial activity of future Professional Junior Bachelors in the qualification «performing artists» is to increase

the level of competence of artists in financial activities, which is one of indicators is their willingness for such a risky business as entrepreneurship (Shymanovskiy and Vovkovinskyi, 2015, p. 8–9). Professionals must be able to independently manage their lives and careers, to open and successfully run their own business. Certain conditions requires for creating and developing own business, which includes personal interests, reliability of personal protection mechanisms, the ability to reduce uncertainty and risk, the ability to generate resources and manage innovations (Kolot et al., 2017, p. 6). The educational process should be organized accordingly to the development of entrepreneurial competence of the specialist, which achieved by his motivation (Yershova, 2017), development of key competencies (Odnoroh, 2019), disclosure of personal potential and ensuring its transformation so that it becomes an independent entity with ability to achieve the set goal (Seredina, 2018, p. 97). The development of future specialists in digital skills and digital culture is also of paramount importance for success in business (Bazeliuk, 2018; Yershov, 2019).

The process of training performing artists for entrepreneurship involves acquiring the skills to the capacity to act upon opportunities and ideas, and to transform them into values for others. Entrepreneurship requires creativity, critical thinking, taking initiative and perseverance, and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or commercial value. (ANNEX to the Proposal for a Council Recommendation on Key Competences for Lifelong Learning. Office of the General secretary of the European ecology, 2018, p. 37). Whereas the professional activity of performing artists involves a certain specificity of self-expression, there is a need to develop these professionals' entrepreneurial competence to support their creativity and achieve commercial goals.

In order to indicate the level of training for entrepreneurship in professional pre-higher education institutions, it is necessary to analyze the components provided by educational and professional programs (hereinafter – EPP), designed to provide future performing artists with the necessary theoretical knowledge, abilities and entrepreneurial skills. According to EDEBO, there are ten institutions of professional pre-higher education in Ukraine, which train performing artists of the specialty 023 «Fine Arts, Decorative Arts, Restoration» (specializing in graphics and painting).

There are only seven of them published the EPP on their websites. It means that future applicants for education who would like to carry out business activities in the chosen specialty, do not have the opportunity to personally get acquainted with the content of the educational program and understand whether they can develop competencies sufficient to start and run their own business. This indicates the inconsistency of certain EPP with the modern requirements of the National Agency for Higher Education Quality Assurance (hereinafter NAQA), in particular regarding access to the educational program.

Sources. The issues of theory and methods of training future professionals for entrepreneurship have been considered in the works of L. Bazyl, V. Baidulin, L. Bondariev, M. Vachevskiy, I. Hrytsenok, L. Yershova, D. Zakatnov, V. Maikovska, G. Matukova, I. Seredina, V. Slipenko and others. Also a number of textbooks and manuals have been published, which set out the legal, economic and psychological issues of youth readiness for entrepreneurship (Z. Varnalii (2003), O. Yemets (2012), Yu. Pachkovskiy (2006), V. Polianko and V. Kruhlianko (2008), V. Syzonenko (2008). The issues of formation and development of entrepreneurial competence in institutions of professional (vocational) and higher education were considered in dissertations of M. Tkachenko, A. Moldovan, V. Slipenko, M. Strelnikov, S. Stebliuk. However, the analysis of these works shows the underdevelopment of the scientific problem of the development of entrepreneurial competence in future performing artists and the prospects for justification of the conditions which have to be created in institutions of professional pre-higher education.

The article aims to analyze valid EPP of professional pre-higher education institutions of the specialty 023 «Fine Arts, Decorative Arts, Restoration» to figure out how much they provide the development of entrepreneurial competence of Professional Junior Bachelors in the qualification «performing artist».

Methods: analytical analysis of scientific sources – to determine the level of research problem; analysis and synthesis, generalization, comparison – to analyze educational programs.

Results and discussion. The analyzed sources testify to the relevance and prospects of scientific problem of the developing entrepreneurial competence in future performing artists. At the same time, they show that in the institutions of professional pre-higher education lack of providing

the conditions necessary for this. It was indicated that the preparation of a specialist for entrepreneurial activity should be systematic, including the developing of knowledge and skills in the correct order in the chosen specialty, to develop the qualities and relevant abilities of the personality. It was also proved that there is necessity to create a program for the development of entrepreneurial competence, aimed at gaining practical experience of entrepreneurial activity (Bida et al., 2021, p. 32). Accordingly to this, it is obvious the need to supplement classes in such components as «Fundamentals of Economics and Entrepreneurship», «Management and Marketing» intensification of extracurricular activities of students in order to harmonize the theoretical and practical components of the educational process in accordance with learning objectives and education of potential business entities (Moldovan, 2021, p. 16).

In this regard, we set a goal to analyze valid EPP in professional pre-higher education institutions, to verify how they provide conditions for the development of future professionals in entrepreneurial competence. The main object were the EPP, which are the basis of the training of specialists at the educational and qualification level «professional junior bachelor of fine arts, decorative arts, restoration of art works», as well as professional qualifications which assigned, and based on specializations.

To carry out the analysis, we selected seven EPP for the training of Professional Junior Bachelors in the qualification «performing artist», which are freely available on the websites of institutions of professional pre-higher education of the specialty 023 «Fine Arts, Decorative Arts, Restoration» (Table 1).

Table 1

List of components created to develop entrepreneurial competence in future performing artists

| Educational institutions | Fundamentals of Entrepreneurship and Management | Fundamentals of Economic Theory | Theory of Economics | Management of Socio-Cultural Activities | Fundamentals of Socio-Cultural Management Activities |
|--|---|---------------------------------|---------------------|---|--|
| 1. Transcarpathian Academy of Arts and Facial College of Arts named after A.Erdeli | | + | | | |
| 2. Zhytomyr Applied College of Culture and Arts named after Ivan Ohienko | + | | + | | |
| 3. Kyiv Industrial Professional College of Kyiv National University of Construction And Architecture | + | | + | | |
| 4. Alexandria Vocational College culture and arts | | | + | + | |
| 5. Kamianets-Podilskyi Professional College of Culture and Arts | | | + | | + |
| 6. Dnipropetrovsk Professional College of Arts and Culture | + | | + | | |
| 7. Vyzhnyts'kyy Koledzh Prykladnoho Mystetstva Im. V.yu. Shkriblyaka | + | + | | | |

It was indicated that each institution can specify a specialization (for example, graphics and painting), which is defined as a «feature of the EPP».

The analysis showed that not all institutions provide preparation of young people for entrepreneurship. Only four of the seven EPP provide the discipline «Fundamentals of Entrepreneurship and Management», (as a selective component), which provides the ability to reveal initiative and entrepreneurship (ability to put forward new ideas, proposals, ability to start a business, initiative). The program result of this educational component is the abilities, knowledge of the fundamentals of entrepreneurship and management, to organize exhibition activities (Educational program «Fine Arts» in the specialty 023 «Fine Arts, decorative Arts, restoration» of the Dnipropetrovsk Professional College of Arts and Culture, 2020). It is assumed that the student must know modern management concepts, theory and practice of management technology, the essence and indicators of socio-economic efficiency, main sources of funding, activities and services of socio-cultural sphere, marketing management and ability to analyze production situations and make optimal management decision, analyze the market and segment it, rationally use available, material, labor and financial resources (Educational program Fine Arts (Painting) of the Zhytomyr Applied College of Culture and Arts named after Ivan Ohienko, 2019).

In other educational institutions, where the discipline «Fundamentals of Entrepreneurship and Management» is not provided, the theoretical fundamentals of entrepreneurial activity can be mastered by studying such educational components as «Fundamentals of Economic Theory» or «Theory of Economics» and «Management of Socio-Cultural Activities» or «Fundamentals of Socio-Cultural Management Activities». These disciplines provide only general theoretical knowledge of entrepreneurship. Disciplines «Fundamentals of Economic Theory» or «Theory of Economics» are usually compulsory components, but also can be selective (Educational program «Fine Arts» (Graphics) of the Kyiv Industrial Professional College of Kyiv National University of Construction And Architecture, 2018). In the absence of the discipline «Fundamentals of Entrepreneurship and Management», they provide only general economic knowledge, and in the presence logically complement it, providing some knowledge (of «economic theory», production process, exchange and consumption, diversity of economic systems, features of modern Ukrainian economic system.

various forms of ownership, types of social production, types and functions of money, mechanism of budget management) and developing appropriate skills (to navigate the global problems of economic development and relations, to delve into into the international division of labor, to determine their places in economic processes, use the services of market institutions, understand the tax legislation of Ukraine) (Educational program Fine Arts (Painting) of the Zhytomyr Applied College of Culture and Arts named after Ivan Ohienko, 2019).

Disciplines «Management of Socio-Cultural Activities» or «Fundamentals of Socio-Cultural Management Activities» are exceptionally selective components, meaningfully related to the compulsory educational components («Fundamentals of Economic Theory» or «Theory of Economics») and also serve as addition to knowledge needed to understand business activities. These disciplines are present through all EPP, which do not have the discipline «Fundamentals of Entrepreneurship and Management». (Educational program «Fine Arts, Restoration» of the Kamianets-Podilskyi Professional College of Culture and Arts).

Conclusions. The analyzed sources indicate the relevance and prospects of the study of the development of entrepreneurial competence in future performing artists. The paper indicates that the training of specialists for entrepreneurial activity should be systematic, cover a set of legal, economic and psychological and pedagogical knowledge, contain a comprehensive program of entrepreneurial competence, which combines classroom and extracurricular, theoretical and practical activities, independent, and group work. Researchers of this problem emphasize necessity to supplement classroom classes in such disciplines as «Fundamentals of Economics and Entrepreneurship», «Management and Marketing» intensification of extracurricular activities of students in order to harmonize the theoretical and practical components of the educational process in accordance with learning objectives and education of potential business entities.

At the same time, the analysis of EPP showed that in the institutions of professional pre-higher education lack of providing the conditions necessary for this. Only 70% of all educational and professional programs for training of future professional young bachelors in the qualification «performing artist» are published on the official websites of educational institutions, which reveals a problem of access for students to information about

learning outcomes. Most of the analyzed EPP only partially ensure the development of entrepreneurial competence in future performing artists. The best conditions for the development of entrepreneurial competence are provided by educational programs which provide the opportunity to study selective discipline «Fundamentals of Entrepreneurship and Management» and compulsory («Fundamentals of Economic Theory» or «Theory of Economics»), which serve as a theoretical basis for study fundamentals of entrepreneurship. The combination of selective and compulsory components creates much better opportunities for students to develop entrepreneurial competence. Less conducive for the preparation of students for entrepreneurship are EPP, where instead of the educational component «Fundamentals of Entrepreneurship and Management» are selected selective disciplines «Management of Socio-Cultural Activities» or

«Fundamentals of Socio-Cultural Management Activities». It is quite difficult to ensure the development of entrepreneurial competence of future professionals, if their EPP contains «Fundamentals of Economic Theory» as a selective discipline and there are no other disciplines provided the development of students' ideas about entrepreneurship in cultural and creative industries. Practically in all analyzed EPP there are not enough types and forms of activity for developing practical skills in future performing artists, which are necessary for self-expression in free labor activity, in process of opening and conducting own business.

It determines the need for further research of organizational and pedagogical conditions for the development of entrepreneurial competence of Professional Junior Bachelors in the qualification «performing artist».

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РОЗВИТОК ПІДПРИЄМНИЦЬКОЇ КОМПЕТЕНТНОСТІ В ОСВІТНЬО-ПРОФЕСІЙНИХ ПРОГРАМАХ ПІДГОТОВКИ ХУДОЖНИКІВ-ВИКОНАВЦІВ

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Реферат.

Актуальність статті зумовлена розвитком молодіжного підприємництва у сфері культурних і креативних індустрій та необхідністю вивчення стану підготовки молоді до підприємницької діяльності у закладах фахової передвищої освіти мистецького напрямку.

Мета: проаналізувати діючі освітньо-професійні програми (далі: ОПП) закладів фахової передвищої освіти з підготовки фахівців за спеціальністю 023 «Образотворче мистецтво, декоративне мистецтво, реставрація», щоб з'ясувати наскільки вони забезпечують розвиток підприємницької компетентності фахових молодших бакалаврів за кваліфікацією «художник-виконавець».

Методи: вивчення наукових джерел і педагогічної документації – для аналізу наукових праць та освітньо-професійних програм.

Результати: з'ясовано ступінь наукової розробленості проблеми; проаналізовано чинні освітньо-професійні програми (далі: ОПП) підготовки майбутніх художників-виконавців, оприлюднені на сайтах закладів фахової передвищої освіти; охарактеризовано їх можливості щодо розвитку у здобувачів освіти підприємницької компетентності.

Висновки: доведено перспективність дослідження проблеми розвитку підприємницької компетентності майбутніх художників-виконавців; з'ясовано, що підготовка фахівців до підприємницької діяльності повинна бути системною (розвивати правові, економічні, психолого-педагогічні й цифрові навички, мати цілісну програму розвитку підприємницької компетентності, поєднувати аудиторні й позааудиторні, теоретичні і практичні види діяльності, самостійну і групову роботу); виявлено проблему доступу здобувачів освіти до інформації щодо очікуваних програмних результатів навчання (на офіційних сайтах закладів освіти оприлюднено лише 70% від усіх діючих ОПП з підготовки майбутніх фахових молодших бакалаврів за кваліфікацією «художник-виконавець»); з'ясовано, що формуванню програмних результатів, важливих для відкриття і ведення власної справи, сприяють такі освітні компоненти як «Основи підприємництва і менеджменту», «Основи економічної теорії», «Економічна теорія», «Менеджмент соціокультурної діяльності», «Основи менеджменту соціокультурної діяльності», проте здебільшого вони мають статус вибіркового і тому лише частково забезпечують розвиток у майбутніх художників-виконавців підприємницької компетентності; це зумовлює потребу обґрунтування певних організаційно-педагогічних умов, що мають бути створені в закладах освіти для розвитку в майбутніх художників-виконавців підприємницької компетентності.

Ключові слова: підприємництво, освітньо-професійна програма, підприємницька компетентність, фаховий молодший бакалавр, художник-виконавець.

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USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN THE TECHNOLOGICAL EDUCATIONAL INDUSTRY

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Abstract.

The relevance of the article is due to the need to study the modernization of methods of teaching disciplines "Labor Training" and "Technology", given the changes in society caused by active informatization and the use of information and communication technologies; the need to introduce innovative approaches to conducting practical classes, in particular on the implementation of STEM projects, combining work on the study of traditional crafts with the use of computer technology.

Purpose: research and systematization of the possibilities of using ICT, laid down by the State standard of basic secondary education and description of practical experience of using ICT in the educational process in teaching disciplines of technological education.

Methods: analysis, comparison, generalization of processed sources (legal documents, scientific articles, textbooks, official Internet resources); empirical methods (pedagogical observation, interviews): a study of the experience of practical examples of the use of ICT in the educational process of secondary schools.

Results: the experience of innovative teachers in the use of methodological complexes in the educational process of the secondary school (Kompas-3D, Corel Draw, Paint-3D, Solidworks, Inventor, Keyshot, computer embroidery programs Embird, Wilcom ES and Pattern Maker) to ensure technological education in accordance with the requirements of the "New Ukrainian School".

Conclusions: it was found that the analyzed methods of teaching disciplines with the use of ICT contribute to the realization of the goals and objectives of modern technological education; identified ways to modernize the educational process, taking into account the experience of teachers-innovators; the feasibility of wide introduction of information and communication technologies in the process of teaching the subjects "Labor training" and "Technology" (for illustration, information retrieval, as software tools) is determined.

Keywords: *technological education, modernization of the educational process, information and computer learning technologies, innovative teaching methods, key skills in technology education, software tools, digitalization of society.*

Introduction. Modernization of education involves the creation of an educational environment based on information and computer technology (ICT). This is the most important condition and tool for improving the education sector to ensure

continuous improvement of its quality. This is a condition designed to help create conditions for the realization of equal opportunities for all citizens on the path to mastering education at all levels and levels. In accordance with the requirements of the

time, basic legislative documents were concluded, which approved the important place of computer technology in the educational process "Law of Ukraine" On Education "(2017), the Concept of state policy in general secondary education reform 2029 (2016) (NUS), the Law of Ukraine on Complete General Secondary Education (2020), the State Standard of Basic Secondary Education (2020).

The NUS program states that graduates of the new school should be well-developed individuals, educated, responsible and patriotic citizens, capable of innovation. The main goal of the NUS project is the reconstruction of the school in order to create comfortable learning conditions in combination with the possibility of obtaining quality knowledge. The most important skill for students is the ability to apply the acquired knowledge in everyday life (Official Website of the Ministry of Education and Science of Ukraine, 2021).

The use of computer technology in the educational process is now a natural phenomenon. The effectiveness of their use depends on a well-formed idea of the place of ICT in the most complex set of relationships between the system "teacher-student". The use of ICT changes the purpose and content of learning. Today, new methods and forms of organizing the educational process are emerging. As a result, we get a qualitatively new model of personality formation, for which the ability to communicate, active mastery of new flexible functions in the work process, creative thinking become a vital necessity.

The organization of student training involves the use of computer technology as: a learning tool that optimizes the process of cognition; subject of study through acquaintance with new methods of processing and giving of the information; tool for solving educational tasks, which provides the formation of relevant knowledge and skills (Grinchenko, 2004, p.191; Gurevich, 2005, p.4; Gurevich, 2014, p.12).

Sources. Pursuant to the Law of Ukraine "On Education", the State Standard of Basic General Secondary Education (2020) sets out the requirements for mandatory learning outcomes of students in the technological field of education. The state standard is based on the competence approach. Information and communication is recognized as one of the eleven key competencies, and skills based on the use of ICT are included in the general compulsory learning outcomes.

The requirements of the modern world for the introduction of ICT in the educational process are described by V. Kremen (2020, pp. 5-10). The

scientific research of I. Dychkivska (2015) is devoted to the theoretical study of innovative processes in education as specific, complex activities that require special knowledge and skills. Features of digitalization of general secondary education and the formation of digital competence of students are set out in the work of M. Yershov (Yershov, 2020, p. 25). Directions for the development of digital competence of teachers were considered by O. Bazelyuk (2018). In the work of scientists of the Department of Pedagogy and Educational Management of Uman State Pedagogical University O. Kobernik, N. Stetsenko, V. Boychenko and others. (2018, pp. 53-57) highlights aspects of didactic support of the educational process of technological education, informatization of education, methodological problems of computer use in the educational process. The introduction of ICT in the field of education has been deeply studied by the founder of the scientific school "Systems of teaching and education in a computer-oriented environment" V. Bykov (Ponomarenko, 2021). New technologies and requirements for knowledge seekers, which are formed as a result of the formation of digital learning environment, are highlighted in the joint work of V. Bykov and O. Burov (2020, pp. 11-21). R. Gurevich's works are devoted to the use of new information technologies in work, study, communication, 2005, pp. 3-10; 2014, pp. 11-15; 2019, pp. 9-13; 2020, pp. 124-126; 2021, pp. 1-13).

The technology education industry has been found to be inherently integrated. This is the only branch of the new Ukrainian school that implements subject-transforming activities (from the idea to its implementation in the finished product). Technological education integrates knowledge from almost all educational fields, including computer science. The transition to computer technology creates the conditions for their testing, implementation, finding a reasonable combination of new and traditional, requires the solution of many psychological, pedagogical, educational and other problems. Professional training of student youth should take into account the achievements and prospects for the development of technology and engineering. An important role in solving the problem of quality technological education is given to the teacher of technological education, from which the appropriate professional knowledge and skills will depend on the degree of readiness of students to work in the field of material production.

The aim of the article is to study and systematize the possibilities of using ICT, laid down by the State

Standard of Basic Secondary Education and describe the practical experience of using ICT in the educational process in teaching disciplines of technological education.

Research methods. The paper uses: general scientific methods (analysis, comparison and generalization of official (Law of Ukraine "On Education", State Standard of Basic Secondary Education), industrial and practical (labor training program (2017), Model curricula "Technology. 5-6 classes »For general secondary education (2021) and scientific sources (including publications of teachers-innovators), Internet resources, personal experience in technological education; and empirical (pedagogical observation, study of ICT experience in the educational process of secondary schools).

Results and discussion. The introduction of ICT in all areas of educational activities has led to the reconstruction of traditional technological education. The purpose of technological education of the new Ukrainian school is the realization of creative talents of students, the formation of critical and technical thinking in them, preparation for the creation of the world without harming the environment by means of modern technologies. Today forms a demand for a specialist capable of productive professional activity, taking into account the changes in the digital society with its high-speed evolution. This request is reflected in the educational concept of "ICT competence" (NUS), proclaiming the important idea of educating such a specialist

who, above all, must be a highly moral person who not only has the necessary knowledge but also able to apply them in practice; a person capable of adequate action in real situations and ready to take responsibility for their actions.

The social and cultural changes witnessed by the world community create the conditions for the demand for training specialists with high potential. adaptation to constantly changing working and production conditions. Therefore, the new State Standard for Technological Education defines the formation of skills in students related to the implementation of project-technological activities that form the information and communication competence. These include skills: safe and effective work with social networks in the process of finding and discussing ideas; critical use of ICT in the process of searching, processing, transmitting information; ethical work with information that corresponds to intellectual property rights; use of digital devices to present results

In contrast to the current labor training program (2017), the Model Technologies programs developed in accordance with the State Standard also indicate the ability to use digital technologies in modern production, including robotics and implementation of projects using the digital environment.

Generalized areas of use of ICT in the process of project-technological activities (by type of work), provided by the State standard for technological education, are presented in table 1.

Table 1

Generalized directions of ICT use in the process of project-technological activity (by types of works), in accordance with the obligatory results of students' education in technological education in the State standard of basic secondary education.

| Types of work | | Possible direction of ICT use | How to use ICT | Tasks that can be solved by using ICT | Class |
|---|---|---|---|--|-------|
| Designing a personally and socially significant product | Generating and substantiating a creative idea or identifying a problem and choosing a design object for its implementation / solution | the computer is used as a storage medium | examples of search work with analogues on the Internet | the rationality of the use of digital devices at different stages of design and technological activities is determined | 5-6 |
| | | | search work with analogues on the Internet, accumulation of "bank of ideas", creation of a clause | intensification of the educational process, development of cognitive skills | 7-9 |
| | Implementation of marketing research, search for information about the design object | the computer is used as an information carrier and communication tool, for printing texts | organizing and conducting marketing surveys via Internet resources | use of computer technology and telecommunication systems for research activities of students in | 5-9 |

| | | | | | |
|--|---|---|---|--|------------|
| | | | | extracurricular activities, formation of information culture of students | |
| | Implementation of artistic design of the product, applying the basics of design using design methods | the computer is used to perform graphic operations; to visualize the results of artistic design of the product on the screen | the use of graphic editors for the artistic design of the product | improving the efficiency and quality of the educational process | 7-9 |
| | Creating a technology card | | | | 5-6 |
| | Creating an individual plan for the technology of manufacturing the product | the computer is used as a tool | use (if necessary) of digital devices and graphic editors; | improving the efficiency and quality of the educational process | 7-9 |
| Evaluation and presentation of results of design and technological activities | Presentation of design results | use of computer technology and telecommunication systems to visualize the results on the screen | use of digital devices and information environment, if necessary, to present design results | formation of information culture of students; improving the efficiency and quality of the educational process | 5-9 |
| Creative application of traditional and modern technologies of decorative and applied arts | Identification of decorative and applied arts. Recognition of works of different types of decorative and applied arts, acquaintance with their creators | possibility of visualization of materials and tools used in the main types of decorative and applied arts, research of works of famous Ukrainian masters of decorative and applied arts | formation of own judgments on the basis of culturological information on decorative and applied arts, in particular from the Internet | development of skills of experimental research and cognitive activity; formation of information culture of students. | 5-9 |
| | Replacing manual technology with computer software | the computer is used as a tool that uses software to upgrade execution technology | transfer of information from a computer by digital media to a machine that performs the technological process | acquaintance with software, performance of work with the help of the teacher or other persons performing work using software, mastering new functions in the workflow | 5-6 7-9 |

The study of the experience of using ICT in the educational process of secondary schools by Ukrainian teachers-innovators shows that such activities today are applied and depend on the teacher's personality, his innovative aspirations, experience and material and technical base of the

school. The most common examples of the use of ICT - as tools to illustrate educational topics. Today, the MozaBook interactive software package approved by the Ministry of Education and Science of Ukraine and running on the Mozaik platform (Official website. Packages of electronic textbooks

for use in the classroom, 2021) is gaining popularity. This is a quality resource in which unique educational materials are collected.

For example, based on the materials that are freely available in the Mozaik program, the teacher of Kalush Polytechnic Vocational College MM In the framework of the discipline "Computer Design" he develops animated films for the subjects "Labor Learning" and "Technology", places them in free access for online communities of teachers of the technological field of education. When creating demonstration materials, the teacher works with the programs Kompas-3D, Solidworks, while illustrating the topic "Machine Parts" he used the programs Solidworks, Inventor, Keyshot. The complex of animated films "Mechanics in Ukrainian" developed by M. Romaniv is an example of an effective means of motivating students (Official page. Mechanics in Ukrainian, 2021).

Today, a large number of online resources are offered for the preparation of lessons in labor training and technology, distance learning of teachers in order to effectively use computer software (Official site. Effective use of online resources for labor training and technology, 2021). Also popular are the courses "Computer Aided Design", "Technical Drawing Based on Computer Programs", which teaches the capabilities of automatic design (CAD), using the application of software and methodological systems Kompas-3D, Corel Draw and Paint-3D. This is a selective course "Professional tests" for students of 8-11 grades in the curriculum of elective courses (Official site of the Ministry of Education and Science of Ukraine. Curriculum of elective courses, 2021). The task of this course is to enable successful adaptation of students to the conditions of the modern labor market, to form their professional mobility and competitiveness, in other words, to be able to use ICT to create knowledge and innovation in processes (technologies) and products.

The example of work on this course can be observed as the process of digitalization of education and changing learning requirements. As a result, graduates are ready to change within existing professions, and in the future - to master new professions, which do not yet exist today.

The experience of using software in working on projects by the teacher of Liko-School (Kyiv) V. Petrenko was also studied. The initial tests of the teacher were the use of the freely available program "Text embroidery". According to the program, the printed words were transformed into graphic geometric ornaments. There were more

sophisticated programs that reproduced a photographic image in the form of embroidery patterns, but it was only a graphic image that had to be embroidered by hand. The process of embroidery technology remained labor-intensive, but reduced the time for assembling and selecting embroidery patterns. This work was interesting and progressive in early 2010, and today the teacher teaches them how to use Embird, Wilcom ES and Pattern Maker machine embroidery programs when students design a project product. V. Petrenko notes the great interest of students in working with software computer embroidery. The interface of these programs is not difficult to work in grades 5-6. As a result, the product is made according to the technology required for study, and software embroidery is chosen as an additional technology. Interest contributes to the intensification of learning during the lesson and additional extracurricular activities. In this way, the embroidery process is accelerated and students can get the result of their design idea faster.

However, the described method of using ICT is possible with special equipment for computer embroidery. Thus, the constant modernization of material and technical base should become the norm for all schools in the country. The implementation of such works is aimed at the development of design-technological and information-digital competencies and clearly demonstrates what changes can occur in the known professions (Personal page Petrenko Victoria. Shopper with machine embroidery, 2021). The number of students who can master machine embroidery is much greater than those who can qualitatively and in sufficient quantities to finish the product by hand. Students have a choice of how to achieve the result and practical experience of combining traditional types of decoration with ICT skills.

Vinnitsia teachers-practitioners R. Leschuk and O. Loik discovered the possibility of to seek the motivation of students to work training through the active use of ICT, as it allows to improve the quality of practical work and their results. An example of such work is the implementation of practical tasks by students in grades 5-6: drawing a working drawing, building a 3D model, developing a scheme for assembling parts in the manufacturing process (Leschuk, Loik, 2013, p.2-8).

The studied experience allows us to conclude that the use of ICT is not possible without self-education and development of an important participant and organizer of the educational process - teacher, teacher, educator. There are objective conditions

that demonstrate the urgency of this task, but in contrast there are subjective reasons that slow down this process. They can be attributed to two main groups: underdeveloped material and technical base of educational institutions and low motivation of teachers.

The Ministry of Digital Transformation of Ukraine has been established in Ukraine, and programs have been launched to remove these obstacles and promote the process of digitalization of society and education. An example is the state program "Action", which helps to improve the digital skills of teachers. In addition, the Ministry of Education and Science of Ukraine approved the Standard Program for Professional Development of Teachers for the Development of Digital Competence (2021). Today, communities of like-minded teachers are being created, which share common issues from the experience of ICT implementation and the desire to be on a par with the world in the process of implementing digital technologies.

Conclusions. Ukraine is in the process of modernizing its education sector. These innovations are recognized by law and reflected in the State Standard of Basic Secondary Education, which publishes the key competencies of the technological education sector, which include information and communication competence and innovation. Innovative teachers explore areas for improving the content of education, introduce the latest forms of ICT in the educational process. These are important pilot projects that need to be studied quickly for widespread implementation in secondary education. Today, the transfer of a new system of knowledge to students is not possible without building a new

educational model based on ICT and changing the classical scheme of knowledge transfer. The rapid digitalization of society affects the study of subjects of technological education ("Labor training" and "Technology"), which are directly related to material production. The technological education industry is a shining example of working with programs that modernize the product design process. With the help of ICT, students develop skills in finding models-analogues, building a creative idea and the practical use of ICT in the technological process of manufacturing products. The digitalization of education has become an objective condition for modern trends in the information society, but continues to depend on subjective conditions - teacher self-education and the conditions of the educational process. The use of ICT promotes mobility in the selection of materials for lessons, makes classes much more interesting and modern. Illustrative material, multi-schemes and interactive models promote the development of visual thinking of students through the involvement of sight, hearing, imagination and emotions. The practical use of ICT in the implementation of projects promotes the conscious assimilation of knowledge by students, forms a positive attitude to learning, arouses interest in learning subjects, motivates in achieving the results of the educational process. ICT is a tool that allows teachers to use a differentiated approach in practice in working with students. Given the needs of the information society, the use of computer technology in schools helps to properly prepare students for new professions created by the demands of the digital society through the formation of relevant key competencies: lifelong learning.

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ВИКОРИСТАННЯ ІНФОРМАЦІЙНО-КОМУНІКАЦІЙНИХ ТЕХНОЛОГІЙ У ТЕХНОЛО-ГІЧНІЙ ОСВІТНІЙ ГАЛУЗІ

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Реферат.

Актуальність статті зумовлено необхідністю дослідження напрямів осучаснення методики викладання дисциплін «Трудове навчання» та «Технології», зважаючи на зміни в суспільстві, викликані активною інформатизацією та використанням інформаційно-комунікаційних технологій; необхідністю впровадження інноваційних підходів до проведення практичних занять, зокрема з виконання STEM-проектів, поєднання роботи з вивчення традиційних ремесл із використанням комп'ютерних технологій.

Мета: дослідження та систематизація можливостей використання ІКТ, закладених Державним стандартом базової середньої освіти та опис практичного досвіду використання ІКТ в освітньому процесі при викладанні дисциплін технологічної освітньої галузі.

Методи: аналізу, порівняння, узагальнення опрацьованих джерел (нормативно-правових документів, наукових статей, навчальних посібників, офіційних інтернет-ресурсів); емпіричні методи (педагогічного спостереження, бесіди-інтерв'ю): дослідження досвіду практичних прикладів використання ІКТ в освітньому процесі загальноосвітніх шкіл.

Результати: досліджено досвід педагогів-новаторів щодо використання в освітньому процесі загальноосвітньої школи методичних комплексів (Kompas-3D, Corel Draw, Paint-3D, Solidworks, Inventor, Keyshot, комп'ютерних програм для вишивання Embird, Wilcom ES і Pattern Maker) для забезпечення технологічної освіти відповідно до вимог «Нової української школи».

Висновки: з'ясовано, що проаналізовані методики викладання навчальних дисциплін з використанням ІКТ сприяють реалізації мети й завдань сучасної технологічної освітньої галузі; визначено шляхи модернізації освітнього процесу з урахуванням досвіду педагогів-новаторів; визначено доцільність широкого впровадження інформаційно-комунікаційних технологій у процесі викладання предметів «Трудове навчання» та «Технології» (для ілюстрування, пошуку інформації, в якості програмних інструментів).

Ключові слова: технологічна освітня галузь, модернізація освітнього процесу, інформаційно-комп'ютерні технології навчання, інноваційні методи навчання, ключові уміння в технологічній освітній галузі, програмні ін-струменти, цифровізація суспільства.

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THEORETICAL GROUNDS FOR THE DEVELOPMENT OF PROFESSIONAL CULTURE OF PRODUCTION TRAINING MASTERS

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Abstract.

The relevance of the study is determined by the affiliation of the training of teaching staff for vocational education (hereinafter: VE) to the priorities of the Framework of the State targeted social program for the development of vocational education for 2022-2027.

Objective: To provide a theoretical analysis of the problem of the development of professional culture and to clarify the conceptual and categorical apparatus of research.

Methods: study and analysis of philosophical, general scientific, methodological, psychological, and pedagogical literature, the legal framework, and educational and planning documentation - in order to determine the state of the problem; Synthesis of the information - obtained with the aim of defining research directions (clarification of hypothesis, conceptual apparatus); comparison - for comparison of the approaches of researchers to solving the problem of the formation and development of the concept of «professional culture»; synthesis - to support the conceptual-categorical apparatus of research.

Results: scientific literature, instructional-methodological, and legal documents have been studied; theoretical analysis of the development of «professional culture» pedagogical phenomenon problem has been performed; researchers' approaches to solving the formation and development of professional culture of the master of industrial training problem have been analyzed; the conceptual and categorical apparatus of research has been clarified.

Conclusions: in modern pedagogical science, the problem of training a highly educated, professional, and mobile specialist is a continuation not only of the national, but also of the world traditions of philosophical and pedagogical thought; the development of the professional culture of VE workers problem is not sufficiently represented in the country's scientific heritage (research is sparse, fragmented, and does not reflect a systemic view of the problem); «the professional culture of the master of industrial education» concept is defined as the integral quality of the individual, which contains a set of interrelated components (professional pedagogical self-awareness, pedagogical knowledge and professionally relevant key skills, pedagogical and professional experience, pedagogical values and convictions); and contributes to the achievement of success in professional pedagogical activities, domestic and professional communication, self-development and self-improvement of a specialist's personality, his or her continuous strive towards the pedagogical ethos.

Keywords: vocational education, professional culture, master of industrial education, self-education, pedagogical consciousness.

Introduction. Modernization of vocational education requires the establishment of a clear mechanism for improving the quality of training. The professional image of a pedagogical worker in a modern VE institution, his or her values, and

professional culture are of great importance both for improving the quality of vocational education and for accelerating educational reforms in general. This is why the training of new types of vocational and pedagogical personnel for the modern vocational

education system is stated as a priority in the Framework of the State targeted social program for the development of vocational education for 2022-2027 (Government portal: unified web portal of executive bodies of Ukraine, 2021).

Sources. In pedagogy and psychology, there has long been no systematic research on the phenomenon of master's professional culture. Many studies have covered its individual components: competence in communication (T. Hordon, Y. Yemelianov); intellectual and legal competence (O. Radkevych, M. Kholodna); social competence (V. Kunitsyna, R. Hintch, R. Ulrich); digital competence (O. Bazeliuk, V. Bykov, O. Humennyi, M. Yershov, A. Zuieva, A. Kononenko, L. Lypska, M. Pryhodii, O. Spiryn); pedagogical and foreign-speaking competence (L. Bazyl, S. Leu, L. Pukhovska), key competencies (H. Odnoroh, V. Radkevych); values and beliefs (O. Asmolov, L. Yershova, A. Kalenskyi, P. Luzan, V. Orlov); self-awareness (L. Bozhovych, I. Chesnokova). The theoretical and practical questions of the cultural approach to professional and pedagogical activity were uncovered by I. Androshchuk, I. Bashkirova, I. Kyiashko, V. Lola, S. Pryima, V. Nikitina. Some aspects of the professional culture of the educator are also presented in the publications by V. Radkevych, S. Brychok, L. Komisarovoi, S. Sysoievoi, V. Kovalchuka, O. Pavliuk, A. Rubtsovoi, and others. In a number of studies, the psychological culture of the personality is considered in the context of subjective experience of the person (L. Diomina, I. Ralnykova) and the age characteristics of its formation are studied (L. Kolmogorova, D. Kashyrskii). Research by scientists of the distance vocational training laboratory of the Institute of VET of the NAES of Ukraine, dedicated to the study of the methodological basis for the development of industrial education masters of VE institutions professional competence (Kruchek, 2021), is of great importance for the study of the peculiarities of the professional culture of industrial apprentices. At the same time, a holistic study of the development of the professional culture of industrial education masters problem, taking into account all the aspects of this problem, described in the works of the above-mentioned scientists and researchers, remains relevant.

The purpose of the article – to provide theoretical analysis of the development of professional culture problem and to clarify the conceptual and categorical apparatus of research.

Methods: study and analysis of philosophical, general scientific, methodological, psychological and pedagogical literature, the legal framework, and educational and planning documentation - in order to determine the state of the problem; Synthesis of the information obtained - with the aim of defining research directions (clarification of hypothesis, conceptual apparatus); comparison - for comparison of the approaches of researchers to solving the problem of formation and development of the concept of «professional culture»; synthesis - to support the conceptual-categorical apparatus of research.

Results and discussion. Singling out pedagogical culture of masters of industrial education as a separate pedagogical phenomenon may be theoretically correct if one adheres to the views of philosophers and cultural scientists (L. Kohan, Y. Vyshnevskiy, V. Benin and others) that every human activity forms its own culture. Pedagogical culture, on one hand, is an element of general culture, a cross-cutting «subset» of society, and on the other - a special subsystem, a specific kind of culture with only its inherent characteristics. Identifying the professional culture of the master of industrial education as a phenomenon requires special attention due to specific nature of pedagogical activity and continuous increase in requirements of the master's personality. The professional culture of the Master of Industrial Training is based on sufficiently high industrial and technological experience, and it is a guarantee for the preservation of professional education workers category. A well-developed professional culture encourages masters to engage in permanent self-learning, self-development and self-education, which are the cross-cutting characteristics of an educator, and which will serve as a bright example of lifelong learning for the students. Professional culture is the guarantor of the preservation of the stock of professional and pedagogical workers among the experienced producers, as it contributes not only to the professional development of a specialist, but also to the personal development.

The high level of development of professional culture means that the master of industrial training is convinced of the true pedagogical methods, forms and methods of vocational training employed by him; he is therefore able to act independently and analyse the results of his activities. This is possible only if the apprentice has an established professional culture, which implies a certain pedagogical identity, pedagogical experience, and a system of values and beliefs. The leading link in this structure

of professional culture of industrial training master is professional pedagogical self-awareness.

Thus, it can be argued that the professional culture of the master of industrial learning is an integral quality of the individual, containing a set of interrelated components (professional pedagogical consciousness, pedagogical knowledge and professionally relevant key skills, pedagogical and professional experience, pedagogical values and convictions) that contribute to the achievement of success in professional pedagogical activities, domestic and professional communication, self-development and self-improvement of the personality of a specialist, his or her continuous strive towards the pedagogical ethos.

Professional activity as a socio-cultural phenomenon has a complex structure, including goals, objectives, subject, means, methods, and results. The high level of professional culture of a specialist is characterized by the developed ability to solve professional tasks, that is, the developed professional thinking and consciousness. The components of a professional culture are axiological, technological and personal creativity.

Professional culture is the measure and method of creative self-realization of the personality of an industrial education master in VE institutions in various types of pedagogical activities and communication, aimed at mastering, transferring, and creating pedagogical values and technologies.

The axiological component of professional culture comprises a system of universal and professional values and a set of axiologically weighted vocational and educational knowledge and skills that are of great social and professional value and that act as pedagogical values.

The technological component of professional culture is the process by which a master of industrial education directly implements his or her vocational and pedagogical functions, performs his or her

pedagogical tasks, formulates and achieves his or her pedagogical goals.

The personal and creative component of professional culture characterizes the personality of the apprentice as a subject of pedagogical activity endowed with pedagogical creativity and certain personal qualities (initiative, individual freedom, autonomy, responsibility, willingness to take risks, independence of judgement) and values (moral, aesthetic, legal, etc.) capable of building harmonious relations with oneself and the world, creating and developing oneself, influencing others in their professional activities in a good way (Popchuk, 2009).

Conclusions. It has been established that in modern pedagogical science the problem of training a highly educated, professional, and mobile specialist is a continuation not only of the national, but also of the world traditions of philosophical and pedagogical thought. It has been established that the problem of developing the professional culture of VE workers in the national scientific heritage is insufficiently represented (studies are few in number, fragmented, do not reflect a systemic view of the problem). The concept of the «professional culture of the master of industrial education» is defined as the integral quality of the individual, which contains a set of interrelated components (professional pedagogical self-awareness, pedagogical knowledge and professionally relevant key skills, pedagogical and professional experience, pedagogical values and convictions), contributing to the achievement of success in professional pedagogical activities, domestic and professional communication, self-development and self-improvement of the personality of a specialist, his continuous strive towards the pedagogical ethos. Further research will focus on the development of a model and methodology for the development of a professional culture of construction-related vocational training.

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ТЕОРЕТИЧНІ ОСНОВИ РОЗВИТКУ ПРОФЕСІЙНОЇ КУЛЬТУРИ МАЙСТРІВ ВИРОБНИЧОГО НАВЧАННЯ

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Реферат.

Актуальність дослідження визначається приналежністю проблеми підготовки педагогічних кадрів для системи професійної (професійно-технічної) освіти (далі: П(ПТ)О) до пріоритетних завдань Концепції Державної цільової соціальної програми розвитку професійної (професійно-технічної) освіти на 2022–2027 роки.

Мета: здійснити теоретичний аналіз проблеми розвитку професійної культури та уточнити поняттєво-категоріальний апарат дослідження.

Методи: вивчення й аналіз філософської, загальнонаукової, методичної, психолого-педагогічної літератури, нормативно-правової бази, навчально-плануючої документації – для виявлення стану розробленості проблеми; узагальнення одержаної інформації – з метою визначення напрямів дослідження (уточнення гіпотези, поняттєвого апарату); порівняння, зіставлення – для порівняння підходів дослідників до розв’язання проблеми формування й розвитку поняття «професійна культура»; синтез – для обґрунтування поняттєво-категоріального апарату дослідження.

Результати: вивчено наукову літературу та інструктивно-методичні й нормативно-правові документи; здійснено теоретичний аналіз проблеми розвитку педагогічного феномена «професійна культура»; проаналізовано підходи дослідників до розв’язання проблеми формування і розвитку професійної культури майстра виробничого навчання; уточнено поняттєво-категоріальний апарат дослідження.

Висновки: у сучасній педагогічній науці проблема підготовки високоосвіченого, професійного і мобільного фахівця є продовженням не лише вітчизняних, а й світових традицій філософської та педагогічної думки; проблема розвитку професійної культури майстрів виробничого навчання закладів П(ПТ)О у вітчизняному науковому доробку представлена не достатньо (дослідження нечисленні, фрагментарні, не відображають системного бачення проблеми); поняття «професійна культура майстра виробничого навчання» визначено як інтегральна якість особистості, що містить сукупність взаємопов’язаних компонентів (професійна педагогічна самосвідомість, педагогічні знання та професійно актуальні ключові навички, педагогічний і професійний досвід, педагогічні цінності й переконання), які сприяють досягненню успіху у професійній педагогічній діяльності, побутовому та професійному спілкуванні, саморозвитку і самовдосконаленні особистості фахівця, його невпинному рухові до педагогічного ідеалу.

Ключові слова: професійна освіта, професійна культура, майстер виробничого навчання, самоосвіта, педагогічна самосвідомість.

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PEDAGOGICAL CONDITIONS FOR THE DEVELOPMENT OF ECOLOGICAL CULTURE OF FUTURE SPECIALISTS OF MARITIME AND RIVER TRANSPORT IN COLLEGES

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Abstract.

Relevance: solving the problem of environmental pollution is possible through a number of measures, among which an important place is the formation of environmental culture of future professionals in maritime and river transport.

Aim: to substantiate pedagogical conditions of development of ecological culture of future specialists of sea and river transport in colleges.

Methods: theoretical – analysis, synthesis, deduction, comparison, generalization (for the analysis of scientific sources on the research problem); empirical - oral and written survey, the method of independent expert assessments (to determine the pedagogical conditions for the development of environmental culture of future specialists in maritime and river transport in colleges).

Results: analysis of legislative documents in the field of environmental protection; attention is focused on the problem of environmental pollution due to the operation of sea and river transport; the importance of ecological culture of future specialists of sea and river transport in the system of ecological education is clarified; the pedagogical conditions of development of ecological culture of future specialists of sea and river transport in colleges are substantiated.

Conclusions: it is substantiated that the effectiveness of the development of environmental culture of future specialists in maritime and river transport in colleges will increase due to the formation of positive motivation to acquire environmental knowledge; holistic greening of the content of vocational training; application of innovative technologies, in particular cooperative learning; providing environmentally-oriented educational and methodological support for the training of future specialists in maritime and river transport in colleges.

Keywords: *professional education, ecological culture; sea and river transport, pedagogical conditions, professional training, innovations.*

Introduction. Environmental issues are a priority in the public policy of each country. Now, the level of environmental pollution is constantly growing, natural disasters caused by climate change irreparable harm on human life and society as a whole. Some United Nations reports developed by the Intergovernmental Panel on Biodiversity and Ecosystems (IPBES) have highlighted the impact of human activities on the environment. Considering the

topic of our study, we will focus on the following: as of 2014, only 3% of the world's oceans are free from human influence; over the last 300 years, the number of wetlands has decreased by 87%; compared to 1980, the level of plastic pollution has increased 10 times; yearly 300-400 million tons of heavy metals, solvents, toxic materials, etc. are dumped into the water bodies of the planet (BBC News, 2019).

These and other facts indicate the need for the formation and development of ecological culture of specialists in almost all sectors of the economy, because without a conscious attitude to nature and the rational use of natural resources it is impossible to build a civilized society. An important place among the diversity of natural resources is occupied by water resources. As you know, the World Ocean occupies 2/3 of the Earth's surface, in Ukraine water bodies occupy 4% of its territory (Ukraine National Library named after Vernadsky V. I., 2021). This means that the need for highly qualified specialists in maritime and river transport is unquestionable, and the development of their ecological culture is one of the urgent pedagogical problems.

Sources. In Ukraine, the legal framework in the field of nature management and environmental protection is regulated by a number of legislative documents. The dominant role among them is played by the Law of Ukraine "On Environmental Protection" (1991), which defines the "legal, economic and social foundations of the organization of environmental protection in the interests of present and future generations" and ensures the implementation of ecological policy in Ukraine aimed at preserving a safe environment for the existence of animate and inanimate nature, protection of life and health from the negative impact of environmental pollution, achieving harmonious interaction of society and nature, protection, rational use and reproduction of natural resources (Verkhovna Rada of Ukraine. Legislation of Ukraine, 1991). Important documents on nature management and environmental protection are also: the Laws of Ukraine «On atmospheric air protection» (1992), «On basic principles (strategy) of state environmental policy of Ukraine until 2030» (2019), «On strategic environmental assessment» (2018), Water Code of Ukraine (1995), etc.

In addition, the problem of rational nature management, formation and development of ecological culture is the subject of research by many scientists, namely: M. Bilyanskaya, S. Boychenko, N. Velychko, L. Lukyanova, V. Lyubarets, O. Mudraka, V. Onoprienko, O. Osipenko, T. Sayenko, A. Slepchenko, Y. Shapran and others. It should be noted that the works of domestic researchers highlighted some theoretical and applied aspects of environmental education of future water transport specialists, namely: environmental education in maritime higher education institutions (Bayramova, 2017), environmental education of cadets of maritime educational institutions (Dulya, 2016), environmental competence of future water

transport specialists (Gurenkova, 2011), which indicates the need for further research.

The article aims is to substantiate the pedagogical conditions for the development of environmental culture of future specialists in maritime and river transport in colleges.

Methods. To achieve this goal we used theoretical and empirical research methods, namely: theoretical – analysis, synthesis, deduction, comparison, generalization – to analyze scientific sources on the research problem; empirical – surveys (oral and written), as well as the method of independent expert assessments – to determine the pedagogical conditions for the development of environmental culture of future specialists in maritime and river transport in colleges.

Results and discussion. The analysis of scientific sources showed that in modern science there is currently no single approach to the definition of «pedagogical conditions». On the one hand, according to scholars, these are «necessary circumstances, features of reality that enable the realization, creation, formation of something or contribute to something» (Great explanatory dictionary of the modern ukrainian language, 2001, p. 1295), on the other hand, - a set of external and internal environmental factors that are likely to affect the development of a particular mental phenomenon (Maslak, 2010). Considering the research of E. Khrykov (2013, p. 13), who notes that «conditions are created by teachers, and factors exist objectively, regardless of activity», we will adhere to the position that pedagogical conditions are circumstances that determine a certain direction in the development of the pedagogical process.

To determine the pedagogical conditions for the development of the environmental culture of future specialists in maritime and river transport in colleges, the method of independent expert assessments was used, the essence of which is indirect observation and questioning with the involvement of competent specialists to assess the phenomena (Sysoieva and Krystopchuk, 2013), in our case, lecturers of water transport colleges, researchers of the Institute of VET of the NAES of Ukraine, as well as stakeholders who interested in high-quality training of maritime and river transport specialists. The experts were asked to assess the significance of the specified pedagogical conditions by their rating. Based on the results of an expert assessment and taking into account the results of the analysis of scientific sources on the definition of the concept of «pedagogical conditions», we have determined the following pedagogical conditions for

the development of the ecological culture of future specialists in maritime and river transport in colleges: the formation of positive motivation to acquire ecological knowledge; holistic greening of the content of vocational training; application of innovative technologies, in particular, cooperative learning; providing ecologically-oriented educational and methodological support for the professional training of future specialists in maritime and river transport in colleges.

As you can see, the first pedagogical condition is *the formation of positive motivation to acquire ecological knowledge*. It is well known that motivation plays a crucial role in any activity. A number of scientists consider motivation as «a set of psychological processes that guide human behavior» (Stoliarenko, 2012, pp. 106–107). There are many criteria by which motivation methods are classified. Among all types of motivation, in our opinion, it is worth distinguishing between internal and external motivation, positive and negative. If we talk about the development of ecological culture of future maritime and river transport specialists, this process is holistic, it includes student learning activities, extracurricular activities and personal life (being at home, in the dormitory, with friends, parents, etc.).

Related to the concept of "motivation" is "motive". Psychologists say that motives are primarily related to needs, in particular, needs are the lack of something, motivation - awareness of needs, motives - the reasoning for a certain decision. The hierarchical system of human needs is reflected in the pyramid of A. Maslow (1943), the primary levels of which are the physiological level and the level of security. It should be noted that the awareness of careful attitude to natural resources, environmental protection is primarily associated with these levels. After all, the consequences of human activities, including professional, affect the level of satisfaction of physiological needs, and determine a safe life of present and future generations.

As noted above, motivation is divided into internal and external. External motivation is related to external circumstances, incentives, internal – comes from the person himself. For the development of the ecological culture of future specialists in maritime and river transport in colleges, both types of motivation are effective and at the same time interconnected. Of course, college teachers have a significant impact on the development of students' environmental culture. The level of awareness the responsibility of future sea and river transport specialists for their own future and the future of next

generations depends on the correct organization the process of formation and further development of ecological culture. Thus, we can state that external motives have a direct impact on the formation of internal one.

We have already noted that the development of ecological culture of students of the marine and river fleet colleges largely occurs during the classes. The educational lesson has its goal, which is triune and at the same time contains the following components: educational, developmental and upbringing. As practice shows, each of these components, in accordance with the theme of the lesson, can and should be aimed at developing the environmental culture of students.

The main principle of modern pedagogy is its humanism. In this aspect, it should be noted that the acquisition of environmental knowledge should take place only under the influence of call motives. However, the awareness of the catastrophic consequences of neglect of the environment, the technogenic impact on the ecosystem should also be one of the motives for the development of the ecological culture of future specialists in maritime and river transport.

The second pedagogical condition is *the holistic greening of the content of vocational training*. The Concept of Secondary School Reform identifies 10 key competencies of the New Ukrainian school, among which are ecological literacy and a healthy life, including «the ability to reasonably and rationally use natural resources within the framework of sustainable development, awareness of the role of the environment for human life and health» (Conceptual principles of Secondary School Reform, 2016, p.12). The educational process, as we know, to combine the process of learning, education and development. These areas are reflected in the purpose of each lesson. Today, the philosophy of education is based on the formation of value relations and judgments, education of responsibility for the welfare of the country and all mankind. In this sense, it is important to implement the cross-cutting content line «Ecological safety and sustainable development», which assumes «the formation of students' social activity, responsibility and environmental consciousness, as a result of which they will carefully and responsibly treat the environment, recognizing the importance of sustainable development for the environmental conservation and development of society» (Ministry of education and science. Cross-cutting content lines, 2018). Official documents state that cross-cutting lines are cross-curricular, socially significant

topics aimed at the formation and development of social and personal values. The implementation of such lines should be a priority of every employee of the educational institution. Ensuring the implementation of the content line «Ecological safety and sustainable development» can be done by solving problems of environmental content, selection of texts of environmental orientation in the study of philological disciplines, thematic extracurricular activities etc.

One of the general competencies defined by the standard of higher education in specialty N 271 «River and sea transport» for the first (bachelor's) level of higher education – «the ability to preserve and increase moral, cultural, scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, techniques and technologies, to use different types and forms of physical activity for active recreation and maintaining healthy lifestyle» (2018, p.8). The natural environment, water resources, the atmosphere are values that require enrichment and multiplication. Therefore, the educational process of future specialists in maritime and river transport in colleges should be directed towards the greening of the content of vocational training.

Regarding to use of *innovative technologies, in particular, the cooperative learning*, as the third pedagogical condition, it should be noted that the implementation of innovative technologies is an effective factor in improving the quality of the educational process, as well as one of the motives for the formation of relevant competencies. Innovations in education are related with novelty. They replaced traditional technologies, which are based on the reproduction of acquired knowledge and methods of activity according to the algorithm provided by the teacher. Experience has shown that such teaching method is not effective, and it is difficult for graduates to apply the acquired knowledge and skills in practical (life and professional) situations. It is worth noting that the competence approach in education, on which modern learning is based, is already an innovation.

An innovative technology that has found wide application in the modern educational process is cooperative learning, which is understood as learning in small groups with simultaneous research, discussion of a specific problem, search for ways to solve it with contemporaneously argumentation of decision-making. American researchers D. Johnson

and R. Johnson (1999) identify 5 criteria for cooperative learning. These are positive dependence, direct support, responsibility, social competence, own assessment. It is not enough to form ecological consciousness on a personal level, it is important to consider the problems of ecology through the prism of interpersonal relations with the possibility of joint discussion, coverage of all aspects of this topic. Therefore, the use of innovative technologies, in particular cooperative learning, is defined as one of the pedagogical conditions for the development of ecological culture of future specialists in maritime and river transport in colleges.

The next pedagogical condition is *the provision of ecologically-oriented educational and methodical maintenance for the preparation of future specialists in maritime and river transport in colleges*. Educational and methodical maintenance for the professional training of future specialists in maritime and river transport combines educational and methodical maintenance for all participants in the educational process and is aimed at creating conditions for the implementation of the requirements of state standards of higher education for the successful training of water transport specialists through the provision of education applicants with a complete package of educational and methodical materials of the appropriate directions. Unlike students who are the subject of educational support, methodical support is primarily aimed at pedagogical staff of the educational institution. The quality of the educational process largely depends on the dynamics of professional development of teachers. The teacher's professional development should primarily be aimed at constant updating of knowledge and skills of pedagogical activity (development not only of ecological culture, but also a legal (Radkevych, 2020), digital (Bazeliuk, 2020; Yershov, 2019), self-educational (Rezvan and Kyrianova, 2020) etc. An important role in this process is played by the methodological maintenance provided by the methodologist of the educational institution and includes collective and individual forms of work with teachers (Kovalchuk and Maslich, 2020, p. 31). Ecologically-oriented educational and methodical maintenance involves the creation and further use in the educational process of educational and methodical materials of ecological orientation. It should be noted here that this pedagogical condition - the provision of ecologically-oriented educational and methodical maintenance involves the creation and further use in the educational process of educational and for the

professional training of future specialists in maritime and river transport in colleges - is closely related to the second condition – the holistic ecologization of the content of vocational education. It is impossible to ensure the greening of the vocational training content without the development of appropriate educational and methodological providing, and, consequently, proper ecologically-oriented educational and methodical maintenance.

Conclusions. Ecological education is an important component of professional training of specialists in any field. The development of ecological culture plays a special role in the training of future specialists in maritime and river transport. The effectiveness of the development of ecological culture of future specialists in maritime and river transport in colleges will depend on the implementation of the following pedagogical

conditions: the formation of positive motivation to acquire ecological knowledge; holistic greening of the content of vocational education; application of innovative technologies, in particular cooperative learning; providing ecologically-oriented educational and methodical maintenance for the training of future maritime and river transport specialists in colleges. However, the result of the implementation of these pedagogical conditions - the development of ecological culture of future maritime and river transport specialists in colleges - depends on the qualitative interaction of all participants in the educational process.

We see prospects for further research in the development, testing and implementation of methods the development an ecological culture of future maritime and river transport specialists in colleges.

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ПЕДАГОГІЧНІ УМОВИ РОЗВИТКУ ЕКОЛОГІЧНОЇ КУЛЬТУРИ МАЙБУТНІХ ФАХІВЦІВ МОРСЬКОГО І РІЧКОВОГО ТРАНСПОРТУ У КОЛЕДЖАХ

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Реферат.

Актуальність: вирішення проблеми забруднення навколишнього середовища можливе через проведення низки заходів, серед яких важливе місце займає формування екологічної культури майбутніх фахівців морського і річкового транспорту.

Мета: обґрунтувати педагогічні умови розвитку екологічної культури майбутніх фахівців морського і річкового транспорту у коледжах.

Методи: теоретичні – аналіз, синтез, дедукція, порівняння, узагальнення (для аналізу наукових джерел із проблеми дослідження); емпіричні – усне та письмове опитування, метод незалежних експертних оцінок (для визначення педагогічних умов розвитку екологічної культури майбутніх фахівців морського і річкового транспорту у коледжах).

Результати: здійснено аналіз законодавчих документів у сфері охорони навколишнього середовища; акцентовано увагу на проблемі забруднення довкілля внаслідок експлуатації морського та річкового транспорту; з'ясовано значення екологічної культури майбутніх фахівців морського та річкового транспорту в системі екологічної освіти; обґрунтовано педагогічні умови розвитку екологічної культури майбутніх фахівців морського та річкового транспорту у коледжах.

Висновки: обґрунтовано, що ефективність розвитку екологічної культури майбутніх фахівців морського і річкового транспорту у коледжах буде зростати завдяки формуванню позитивної мотивації до набуття екологічних знань; цілісної екологізації змісту професійного навчання; застосуванню інноваційних технологій, зокрема кооперативного навчання; забезпеченню еколого-орієнтованого навчально-методичного супроводу професійної підготовки майбутніх фахівців морського і річкового транспорту у коледжах.

Ключові слова: професійна освіта, екологічна культура; морський і річковий транспорт, педагогічні умови, професійне навчання, інновації.

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METHOD FOR CONSTRUCTING THE TASKS OF EVALUATING THE LEARNING OUTCOMES OF TECHNICAL COLLEGE STUDENTS

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Abstract.

Relevance is determined by reforming the content, methods, forms, technologies of engineering education, which is based on the competence approach and necessitates such diagnostic techniques that would effectively manage personality-oriented pedagogical interaction, objectively and reliably assess the level of mastery of components of educational and professional programs by future mechanics, technicians, technologists.

Objective: to develop a methodology for designing and assessing the complexity of individual learning tasks as a step-by-step procedure based on the analysis of the conditions of the proposed educational action and indicators of the novelty of its implementation by a student of technical college.

The research methodology is based on the unity of activity, system, personality-oriented and technological approaches, which has allowed to develop a student-centered, algorithmic (focused on the structure of educational activities) method of constructing individual tasks for assessing educational achievements of technical college students.

Results: (on the basis of the theory of gradual formation of mental actions), indicators of the description of educational actions in sequence of their formation are allocated (the form of representation of the contents of an approximate basis of action to the performer – the presence of the operation of the transformation of the object in the approximate basis – the form of representation of the object of action – the form of transformation of the object of action – the degree of novelty of the action performed for the student); examples of constructing a system of individual learning tasks of students are given.

Conclusions: the need to formalize the procedure for assessing the complexity of individual learning tasks of students by using indicators of the approximate basis of action, executive part and novelty of action for their differentiation from the simplest to complex, highly intelligent.

Keywords: *complexity of educational task, student, theory of formation of mental actions and concepts, estimation, method.*

Introduction. The rapid growth of innovation processes in the economy and industry, the introduction of interacting high technologies (telecommunications, information, nuclear, *Professional Pedagogics/2(23)'2021*

nanotechnology, microtechnology, biotechnology, engineering, etc.) necessitate significant modernization of vocational education, including engineering and technical, and giving this process a

systemic character. Based on the ideas of the competence concept, the technology of training the specialists should change significantly, the main criterion of which should be the quality of professional pre-higher education. Naturally, updating the content of technical education, methods, tools, forms, technologies of mastering modern knowledge by students should be accompanied by the development of such diagnostic techniques that would effectively manage personality-oriented educational process, objectively and reliably assess the level of students' mastery of the disciplines of the educational and professional program (Artiushyna et al., 2015).

These positions update the study of didactic problems on the principles, methods, tools for assessing students' knowledge. The study of tools and practices of multilevel control of educational achievements of future specialists in technical specialties is especially important and expedient. This is primarily due to the complexity of technical facilities and systems, features of modern professional activity of mechanics, technicians, the need for purposeful development of creative and technical potential of students and, accordingly, systematic reliable evaluation of their academic achievements (Titova, et al., 2019; Pashchenko, 2014).

At the same time, pedagogical science has not yet developed detailed theories and technologies that can reliably assess the level of mastery of future mechanics', technicians' professional skills, abilities, other complex competencies, defined by educational standards and learning outcomes. The lack of reasonable, (understandable to the general pedagogical community) valid diagnostic methods in some way affects the pedagogical practice. In particular, the tests used today to assess the level of professional competence of graduates are often composed intuitively, without a clear analysis of the actions that a specialist should have according to learning outcomes. In addition, the level of complexity of the test task is said more than it is determined in practice: currently there is a lack of specific, practically grounded methods that can objectively assess the complexity of the educational (and, therefore, test) task and, consequently, the test as a whole.

Therefore, the problem of developing a methodology for constructing individual tasks for assessing the academic achievements of future specialists in technical specialties is extremely relevant for both pedagogical theory and educational practice.

Sources. According to many scholars, the leading didactic characteristic of the educational task is its complexity. Some researchers attribute the complexity of the task to the number of operations to solve it, other scientists, professing the provisions of psychological theory of activity, suggest calculating the complexity of the educational task taking into account levels of thinking and learning (Luzan et al., 2021).

In the scientific work (Naimushyna and Starychenko, 2010), devoted to the development of technology for estimating the complexity of educational tasks in Physics, it is proposed to take into account the following factors of complexity (when calculating): technical complexity (number of actions in solving problems); cognitive complexity (knowledge of formulas, laws, processes, creative application of knowledge, etc.); additional complexity (volume of text, system of equations, unusual problem, proportions, redundant data, etc.). It is not difficult to see that this approach is quite complex for practical application, and quantitative estimates of the significance of factors are plausible.

The algorithm for evaluating the structure and process of the educational task is substantiated in the dissertation of G. Kyrillova (2001). Here, the complexity of the educational task is proposed to be calculated by the following formula:

$$TD = f(T, K, H, Nh, Na, Nz, Nw),$$

where the task difficulty function (TD) depends on time (T), number of attempts (K), frequency of decision making (H), number of erroneous decisions (Nh), number of correct decisions (Na), number of objects and operations (Nz, Nw).

Thus, the technology of estimating the complexity of the educational task of the just mentioned method is based on serious experimental work regarding accumulation of statistical data on the results of pedagogical measurements (task time, number of erroneous and correct decisions, etc.), which, in our opinion, reduces its practical significance.

We are impressed by the approach to solving this problem by scientists (Demin, 1990), who associate the complexity of technical objects with the design features of parts, assemblies or machines. The main positions of this theory are represented in the following provisions:

- the concept of "complexity" expresses the fact that the object (system, subject, phenomenon, object) consists of systems, subsystems, parts of systems, elements. The name itself (complexity) focuses primarily on the quantitative composition of the object;

- "difficulty" is a subjective reflection of the complexity of the object, its characteristics in terms of educational and cognitive activities. The difficulty is determined by the properties of the object under study;

- the carrier of the difficulty is the educational object;

- when selecting the content of training, it is necessary, first of all, to take into account objective didactic conditions, which determine the difficulty of technical objects to study (the presence of complex parts in the object; accessibility of the object for inspection; density of parts, etc.).

The method of determining the difficulty of educational objects by taking into account the didactic conditions that hinder the educational and cognitive activities of learners, of course, can be successfully applied where students are offered to study the design of real technical devices, machines and equipment. However, it does not take into account the peculiarities of instructional materials (task conditions), the form of presentation of the object of educational and cognitive activities, the proposed transformation operations, the degree of novelty for the student of the action performed, and so on

Thus, in pedagogical theory there is still no clear answer to the question: in what sequence, by what criteria or indicators to determine the complexity of educational activities, develop control tasks and, accordingly, evaluate the results of implementation.

The research methodology is based on the unity of activity, system, personality-oriented and technological approaches, which provided an opportunity to develop student-centered, algorithmic (focused on the structure of educational activities) method of constructing individual tasks for assessing educational achievements of engineering students. The activity approach made it possible to consider the educational process as a complex multilevel activity, consisting of individual cognitive actions and operations, characterized by the transition from external practical action to internal mental action (Galperin, 1957; Talyizina, 1975). The personality-oriented approach allowed to introduce parameters of novelty of components of action for the student to indicators of complexity of the educational task. According to the requirements of the system approach, a set of indicators has been identified that reflects the student's mastery of the approximate basis of action, knowledge and skills of the actual implementation of operations to transform the object. This methodology determines the main task of the studied phenomenon – to develop a

system of individual learning tasks that can systematically and consistently bring future engineers to higher levels of knowledge, as well as objectively and reliably differentiate students by levels of academic achievement. The technological approach helped to develop a method of designing (and evaluating) educational tasks as a step-by-step procedure, which first studies and analyzes the nature of the approximate basis of action (the form of execution of the contents and presentation of operations to transform the object), then performance indicators, then parameters of action novelty to establish the level of complexity of the task.

Results and discussion. According to the psychological theory of activity, the performance of an individual task by a student is a learning action, which is not only an object but also a means of learning; the ultimate goal of learning is the ability to perform certain actions. These positions are taken into account by the theory of gradual formation of mental actions (Galperin, 1957; Talyizina, 1975), which allows us to identify the structural and functional (internal) structure of action. The leading provisions of this theory are the basis for assessing the complexity of educational activities. Let's dwell on these aspects in more detail.

The dominant position of the theory of gradual formation of mental actions is that the functional construct of action consists of three components – approximate basis of action (ABA), executive and control parts. Proponents of this theory are convinced that any human action is like a kind of management microsystem, which includes a tentative part – "governing body", executive – "working body" and control – mechanisms of tracking and comparison (Talyizina, 1975).

ABA is an idea of the performer, his predictions about the composition and sequence of operations that he must perform. ABA consists of meaningful and logical parts. The meaningful part of the ABA is information about the object of action, and the logical part is information about the structure and nature of the transformations that the student must perform. Indicators of completeness and forms of its presentation are used to characterize the ABA. The completeness of the ABA submission is determined by the presence of all constituent elements of the object of action and the definition of operations for its transformation. The form of representation of the ABA is determined by the form of display of the object of action and operations for its transformation.

Example. *Complete ABA in material form* – factory instructions for use of household appliances – washing machine. Note that the instructions describe the object of action and operations for its application.

The absence of ABA is observed in the following training task: *adjust the gap in the intake valves of the D-240 engine*. It is not difficult to notice that the object of action that needs to be changed is named here, but there

are no operations, tools and technologies of transformations in the given ABA.

Thus, to determine the nature of ABA, two indicators can be used:

1. The form of submission to the performer (pupil, student) of the contents of approximate basis of action (ABA).

2. Submission of operations for the transformation of the object to the ABA.

Each of these indicators has different types of implementation. Thus, the form of presentation of the contents of the ABA to the student can be:

The real object. A teacher or master demonstrates a real object, names and shows its components.

Picture. The student is given a picture (poster) with the image of the object, which is as close as possible to its natural state, and the perception of which does not require special training from the student.

Drawings or diagrams. To complete the learning task, the student receives a symbolic image of the object of action. In order to perceive and comprehend the information carried by such clarity, the student must be prepared in some way – be able to read and interpret drawings and diagrams. Possession of such specific skills and abilities is an important indicator of the level of professional competence of a person in certain professional activities.

Description of the features of the object. It is used when the student has formed an ideal image of the object of action, and the names of the elements are consciously associated with their real appearance. But in order to clearly define the field of activity, the student should be provided with information about the structure of the object of action, the name of its elements, and so on.

Object name. It can be used when the student is free to operate the components of the object of action in perfect shape.

Information about the nature and sequence of the operation to transform the object of action (logical part of the ABA) depends on the form of representation of the object and may be as follows:

Real transformation. The teacher or tutor demonstrates the transformation of the object and then asks the student to repeat the practical steps.

Real transformation with linguistic explanation. The teacher demonstrates to the student the real transformation of the object, accompanied by a verbal commentary on the practical demonstration of operations.

Written instructions. The student is shown the sequence of actions and described the operations for the transformation of the object.

Named operations. The operations to convert the object of the action are named, but it is not specified how they should be performed. For example: adjust the chain tension using the offset supports.

There are no instructions.

It may be worse noting, the first two options for presenting the logical part of the ABA are possible only if the substantive part is presented in material form.

Let's note that the ABA can be formulated by the performer or provided to him from the outside, it is constantly supplemented and improved in the process of performing the action. Completeness, accuracy and rationality of ABA are one of the determining conditions for the success of the formation of skills for its implementation. ABA differs in the form of presentation of information: it can be given in textual, graphical or material forms. The application form of the ABA must correspond to the level of personal development and the level of training of the learner. For example, it is not possible to provide information about a complex object of action in the form of a drawing to students who have not mastered the course "Technical Drawing".

ABA also differs in the form of its formation: it can be completely ready-made, and can be formed by the student only independently or by analogy with similar previous actions. The higher the level of student's independence is during the preparation of the ABA, the higher its quality is – the strength of ideas, ease of transfer to new conditions and so on. It should be noted that the formation of ABA is a necessary condition, but not enough to decide that the student has mastered the necessary ability to perform the action. N. Talyizina (1975), one of the founders of the theory of gradual formation of mental actions, draws attention to this: "Whatever the quality of the approximate basis of the action is, and no matter how it is presented – in the form of ideas or external schemes – it still remains nothing more than a system of instructions on how to perform a new action, not the action itself. Our student does not have the action itself yet, he has not performed it at all, and without performing the action it is impossible for him to learn" (p. 64). Special attention should be paid to the last remark, as in the learning process some teachers are satisfied with the student's ability to explain how a certain action should be performed. Let's note that the student's explanation of the sequence and conditions for performing the action, learned by him from the lecture notes or textbook text, is not the actual action, but it is only a reproduction of its ABA, usually incomplete and inaccurate.

To fully master the action, the student must actually perform its executive part. Depending on the form of representation and transformation of the object, there are the following forms of action: material, materialized (perceptual), verbal (foreign, intralingual), mental.

Therefore, two main indicators are used to characterize the executive part of the action: the form of representation of the object of action and the form of its transformation. The form of representation of the object of action may have the following options:

Natural object. To complete the learning task, the student is given an object of action in kind – a real machine, a cut, an animal, a plant, a device, a seed collection, biological products, etc.

Layouts or models. The student is offered a specially prepared object for educational purposes, which in a real or simplified form reflects not only the external form but also the internal essence of the subject, the relationship and interaction of its elements.

Picture. To complete the task, the student receives a flat image of the object of action, as close as possible to the natural one.

Schemes and drawings. The object of the action is presented in a symbolic form, for which the learner must have a certain level of special training.

Description. The structure and characteristics of the object of action are presented in the form of text.

Name. Only the name of the object of action is communicated to the student.

The form of the transformation is related to the form of representation of the object of action and may have the following options:

Material. Real transformation of the object of action in order to achieve the desired results. It is only possible if the object is presented as a natural object, layout or model.

Perceptual. The transformation of the object takes place in the form of utterance (linguistic description of the procedure) of the contents of the action in the presence of visual support. It is possible with material and graphic forms of representation of the object of action.

Verbal. The transformation of an object takes the form of utterance (linguistic description of the procedure) of the contents of the action. It is possible if the object is presented in the form of a description and name.

Mental. The conversion of the object takes place in perfect shape without an external image and ends with a message of the result.

The material form assumes that the object is presented in real form, and in the process of action its material transformations are carried out: the machine is disassembled and tested, experiments with chemicals are conducted, biological medicine is prepared and studied, etc.

Perceptual action differs from material action in the way that the object can be given in material (real object, model, layout) or materialized (drawing, poster, stand, table, etc.) form, and its transformation is carried out visually. The conversion operation can be described in words. An example of perceptual action is the story of the operation of an induction motor using its layout or model.

Foreign language action is that the performer performs the entire operation of transforming an object into an oral (speaking) or written (describing) form without relying on a tangible or materialized object. That is, there is no object, it is just named. An example of an action in a foreign language is a story or description of the structure of a machine or the process of its operation from memory.

The intralingual form assumes that the performer speaks the operations if he thinks about their performance. Instead, the mental form of action implies that the student does not think about the contents and order of operations during the action.

Thus, using the provisions of the theory of gradual formation of mental actions, we can characterize the learning action on five indicators:

1. The form of submission to the performer of the contents of the ABA.
2. Presence of operations on transformation of object in the ABA.
3. Form of presentation of the object of action.
4. The form of transformation of the object of action.
5. The degree of novelty of the action performed for the student.

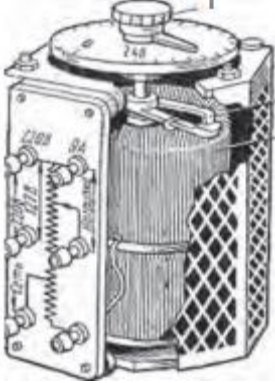

Using these indicators, you can give a general description of the actions in the sequence of their formation, improvement and complexity, both in terms of characteristics of the ABA and the characteristics of the executive part.

Here is a general description and examples of actions, starting with the simplest and ending with actions of high intellectual level (Table 1).

Table 1

Description and examples of actions in material form

| Marking | Content of the action (operation) | Examples |
|---------|--|---|
| 1 | 2 | 3 |
| 1.1.1.1 | To repeat (in material form) the procedure presented in material form and commented by the teacher. | 1. After demonstrating and explaining to the teacher the sequence of measuring the density of the electrolyte with a hydrometer in the banks of the battery, repeat the operation. 2. After showing and explaining to the teacher the procedure for measuring power and electricity using a wattmeter and an AC electricity meter, repeat the operation. |
| 1.1.1.2 | To perform the operation in material form in accordance with the sample shown in real form or visually specified sequence of actions without linguistic explanation. | 1. Draw a diagram of the technological process, which is performed by the teacher on the board. 2. After the practical demonstration of the operation of measuring the quality of the electrolyte by the teacher, repeat its actions. |

| | | |
|---------|---|--|
| 1.1.2.3 | To perform the operation in material form according to the provided written or oral language instructions and graphic representation of the object. | <ol style="list-style-type: none"> 1. To study the characteristics of the engine with sequential excitation in idle mode, assemble an electrical circuit according to the provided scheme. 2. Using the manual, select the components of the DC motor on the rack. |
| 1.1.3.3 | To perform the operation in material form in accordance with the instructions provided in writing or orally. | <ol style="list-style-type: none"> 1. After the teacher explains the sequence of actions, set voltage of 12 V, 24 V, 110V on the output terminals of the laboratory autotransformer LATR.  <ol style="list-style-type: none"> 2. Using the written instructions, adjust the clearances in the valves of the D-240 engine. |
| 1.1.2.4 | To perform the operation in material form according to the given command to act. | <ol style="list-style-type: none"> 1. Demonstrate the sequence of passing the intersection by vehicles located on the model. 2. Assemble the scheme of the experiment (physics, electrical engineering) according to the scheme provided in the instructions. |
| 1.1.3.4 | To perform the action in material form according to the instructions given in verbal form and the named components. | <ol style="list-style-type: none"> 1. Assemble the scheme of the experiment from the named components according to the verbal instructions. 2. Using the list of components and parts of the engine, select on the racks those that make up the lubrication system. |
| 1.1.4.4 | To perform an action in tangible form, knowing only the name of the object. | <ol style="list-style-type: none"> 1. Among the lighting devices presented on the shelves, select fluorescent, halogen and LED lamps.  <ol style="list-style-type: none"> 2. Perform the electrical circuit of the welding equipment. |

Listed actions (in Table 1) are performed in material form, but they differ in the level of presentation of the approximate basis. Performing such actions is very important, because without mastering the object in material form, it is impossible to form actions of higher intellectual levels. In our opinion, in the previous and current control, checking

the formation of actions in material form should be mandatory.

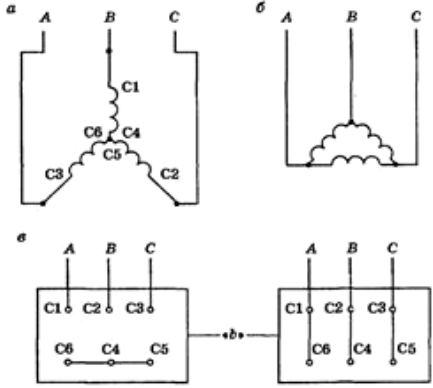
Instead, when forming actions in perceptual or verbal forms, tasks can be used in which the ABA is presented in material form, and the executive part is carried out in perceptual, verbal or mental forms (Table 2).

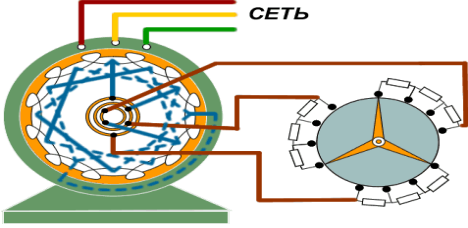
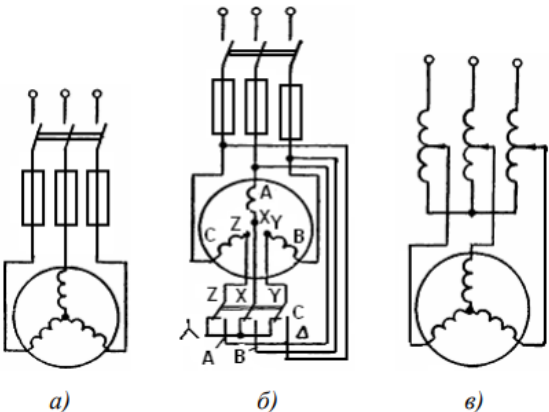
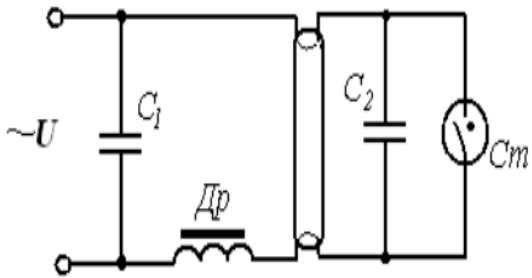
It is not difficult to notice that, in the Tables 1 and 2 (examples), the complexity of actions changes from the simplest (material) to the most complex (mental). Naturally, a clear definition of

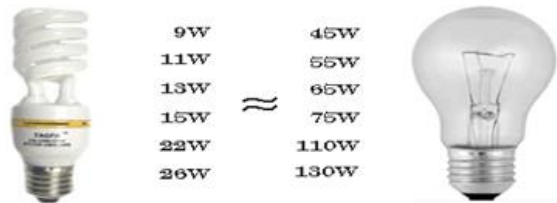
the characteristics of actions as a learning goal allows to determine the level of mastering the material, which should be assessed by means of test control (Ilin et al., 2010).

Table 2

Description and examples of actions in the perceptual, verbal and mental forms

| Marking | Contents of action (operation) | Examples |
|---------|--|---|
| 1 | 2 | 3 |
| 1.2.1.1 | To perform a verbal operation based on the material object, commenting on the actions performed in the material form by the teacher or demonstrated on the screen. | 1. After watching the video "Threading" explain the procedure for cutting the internal thread with taps 2. After the practical demonstration of the technology of processing of external cylindrical surfaces by the teacher or master, comment on the rules of installation of cutters on a lathe. |
| 2.1.1.1 | On the object presented in the graphic form, show the order of transformation, reproducing a practical demonstration of the teacher or a fragment of the video. | Show on the diagram of the SKIF-310 combine the sequence of passage of the grain straw mass after the teacher explains the technology of the combine on the current stand. |
| 2.2.1.1 | To perform the operation in verbal form based on the external image, commenting on the actions performed in material form by the teacher. | Show and explain the order of operation of the cylinders in the diagram of the engine SMD-62 after the demonstration by the teacher of its work in section. |
| 1.2.2.3 | To perform the operation in perceptual form according to the instructions with a diagram and verbal explanation. | Using the diagram and explanation instructions, find out and show the path of the oil from the pump to the valve rocker arm in the section. |
| 1.2.4.4 | To perform the operation in verbal form based on the external image of the given command to act. | <p>1. Using the layout of the intersection, name the sequence of traffic.</p> <p>2. Using the scheme of the combine "SKIF-310", name the units and aggregates through which the grain straw mass passes.</p> <p>3. Name which of the following connection diagrams of the stator windings of a three-phase induction motor is made "in star";</p>  <p>"in the triangle"; "in star and triangle on the terminal board of the electric motor"</p> |

| | | |
|---------|--|--|
| 2.2.3.4 | To perform operations in perceptual form according to the instructions given in verbal form. | <p>1. Using the assembly drawing of a two-stage reducer (conical-worm) select the details which can be made of bronze</p>  <p>2. Show the device which serves for reduction of starting current on the diagram</p> |
| 2.2.3.4 | To perform operations in perceptual form according to the instructions given in verbal form. | <p>1. Show the diagram of switching the stator windings of an induction motor from star to triangle.</p>  |
| 3.3.3.4 | To perform operations in verbal form by signs specified in verbal form. | <p>1. Name the order of movement of the plow unit on the slopes.</p> <p>2. Name the type of bearing that is installed on the driven shaft of the belt conveyor.</p> <p>3. Name the starting characteristics of DC motors.</p> |
| 4.3.4.4 | To perform operations in verbal form to determine certain features (components) of the named object. | <p>1. Name the parts of the bearing № 7306.</p> <p>2. Justify which parts of the worm gearbox should be made of bronze.</p> <p>3. Name the ways to connect three-phase motors to a single-phase network.</p> <p>4. Name the main advantages and disadvantages of induction motors.</p> |
| 2.4.4.4 | To perform operations in mental form on a graphically defined object. | <p>Bearing in mind the principle of operation of a fluorescent lamp with first-generation ballast, the switching scheme of which is shown in Fig. 1, explain what processes take place when connecting an electrical circuit to the network. What are the functions of the choke Dp? What is the purpose of the starter Ct? What is the role of capacitors $C1$ and $C2$</p> |
| 2.4.4.4 | To perform operations in mental form on a graphically defined object. |  <p>Fig. 1. The scheme of switching on a fluorescent lamp</p> |

| | | |
|---------|--|---|
| 4.4.4.4 | Forecasting the results of activities in which these objects are involved. | <p>1. Predict how the power consumption in the workshop will change if incandescent lamps (5 units - 130 W, 15 units - 110) are replaced by energy-saving fluorescent lamps.</p>  <p>2. Explain how the situation will affect the operation of the mover, in which after the electric motor, put not a sleeve-finger, but cam-disk coupling (Oldem coupling).</p> <p>3. Imagine that when designing a single-speed gearbox with a spur gear, you have decided: make the gears not of steel 40, but of wood. Explain whether such a gearbox will be workable, which will change due to changes in the material of the gears.</p> |
|---------|--|---|

Considering the indicators of action, it is not difficult to see that their combination affects the complexity of the educational task, requiring the learner to implement different levels of educational and cognitive activities. In view of the above, it is possible to assess the complexity of not only traditional but also test tasks, and, accordingly, to develop such tests that would really differentiate students or pupils according to their levels of academic achievement. This procedure can be formalized by entering the coefficient of complexity of the action. Let's focus on the quantitative method of assessing the complexity of educational activities in more detail.

The analysis of the indicators described above shows that the simplest actions are characterized by the following features: *the object* is presented in material form; *the transformation* is performed in material form; *meaningful and executive* parts of Φ BA are set in material form; the action is performed by the student (student) **repeatedly** (Ilin et al., 2010).

Thus, 5 indicators of description were used to evaluate this action. The coefficient of complexity for each of these indicators in the simplest case is taken as 1. Naturally, if in the future the action is complicated by a certain indicator, the coefficient should increase by a certain amount.

As a result of theoretical and practical research, we came to the conclusion that when complicating the signs of action on the indicator "*form of representation of the object*" the corresponding coefficient of complexity acquires the following values: $K_{fo} = 1$, if the object is presented in material or materialized form; $K_{fo} = 1,1$, if it is presented in symbolic form (scheme or drawing); $K_{fo} = 1,2$, if the description of the object is given; $K_{fo} = 1,3$, if the

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object is just named. If the object of action is not named in the educational task (the student has to choose it independently), then $K_{fo} = 1,4$.

Accordingly, if *the transformation of the object* is performed in material form, the coefficient of complexity of the action on this indicator will be $K_{po} = 1$; at the perceptual form of transformation $K_{po} = 1,1$; at verbal form $K_{po} = 1,2$; if mental operations are performed with a given object, then $K_{po} = 1,3$.

It is accepted that according to the indicator "*Form of presentation of the meaningful part of the approximate basis of action ABA to the performer (student)*" the coefficient of complexity acquires the following values: $K_{zch} = 1$, if the student is told that he must perform the learning activity on a real object; if the student is asked to use a drawing or diagram for this, then $K_{zch} = 1,1$; description of the features of the object – $K_{zch} = 1,2$; the name of the object – $K_{zch} = 1,3$; in the absence of the meaningful part of the ABA in the task $K_{zch} = 1,4$.

According to the indicator "*Presentation of operations for the transformation of the object in the ABA*" there is also a rule: the coefficient of complexity in the simplest variant of action has a value of $K_{ip} = 1$, and each variant of complication of action increases its value by 0.1. In particular, if in the educational task the student is asked to perform the educational task after the demonstration of actions with their explanation by the teacher or master on the real object, $K_{ip} = 1$; if the student has to perform the same task after he has been shown the sequence of actions by the teacher without explanation, $K_{ip} = 1,1$; when the logical part of the ABA is given only by the language instruction, $K_{ip} = 1,2$; provided that in the task, the student is listed with operations that he must perform, $K_{ip} = 1,3$; if

the logical part of ABA is absent in the task, $K_{ip} = 1,4$.

It will be recalled that the values of the coefficients of complexity of educational activities on four indicators have been determined so far. The fifth indicator is integrative: it characterizes the learning activity depending on whether new or repeated for the student are signs of action and performance of the task as a whole. In view of the above, it was assumed that if the student has already performed such a task (all signs of action he had encountered before, he is familiar with the object, did similar operations to transform it, etc.), the coefficient of complexity of this indicator $K_n = 1$. If for the student one sign of action (for example, object) is new, the coefficient of complexity makes $K_n = 1,25$; if there are two or three new signs of action in the task, the coefficient of complexity is $K_n = 1.5$ and $K_n = 1.75$, respectively. Provided that all

the signs of the action to be performed and met for the first time by the student, are completely new to him, the coefficient of complexity is $K_n = 2$.

The total coefficient of complexity of the action, and, accordingly, the learning task, can be calculated by the formula:

$$K_z = K_{fo} \times K_{po} \times K_{zch} \times K_{ip} \times K_n,$$

where K_{fo} , K_{po} , K_{zch} , K_{ip} , K_n – coefficients of complexity of the action on the relevant indicators (Ilin, Luzan, Rudyk, 2010).

Consider examples of determining the overall complexity of a simple and complex educational task according to the proposed method.

Example 1. Using the provided drawing with explanation, find among the located on the rack (section, stand) parts that belong to the depicted mechanism, select and name them (the action is performed on a known student object).

| № | Performance indicators | Characteristics of the indicator | Coefficient of complexity on the appropriate basis |
|---|--------------------------|----------------------------------|--|
| 1 | Contents of ABA | Drawings and explanations to it | 1 |
| 2 | Logical part of ABA | Verbal (instruction) | 1,2 |
| 3 | Object presentation form | Material | 1 |
| 4 | Form of transformation | Material and verbal | 1,1 |
| 5 | Novelty | The action is repeated | 1 |
| Total coefficient of complexity of action | | | 1,32 |

Example 2. Name the parts that make up the crank mechanism of an internal combustion engine (the action is performed with an object that is already known to the student).

| № | Performance indicators | Characteristics of the indicator | Coefficient of complexity on the appropriate basis |
|---|--------------------------|----------------------------------|--|
| 1 | Contents of ABA | Object name | 1,3 |
| 2 | Logical part of ABA | Verbal | 1,3 |
| 3 | Object presentation form | Verbal (name details) | 1,3 |
| 4 | Form of transformation | Mental | 1,3 |
| 5 | Novelty | The action is repeated | 1 |
| Total coefficient of complexity of action | | | 2,86 |

In the first example, the coefficient of complexity of action is $K_z = 1.32$. This educational task is relatively simpler than the second one, in which the coefficient of complexity of action is $K_z = 2.86$. It is worth noting that if this action was completely new to the student, the specified parameter of the complexity of the task would be equal to 5.72.

Conclusions. Based on the provisions of the theory of gradual formation of mental actions and concepts, the following indicators of the complexity of the educational task are identified: the form of presentation of the contents of the approximate basis
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of action to the performer; the presence of actions of operations to transform the object in the approximate basis; the form of presentation of the object of action; the form of transformation of the object of action; degree of novelty for the student of the action being performed. The scientifically-grounded methodology of designing (and evaluating) the complexity of the educational task allows the teacher:

- to develop a complex, base of individual educational tasks for pupils or students on the principle "from simple to complex";

- by purposeful selection of educational tasks with a certain degree of difficulty to develop educational and cognitive activities of students from reproductive, executive levels, to productive, creative;

- to assess objectively the competence achievements of students, determine the level of quality of professional training of future mechanical technicians, electrical technicians, etc .;

- to interpret unambiguously the results of assessment of knowledge, skills and other abilities of students and effectively to manage the educational process.

Prospects for further research will be related to the substantiation of the technology of assessing the quality of training of specialists in technical specialties in colleges.

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МЕТОДИКА КОНСТРУЮВАННЯ ЗАВДАНЬ ОЦІНЮВАННЯ РЕЗУЛЬТАТІВ НАВЧАННЯ СТУДЕНТІВ ТЕХНІЧНИХ КОЛЕДЖІВ

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Реферат.

Актуальність визначається реформуванням змісту, методів, форм, технологій інженерно-технічної освіти, що відбувається на основі компетентнісного підходу й зумовлює потребу в таких діагностичних методиках, які б дозволили ефективно управляти особистісно орієнтованою педагогічною взаємодією, об'єктивно й надійно оцінювати рівень опанування майбутніми механіками, техніками, технологами компонентами освітньо-професійних програм.

Мета: розроблення методики конструювання й оцінювання складності індивідуальних навчальних завдань як поетапної процедури, заснованої на аналізі умови пропонованої навчальної дії та показників новизни її виконання студентом технічного коледжу.

Методологія дослідження базується на єдності діяльнісного, системного, особистісно-орієнтованого та технологічного підходів, що дало змогу розробити студентоцентровану, алгоритмізовану, орієнтовану на структуру навчальної дії методику конструювання індивідуальних завдань оцінювання освітніх досягнень студентів технічних коледжів.

Результати: на основі концепції поетапного формування розумових дій виокремлено показники опису навчальних дій у певній послідовності їх формування (форма подання виконавцю змістової частини орієнтовної основи дії – наявність в орієнтовній основі дії операцій щодо трансформації об'єкта – форма подання об'єкта дії – форма трансформації об'єкта дії – ступінь новизни для здобувача освіти дії, що виконується); наведено приклади конструювання системи індивідуальних навчальних завдань студентів.

Висновки: доведено необхідність формалізації процедури оцінювання складності індивідуальних навчальних завдань студентів шляхом використання показників орієнтовної основи дії, виконавчої частини та новизни дії задля їх диференціації від найпростіших до складних, високоінтелектуальних.

Ключові слова: складність навчального завдання, студент, теорія формування розумових дій і понять, оцінювання, методика.

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THE ESSENCE AND STRUCTURE OF PEDAGOGICAL SKILLS OF THE TEACHER OF GENERAL EDUCATION DISCIPLINES OF THE VOCATIONAL EDUCATION INSTITUTION

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Abstract.

The relevance of the study is determined by society's demand for advanced pedagogy, which ensures the formation and development of the future teacher as a creative person, competent, responsible, able to carry out professional activities at world standards, ready for continuous professional growth, social and professional mobility.

Purpose: to study the essence and structure of pedagogical skills of the teacher of general education disciplines of the vocational education institution.

Methods: study of scientific sources – to determine the degree of development of the problem; generalization and systematization – to formulate own views on defining the essence of the concept of "pedagogical skills of the teacher of general education disciplines of vocational education"; structural-component analysis – to identify components of pedagogical skills of teachers of general education disciplines of vocational education.

Results: the essence and structure of the pedagogical phenomenon "pedagogical skills of the teacher of general education disciplines of the vocational education institution" are determined.

Conclusions: pedagogical skills of the teacher of general education disciplines of vocational education are justified as an integrative complex personality trait based on perfect professional and pedagogical competence, and which provides a high level of self-organization of pedagogical activities through synthesis of knowledge, experience, values and qualities of the teacher and creative solution of professionally oriented tasks of students mastering the system of knowledge in the disciplines of general education for the development of key competencies of future skilled workers; five interdependent components of pedagogical skills of the teacher of general education disciplines of the vocational education institution (motivational-value, cognitive, activity, personal-reflexive, creative) are singled out; the prospects of further substantiation of pedagogical factors and conditions of effective formation of pedagogical skills of the teacher of general educational disciplines of the institution of vocational education are determined.

Keywords: *professional education, pedagogical skill, professional-pedagogical competence, general educational disciplines.*

Introduction. The problem of formation of pedagogical skills of the teacher in our pedagogy is investigated rather actively. Pedagogical skills are the high level of professional and pedagogical activity, which achieves the unity of polished skills and abilities to apply psychological and pedagogical

theory in practice and the formed personal characteristics of the teacher, which determine the effectiveness of the pedagogical process. Pedagogical skills are manifested primarily in pedagogically appropriate actions and deeds of the teacher, in the refinement of skills of effective organization of

educational and cognitive activities of students and the formation of pedagogical communication with all participants in the educational process, as well as in the skills and abilities of self-improvement of pedagogical abilities and other significant professional and pedagogical properties and qualities. This understanding of the essence of pedagogical skills allows us to understand pedagogical skills as a complex activity and personal phenomenon of the teacher, to reveal, in more detail, its internal structure and correctly determine the ways of its effective formation.

But in modern Ukrainian education, criteria for assessing effectiveness are being formed and new requirements for ways to build pedagogical activities are being developed. Pedagogical activity, like other areas of human activity, is changing. In these changes, modern researchers identify the following trends: teachers strive for self-analysis of activities, processes and results of their activities, increasing the complexity of pedagogical activities and at the same time the formation of creative position of the teacher in professional activities.

Sources. The works of many scientists are devoted to the study of the essence of pedagogical skills of the teacher, his/her structure, ways of formation and development. Scientific research on pedagogical skills was carried out by Ukrainian and foreign scientists E. Barbina, S. Goncharenko, M. Golovan, M. Dyachenko, I. Ziaziun, L. Kandybovych, L. Kramushchenko, I. Krivonos, N. Kuzmina, V. Kutsenko, Z. Levchuk, V. Luhovy, P. Luzan, N. Nosovets, N. Ostroverkhova, O. Otych, O. Pekhota, O. Snisarenko, V. Semychenko, A. Subetto, V. Sukhomlynskyi, T. Sushchenko, N. Tarasevich, M. Yarmachenko and others. The founder of the scientific and practical direction of research of pedagogical skills of teachers in the system of secondary and higher education is I. Zyazyun (1997, p. 30), who defines pedagogical skills as "a set of personality traits that provides self-organization of high professional activity on a reflective basis." An important aspect of the problem is the study of the structure of pedagogical skills, which were considered in the works of I. Ziaziun, I. Krivonos, N. Tarasevich, O. Kirichuk, V. Madzigon, V. Oliynyk, N. Kuzmina, A. Shcherbakov and others. I. Andriadi, I. Ziaziun, I. Krivonos, L. Kramushchenko, P. Luzan, A. Markova, N. Tarasevich, N. Telichko, V. Teslyuk, L. Shovkun and others substantiated the general questions of the content, methods and ways of formation and development of pedagogical skills of teachers. However, in our opinion, insufficient

attention of scientists is focused on the study of pedagogical skills of teachers of vocational education institutions.

The article aims to study the essence and structure of pedagogical skills of the teacher of general education disciplines of the vocational education institution.

Methods: study of scientific sources – to determine the degree of development of the problem; generalization and systematization – to formulate own views on defining the essence of the concept of "pedagogical skills of the teacher of general education disciplines of vocational education"; structural-component analysis – to identify components of pedagogical skills of teachers of general education disciplines of vocational education.

Results and discussion. The works of many scientists are devoted to the study of the essence of pedagogical skills of the teacher, his/her structure, ways of formation and development. Thus, I. Ziaziun considers pedagogical skills as "the highest level of pedagogical activity, which is manifested in the fact that in the allotted time the teacher achieves optimal results" (2000). I. Ziaziun, I. Krivonos and N. Tarasevich (1989) approach the disclosure of the essence of pedagogical skills from the standpoint of personal-activity approach, in which skills are understood as "a set of personality traits that provides a high level of self-organization of pedagogical activities." Among the most important personality traits of a teacher, scientists include the humanistic orientation of the teacher, his/her professional knowledge, pedagogical abilities and pedagogical techniques.

It is possible to allocate properties of the personality of the teacher promoting productivity of pedagogical activity: politeness, attentiveness, endurance and self-control, flexibility of behavior, humanity, discipline, kindness, honesty, benevolence, initiative, sincerity, consciousness, observation, love to children, responsibility, sensitivity, organization, camaraderie, decency, patriotism, pedagogical erudition, foresight, principledness, independence, self-criticism, justice, intelligence, courage, desire for self-improvement, tact, sense of the new, self-esteem, etc. (Tarasevich, 1985). There is an opinion that the content of the concept of "pedagogical skills" should include professional skills, which are the defining elements of pedagogical skills, giving the teacher's actions depth, thoroughness, meaningfulness (Ziaziun, 1997; Ostroverkhova, 2006; Kutsenko, 1985). In the profессиogram presented by V. Slastenin there are

about 107 such skills (the ability to put forward problems; the ability to find original solutions; the ability to anticipate; etc.). Well-known Ukrainian scientist, organizer of education, teacher, philosopher I. Ziaziun notes in the "Encyclopedia of Education":

"You can be a professionally competent teacher, i. e. free to navigate in the subject area, systematically perceive and act in pedagogical reality... have modern pedagogical technologies, but not be a master, you can remain a good craftsman. To be a master, you need to have personal professional uniqueness, your style of work, the concept of professional thinking... Therefore, a true master-teacher has his own author system, his school, his followers. (Ziaziun, 2008, p.642)

The outstanding Ukrainian pedagogue V. Sukhomlynskyi in the book "Pavlyska Secondary School" gives a consonant description of the master-teacher to I. Zyazyun:

"What does a good teacher mean? This is, first of all, a person who loves children, finds joy in communicating with them, believes that every child can become a good person ... knows the soul of a child ... A good teacher is, secondly, a person who knows well the science on which the subject he teaches is based, who is in love with this science, knows its horizon – the latest discoveries, research, achievements ... A good teacher is, thirdly, a person who knows psychology and pedagogy, understands and feels that it is impossible to work with children without knowledge of the science of education. A good teacher is, fourthly, a person who has perfect skills in one or another work activity, a master of his craft. (Sukhomlynskyi, 1977, p.49-50)

Thus, the master-teacher reveals the highest forms of activity in professional activities, creative initiative, which is revealed in the appropriate use of methods and means of pedagogical interaction in each specific situation of teaching and education (Telychko, 2014, p. 7). When clarifying the definition of "teacher of general education disciplines", we will be guided by the specified definition of qualities-characteristics of the teacher-master.

Let's move on to the definition of pedagogical skills. The essence of this phenomenon is expressed, as I. Ziaziun (1997, p. 29) convinces, in

the personality of the teacher, his position, ability to show creative initiative on the basis of own system of values. Examining the processes of formation of the future teacher-master N. Telychko (2014) rightly notes that pedagogical skills are manifested in the activity, but not reduced to it, are not limited to a high level of development of special generalized skills. The skills of the teacher can also be seen as a manifestation of the highest form of activity of the teacher (in professional activities, in his positions, the ability to show creative initiative based on the implementation of own value system, in activities based on humanism and revealed in the appropriate use of methods and means of pedagogical interaction in each specific situation of learning and education) (Otych, 2014, p. 7).

After analyzing various definitions of the studied concept, following scientists (Ziaziun, 1997; Otych, 2014; Semychenko, 2004; Telychko, 2014) we come to the conclusion that:

–scholars consider this phenomenon from the standpoint of personal (complex personality traits of the teacher), procedural (manifestation of activity, creative initiative, reflection), effective (comprehensive solution of problems of teaching, education, student development, the highest level of pedagogical activity, the maximum possible – under certain conditions – the result of solving (pedagogical tasks) approaches;

–this category is a complex semantic structure, and therefore can not be defined by a single definition, and receives a comprehensive description in a set of definitions and interpretations;

–in order to consider in detail the semantic characteristics-formations of the studied phenomenon, it is advisable to define the accompanying concepts that scientists use in one way or another in defining the phenomenon, such as "*pedagogical activity*", "*pedagogical culture*", "*pedagogical competence*", "*pedagogical creativity*".

The analysis of existing psychological and pedagogical works on the content, essence of the just mentioned categories for further conceptual separation, content and formulation of the main definition of our study allows to model the relationship between the characterized pedagogical categories as follows (*Fig. 1*).

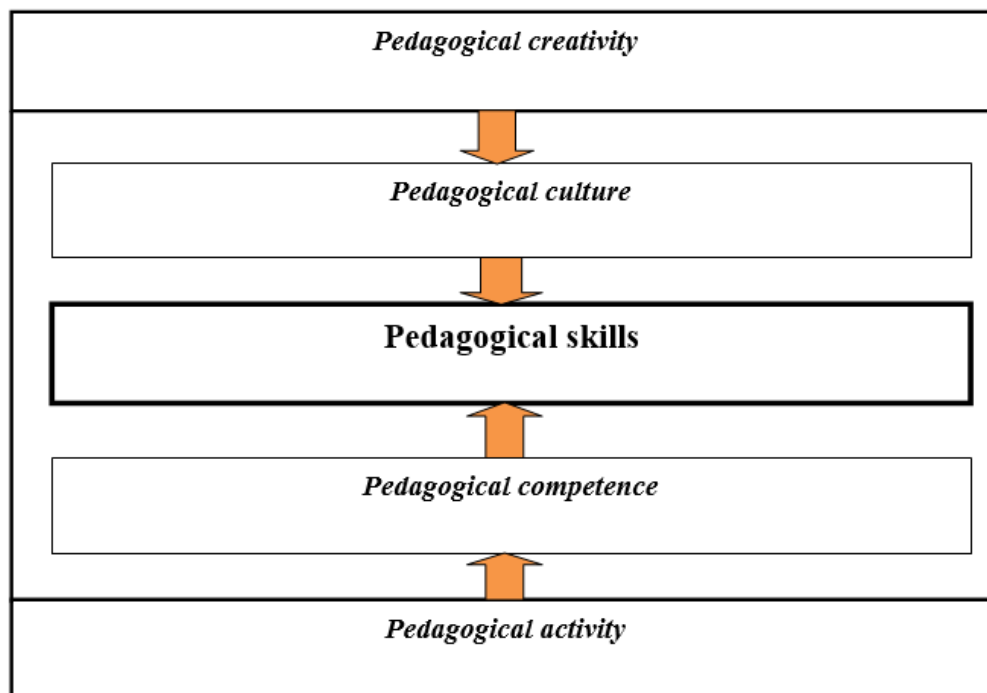


Fig. 1. Schematic representation of the links between concepts related to pedagogical skills

The ideal construct proposed in Fig. 1 reflects our ideas about the interaction of these phenomena and characterizes their conceptual essence with the following provisions:

–pedagogical activity of the teacher of general education subjects is a creative activity, but "pedagogical creativity of the teacher" is a broader (according to S. Sysoeva) concept, as it includes "creative educational and cognitive activity of the student" (Encyclopedia of Education, 2008, p. 650), so these interconnected elements are presented separately in the diagram;

–since pedagogical skills are the highest level of pedagogical activity, based on the professional competence of the teacher, which, in turn, is a systemic ability to perform professional activities, the relationships of this triad show the essence of the studied personality trait from the standpoint of effective approach;

–pedagogical culture of the teacher has creative origins and is a necessary concept of organizing pedagogical influences by the master professional (Ziaziun, 1997), under the conditions of a synthesis of professional (humanistic orientation, desire for self-improvement, ability to organize self-education, etc.), universal (good health, intellectual development, speech), moral (moral purity, sensitivity, humanity, honesty and truthfulness, etc.) qualities with his pedagogical competence.

Therefore, having determined the essence of pedagogical skills in general, we will try to define the concept of "pedagogical skills of the teacher of

general disciplines of vocational education". Focusing on the just analyzed definitions, we first determine the closest generic feature of the studied concept. The results of the above analysis show that scientists define the most common generic features of the concept of "pedagogical skills" a set of properties, ability, individual potential, activity, resource, synthesis of knowledge, experience and personality, level of teaching, integrative system, etc.

Focusing on the definition of pedagogical skills by I. Ziaziun, using the logic of imitation of terms, the closest generic feature (*genus proximum*) we choose the *integrative complex property of the individual* (*integrative* – refers to integration, unification); *complex* – which covers a group of objects, phenomena, actions, properties; which is a complex of something (Great Explanatory Dictionary of the modern Ukrainian language, 2009).

The next stage of defining the concept is related to finding the species' difference (*differentia specifica*) of the defined concept. Bearing in mind that the definition should include all the most essential features that distinguish it from other generic concepts. To do this, we use the specific features of the pedagogical activities of the teacher of general education disciplines of vocational education. Teachers of general education subjects provide students with a complete secondary education. The teaching of social sciences, humanities, natural sciences and mathematics is

held in parallel with the students' mastery of the disciplines of professional-theoretical and professional-practical training. The point is that all types of training of future skilled workers must be systematically combined. And such a combination is provided through compliance with the requirements of the principle of professional orientation. The structure of professional and pedagogical activity of the teacher combines pedagogical and professional (production and technological) components into a single personal construct, which allows for purposeful education and development of students, and the formation of their professional competence, students' qualifications.

Teachers of general education subjects by means of pedagogical integration, through the use of interdisciplinary links provide professional orientation of teaching general education subjects, form orientations on future professional activity, develop needs and motives of students for mastering the profession, and accordingly, the teacher of general education must at a certain level have the basics of future professional activities of students, use professional information in the formation of students' knowledge system in the discipline. Thus, the first essential feature of the concept is *the creative solution of professionally oriented tasks of mastering the system of knowledge by students in the discipline of general education*.

In the theory of I. Ziaziun (1997) it is determined that the basis of pedagogical skills is professional competence – knowledge of the subject, methods of its teaching, psychology and pedagogy. The professional competence of the teacher of general education disciplines (*professional and pedagogical competence – M. K.*) is formed in the course of mastering the educational program, and this process ends with the assignment of the professional qualification to the graduate. This shows that even in the conditions of university education, future teachers have elements of pedagogical skills, and the level of formation of professional and pedagogical competence of the graduate depends on the *"speed of acquiring pedagogical skills"* (Encyclopedia of Education, 2008, p. 643). The point is that, probably, those graduates who demonstrate high levels of professional and pedagogical competence have the opportunity to become professional masters. Thus, the definition of the studied concept should introduce the sign of *"perfect pedagogical competence"*.

The results of the analysis of existing research (Ziaziun, 1997; Krasnytska, 2020; Otych, 2014; Semychenko, 2004; Telychko, 2014), devoted to aspects of teachers' pedagogical skills, show that scientists unanimously recognize that the master-teacher has *a high level of self-organization of pedagogical activity*. This characteristic must also be recognized as an essential feature of the pedagogical skills of the teacher of general education disciplines.

The characteristic of the teacher's pedagogical skills – self-organization of his activity – is based, in our opinion, on *the synthesis of such components as knowledge, experience, pedagogical qualities*. We mean that, knowledge and qualities of the teacher are synthesized, developed in parallel with such characteristics as pedagogical abilities, pedagogical technique.

As noted above, the pedagogical activity of the teacher of general education subjects is functionally different from the teaching of subjects of general professional or professional-theoretical training. The point is that in addition to forming a system of knowledge in a particular discipline, these teachers must take care of the development of key competencies of future skilled workers, which are manifested through certain abilities (responsible for professional activities; work in a team; make decisions independently; act in unusual situations; plan work activities; adhere to professional ethics; prevent conflict situations). These abilities, in our opinion, should be in the field of view of all pedagogical staff of vocational education institutions, and, above all, teachers of general education disciplines.

Thus, *"pedagogical skills of the teacher of general disciplines of vocational education" is an integrative complex property of the individual, based on perfect professional and pedagogical competence, provides a high level of self-organization of pedagogical activities through synthesis of knowledge, experience, values and qualities of the teacher and is manifested in the creative solution of professionally oriented tasks of students mastering the system of knowledge in the discipline of general education for the development of key competencies of future skilled workers*.

Due to the purposeful formation and diagnostics of levels of development of pedagogical skills it is necessary to be defined with structure of this integrative complex property of the person. In *Table.1* we present the most typical approaches of scientists to the selection of structural components of pedagogical skills.

The structure of pedagogical skills in the research of scientists

| № | Author, source | Structural components |
|---|-------------------------------------|--|
| 1 | I.A.Ziaziun (1997) | Humanistic orientation, professional and pedagogical competence, pedagogical abilities, pedagogical technique |
| 2 | N.V. Kuzmina, N.V. Kukhareva (1976) | Gnostic (related to the field of knowledge of the teacher); design (outlines the goals of training and education, as well as strategies and means to achieve them); constructive (reflects the teacher's ability to construct own activities and the activities of students); communicative (characterizes the specifics of interpersonal relationships between teachers and students); organizational (related to the ability to organize the activities of students and their own activities) components |
| 3 | O.V.Krasnytska (2020) | Professional knowledge; pedagogical skills; professionally important qualities; pedagogical culture; pedagogical technique |
| 4 | V.I. Kovalchuk (2011) | High general culture; humanistic orientation; professional knowledge and skills; creativity and pedagogical abilities |
| 5 | E.V. Bondarevskaya (1999) | The humanistic position of the teacher in relation to the subjects of the educational process, the ability to be an educator; psychological and pedagogical competence and developed pedagogical thinking; awareness of the subject taught and mastery of pedagogical technologies; experience of creative pedagogical activity; ability to justify one's own pedagogical system (didactic, methodical, educational); ability to develop an author's educational project; culture of professional behavior; ways of self-development; ability to self-regulate own activities; communication |
| 7 | N.V. Telychko (2014) | Deontological, axio-acmeological-motivational, personal-developmental, practical-technological, cognitive, communicative components |
| 8 | N.N. Tarasevich (1985) | Ability to make learning material available; creativity in work; pedagogical and volitional influence; ability to organize a team; curiosity and love; content and brightness of language (its imagery and persuasiveness); pedagogical tact; ability to combine the subject with life; observation, pedagogical courage. The scientist includes: organization, efficiency, curiosity, self-control, activity, persistence, concentration and distribution of attention into the accompanying individual personality traits of the teacher. |

According to the results of the analysis of existing scientific works and own scientific research we distinguish the following content components: professional competence, pedagogical skills, humanistic orientation, pedagogical abilities, pedagogical technique, professional knowledge, psychological and pedagogical knowledge, pedagogical creativity, professionally important qualities, pedagogical culture, creative experience, pedagogical tact, pedagogical communication, ethics, pedagogical morality, external culture, speech culture, pedagogical interaction, professional motivation, creative thinking, pedagogical experiment, interpersonal competence, ability to teach the

educational material, ability to develop students' interests, organizational skills, ability to predict results of their work, pedagogical observation, pedagogical imagination, demanding, simplicity, clarity and persuasiveness of language, the ability to communicate, to teach educational material clearly, to argue, to lead the discussion, abilities (scientific-cognitive, didactic, perceptual, suggestive and expressive), observation, emotional stability, creativity, personal dynamism, communication, high art of teaching and education, activity, pedagogical and volitional influence, love for students, content and brightness of language (its imagery and persuasiveness), ability to combine the subject with life, pedagogical courage, pedagogical

optimism, pedagogical improvisation, efficiency, self-control, curiosity, persistence, concentration and distribution of attention, diversity of interests, desire for professional self-improvement, mastery of innovative pedagogical technologies, self-teaching, pedagogical erudition, pedagogical thinking, creative search, individual style of activity, author's handwriting, ability to teach Z-generation students, digital culture, etc.

Based on the analysis of the above semantic characteristics, it is proposed to consider the pedagogical skills of the teacher of general disciplines of the vocational education institution as a unity of five interdependent components.

Motivational and value component provides high levels of development of moral and ethical values and personal values of the teacher (morality, patriotism, civic and family values, natural consciousness, etc.), positive motives, aspirations to innovative pedagogical activity, sustainable needs of professional self-development, self-realization, purposeful development of creative abilities of students; based on the principles of motivation of achievements, this component is designed to stimulate the development of creative potential of the subjects of pedagogical interaction – both teachers and future skilled workers.

The cognitive component presents a system of knowledge in a particular discipline (or disciplines) of general education (pedagogy, methodology, psychology, basics of future professional activity of students); ability to productively, creatively solve atypical pedagogical situations on the basis of developed pedagogical abilities (didactic, perceptual, expressive, communicative, etc.), which involves the teacher's ability to use own intellectual potential to design effective methods and technologies, to acquire knowledge and organize productive self-education of students independently. In addition, this component includes the teacher's knowledge of the content of key competencies as the goal of complete general secondary education. In the structure of pedagogical skills of the teacher of general education disciplines, this component performs an instrumental function.

The activity component provides creative realization of the teacher's functions (educational, developmental, informative, illustrative, sense-forming, diagnostic, differential, stimulating, prognostic, culturological, psychotherapeutic, recreational) (Semychenko, 2004) thanks to the

perfect professional and pedagogical competence, developed methods of mastering the teacher's physical, mental, emotional state; voice, facial expressions, pantomime, as well as techniques and methods of influencing others through nonverbal and verbal means. In the structure of pedagogical skills of the teacher of general education disciplines, the activity component performs a technological function.

The personality-reflexive component takes into account the general requirements for the personality of the pedagogical worker of the vocational education institution (Otych, 2014; Barbina, 2001) and is an interconnected set of such characteristics: *emotional and volitional qualities* – proper self-control, persistence, ability to reflect in teaching; high self-demand, self-confidence, patience, emotionality, emotional sensitivity, emotional stability, etc.; *communicative qualities* – the ability to engage in dialogic interaction, to establish contact with people, to listen to the interlocutor and take into account his opinion, to create a favorable psychological microclimate, to predict the results of psychological impact on students, observation, etc.; *organizational qualities* – the ability to manage a group of people, to provoke and develop their activity, to exercise individual influence in group communication; ability to plan work, to distribute tasks and check their performance; *moral qualities* – humanism, respect for others, tolerance, tact, delicacy, sensitivity, kindness, tolerance, honesty, decency, obligation, responsibility, justice, sense of humor, etc. (Barbina, 2001; Yershova, 2015); ability to determine the reserves of the further career and personal growth; ability to regulate the activities.

Creative component provides a developed ability of the teacher to creative search, non-standard solution of pedagogical problems, which is expressed by such parameters as originality of conclusions, flexibility of thought, curiosity, skills of transposition, openness, interest in everything new, ability to generate paradoxical, unexpected decisions (search for new methods and technologies of teaching and educating the students), the ability to make decisions in situations of uncertainty, not to be afraid of own conclusions and bring them to an end, risking their professional careers and reputations; search-transforming style of thinking; creative imagination, developed imagination; problematic vision of the situation; the ability to immerse oneself deeply in attractive activities; desire for inventions, creativity; interest in mysteries,

paradoxes, improvisation (Barbina, 2001). In the structure of pedagogical skills of the teacher of general education disciplines, the creative component performs a creative function.

Conclusions. The study substantiates the attributive-relational definition of pedagogical skills of the teacher of general disciplines of vocational education as an integrative complex personality trait based on perfect professional and pedagogical competence, provides a high level of self-organization of pedagogical activities through synthesis of knowledge, experience, values and qualities of the teacher and is manifested in the creative solution of

professionally oriented tasks of mastering of the system of knowledge by students in the disciplines of general education for the development of key competencies of future skilled workers. There are five interdependent components of pedagogical skills of the teacher of general education disciplines of the vocational education institution (motivational-value, cognitive, activity, personal-reflexive, creative-creative). The prospects of further substantiation of pedagogical factors and conditions of effective formation of pedagogical skills of the teacher of general educational disciplines of the institution of professional education are determined.

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СУТЬ І СТРУКТУРА ПЕДАГОГІЧНОЇ МАЙСТЕРНОСТІ ВИКЛАДАЧА ЗАГАЛЬНООСВІТНІХ ДИСЦИПЛІН ЗАКЛАДУ ПРОФЕСІЙНОЇ ОСВІТИ

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Реферат.

Актуальність дослідження визначається запитом суспільства на випереджальну педагогіку, що забезпечує становлення й розвиток майбутнього педагога як творчої особистості, компетентної, відповідальної, здатної здійснювати професійну діяльність на рівні світових стандартів, готової до постійного професійного зростання, соціальної та професійної мобільності.

Мета: дослідження суті і структури педагогічної майстерності викладача загальноосвітніх дисциплін закладу професійної освіти.

Методи: вивчення наукових джерел – для з'ясування ступеня розробленості проблеми; узагальнення й систематизації – для формулювання власних поглядів на визначення сутності поняття «педагогічна майстерність викладача загальноосвітніх дисциплін закладу професійної освіти»; структурно-компонентний аналіз – для виокремлення компонентів педагогічної майстерності викладача загальноосвітніх дисциплін закладу професійної освіти.

Результати: визначено сутність і структуру педагогічного феномена «педагогічна майстерність викладача загальноосвітніх дисциплін закладу професійної освіти».

Висновки: педагогічну майстерність викладача загальноосвітніх дисциплін закладу професійної освіти обґрунтовано як інтегративну комплексну властивість особистості, що ґрунтується на *Professional Pedagogics*/2(23)'2021

досконалій професійно-педагогічній компетентності, забезпечує високий рівень самоорганізації педагогічної діяльності за рахунок синтезу знань, досвіду, цінностей і якостей педагога та виявляється у творчому розв'язанні професійно спрямованих завдань опанування учнями системою знань з дисциплін загальноосвітньої підготовки задля розвитку ключових компетентностей майбутніх кваліфікованих робітників; виокремлено п'ять взаємозалежних та взаємообумовлених компонентів педагогічної майстерності викладача загальноосвітніх дисциплін закладу професійної освіти (мотиваційно-ціннісний, когнітивний, діяльнісний, особистісно-рефлексивний, креативно-творчий); визначено перспективність подальшого обґрунтування педагогічних факторів та умов ефективного формування педагогічної майстерності викладача загальноосвітніх дисциплін закладу професійної освіти.

Ключові слова: *професійна освіта, педагогічна майстерність, професійно-педагогічна компетентність, загальноосвітні дисципліни.*

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USING PROJECT-BASED LEARNING TO TEACH PROFESSIONAL-PEDAGOGICAL ENTREPRENEURSHIP TO PRIMARY SCHOOL TEACHERS IN THE SYSTEM OF CONTINUING EDUCATION

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Abstract.

Relevance: continuing teacher education directly affects the development of both pedagogical skills and professional entrepreneurship in primary school teachers. This particular problem has been widely publicized since primary school teachers are seen as the foremost implementers of public policy in the field of the education and formation of future generations. Recently, in Ukraine, there have been established numerous specialist gymnasiums and schools, including private ones, that actively introduce the latest pedagogical technologies and search for new approaches to a quality preparation of the younger generation for further education and adaptation to society. In this regard, today's educators must strive for innovation and entrepreneurship.

The article aims to describe how project-based learning can be used to teach professional-pedagogical entrepreneurship to primary school teachers.

Research methods include *theoretical* (systemic-axiological, structural-comparative, structural-logical) and *empirical* (theoretical analysis of relevant pedagogical, philosophical and management literature, legal documents, academic papers and conference proceedings; structural and logical analysis, systematization).

Results: careful theoretical analysis of the above-mentioned sources has made it possible to describe the most effective ways of using project-based learning to teach professional-pedagogical entrepreneurship to primary school teachers. In particular, they lie in developing future teachers' entrepreneurial knowledge, skills, abilities and initiative, promoting their professional growth, as well as helping them implement business ideas.

Conclusions: simulation games, design thinking, Agile methodology and business planning are the main tools of project-based learning used to teach professional-pedagogical entrepreneurship to primary school teachers in the system of continuing education.

Keywords: *professional-pedagogical entrepreneurship, primary school teacher, continuing education, project-based learning.*

Introduction. Nowadays, continuing education requires new approaches to professional development of teaching staff. Project activity is one of the most promising areas in the education sector since it creates conditions for developing life competencies. Emphasis should be placed on entrepreneurship competence of primary school

teachers. It is viewed as one's ability to generate new ideas and initiatives and implement them to improve one's social status and well-being, as well as to develop society and the state. According to the Order of the Ministry of Education and Science of Ukraine as of January 15, 2018, No 36 "On approval of the Standard educational programme

on organization and implementation of advanced teacher training in postgraduate teacher education institutions”, this implies developing entrepreneurship competence within the framework of advanced training. After the introduction of the New Ukrainian School concept, the educational community faced new challenges. In turn, these challenges change the teacher’s mission in the context of European professionalism. To renovate the Ukrainian school system, it is crucial to introduce project-based learning to enable future professionals to acquire new skills, develop new competences, including entrepreneurship, become more professionally mobile, think innovatively and strive for continuing professional development. Continuing teacher education directly affects the development of both pedagogical skills and professional entrepreneurship in primary school teachers. This particular problem has been widely publicized since primary school teachers are seen as the foremost implementers of public policy in the field of the education and formation of future generations. Recently, in Ukraine, there have been established numerous specialist gymnasiums and schools, including private ones, that actively introduce the latest pedagogical technologies and search for new approaches to a quality preparation of the younger generation for further education, adaptation to society and self-identification.

In this regard, primary school requires creative professionals who can work in new formats and stay competitive in the labour market. They are not passive transmitters of well-known pedagogical or methodological postulates but charismatic and creative leaders, generators of educational initiatives and innovations and bright individuals who advocate humanism and cooperate with all the actors in the educational process. It means that they strive for continuing personal and professional development and are ready for pedagogical experiments, given that any activity is meaningless unless it creates a new product or leads to new achievements.

Sources. Many scholars have studied the problem of project-based learning in the context of the educational process (K. Bakhanov, V. Bolotov, I. Dychkivska, N. Halskova, H. Isaiev, O. Liubarska, N. Morze, O. Piekhota, Ye. Polat, O. Pometun, V. Serykov, S. Shevtsova, H. Vorobiov, A. Uvarova, I. Yermakov et al.). In the international discourse of the 20th century, it was J. Dewey, W. Kilpatrick and E. Collings who were in search of effective ways to implement

project-based learning. In turn, T. Matveieva justified the effectiveness of project-based learning in developing entrepreneurship competence. As noted by I. Yermakov, O. Kobernyk, N. Matiash, O. Savchenko, V. Tymenko and A. Tsymbalaru, project-based learning is one of the innovative teaching methods that enable the development of basic competences. Despite an abundance of research on this topic, there are a few studies on the problem in question, namely, using project-based learning to teach professional-pedagogical entrepreneurship to primary school teachers.

The article aims to specify how project-based learning can be used to teach professional-pedagogical entrepreneurship to primary school teachers in the system of continuing education.

Methods: include theoretical (systemic-axiological, structural-comparative, structural-logical) and empirical (theoretical analysis of relevant pedagogical, philosophical and management literature, legal documents, academic papers and conference proceedings; structural and logical analysis, systematization). Together, they are called to describe professional training of the new generation of teachers.

Results and discussion. Education has shifted from transferring knowledge to developing in-demand skills and competences, including teamwork skills, emotional intelligence, critical and creative thinking. By using design thinking to teach professional-pedagogical entrepreneurship to primary school teachers, one can develop their entrepreneurial skills and prepare them to solve problems associated with the implementation of entrepreneurial ideas. There is no uniform interpretation of the “design thinking” concept. Consisting of two terms “design” and “thinking”, it defines the main approaches to creating innovative products. Design means the process of planning or fashioning something that, in essence, is much broader than visualization. Project thinking, as mental activity of creating innovative products, is synonymous with design thinking. According to I. Yaloveha, design thinking lies in a non-standard approach to solving problems through understanding and defining people’s desires and, consequently, creating an innovative product to meet their needs. It reduces the risk and uncertainty that always accompany innovation (Yaloveha, 2019, p. 151). Design thinking answers the following basic questions: 1) What is it? (to explore the existing reality); 2) What if ... ? (to imagine a new future); 3) What catches attention? (to make a choice); 4) What really works? (to evaluate results)

(Liedtka, 2011). At the same time, design thinking relies on empathy, non-standard thinking, as well as one's ability to accumulate ideas and invent schemes to further identify patterns and generate ideas.

In the context of project-based learning, design thinking is a tool which helps teachers test an entrepreneurial idea and, consequently, introduce educational products and services into the market. In other words, design thinking can be used to implement educational entrepreneurial innovations. In particular, it is facilitated through: a) accumulating entrepreneurial ideas and beating stereotypes; b) making risky decisions at the start of the project; c) eliminating the fear of failure; d) understanding the needs of consumers of educational services, their goals, behaviour and inclinations; e) testing business ideas preliminarily; f) modifying ergonomics, applying and perceiving the value of educational products.

Design thinking characterizes one's position that one needs to transform and organize the space around oneself (Izmesteva, 2015). It consists of seven stages, such as 1) identifying the problem; 2) researching; 3) shaping ideas; 4) prototyping; 5) choosing the most effective solution; 6) implementing the decision; 7) evaluating results.

The "identifying the problem" stage is of paramount importance since it determines the required solutions. Next, it is necessary to determine the end-user (whose problem is being solved?) and expected results (what is the successful outcome of the project?). The "researching" stage traditionally begins with a review of the problem's history (has anyone solved this problem before?; how to solve it?; were the decisions effective or not?) to help one avoid the mistakes made. The "shaping ideas" stage includes gathering all available information, understanding the needs and, subsequently, brainstorming solutions. One should not focus on one idea only, even if it seems rather effective. It is essential to consider the problem from different angles which will help one generate the most unexpected and interesting ideas. Cooperative learning is extremely suitable in this context. Besides, emphasis should be placed on teamwork (five individuals who work on solving a problem during one day almost always come up with more different ideas than one individual doing the same during five days). It is also advisable to follow the rules of group work, take the expressed ideas positively and not criticize even the absurd ones. Nothing revolutionary is ever possible if participants hesitate to express ideas that

may seem rather eccentric. At the "prototyping" stage, one works with the expressed ideas, namely, by choosing the most effective ones, combining or improving them. It is vital to carefully review all the goals and ideas objectively. Design thinking allows one to evaluate what is achieved and, if necessary, refine or change the product. Feedback can be obtained from potential users by asking them the following questions: "Are you satisfied with the result?"; "What should be improved?".

In 2020, the course on design thinking at school was added to Prometheus (follow the link: https://courses.prometheus.org.ua/courses/course-v1:MIT+DTLL101+2018_T3/about). This course was funded by Microsoft as part of the Microsoft K-12 Education Leadership programme, founded to provide educators with professional development opportunities worldwide. The course combines the theory of design thinking and the examples of its use. Also, it acts as a platform for advanced training of teachers in effective planning of the educational process and introduction of new learning technologies.

Special attention should be paid to simulation games. Business simulation is a large-scale interactive simulation system specifically designed to develop economic and managerial competencies and skills. Simulators create opportunities for acquiring practical skills to manage the economic processes of the entire technological chain of production, marketing and competition in a market environment. Today, there are hundreds of professional simulators with varying degrees of immersion and process development. After registration in the system, the participant becomes responsible for a company in an environment close to reality and can make economic and managerial decisions necessary for the start of its work and further development. Also, the participant is allowed to use existing financial instruments in Ukraine, determine the range of products planned for production, expand and modernize production and technology base, hire staff and organize their work. Using appropriate marketing tools, the participant can start promoting and selling products. It must be noted, however, that the company is in a market environment, and when making decisions the participant should consider the presence of other market participants. Thus, competition in the virtual market space forces the participant not only to look for effective tools and ways to promote the product but also to modify production to change the consumer quality of products and optimize its cost. Importantly, business simulation consists of the following stages: 1) adapting to the simulation environment; 2) shaping a comprehensive

vision of the company as a system that includes interconnected functional units; 3) understanding causal relations within business process management in the competitive market environment; 4) implementing and adjusting the previously approved action plan, as well as analyzing the obtained results professionally; 5) consolidating the acquired competencies and entrepreneurial skills. Upon completing advanced training courses in the system of postgraduate teacher education, primary school teachers acknowledged their expediency and necessity. In this regard, it is essential to specify the necessary prerequisites for using business simulation in teacher retraining: prioritizing tasks; exceeding traditional learning and existing patterns; familiarizing with economic terminology and logic of managerial decision-making in market conditions; updating digital skills; providing assistance in decision-making, explaining the consequences of decisions and fostering attention to detail; clarifying the links between education and business in the light of the launched education reform (Pazdrii, 2019).

Agile methodology manifests itself through the following values: people and collaboration are more important than processes and tools. At the same time, a working product is more important than comprehensive documentation, and readiness for change is more important than following a plan (Highsmith, 2001). Agile methodology is widely used within the framework of advanced training for primary school teachers during which they learn practical techniques of planning individual sprints, creating roadmaps for business projects, developing delegation maps, engaging in mutual learning (from the back of the room), participating in motivational games, applying permanent reporting and receiving feedback. Besides, this methodology has many advantages, including making and coordinating decisions promptly, setting the individual pace for each stage of activity and promoting adaptability to today's requirements (Sutherland, 2014, p. 50). Agile methodology is especially effective in the context of creative approaches, creativity, as well as uncertain situations requiring quick and non-standard solutions. P. Salza prepared a list of methodologies derived from Agile methodology (Salza, 2019). The author of this article has adapted the list to the practice of teaching professional-pedagogical entrepreneurship within advanced training courses for primary school teachers at the Volyn Institute for Postgraduate Teacher Education.

1. Adaptive software development that encourages iterative development, with constant prototyping, and

coordinates the activities of participants, simultaneously retaining their creativity.

2. Crystal methods. Depending on project complexity, tasks can be divided between teams with different numbers and capabilities of participants. Teams perform partial tasks of varying importance. The location of teams is marked by different colours (white, yellow, orange, red, blue) that correspond to the complexity of a partial task. Most often, communication takes place in small groups that work on the most less strategic part of the project. Such groups are marked in white.

3. Dynamic software development method that consists of three stages (pre-project, pro-project life-cycle, post project). This allows expanding the capabilities of the project team, meeting existing needs and making modifications.

4. eXtreme programming. It widely uses teacher cooperation and obligatory feedback on the following plans in the course of solving problems, completing tasks, managing processes and applying tools.

5. Feature-driven development. Work is divided under the initial object model, with a two-phase iteration (design and development).

6. Kanban. Its main tool is a physical or electronic board to visualize team management. Each task on this board consists of the following stages: "do", "in progress", "done".

7. Scrum. It aims to achieve learning outcomes gradually and iteratively, using such soft skills as organization, planning, collaboration and teamwork. The process itself takes place in stages and consists of a series of iterations called "sprints", which are essentially boundaries for evaluation and feedback. The "Scrum" methodology allows solving many educational problems of different levels and professional orientations through Lego-based games, as well as games with limited conditions (such as SCRUMIA, in which artefacts are developed only with the help of pencil and paper).

Teaching practice shows that motivated teachers, using even only some elements of Agile methodology, have grown professionally. By participating in real projects, or when valued for their skills and creativity at the workplace, teachers can reveal their potential much more effectively and build motivation for continuing professional development. Careful analysis of educational practice proves that there are a sufficient number of teachers who intuitively use elements of Agile methodology. Positive results encourage them to implement entrepreneurial ideas, achieve entrepreneurial success and expand their experience.

Business planning is also one of the tools of project-based learning in the context of continuing teacher

education. In particular, it differs in the level of detailing and the list of indicators used to justify the economic benefits of implementing business ideas. A business plan is an economically sound analytical document that shows the reality of planning one's business. It offers an objective vision of development opportunities, ways to promote goods on the market, prices, possible profits, the main financial and economic results of activities, as well as identifies areas of risk and suggests ways to limit them. Such a plan is used regardless of the field of activity, scale, type of ownership, organizational and legal form. Furthermore, it allows solving internal tasks related to running one's business, and external ones, determined by the relationships with other companies and organizations. The components of a business plan also depend on the size of the expected market, the presence of competitors and the prospects for growth of the educational product (Khyzrych, 1993). Many teachers somehow avoid planning since it requires them to conceptually comprehend and present ideas, goals, methods and ways of running a business. They lack the necessary knowledge and experience to position themselves as start-up entrepreneurs. Business plans make it possible to determine the viability or expediency of a planned business project.

There is a saying that a business plan can tell what one is capable of (Yurhutis, 1998).

Conclusions. Thus, simulation games, design thinking, Agile methodology and business planning are the main tools of project-based learning used to teach professional-pedagogical entrepreneurship to primary school teachers in the system of continuing education. Design thinking is a tool with helps teachers test an entrepreneurial idea and, consequently, introduce educational products and services into the market. Agile methodology is widely used within the framework of advanced training for primary school teachers during which they learn practical techniques of planning individual sprints, creating roadmaps for business projects, developing delegation maps, engaging in mutual learning (from the back of the room), applying permanent reporting and receiving feedback. Business planning involves the following: prioritizing tasks; exceeding traditional learning and existing patterns; preparing for entrepreneurial thinking and managerial decision-making in market conditions; updating digital skills; defining the links between education and business. After learning how to develop business plans, teachers can analyze the prospects or expediency of a planned business project.

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ПРОЄКТНІ ТЕХНОЛОГІЇ НАВЧАННЯ ПРОФЕСІЙНО-ПЕДАГОГІЧНОМУ ПІДПРИЄМНИЦТВУ ВЧИТЕЛЯ ПОЧАТКОВОЇ ШКОЛИ В СИСТЕМІ НЕПЕРЕРВНОЇ ОСВІТИ

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Реферат.

Актуальність: неперервність педагогічної освіти педагогів безпосередньо впливає на формування та розвиток їхньої педагогічної майстерності загалом, і професійної підприємливості зокрема; в останні роки означена проблема особливо потребує своєчасного та неперервного коригування, викликаного ще й тим, що саме вчителі початкової школи вважають первинним реалізатором державної політики у площині розвитку і формування майбутнього покоління; значущість формування інноваційних та підприємницьких якостей сучасного педагога підкреслюється тим, що в Україні, за останні роки, з'явилась велика кількість спеціалізованих гімназій та шкіл, зокрема приватної форми власності, спрямованих на активне і неперервне впровадження новітніх педагогічних технологій, пошук нових підходів до якісної підготовки молодого покоління до подальшого навчання, адаптації у суспільстві.

Мета: охарактеризувати проєктні технології навчання, впровадження яких забезпечить формування професійно-педагогічного підприємництва вчителя початкової школи.

Методи: теоретичні: системно-аксіологічний, структурно-порівняльний, структурно-логічний, *емпіричні:* теоретичний аналіз педагогічної, фундаментально-філософської, управлінської літератури, нормативних документів, матеріали періодичних фахових і науково-метричних видань із теми дослідження; структурно-логічний аналіз та систематизація.

Результати: на основі теоретичного аналізу опрацьованих джерел охарактеризовано найбільш ефективні проєктні технології навчання професійно-педагогічному підприємництву вчителів початкової школи, що передбачають формування в них комплексу підприємницьких знань, умінь і навичок, сприяють професійному зростанню, реалізації власних підприємницьких ідей та розвитку підприємницької ініціативності.

Висновки: основними проєктними технологіями навчання професійно-педагогічному підприємництву вчителя початкової школи в системі неперервної освіти є: технологія симуляційних ігор, технологія дизайн-мислення, Agile – технології та бізнес-планування.

Ключові слова: професійно-педагогічне підприємництво, вчитель початкової школи, неперервна освіта, проєктні технології навчання.

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ACTIVITIES OF THE INSTITUTE OF VOCATIONAL EDUCATION AND TRAINING OF NAES OF UKRAINE IN THE CONDITIONS OF MODERN CHALLENGES

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Abstract.

The relevance of the study is conditioned by the need to promote the results of scientific, educational, information-analytical, advisory activities of the unified scientific institution in Ukraine that provides scientific and methodological support to domestic vocational and professional pre-higher education, which is in a state of reform.

Purpose: to characterize the current challenges and risks for the system of professional and vocational pre-higher education, highlight the main results of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine (hereinafter: institute of VET of NAES of Ukraine) in 2021 and prospects for its further development.

Methods: theoretical (analysis, synthesis, generalization); empirical (study of legislative and regulatory documents in the field of vocational and professional prehigher education, analysis of the results of structural units of the institute of VET of NAES of Ukraine and materials published on its official website and the website of the professional journal "Professional Pedagogy").

Results: The Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine is presented as a single scientific platform that provides scientific and methodological support for the modernization of modern vocational and professional prehigher education; conducts research on issues relevant to vocational and professional higher education; develops and implements pedagogical innovations in educational institutions (concepts, methodological systems, methods, technologies, etc.); carries out innovative educational activities of different levels; prepares highly qualified personnel for vocational, professional pre-higher and higher education in the specialties 011 Education. Pedagogy and 015 Vocational education (by specializations); is engaged in publishing, information-analytical and expert activities; actively develops international scientific relations, participates in international scientific and educational projects; systematically implements the principles of predictability, academic freedom, integrity, student-centeredness. The main challenges and risks in the activities of the scientific institution are described, its current tasks and ways to solve them are identified.

Conclusions: the main *challenges* to the system of vocational education are described (strengthening of world integration processes, rapid development of digitalization, nationalization, greening, internationalization of professional training of future specialists in developed countries); *the risks* caused by

them are analyzed (centralized and bureaucratized management system in the field of scientific and technical activities; insufficient funding for socio-humanitarian research; low wages of research and teaching staff; reduced prestige of vocational education; underdevelopment of dual education). Based on the analysis of the institute of VET of NAES of Ukraine in 2021 *promising areas* for further development of scientific institutions are identified (basic and applied research, strengthening the principles of academic integrity; improving educational programs for Masters and Doctors of Philosophy; introduction of modular programs of professional development of pedagogical workers of institutions of vocational and professional pre-higher education); development of corporate culture of the institute and its international activities); *the main tasks* of the scientific institution are outlined (ensuring the quality of vocational and professional higher education; promoting the development of public-private partnership; improving the system of training teachers in the field of vocational education and training, etc.).

Keywords: *Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine, vocational education, scientific, educational, experimental, publishing, international, innovative educational activities.*

Introduction. In today's conditions, there is the importance of scientific and methodological support for the development of domestic vocational and professional prehigher education in accordance with modern challenges and trends (Radkevych et al., 2021), which is carried out in Ukraine by the Institute of Vocational Education and Training of NAES of Ukraine (hereinafter the Institute). The scientific institution is the legal successor of the Institute of Vocational Education and Training of the Academy of Educational Sciences of Ukraine, which was established on March 27, 2006 and renamed on January 31, 2022 (Radkevych, ed., 2018a; 2018b; 2018c; 2018d; 2018e). According to the development strategy (Development Strategy of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine for 2020-2025, 2020, p.8) the mission of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine is defined by the slogan "From research to best educational practices". In view of this, the main direction of its activity is to conduct basic and applied research for the needs of the individual, economy, society (Radkevych 2019b; Radkevych, Yershova & Nychkalo, 2021a; 2021b). The vision of the Institute is determined by a harmonious combination of scientific activity, educational process and scientific and methodological support of training of innovative specialists – individuals, citizens, professionals. The basic values of the Institute are academic culture, openness, humanism, democracy virtue and freedom, innovation, leadership, human-centeredness, partnership, predictability, personal development, etc. (Development Strategy of the Institute 2020, 2020, p.8; Bazyl, 2019b; Radkevych, 2021).

Sources. Normative-legal, reference, information-analytical, reporting products of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine, its official website, the site of the professional journal "Professional Pedagogy", scientific publications (on reforming the education system in Ukraine) are analyzed in order to highlight the results of the scientific institution in 2021.

Purpose: to characterize the current challenges and risks for the system of professional and vocational pre-higher education, to highlight the main results of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine in 2021 and prospects for its further development.

Methods: theoretical (analysis, synthesis, generalization); empirical (study of legislative and regulatory documents in the field of professional and vocational prehigher education, analysis of the results of structural units of the institute of VET of NAES of Ukraine and materials published on its official website and the website of the professional journal "Professional Pedagogy").

Results and discussion. The basis of the Institute's activity is practical cooperation with institutions of professional (vocational and technical) education (hereinafter (VET)) and professional prehigher education; scientific and methodological relations with educational (scientific) and methodological centers (offices); cooperation with employers interested in modernizing the domestic education system; communication with state and local authorities and public associations; development of international scientific relations (Yershova & Bazyl, 2020; Kremen, 2021; Luhovyi, Reheilo & Hudym, 2021).

Close cooperation of the Institute with various groups of stakeholders increases the level of influence of science on the educational policy of the state and the quality of professional training of future professionals; improves information-analytical, expert, consultative and advisory activities of scientists; contributes to the popularization of scientific achievements of scientists; helps to disseminate advanced scientific and pedagogical experience; develops innovative educational activities of educational institutions; contributes to improving the quality of training of pedagogical and scientific-pedagogical staff for the system of professional, professional prehigher and higher education; provides new opportunities for professional development of scientific and scientific-pedagogical workers) (Bazyl, 2019a; 2019c; 2020a; 2020b).

During 2006-2021, 32 scientific studies (26 fundamental and 6 applied) were conducted on issues relevant to vocational and professional pre-higher education: designing the content and creating standards of vocational education based on the competence approach; development of marketing management technologies; development of energy-efficient, health-preserving, career, entrepreneurial, self-educational competencies of future skilled workers and pedagogical workers; study of vocational education and training systems in the countries of the European Union; introduction of distance and dual forms of vocational education; project management development; creation of electronic textbooks and SMART-complexes of academic disciplines; preparation of future qualified personnel for entrepreneurial activity in the conditions of small business development; development of methodical bases of application of digital technologies in preparation of future skilled workers; development of project management in vocational education institutions in domestic and foreign practice; development of professional competence of masters of industrial training in establishments of vocational education; introduction of the dual form of training in professional training of future skilled workers of construction, machine-building branches, sphere of service and public catering; assessing the quality of training in institutions of vocational pre-higher education, etc.). (Radkevych, 2021).

Currently, the Institute has six research laboratories (foreign systems of vocational education and training; professional career; distance vocational training; vocational training technologies; scientific and methodological support

of training in colleges and technical schools; e-learning resources). Within the framework of the performed scientific research carried out by the Institute, 30 concepts and models, 50 methods and technologies, dozens of other scientific developments were developed, tested and implemented in vocational education institutions (Pedagogical Innovations for Educational Practice, 2022); 1943 types of scientific products were prepared, 145 – production and practical, 84 – educational, 73 – reference (Planned products on research topics of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine, 2022). More than 2,000 resources have been downloaded to the e-library of the National Academy of Educational Sciences of Ukraine and more than 307,428 downloads have been recorded. In Google Scholar, the Hirsch Institute's index rose to 48 and “the 10-index” to 290.

The main scientific achievements of the Institute: *concepts* (content libraries of electronic textbooks for vocational education in Ukraine; vocational guidance of young people in working professions; formation of students' values of health; development of young people's ideas of professional success; vocational training of the unemployed in the workplace; modular professional training of skilled workers in production; development of information and analytical competence of pedagogical workers; project and distance professional training; designing the information and educational environment of vocational education institutions and SMART-complexes of academic disciplines; managing the development of vocational education in a market economy; activities of professional career centers; standardization of professional training of professional junior Bachelors; assessment of the quality of training of specialists in institutions of vocational pre-higher education); *models* (marketing management of vocational education institutions; development of information and analytical competence of heads of vocational education institutions; networking of vocational education institutions with social partners; online counseling of students on professional career development); *methods and technologies* (training of teachers for the introduction of personal developmental pedagogical technologies; application of distance learning; standardization of professional training of future professional Bachelors; creation of a career counseling system; formation of educational content on a competency basis; development of project technologies;

development of professional, energy saving, environmental, information-analytical, self-educational, project, digital, career and entrepreneurial competencies of teachers and future skilled workers, development of electronic textbooks, professional and educational standards, design of distance courses, measurement of educational outcomes, organization of distance and dual learning; managing the competitiveness of educational institutions; development of safety culture of professional activity of enterprise personnel); *professional standards* ("Methodist of vocational education", "Teacher of vocational training", "Master of industrial training"); *content library*, which includes 35 electronic textbooks for training future professionals in various fields; *a repository* containing more than 300 electronic training resources for the training of future skilled workers.

The research topics of the Institute are advanced and are a timely response to the urgent challenges of today, in particular to improve the quality of professional (vocational), professional prehigher education and their compliance with the requirements of the modern labor market. This is clearly illustrated by the results of research conducted at the Institute in 2019 – 2021. Thus, received and implemented in educational institutions pedagogical innovations on the development of entrepreneurial competence of future professionals helped increase their interest in starting and successful business doing; improving the activities of career centers, business centers, business incubators, business accelerators, business simulator websites; increasing the level of digital culture, creativity, stress, competitiveness of future professionals and their readiness for self-employment in small business development. Implementation of the applied research "Development of project management in institutions of vocational (professional-technical) education in domestic and foreign practice" allowed the scientists to develop, publish and test current pedagogical innovations designed to promote the competitiveness of the VET institution in the market of educational services of the region/city; modernization of mechanisms of cooperation of educational institutions with social partners; improving the diversification of funding sources for educational institutions; improving the quality of the educational process. The results of the implementation of applied research "Methodological foundations of professional competence of masters of industrial training of

vocational education institutions" were aimed at: improvement of the value attitude of masters of industrial training to pedagogical activity; increasing the quality of special knowledge of masters of industrial training related to pedagogical, methodological and professional activities; improving the ability of masters of industrial training to successfully implement job competencies in the process of their professional activities; increasing the activity of masters of industrial training, awareness of their own actions, personal and professionally important qualities, professional self-esteem, self-reflection and professional "I-concept". Research of "Methodical bases of introduction of elements of the dual form of training in professional training of future skilled workers of construction, machine-building branches, sphere of service and public catering" will develop the dual form of education, increasing the level of professional competencies of applicants of VET institutions, necessary for professional activities and their competitiveness in the labor market; reducing the adaptation of workers in the first workplace; increase in the number of social partners in VET institutions (executive authorities, employers' associations, trade unions, enterprises of various forms of ownership and subordination, employment service institutions, etc.); growth of investments in the system of VET.

The Institute continues to develop methodological principles for assessing the quality of training in vocational prehigher education institutions (2020-2022), which involves improving the objectivity of assessing the quality of training in colleges and technical schools, increasing the motivation of applicants for professional prehigher education and improving their training. Methodical bases of application of digital technologies in preparation of future skilled workers (2021-2023) are studied, thanks to what it was already possible to substantiate advantages of use of digital technologies in educational process of VET establishments, to classify digital technologies applied in professional training of future skilled workers, to improve the methods of choosing digital technologies for the training of future skilled workers, to develop criteria, indicators and levels of competence of teachers to use digital technologies in the training of applicants of VET.

An important activity of the institute of VET of NAES of Ukraine is *publishing*, which ensures the publication of pedagogical innovations (scientific results) developed by scientists through the preparation and publication of planned and

additional final results. The institute has done systematic work to improve the quality of publishing. All unpublished works prepared in previous years and stored in the library of the institute on the rights of manuscripts were digitized and published on the website of the scientific institution and the electronic library of the NAES of

Ukraine. In 2017, the branding of the publishing products of the institute of VET of NAES of Ukraine was carried out, the purpose of which is to create a unique name of the scientific institution and the image of intellectual products prepared by scientists and researchers (Fig. 1)..

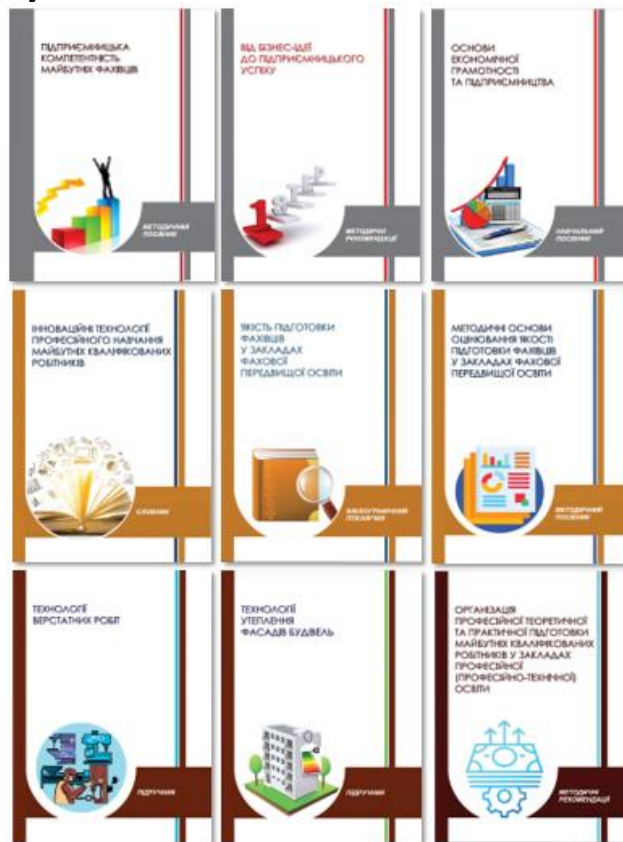


Fig.1. Branding of publishing products Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine

The Institute published collections of scientific works "Vocational Education: Problems and Prospects" (2013-2018), "Vocational Training in Work" (2006-2015) and electronic scientific publication "Theory and Methods of Vocational Education" (2011-2018). The Institute is also the founder of the professional scientometric journal (category "B") "Professional pedagogics" (until 2011 – "Scientific Bulletin of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine. Professional Pedagogy") and co-founder of the scientometric publication "Art education: content, technology, management" and the scientific-methodical journal "Professional Education" (which publishes materials on didactics and history of vocational school, education, vocational guidance and effective study of various subjects in vocational education institutions, comments and articles by leading vocational educators) (Fig. 2).

In 2021, the establishment of an electronic continuing publication "Innovative Vocational Education" was initiated in order to publish the results of theoretical and practical work of scientists of the Institute and teachers-innovators, which are relevant for the modernization of domestic vocational education.

The important area of the institute of VET of NAES of Ukraine is *experimental work*, primarily focused on obtaining empirical data needed to determine the features, factors, patterns, mechanisms of the studied pedagogical phenomena, as well as activities to test the validity, productivity and feasibility of socially important pedagogical innovations. In addition, the organization and conduct of experimental activities aimed at improving the quality of research of the institute, implementation of its results in practice, uniting pedagogical teams of experimental educational institutions, increasing the scientific and methodological level of teachers participating in

experimental activities, increasing the credibility of teachers and strengthening the image of experimental educational institutions, theoretical

and practical assistance in the process of reforming the domestic system of professional and vocational prehigher education.



Fig. 2. Periodicals of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine

The subjects of experimental activity are the following: the Institute (endowed with the appropriate powers to open, implement research and report on the use of budget funds received for this purpose; six laboratories (that provide development of the program of experimental activity, organization of collection of empirical data, experimental verification of the developed pedagogical innovations and implementation of the received results; scientific and organizational department that provides information and communication support of experimental activities; researchers, as direct developers and executors of the tasks provided by the research program at each

stage of experimental work according to the individual work plan. *Objects* of experimental activity are public authorities and local governments, educational institutions, institutions, enterprises, organizations on the basis of which experiments are conducted. Thus, all laboratories and centers of the Institute, as well as teachers and heads of almost 100 educational institutions from all regions of Ukraine take part in innovative educational activities of different levels (all-Ukrainian, regional, subordinate institution of NAES of Ukraine) (Fig.3).



Fig. 3. Innovative educational activities of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine (2006-2021)

Innovative educational activities were carried out in *two priority directions* (topics) of research: *direction 24. "Theoretical and methodological principles of vocational training"*, *direction 8. Vocational (professional-technical) education. Professional prehigher education, the problem of research "Professional and personal development of future specialists"* (six experiments at the national level, two – regional, four – subordinate to the NAES of Ukraine); *direction 3. Quality of education. Information educational environment. Methods and ways of assessing the quality of education. The experiments were divided by levels* (at the national, regional and subordinate levels of institutions of the NAES of Ukraine).

A total of 64 experiments were conducted under the scientific guidance of scientists of the Institute, of which 23 were all-Ukrainian.

The results of innovative educational activities at the national level were pedagogical innovations important for vocational education and the domestic economy: the concept of creating and operating a career center, models (marketing management of educational institutions, interaction of vocational schools with social partners using strategic management technologies); methods (creation of information and educational environment, development of electronic learning resources, technical support of distance learning, formation of youth readiness for project and entrepreneurial activities); working curriculum and educational program for retraining of workers in the new profession 8169 Master of installation and maintenance of renewable energy systems; training modules for the implementation of certified training of workers on partial professional qualifications, etc.

Research was of great pedagogical and social importance: organization of distance professional training of students and adults living in the temporarily occupied territory of Ukraine and in the settlements of the line of contact (head – Doctor of Pedagogical Sciences, Prof. M.A. Prigodiy); introduction of project training (Doctor of Pedagogical Sciences, Prof., G.M. Romanova); creation and functioning of the Center for Professional Career (Candidate of Pedagogical Sciences, Candidate of Pedagogical Sciences, D.O. Zakatnov); development of career competence (Doctor of Pedagogical Sciences, Prof., V.F. Orlov); professional training of skilled workers in the field of maintenance of renewable solar and thermal energy systems (Doctor of Pedagogical Sciences, Professor, Academician V.O. Radkevych); preparation of young people for entrepreneurial activity (Doctor of Pedagogical Sciences, Associate Professor, L.M.

Yershova); development of public-private partnership in the field of vocational education with the use of strategic management technologies (Doctor of Pedagogical Sciences, Senior Research Fellow, Corresponding Member O.V. Borodienko); organization of professional training of future skilled workers in the dual form of education (Doctor of Pedagogical Sciences, Assoc. Prof., N.V. Kulalaeva); improvement of professional training of cooks on the basis of the competence approach (Candidate of Pedagogical Sciences, Senior Research Fellow, S.G. Kravets) and many others.

In the process of implementing innovative educational activities, the Institute's system links have been formed with many vocational education institutions, in particular: state educational institution "Odessa Higher Vocational School of Trade and Food Technology", Khmelnytsky vocational schools 11 and 25, state educational institution "Khmelnytsky Center for Vocational Education and Services", state vocational educational institution "Romney vocational school" Sumy region, state educational institution "Vinnytsia Center for Vocational Education of the Processing Industry", state vocational educational institution "Dnipro Center for Vocational Education", state educational institution "Melitopol Multidisciplinary Center for Vocational Education", Separate structural subdivision "Professional and Pedagogical Professional College of Hlukhiv National Pedagogical University named after Oleksandr Dovzhenko", Kolky Center of Vocational Education of Volyn Region, state educational institution "Dniprorudne Professional Lyceum" as well as educational (scientific) methodological centers of vocational education in Vinnytsia, Dnipropetrovsk, Zaporizhia, Kyiv, Sumy, Khmelnytsky, Kharkiv and other regions of Ukraine. Scientific and methodological cooperation allows not only to know the problems of modern vocational education institutions, but also to be a representative of their interests in the legislative process of the country. For many educators, experiments become an incentive for independent research and further development of scientific careers.

The results of experimental activities are published on the Institute's website (Scientific Guide to Experiments of the All-Ukrainian Level, 2022), summarized in the annual information and analytical materials "Vocational (professional-technical) and professional pre-higher education" (Radkevych & Artyushina, ed., 2017; Radkevych & Yershova, ed., 2019; 2021).

Scientists of the Institute take an active part in *scientific and expert activities*, which include

scientific examination of draft legislation, regulations, educational innovations, programs, educational and methodological literature in the field of vocational education and training. Researchers of the Institute submitted proposals for bills: "On Professional Preigher Education", "On Adult Education", "On Vocational Education", "On Professional Qualifications", as well as to the "Regulations on Accreditation of Educational Programs for Training Higher Education Applicants", to the draft resolution of the Cabinet of Ministers of Ukraine "On Amendments to the Licensing Conditions for implementation of Educational Activities", to the "Code of Ethics of the NAES of Ukraine".

In the process of developing conceptual and normative documents in the field of education, the Institute's scientists provided proposals for the content of: National Strategy for Barrier-Free Space in Ukraine, Budget Declaration for 2022 – 2024, Reading Development Strategy for 2021 – 2025 "Reading as a life strategy ", Concepts of implementation of state policy in the field of professional (vocational) education "Modern professional (vocational) education" for the period up to 2027, Concepts of the State target social program for the development of professional (vocational) education for 2022 – 2027, Concepts of digital transformation of education and science for the period up to 2026, the draft State Budget of Ukraine for 2022 – 2024 on the training of applicants for Master's degree in higher education and training, List of scientific specialties in science, developed in accordance with Article 42 of the Law of Ukraine "On scientific and scientific-technical activity", "Procedure for awarding the degree of Doctor of Philosophy and cancellation of the decision of the one-time specialized academic council of the higher education institution, scientific institution for awarding the degree of Doctor of Philosophy", Regulations on the procedure for financing new research and scientific and technical (experimental) developments carried out at the expense of the general fund of the state budget in the National Academy of Educational Sciences of Ukraine, professional standard for the profession "Head of General Secondary Education".

Only in 2021, the Institute's researchers submitted proposals for the content of 41 draft legislative and regulatory documents:

- Laws of Ukraine "On Amendments to Paragraph 3 of Section X "Transitional and Final Provisions", "On Complete General Secondary Education", "On Amendments to the Law of

Ukraine "On Education", "On Adult Education", "On Amendments to Law of Ukraine "On Scientific and Scientific-Technical Activity" on expanding the functions of the Supervisory Board for Science and Technology Development to the sphere of innovation ("On Support and Development of Innovation Activity");

- Resolutions of the Cabinet of Ministers of Ukraine "On approval of the Concept for the development of children's digital rights and approval of the action plan for its implementation", "On approval of the Procedure for development, implementation and revision of professional standards", "On approval of the State target program for research infrastructures in Ukraine for the period until 2026", "On amendments to some resolutions of the Cabinet of Ministers of Ukraine "on determining the procedure for exercising the right to academic mobility", "On amendments to resolutions of the Cabinet of Ministers of Ukraine of August 16, 1994 №560 and August 23, 1994 № 582 "on updating the system of state support for young scientists defined by the Law of Ukraine" On Scientific and Scientific-Technical Activities", "On Amendments to the Procedure for Competitive Selection and Financing by the National Research Fund of Research and Development Projects");

- orders of the Cabinet of Ministers of Ukraine ("On approval of the action plan to promote natural sciences and mathematics until 2025", "Some issues of implementation in 2021 – 2023 of the State Strategy for Regional Development for 2021 – 2027", "On approval of the action plan to implement the Concept communication in the field of gender equality for the period up to 2021");

- Orders of the Ministry of Education and Science of Ukraine "On approval of the Regulations on the specialized scientific council for awarding the degree of Doctor of Sciences", "On approval of the Procedure for passing the certification for the recognition of qualifications, learning outcomes and periods of study in higher education, obtained in the temporarily occupied territory of Ukraine after February 20, 2014", " On approval of the Procedure for state registration and accounting of research and development works and dissertations", Order of the Ministry of Economic Development and Trade of Ukraine "On approval of forms of submission of information on indicators of the approximate average cost of training by state order of one skilled worker, specialist, graduate student, doctoral student, student", updated proposals for the draft state order for 2022 and the draft forecast of the state

budget for 2023 – 2024 for the training of scientific and scientific-pedagogical staff).

The institute has five *scientific schools* (Scientific Schools of Scientists of the Institute of Vocational Education and Training, 2022), namely: scientific and methodological support for the development of vocational education and training (head – Doctor of Pedagogical Sciences, Professor, Academician V.O. Radkevych); introduction of information technologies in the educational process (Doctor of Technical Sciences, Professor, Academician A.M. Gurzhiy); personal and professional development of future specialists in the system of professional education (Doctor of Pedagogical Sciences, Prof. V.F. Orlov); study of theoretical and methodological bases of quality assurance of professional education (Doctor of Pedagogical Sciences, Prof. P.G. Luzan); current problems of professional training of teachers (Doctor of Pedagogical Sciences, Professor, M.A. Prigodiy).

In addition, heads of scientific schools, professors: M.V. Artyushina, O.V. Didenko, V.T. Lozovetska, L.M. Petrenko, L.P. Pukhovska, G.M. Romanova, V.I. Svistun, V.V. Yagupov worked at the institute, supervised scientific research of laboratories, experiments of all-Ukrainian level, training of Candidates and Doctors of Pedagogical sciences (specialty 13.00.04 Theory and Methods of Vocational Education); they are now active stakeholders in modernization of educational and professional training of applicants for higher education (specialties: 011 Educational, pedagogical sciences; 015 Professional education / Theory and methods of vocational education).

The achievements of scientific schools contribute to the realization of the strategic task of the institute – the training of highly qualified personnel for the systems of vocational and professional pre-higher education. Since 2007 the postgraduate and doctoral studies have been functioning at the Institute of Ukraine; since 2011 – specialized academic council D 26.458.01 (with the right to accept for consideration and defense of dissertations for the degree of Candidate and Doctor of Pedagogical Sciences in specialty: 13.00.04 – theory and methods of vocational education). Since 2016, the institute has received a license from the Ministry of Education and Science of Ukraine for the preparation of applicants for higher education degrees of Doctor of Philosophy and Doctor of Science in the field of knowledge 01 Education / Pedagogy, specialty 015 Vocational education (by specialization). In the same year, the Department of Theory and Methods of Vocational Education was

established to ensure the implementation of the educational goals of the institute. Since 2018, there has been the training of applicants for the second (Master's) level of higher education in the field of knowledge 01 Education / Pedagogy, specialty 011 Educational, Pedagogical Sciences. Both educational programs (for the training of masters and doctors of philosophy) are accredited.

Since 2020, one-time specialized scientific councils have certified candidates for the degree of Doctor of Philosophy. 48 Masters, 52 Candidates of Sciences, 13 Doctors of Philosophy, 20 Doctors of Sciences were prepared.

Since 2018, the Institute has been carrying out educational activities in the field of postgraduate education in the specialty 011 Educational, Pedagogical Sciences. During this time, 580 certificates of advanced training of scientific, scientific-pedagogical and pedagogical workers of the vocational education system were issued.

In 2018, a scientific and organizational department (Head – Candidate of Pedagogical Sciences, A.G. Kononenko) was established to provide effective scientific and information support for all areas of the Institute's activities. The main functions of the department are the opening, administration, security and development of the institute's website; information and analytical support of scientific research, publication of the results and monitoring the quality of their use; development and administration of sites of periodicals; organization of systematic interaction with organizations that provide digital object identifiers (for example, Crossref DOI display); establishing constant communication with domestic and foreign scientometric databases, e-catalogs, library e-archives in order to fully present the results of scientific activities of the institute in the domestic and world scientometric space; systematic monitoring of scientific ratings of the Institute and its researchers; promoting the development of information competence of young researchers; technical support for webinars, Internet conferences; ensuring the functioning of remote platforms, etc. The department provides presentation of the Institute's activities in the information scientific and educational space: researchers and teaching staff have bibliometric profiles in Google Scholar and the system "Bibliometrics of Ukrainian Science", work places are connected to international scientometric databases Scopus and WOS, access to full text resources Springer Link is opened.

Since 2009, the institute has had a scientific library (headed by V.O. Markova) as an important

scientific and educational unit of the institute, which contributes to the professional growth of researchers and students. The library has also become a modern research and information center. The section "Library" has been created on the official website of the scientific institution, where all the final results of scientific research are systematically presented; bases of Master's, Candidate's and Doctoral dissertations and abstracts on problems of theory and methods of professional education; basic sources of academic disciplines for mastering educational-professional and educational-scientific programs; electronic resources for vocational education institutions; conference proceedings, reference books, scientific publications of scientists of the Institute, presented in the databases Scopus and Web of Science, which are a source of potential reviewers and opponents for the certification of Doctors of Philosophy in the specialty 015 Vocational Education. The library takes an active part in providing extracurricular activities with students: provides information and bibliographic services of the educational process, provides psychological counseling, acquaints with current educational issues (academic integrity, academic mobility, academic freedom, publication, etc.).

The Academic Council of the Institute is of great importance for the development of academic freedom of scientists and research teams, realization of their right to autonomous decision-making, ensuring the quality of scientific research and training of highly qualified personnel for the system of professional, professional higher and prehigher system of Ukraine (Chairman – Doctor of Pedagogical Sciences, Academician V.O. Radkevych, Scientific Secretary – Doctor of Pedagogical Sciences, Assoc. Prof., L.O. Bazyl). More than 200 issues are annually considered at the meetings: definition of strategic directions of development institute; discussion of drafts of forecast and program documents (doctrines, concepts, strategies, etc.), other materials of strategic planning for the development of domestic pedagogical science, vocational and professional pre-higher education, draft laws, government decisions and programs; conducting independent scientific and scientific-technical examination of topics and results of scientific research, manuscripts of textbooks, manuals, other educational literature to obtain the stamps of the Ministry of Education and Science of Ukraine; implementation of innovative educational activities and implementation of their results; ensuring the managerial and strategic level of division of responsibilities of all structural units

and officials of the Institute for the successful implementation of the goals of educational programs, adoption of strategies and policies for internal quality assurance of education.

In 2019, a council of young scientists (chaired by O.P. Radkevych and L.O. Shesterikova) was established at the institute to support talented young scientists. The council ensures the observance of their rights and interests in the development of science-intensive ideas, innovations and knowledge exchange, acting on the principles of freedom of scientific creativity, scientific ethics, voluntariness, collegiality, publicity, openness, democracy, etc.

Thanks to the activities of the Council, masters and postgraduate students are partners in ensuring the quality of educational programs of the Institute. With the assistance of the Council (in order to study the attitude of students to the quality of the organization of educational activities), an anonymous survey of students of the first and second year of study is conducted. To form the individual educational trajectory of students, members of the Council participate in the formation of plans for extracurricular activities of students, compiling questionnaires for freshmen for Masters and Doctors of Philosophy, conduct surveys and ensure consideration of the results in the process of individual student curricula.

In order to ensure the accessibility of the educational and scientific program, the members of the Council together with the scientific and organizational department developed video business cards of educational components, which were published on the official website of the Institute (<http://surl.li/bdbqo>). To modernize the educational and scientific program, representatives of the Council participated in: conducting an annual analysis of the labor market and the market of educational services; survey of students and graduates on the quality of education and improvement of the educational process; reviewing curricula and programs of disciplines for their compliance with licensing and accreditation requirements; the work of the working group on quality control of teaching disciplines by all teachers of VET institution; annual analysis of student performance and discussion of the results of the analysis at meetings of the Academic Council. The conclusions and recommendations of the Council are published on the Institute's website in the section "Modernization of the educational and scientific program" (<http://surl.li/bdbtb>). In 2021, the Recommendations of the Council of Young Scientists on the combination of teaching and

research of future Doctors of Philosophy in the context of internationalization of VET institution of NAES of Ukraine (<http://surl.li/bdbsz>) were published. For the development of students' academic integrity, members of the Council participate in filling the page of the Institute's website "Academic Integrity", promote the study, signing and compliance with the "Declaration of Academic Integrity" by Masters and postgraduate students "Declaration of Academic Integrity", the text of which is also posted on the website of VET institute of NAES (<http://surl.li/tdsl>). In order to collect and take into account information on the career path and employment trajectory of graduates, the Council has started work on the development of the page "Information about applicants" (<http://surl.li/bdbtn>) to place an e-portfolio of applicants and graduates of educational and scientific programs.

The result of the council was the victory of young scientists of the VET institute of the NAES

of Ukraine in the competitive selection of research on "New approaches to professional self-improvement of teachers of vocational (professional-technical) education in the intercourse training period" (2020). Supervisor – Doctor of Pedagogical Sciences, O.B. Koshuk. In the process of scientific research, the program "Professional self-improvement of teachers of vocational education institutions", a series of trainings ("Time Management", "Professional self-improvement", "Pedagogical opportunities of the case method") and the website "Teacher-innovator" were prepared (innovation.ivet.edu.ua). In addition, within the framework of the competitive research by Doctor of Pedagogical Sciences, Senior Researcher O.P. Radkevych developed the "Teacher-innovator" website, which is active, strengthening the links of the research institution with successful teachers-practitioners across the country.

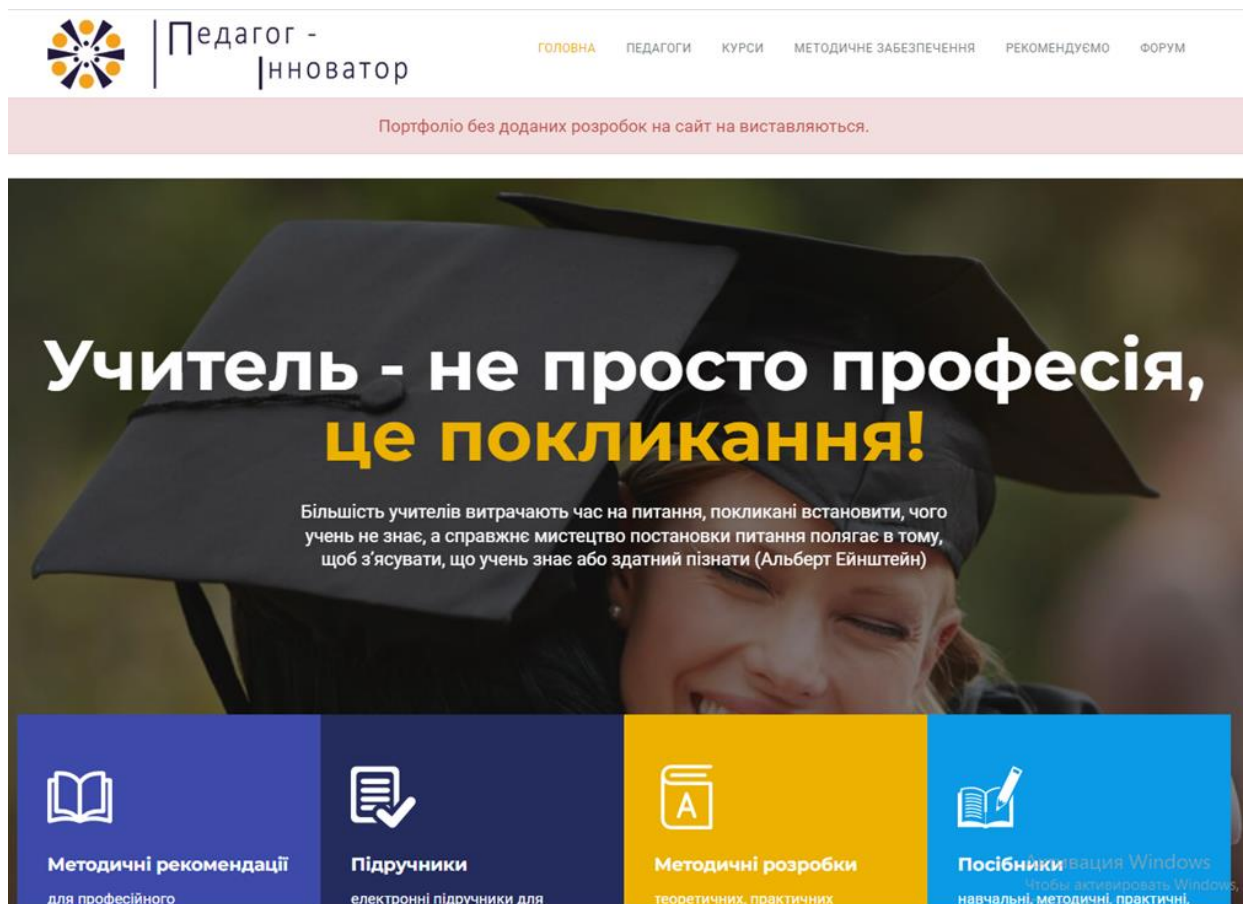


Fig. 4. Website "Teacher-innovator" (innovation.ivet.edu.ua)

From 2021, young scientists take an active part in the competition "Teacher of the Year" (<http://surl.li/tmhl>), in particular, are involved in a survey of students (<http://surl.li/topo>) to determine the ranking of teachers – participants of the competition. The Council has also launched a competition "Best Postgraduate Student of the Year"

(<http://surl.li/bdbuk>), which is to be held among postgraduate students of the Institute. The purpose of the competition is to support talented students of the degree of Doctor of Philosophy, increase their interest in scientific activities, support in the development of postgraduate students' scientific

careers, increase the motivation of postgraduate students to scientific and research activities.

For many years there has been cooperation with international organizations, research institutions and educational institutions, namely: the German Society for Technical Cooperation (GTZ), the Federal Institute for Vocational Education of Germany (Bundesinstitut für Berufsbildung – BIBB), the Institute for Technology and Education Institute of Engineering and Education at the Technical University of Bremen (ITV, Federal Republic of Germany), European Education Foundation (EEF), University of Konstanz (Germany), University of Valencia (Spain), Vienna University of Economics and Business (Austria), Institute for Advanced Training “TuranProfi International Professional Academy” (Republic of Kazakhstan); Republican Institute of Vocational Education (Republic of Belarus); Higher School of Linguistics in Czestochowa (Poland); Academy named after Jan Dlugosz in Czestochowa (Poland). International research is constantly strengthened through the active participation of the Institute's staff in international projects, including: "Effective management of labor migration and its qualifications" in cooperation with the ILO Subregional Office for Eastern Europe and Central Asia 15 (2013); "Modernization of state standards and principles of education and training in accordance with the European Union's policy on lifelong learning" (2012-2014); EcoBRU (2013-2016); “Joker – my business, my identity” (Joker – moja firma, moje ja) (2015); "Development of labor potential in Ukraine" (2013-2014); "Professional orientation of learning foreign languages in vocational schools" (2015); "Improving practice-oriented training of teachers of vocational education and training" (2016-2018).

Currently, scientists of the Institute participate in ERASMUS + project "New governance mechanisms based on partnership and standardization of training of teachers in vocational education in Ukraine (PAGOSTE)" (2020-2023). Its goal is to improve the quality of training of teachers of VET institutions in Ukraine. In the process of solving the project tasks: the system of management of professional training of teachers in the EU countries is presented; scientifically sound tools are developed for analyzing the needs of target groups (teaching staff of higher education institutions that train teachers of vocational education, their students, teachers and heads of VET institutions for training teachers in vocational education; a national roadmap is developed for changes in the management of

professional training of teachers of VET institutions in Ukraine; a Questionnaire for the perception of one's own skills and beliefs, self-assessment of strategic competencies by teachers of VET is developed and a corresponding survey is conducted; for each higher education institution that is a partner of the project, the concepts of effective management based on partnership have been developed; the concept and design of the online platform "Partner Space" 015 "for the development of cooperation between various stakeholders in the training of teachers for the VET system are developed; piloting of new management structures on the basis of partnership is carried out (Resource Center for Vocational Education in Design Technologies of the State Institution "South Ukrainian National Pedagogical University named after K.D. Ushinsky"); Professional Advisory Committee of the specialty "Professional Education (Economics)" (EPP "Economic and Business Education") of Kyiv National Economic University named after Vadym Hetman; Committee for Support of Quality Assurance and Development of Training of Teachers of Vocational Education and Training of the National Transport University; Public Union "Association for the Development of Vocational and Continuing Education" of the Ukrainian Academy of Engineering and Pedagogy); training materials for staff training are developed; a program document is being prepared, which will contain recommendations for Ukrainian higher education institutions on the implementation of governance mechanisms based on partnership; changes are being developed to the professional standard "Teacher of Vocational Training" and educational standards for the training of teachers of the VET system, taking into account the management based on partnership; the creation of a network or association of higher education institutions is initiated for providing the training in the curriculum "Professional Education (by specialization)"; staff training on educational reforms and partnerships in teacher education is conducted and study visits of Ukrainian students to partner universities in the European Union are organized; it is planned to publish an anthology of professional training of teachers of VET in Ukraine.

In the process of international project activities, scientists prepared distance learning programs for teachers of vocational education institutions ("Culture of environmental safety of professional activities in the construction industry", "Energy efficient competence of teachers of vocational educational schools of construction profile", "Eco-oriented pedagogical technologies"); production and

practical publications "Digest of courses to improve the environmental competence of teachers, pupils and students", "Eco-oriented technologies of vocational training", "Collection of environmental projects"; analytical reports on the results of comparative analysis of curricula for teachers of economics for the system of vocational education in higher education institutions of Ukraine and abroad; model of practice-oriented training of teachers of vocational education and training and methodological recommendations for its improvement; the results of a nationwide survey on the current state of management of vocational training for teachers; roadmap for changes in the management of teacher training for the modern system of vocational education in Ukraine, etc. In 2021, a cooperation agreement was signed with the European Institute of Continuing Education (EIDV) in Slovakia, according to which the Institute's staff will undergo research, improve their skills in accordance with international programs and obtain European-style certificates.

The Institute is an active organizer, co-organizer and participant of numerous mass events, which address current issues of development of domestic systems of professional, professional prehigher and higher education. Nearly 100 of them are international (Video Conference Archive, 2021). Cyclical mass scientific and practical events have gained wide recognition among the scientific and pedagogical community: *international conferences*: "Professional training of staff – a European choice", "Professional education in the sustainable development of society", "Professional development of personality: problems and prospects", "Modern information technologies and innovative teaching methods in training: methodology, theory, experience, problems", "Technological and professional education: problems and prospects"; *all-Ukrainian scientific-practical conferences*: "Scientific and methodological support of vocational education and training" (report), "Theory and practice of distance learning in vocational education", "Professional pre-higher education: current challenges and prospects for development"; *web-conference* "Actual problems of professional development of masters of industrial training of vocational (professional-technical) education"; *all-Ukrainian scientific-practical seminars*: "Development of research competence of young scientists in the context of harmonization of Ph.D. training systems in the EU", "Modernization of educational programs: experience and challenges of today", "Training of vocational training teachers:

problems and prospects". Since 2016, the Institute organizes and successfully conducts an all-Ukrainian competition for the best electronic educational resource "Planet-IT" in the following categories: electronic textbooks, manuals, workshops; distance learning courses; SMART complexes.

Particular attention was paid to the search for effective theories and practices for the development of business activity of educational entities; development of effective algorithms for pedagogical design in the innovative educational space of Ukraine and features of the use of digital technologies; substantiation of practical aspects of professional development and career growth of educators, teachers and scientists in a market economy, analysis of trends in modern vocational and professional prehigher education, discussion of models and methods of training competitive skilled workers and VET teachers, etc. This contributed to the advanced development of vocational education institutions; substantiation of priority directions of interaction of science and educational practice, experience of introduction of project management in professional training of future skilled workers; establishing priority areas for professional development and career growth of subjects of educational institutions, the development of partnerships between institutions of higher, secondary and vocational education in Ukraine and abroad, etc.

In 2020-2021, a major challenge for the Institute's activity was the COVID-19 pandemic and the long-term quarantine caused by it, which hindered the implementation of experimental activities, in particular, training with teachers and students of educational institutions, testing and surveys. At the same time, to solve the quarantine-related organizational problems, mechanisms have been developed for the implementation of remote work and reporting of researchers, online accounting of working hours has been created, electronic document management and online communication with educational institutions, etc. have been improved.

To ensure the effectiveness of the educational component of the Institute during the quarantine period, the capacities of its own distance learning system (SDL) were used, namely: to conduct classes and consultations with Masters and Postgraduate students, present and discuss research results, provide the individual educational trajectory of students, the implementation of automated enrollment in elective courses, etc.

Researchers of the Institute also conducted a series of thematic all-Ukrainian scientific and practical webinars for teachers of vocational (professional and technical), professional prehigher and higher education to organize work during quarantine restrictions. Among them: "Improving the environmental competence of teachers of vocational education institutions through distance learning courses", March 23, 2020 (<https://youtu.be/A1L5OC1oBk0>); "Organization of distance learning in vocational education institutions", March 24, 2020 (<https://youtu.be/zijmC0nL5wU>); "Organizational and pedagogical conditions of distance vocational training", March 26, 2020 (<https://www.youtube.com/embed/wP4eW1e7joc>); "We are together: psychological support for students and teachers during quarantine", March 27, 2020 (<https://www.youtube.com/watch?v=cCfKfJbCvE>); "Self-educational activity of a teacher in the conditions of distance learning", March 30, 2020 (<https://www.youtube.com/embed/wP4eW1e7joc>); "Methods for assessing the complexity of educational activities in institutions of professional higher education", March 31, 2020, (<https://youtu.be/Gcc2g8U28rM>); "Creation of SMART-complexes in the distance learning system", April 2, 2020 (<https://youtu.be/6afPQ2T4y8Y>); "Psychological prevention of panic during quarantine", April 7, 2020 (<https://youtu.be/SKF8YC9zVIQ>); "Main factors of selection and design of innovative learning technologies", April 8, 2020 (<https://youtu.be/Hdsi4KC-t7M>); "Application of mobile applications in distance learning", April 10, 2020 (https://youtu.be/_3GDMvibm9E); "Distance learning technologies in the training of skilled workers of the new formation", May 20, 2020 (<https://www.youtube.com/watch?v=VxcJDFFK83c>); "Development of the content of the program of distance learning courses for future masters of industrial training", May 6, 2020 (<https://youtu.be/sfyYHFmOnxM>); 1. "Methods of using" Google Classroom ", June 1, 2020 (<https://youtu.be/XDEoXgAQg5A>); "The practice of organizing independent work of students by distance

means", June 4, 2020 (<https://youtu.be/9iiKeCIVslc>); "Application of CAD software in the training of future professionals", June 15, 2020 (<https://youtu.be/-f2q0PnZuBQ>) and many others, videos of which are presented on the website of the Institute.

Conclusions. Summarizing the results of the Institute of Vocational Education and Training of the National Academy of Educational Sciences of Ukraine, it is worth focusing on the most important areas of its further development. The team of the scientific institution sees its main mission in further development of:

scientific activity (implementation of fundamental and applied research on topical issues of development of domestic vocational education and ensuring its quality; system integration of education, science and practice; creation of innovative educational technologies and educational products; promotion and commercialization of intellectual and technological projects);

public-private partnership in the field of vocational education (formation of state policy in the field of vocational education at all levels; development of professional standards, educational standards and educational programs; formation of the National Qualifications System and improvement of the National Qualifications Framework; introduction and dissemination of dual education; creation of modern educational environment, in particular in the centers of professional excellence; systematic monitoring of employment of graduates of vocational education institutions; formation of state and regional orders for training based on forecasting labor market needs in vocational qualifications; evaluation of learning outcomes of graduates of vocational and professional prehigher education institutions);

international activities (development of internship programs; involvement of foreign teachers and scientists in the implementation of educational programs and research; creation of international research teams; introduction of double degree programs; participation in international academic mobility programs; intensification of participation in international educational and research projects).

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ДІЯЛЬНІСТЬ ІНСТИТУТУ ПРОФЕСІЙНО-ТЕХНІЧНОЇ ОСВІТИ НАПН УКРАЇНИ В УМОВАХ СУЧАСНИХ ВИКЛИКІВ

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Реферат.

Актуальність зумовлена необхідністю популяризації результатів наукової, освітньої, інформаційно-аналітичної, консультативно-дорадчої діяльності єдиної в Україні наукової установи, що здійснює науково-методичний супровід вітчизняної професійної та фахової передвищої освіти, що перебувають у стані реформування.

Мета: охарактеризувати сучасні виклики й ризики для системи професійної та фахової передвищої освіти, висвітлити основні результати діяльності Інституту професійно-технічної освіти Національної академії педагогічних наук України (далі: ІПТО НАПН України) у 2021 р. та перспективи його подальшого розвитку.

Методи: теоретичні (аналіз, синтез, узагальнення); емпіричні (вивчення законодавчих та нормативно-правових документів у сфері професійної та фахової передвищої освіти, аналіз результатів діяльності структурних підрозділів ІПТО НАПН України та матеріалів, оприлюднених на його офіційному сайті та сайті фахового журналу «Професійна педагогіка»).

Результати: Інститут професійно-технічної освіти НАПН України представлено як єдину наукову платформу, що забезпечує науково-методичний супровід модернізації сучасної професійної та фахової передвищої освіти; проводить наукові дослідження з актуальних для професійної та фахової передвищої освіти проблем; розробляє і впроваджує в закладах освіти педагогічні інновації (концепції, методичні системи, методики, технології тощо); здійснює інноваційну освітню діяльність різних рівнів; готує висококваліфіковані кадри для професійної, фахової передвищої та вищої освіти за спеціальностями 011 Освіта. Педагогіка та 015 Професійна освіта (за спеціалізаціями); займається видавничою, інформаційно-аналітичною та експертною діяльністю; активно розвиває міжнародні наукові зв'язки, бере участь у міжнародних науково-освітніх проєктах; системно впроваджує принципи прогностичності, академічної свободи, доброчесності, студентоцентризму. Охарактеризовано основні виклики й ризики у діяльності наукової установи, виявлено її актуальні завдання та шляхи їх розв'язання.

Висновки: охарактеризовано основні *виклики* системі професійної освіти (посилення світових інтеграційних процесів, стрімкий розвиток цифровізації, націоналізації, екологізації, інтернаціоналізації професійної підготовки майбутніх фахівців у розвинених країнах світу); проаналізовано зумовлені ними *ризики* (централізовану й бюрократизовану систему управління у сфері наукової і науково-технічної діяльності; недостатні обсяги фінансування соціогуманітарних досліджень; низький рівень оплати праці науково-педагогічних працівників; зниження престижності професійної освіти; нерозвиненість дуальної освіти); на основі аналізу діяльності ІПТО НАПН України у 2021 р. визначено *перспективні напрями* подальшого розвитку наукової установи (виконання фундаментальних і прикладних досліджень, зміцнення принципів академічної доброчесності; удосконалення освітніх програм підготовки магістрів і докторів філософії; запровадження модульних програм підвищення кваліфікації педагогічних працівників закладів професійної та фахової передвищої освіти); розвиток корпоративної культури інституту та його міжнародної діяльності); окреслено *основні завдання* наукової установи (забезпечення якості професійної та фахової передвищої освіти; сприяння розвитку державно-приватного партнерства; удосконалення системи підготовки педагогічних працівників у сфері професійної освіти і навчання тощо).

Ключові слова: *Інститут професійно-технічної освіти НАПН України, професійна освіта, наукова, освітня, експериментальна, видавнича, міжнародна, інноваційна освітня діяльність.*

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RESULTS OF DIAGNOSING THE LEVEL OF DEVELOPMENT OF THE COGNITIVE COMPONENT OF THE PROFESSIONAL COMPETENCE OF CIVIL SECURITY SPECIALISTS

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Abstract.

Relevance: The need to develop the professional competence of specialists in civil security is determined by the tasks of increasing the capacity and strengthening the operational readiness of civil defense forces to ensure the stability of the state during crisis situations of various origins. The readiness of these specialists for professional activity is a personal basis of their professionalism, which must be developed in the context of postgraduate education.

Aim: to analyze the development of the cognitive component of the professional competence of specialists in civil security in the system of postgraduate education.

Methods: theoretical (systematization of scientific and pedagogical literature); complex (analysis and synthesis); empirical (study and analysis of pedagogical experience, questionnaires, expert evaluation); mathematical; statistical.

Results: the development of the cognitive component of the professional competence of specialists in civil security in the process of improving their professional skills is analyzed.

Conclusion: there is a need to create and implement the author's pedagogical system of professional development of specialists in civil security in order to increase the level of development of their professional competence.

Keywords: *advanced training of specialists; civil security, postgraduate education, professional competence*

Introduction. Due to the significant risk of emergencies, in particular the armed conflict in the east of our country, the problem of improving the professional competence of civil security professionals is acute. The readiness of specialists for professional activity is the personal basis of their professionalism, which must be developed in the context of postgraduate education. The practice of professional development of this category of specialists, as shown by the diagnostic study of its condition, is quite controversial and requires a thorough study of the features and

experimental confirmation of existing problems (Mykhailov, 2020).

Sources. Theoretical analysis of the researched problem was carried out on the basis of scientific works on professional training of specialists in the field of security (P. Volyansky, I. Kobylanska, M. Kozyar, M. Koval, O. Kosolapov, R. Kravchenko, E. Litvinovsky, Y. Nenko, O. Povstin, O. Samoilenko, R. Sirko, Y. Taimasov, A. Terentyeva, V. Yurchenko and others). The results of scientific research (I. Anosov, L. Baiborodova, S. Honcharenko, L. Zhuk, A. Novikov, D. Novikov, I. Obraztsov, V. Tusheva, A. Chernyavska,

F. Chmilenko and others) show a significant amount of scientific works on the organization, conduct and processing of experimental results and confirm the importance of organizing and conducting empirical research. However, the process of developing the professional competence of civil security specialists in the process of improving their professional skills requires further study.

The article aim to analyze the development of the cognitive component of professional competence of civil security specialists in the system of postgraduate education.

Methods: theoretical (systematization of scientific and pedagogical literature, analysis and synthesis); empirical (study and analysis of pedagogical experience, questionnaires, expert evaluation); mathematical; statistical.

Results and discussion. Professional competence of civil security specialists is an integrated characteristic of the individual, which reflects the level of professional knowledge, skills and abilities based on the components of civil protection, and affects the success of professional activity (Mykhailov, 2020). It was found that the components of professional competence of the studied category of specialists are cognitive (theoretical and technological knowledge), activity (analytical and synthetic skills, managerial and communicative knowledge and skills) and personal values (professionally important personality traits). In turn, it provides a variety of forms and methods of pedagogical influence on professionals in order to improve their skills (Mykhailov, 2021). Therefore, the complexity and multifaceted nature of the subject we studied determined the need for a comprehensive pedagogical experiment.

The experimental study involves: studying the current state of the problem of professional development of specialists in civil security in pedagogical theory and practice; development and substantiation of the author's model of advanced training of civil security specialists; development of conceptual bases of research; diagnostics of key issues in the context of advanced training of civil security specialists; conducting a formative experiment and clarifying the pedagogical feasibility and effectiveness of the concept, content, methods and technologies of training specialists in civil security; confirmation of the hypothesis by methods of mathematical statistics (Honcharenko, 2008).

At the ascertaining stage of the experiment, there was a questionnaire filled out by 42 respondents who took part in advanced training in civil security educational institutions. The survey

results were processed using the average value as a generalized characteristic of a qualitatively homogeneous population on a certain quantitative basis - the calculation of the average quantitative characteristics of correct and incorrect answers to questions about professional theoretical and technological knowledge, analytical, synthetic skills, management, communication and professional skills used by them in the process of professional activity.

The arithmetic mean of these parameters is an indicator of the level of cognitive and activity components of professional development and at the same time an indicator of the effectiveness of the author's methodology. This value is calculated by formula 1 (Obraztsov, 2004):

$$X = \frac{X_1 + X_2 + X_3 + X_4 + \dots + X_n}{N} = \frac{\sum_{i=1}^n X_i}{N} \quad (1)$$

where X – an arithmetic mean;

X₁, X₂, X₃, ... X_n – results of individual observations (sign values);

N – number of observations;

∑ – the sum of the results of all observations.

In the course of the study of the levels of development of the cognitive component of professional development of civil security specialists, the methods of the final generalization of data were used. To measure the level of development of the cognitive component of professional competence of specialists in civil security to pedagogical impact, the diagnosis is made on a relative scale of the results of mastering the relevant training courses: 0-33% – low level of professional knowledge; 34-66% – the average level of professional knowledge; 67-100% – high level of professional knowledge. Analytical grouping of data contributed to the establishment of relationships between professional theoretical and technological knowledge in the cognitive component of professional competence of civil security professionals, their interdependence in accurate calculation.

The obtained data on the development of the cognitive component are summarized in table 1.

The graph (*Fig. 1*) shows the synergy of components of theoretical and technological professional knowledge, which form a cognitive component of professional competence of specialists in civil security.

Results of the comparative analysis of development of a cognitive component of professional competence of experts on questions of civil safety at a statement stage of pedagogical experiment

| Theoretical knowledge | | |
|-------------------------|---------------|------------|
| Low level | Average level | High level |
| 11,9 % | 69,06 % | 19,04 % |
| Technological knowledge | | |
| Low level | Average level | High level |
| 19,04 % | 50,01 | 30,95 % |

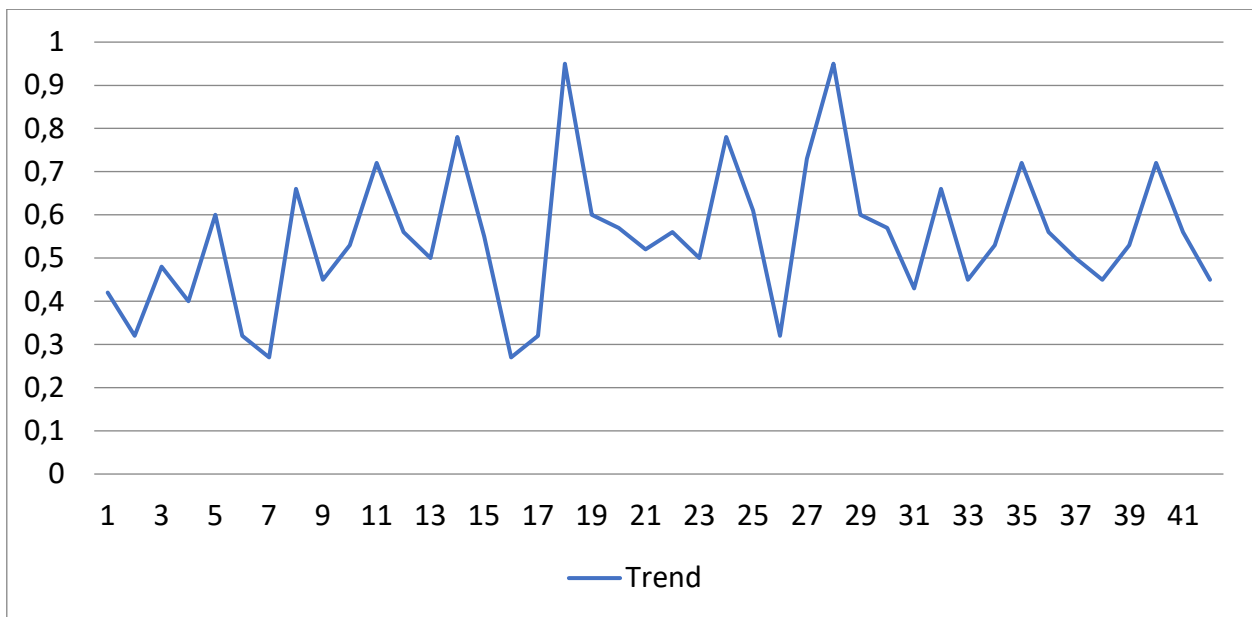


Fig. 1. Graph of indicators of levels of development of the cognitive component of professional competencies of specialists in civil security.

Diagnosing the levels of development of the cognitive component of professional competence of civil security professionals shows that 16.8% of respondents had a low level of development ($0 < \text{Effective Development} \leq 0.33$), 66.6% of respondents had a medium level of development ($0.34 \leq \text{Effective Development} \leq 0.66$), high - 16.6% of respondents ($0.67 \leq \text{Effective Development} < 1.0$).

Conclusions. The results of the observational

experiment indicate an insufficient level of development of the cognitive component of professional competence of civil security specialists. This suggests that most professionals who implement civil security tasks in government (enterprises, institutions, organizations) need to improve professional knowledge, skills and personal qualities, which is possible through the creation and implementation of author's pedagogical system of training specialists in civil security field.

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РЕЗУЛЬТАТИ ДІАГНОСТУВАННЯ РІВНЯ РОЗВИТКУ КОГНІТИВНОГО КОМПОНЕНТА ПРОФЕСІЙНОЇ КОМПЕТЕНТНОСТІ ФАХІВЦІВ З ПИТАНЬ ЦИВІЛЬНОЇ БЕЗПЕКИ

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Реферат.

Актуальність: потреба розвитку професійної компетентності фахівців з питань цивільної безпеки визначається завданнями підвищення спроможності та посилення оперативної готовності сил цивільного захисту щодо забезпечення стійкості держави під час кризових ситуацій різного походження. Готовність цих фахівців до професійної діяльності є особистісною основою їх професіоналізму, яку необхідно розвивати в умовах післядипломної освіти.

Мета: проаналізувати розвиток когнітивного компонента професійної компетентності фахівців з питань цивільної безпеки в системі післядипломної освіти.

Методи: теоретичні (систематизація науково-педагогічної літератури); комплексні (аналіз і синтез); емпіричні (вивчення та аналіз педагогічного досвіду, анкетування, експертне оцінювання); математичні; статистичні.

Результати: проаналізовано розвиток когнітивного компонента професійної компетентності фахівців з питань цивільної безпеки у процесі підвищення ними своєї професійної кваліфікації.

Висновки: виявлено необхідність створення та впровадження авторської педагогічної системи підвищення кваліфікації фахівців з питань цивільної безпеки з метою підвищення рівня розвитку їхньої професійної компетентності.

Ключові слова: *підвищення кваліфікації фахівців; цивільна безпека, післядипломна освіта, професійна компетентність.*

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TRAINING OF FUTURE SPECIALISTS FOR ENTREPRENEURIAL ACTIVITY: REALITIES AND PROSPECTS

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Abstract.

Introduction: The urgency is due to the objective need to solve the problem of training future professionals for entrepreneurship, which involves the implementation of innovative, and in particular entrepreneurial initiatives of citizens, the formation of a "comfortable business climate". This will contribute to the economic progress of the Ukrainian.

Purpose: to analyze the current state of training of future specialists in non-economic specialties for entrepreneurial activity, to highlight its main achievements, obstacles and to predict the prospects for the development of entrepreneurial ability in young students VET.

Methods: general theoretical methods of analysis and synthesis of scientific works, comparison and generalization of conceptual views on the research problem.

Results: On the basis of understanding the course and results of democratization and market transformation of the national economy in the Ukrainian state, the need to reform the training of students for entrepreneurship as professionals who must have a high level of professional and key competencies, be deeply acquainted with theories and theories, fluent in techniques and techniques of self-management and navigate in the economic and legal space of entrepreneurial activity, as well as be able to predict and objectively assess the degree of risk of each situation of entrepreneurial activity; *generalized* the need to take into account social factors in the process of reforming vocational and entrepreneurial education of future professionals: reducing population activity and reducing production due to the COVID-19 pandemic and the introduction of quarantine measures; change of priorities in motivation of business activity and behavior of citizens (the motive of caution became the determining motivator of professional activity of experts); *analyzed* the realities of preparing young people for entrepreneurship, related to the development of the introduction of: educational standards for specific professions, educational programs, educational publications, organization and conduct of mass events, online courses, classes, competitions, etc.; *stated* that the purpose of creating these developments is to ensure quality training of applicants of different levels of education for entrepreneurship, as well as the development of entrepreneurship as one of the key competencies; *it was found* that the preparation of students to start their own business is sporadic, and as a result - we have slight changes in the levels of entrepreneurial competence of pupils and students; Insufficient level of special knowledge in the field of market economy and lack of experience of entrepreneurial activity of teachers also reduces the effectiveness of training students for entrepreneurship; real acquaintance of students with the nature of entrepreneurial activity takes place mostly in the system of extracurricular and, in particular, non-formal education.

Conclusions: it is generalized that in the modern scientific and educational space the main purpose of preparing students for entrepreneurship is their acquaintance with the essential nature of this activity, the acquisition of basic knowledge and relevant skills; found that the most important means of developing the ability of subjects to start their own business and successful entrepreneurship is their initial experience as a determining factor in the choice of graduates of general secondary education in such areas of professional activity, which would be associated with entrepreneurship; it is substantiated that the overarching idea of the methodology of development of entrepreneurial competence of future specialists in vocational education institutions is the activation, manifestation and improvement of individual and

personal qualities for successful entrepreneurial activity; proved that as a result of shifting the emphasis from the actual teaching and learning activities of teachers to activate the mechanisms of cognitive activity and creative independence of students, in the educational process provides their mastery of algorithms and ways to independently construct the trajectory of personal growth.

Keywords: *vocational education, entrepreneurship, entrepreneurial activity, preparation for entrepreneurship.*

Introduction. At the end of 2019, the fundamental basis for qualitative economic progress of the world's countries was formed, the key priority of balanced human and social development in Ukraine was recognized as the creation of a human – centered model of economic development, and its main driving force is the effective implementation of the creative potential of the nation (Ukraine 2030, p. 73 Єршова, 2018). The essence of the economic dimension of human creativity is “to identify its impact on entrepreneurship, generate and stimulate innovation, increase productivity and economic growth” (Ukraine 2030, p. 113). In this context, the position of the President of the National Academy of Pedagogical Sciences of Ukraine Vasyl Kremen regarding the “formation of an innovative person” is extremely important. The philosopher, based on the analysis and generalization of the results of monitoring and analytical studies of the Atlantic Council, identifies the following difficulties in the social development of Ukraine: “the nation is rapidly shrinking and aging; the birth rate is significantly lower than the level necessary for normal reproduction of the population; the number of working-age population is decreasing; labor migration is growing, especially vulnerable is the fact that Ukraine is losing intellectual capital; there is a deterioration in the health status of citizens and the quality of their education” (Kremen, Luhovyy & Saukh, 2020, p. 1-2). Such phenomena lead to a shortage of “innovative human capital in all sectors of the economy” (Kremen, Luhovyy & Saukh, 2020, p. 2). Consequently, the problem of training future specialists for entrepreneurial activity is being updated, which provides for the implementation of innovative, and in particular entrepreneurial initiatives of citizens, the formation of a “comfortable business climate” that contributes to the economic development of Ukraine.

Sources. In the modern scientific and educational space, a number of economic theories, concepts are substantiated, the genesis of the formation of entrepreneurship in Ukraine and the world is revealed (Z. Varnalii, L. Yershova, A. Karsrud, R. Kiyosaki, T. Lazanska, S. Pryshchepa, O. Romanovskyi, etc.); the main mechanisms of entrepreneurship and driving sources of business are clarified from the standpoint of identifying the advantages and risks of interaction in

different social groups (O. Ivashchenko, M. Telovata S. Farenyk, R. Umierov, etc.); individual and organizational features of successful running of own business, productive communicative interaction, employee cohesion and team formation are defined and characterized (L. Bazyl, D. Zakatnov, L. Karamushka, S. Kovi, O. Kredentser, S. Maksymenko, V. Orlov, N. Pobirchenko, N. Khudiakova, etc.); psychological characteristics of entrepreneurial behavior are revealed and its models are designed (M. Bazunova, V. Moskalenko, Yu. Pachkovskiy, R. Khizrych, etc.); justified theoretical and methodological bases of preparation of applicants of different levels of education for entrepreneurial activity (D. Aistrakhanov, S. Aliksieieva, M. Vovkovinskyi, I. Hrytsenok, V. Madzigon, A. Moldovan, M. Tkachenko, O. Protsenko, R. Shcherbyna, etc.), as well as concepts and methods of developing entrepreneurial competence of specialists of various specialties (Yu. Bilova, O. Klymko, V. Kolot, G. Matukova, H. Nazarenko, M. Strelnikov, etc.).

Purpose of the article is to analyze the current state of training future specialists of non-economic specialties for entrepreneurial activity, identify its main achievements, obstacles and predict the prospects for developing the ability to do business in students of Vocational (Vocational and Technical) Education Institutions.

Methods. To achieve this goal, general theoretical methods of analysis and synthesis of scientific works, comparison and generalization of conceptual views on the problem under study were used.

Results and discussion. The increased public attention to entrepreneurship as an effective form of small business is a natural, socially significant and justified phenomenon, because it is possible to solve acute socio – economic problems by promoting the successful functioning of small and medium-sized businesses. The processes of democratization of Ukrainian society and market transformation of the national economy make it necessary to modernize the functions of entrepreneurship, and therefore train representatives of various specialties, including: non-economic specialists who have a high level of

professional and key competencies, are deeply familiar with management theories and practices, know the techniques and methods of self-management, are freely oriented in the economic and legal space of entrepreneurial activity, are able to predict and objectively assess the degree of risks and make an adequate management decision in each situation. (Alyeksyeyeva et al., 2020; Yershova, 2017).

However, due to the pandemic and the introduction of quarantine measures for the COVID-19 disease, there is a decrease in population activity and a reduction in production, there is a change in priorities for motivating business activity and people's behavior. In particular, the determining motivator of professional activity of specialists was the motive of caution, and not economic expediency. Changes in a person's preferences for professional work, everyday life and business needs, radically transforming consumer supplies, affected the state of production of goods and the list of services provided. In addition to this, there was an increased demand for the provision of services in digital format, in particular for trade and business, which was due to the transition of enterprises to forms of remote, home-based work and distance learning. Thus, in 2020-2021, the share of retail trade in the Internet network almost doubled (from 1.2% in 2019 to 2.1% in 2020 of the total number of retail trade), and the volume of non-cash payments exceeded 36% of all retail trade volumes in Ukraine. Due to the growth rate of digitalization processes, the progress of introducing digital technologies into economic processes accelerated by 1.5 years (the level of digitalization of the Ukrainian economy, according to the Ministry of Economy, was 5.3%, which corresponds to the

projected level of mid-2023 under pre-pandemic conditions). In this regard, there are new opportunities for business entities to optimize business processes (adaptation of business entities to the new motivation of the population, reducing operating costs, widespread introduction of digital technologies in production processes, reducing the cost of goods and services, increasing labor productivity of employees), development of industrial enterprises, and greening of public activities. Consequently, the recovery of economic activity of citizens and a slowdown in GDP decline became natural. According to statistics from the State Statistics Service, GDP in the third quarter of 2020 decreased by 3.5% compared to the third quarter of 2019, and in the fourth quarter – by 0.5%. Seasonally adjusted GDP in the third quarter of 2020 compared to the second quarter of 2020 increased by 8.5 %, in the fourth quarter of 2020 compared to the third quarter of 2020 – growth of 0.8%. This indicates a transition to the gradual establishment of production activities and adaptation of economic entities to sudden changes in conditions both within the country and abroad. In general, in 2020, GDP decreased by only 4%, which is significantly less than most experts predicted and than was budgeted by the Government (4.8 %). Based on the study and generalization of statistical data on the economic development of Ukraine, real GDP in the fourth quarter of 2021 increased by 1.8% compared to the previous quarter (taking into account seasonally adjusted factor), and by 5.9% compared to the fourth quarter of 2020. In addition, since 2019, despite the existing economic problems and political difficulties, there has been an objective increase in the number of Business Objects, which is graphically represented in the diagram (Fig. 1).

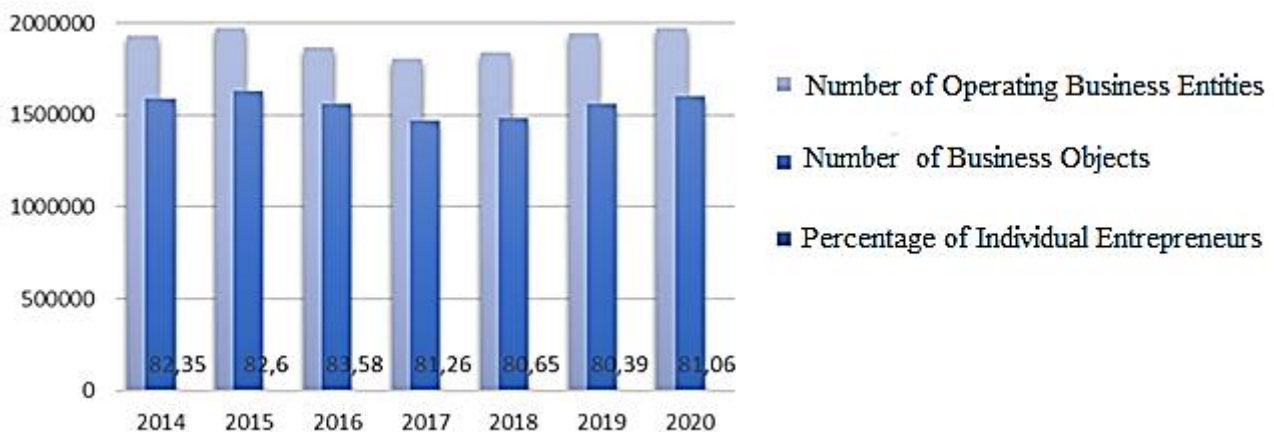


Fig.1 Dynamics of Operating Business Entities (2014-2020)

The study of scientific works and monitoring studies on the state of business entities and summarizing the results of theoretical analysis have identified the main factors in the dynamics of small and medium-sized businesses: current reforms related to deregulation, public procurement; improvement of the legal framework and unification of bankruptcy procedures in the world; changes in the national institutional and legislative policy on small and medium enterprises; development and implementation of concepts, models, technologies and methods of development of entrepreneurial and key competencies, in particular the entrepreneurship of applicants at different levels of education. Taking into account the selected circumstances, scientists, educators and employers began to develop educational standards for specific professions, which, among other things, provide for the formation of entrepreneurial competence (Ministry of Education and Science of Ukraine, 2021); to conclude educational programs (for example, "Fundamentals of Innovative Entrepreneurship" (Alyeksyeyeva et al., 2019; Bazyl and Yershova, 2020); to create numerous educational publications; (author-compiler: G. Karpyuk); "Fundamentals of economic literacy and entrepreneurship" (authors: S. Alyeksyeyeva, L. Bazyl, I. Hrytsenok, D. Zakatnov, etc.), methodical manual "Entrepreneurial competence of future professionals" (authors: S. Alyeksyeyeva, L. Bazel, L. Yershova, etc.); methodical recommendations "From business idea to entrepreneurial success" (authors: V. Baidulin, I. Hrytsenok).

The purpose of creating these developments was to ensure quality training of students of different levels of education in entrepreneurship, as well as the development of entrepreneurship as one of the key competencies in accordance with the European Framework Program of Key Competences (European Commission, 2018). When developing a new State Educational Standard, Training Framework and Teacher Training Programs the EU Framework Programs for Training Entrepreneurship Competencies and Key Digital Competences EntreComp and DigiComp. Promoting entrepreneurial skills is also part of the action Plan to Support the SMEs Development Strategy 2020.

The implementation of the state reform of the New Ukrainian School was launched in 2017. The National Pilot Program was launched from the first grade of Primary School in the 2017/2018 academic year in 100 primary schools in different regions. Subsequently, the Pilot Program was introduced on a national scale in the 2018/2019 academic year,

while on the basis of a similar model, the Pilot Program was simultaneously launched in the second grade; the implementation of the reform will continue and fully extend to the 12-year education system using a competence-based approach. In order to be able to teach under the new competence-based training program, in which entrepreneurship is a key competence, teachers are simultaneously retrained. In 2018, with the support of the European Foundation for Education (EFE), 50 trainers from the country's teacher Development Institutes and 25 NUS regional coordinators were trained in a key competence-based approach and retrain other teachers. It is important that the professional development of teachers continues in the future and is focused on the results of the competence-based training program using teaching methods that are primarily focused on the needs of students. At the same time, future teachers should also be fully prepared for the new teaching method as part of the NUS reform. Existing tools used to monitor the implementation of key competencies have formed the basis for preparing reports on the impact of student-centric teaching methods on students, teachers, and schools. Careful monitoring is carried out through surveys and with the involvement of focus groups consisting of teachers, parents, school principals and other interested parties who participated in the reform of the New Ukrainian school. However, systematic monitoring and a program to assess the formation of key competencies within the entire education system are still lacking. The introduction of a competency-based curriculum at the system level has begun in the field of Vocational Education (VE). Such a program was prepared by scientists of the Institute of vocational education of the National Academy of Sciences of Ukraine "Fundamentals of Innovative Entrepreneurship" and from 2019 is being introduced in the Vocational (Vocational and Technical) Education Institutions in most regions of Ukraine.

The New Standard of Higher Education provides for key entrepreneurial competence, but it has not yet been implemented in all faculties at all universities. At the same time, there are many successful examples in higher education when students gain entrepreneurial experience. In particular, to ensure the formation of an innovative culture of entrepreneurship among students of 25 Higher Educational Institutions, together with the NGO "Platform for Innovative Partnership", the Ministry of Education and Science of Ukraine has created business clubs that systematically conduct

advisory classes and trainings (for example, the information day for SMEs “Opportunities and Challenges of Project Activities for the development of Small and Medium-Sized Businesses in the Region” in 2018 (EUREKA Information Day). At the 4th All-Ukrainian Innovation Festival in 2019 a round table was held on the development of academic entrepreneurship in Higher Educational Institutions and Scientific Institutions of Ukraine. To improve partnership between Higher Education Institutions and Enterprises, the Center for the Development of Corporate Social Responsibility organized the Annual National Forum “Business and Universities”.

For the development of self-employment and entrepreneurship, an action plan for the implementation of the Concept of the State Professional Orientation System has been introduced since 2019. The plan includes entrepreneurship in the professional orientation for young people and provides for the creation of youth centers to encourage entrepreneurship among young people by providing consulting services, holding events for establishing business connections and competitions among young entrepreneurs. In addition, the State Employment Service provides vocational guidance services and conducts entrepreneurship courses, including vocational training for registered unemployed persons in the basics of entrepreneurship. In general, Ukraine invests in the formation of an entrepreneurial mentality among citizens through formal and non-formal education and training (for example, by organizing various awards and competitions for the best entrepreneurial idea or the best business plan for startups). Students of many Higher Education Institutions learn creative entrepreneurship, participate in online courses on entrepreneurship, pitching business ideas, and so on.

In addition, the content of the Internet network is full of hundreds of videos and presentations from businesspersons, scientists about the essence and functions of entrepreneurship, business and entrepreneurship, forms, methods and mechanisms of starting and successfully running your own business, algorithms for developing business plans, “road maps” of starting your own business, etc. Many publications talk about the peculiarities of the formation and development of entrepreneurship, entrepreneurial competence, and individual qualities of a successful entrepreneur’s personality. Numerous psychological and pedagogical studies describe the individual and personal qualities of a successful entrepreneur and businessman, offer

interesting diagnostic methods for identifying them, effective models, technologies, methods, techniques and means of preparing applicants of different levels of education for entrepreneurial activity.

According to the results of comprehensive surveys and the use of numerous methods of psychological and pedagogical diagnostics of applicants for Professional Education, conducted by practical psychologists of the Vocational (Vocational and Technical) Education Institutions, basically all students plan their own future in advance. Generalization of empirical data allows us to state that more than 42% of future qualified workers are determined to work in the profession they are mastering at the employer's Enterprise; a third of students (29 %) intend to start their own business and almost the same number plan to continue receiving Higher Education. Therefore, it is important for teachers to provide appropriate conditions for the development of individual and personal qualities of applicants for professional education, which will contribute to their professional and life success in no case trying to “transform” their entrepreneurs. For this purpose, it is desirable, firstly, to analyze the ideas of young students about a successful person; secondly, to convince them of the fallacy of the stereotype of success spread in the mass media, based on material and financial support; third, teach them to apply “SMART-Goal Formulation Technology”, identify ways and resources to achieve goals and apply them accordingly; fourth, help each student identify character strengths, understand their personality, peculiarity and encourage them, relying on these strong qualities, to achieve “their success” in the most comfortable environment (hired work, training, entrepreneurship). The quintessence of this approach is to reject the stereotype of identifying the weaknesses of a person’s character and their development to the level of a generally recognized standard and promote the idea that a person who is aware of their strengths can successfully realize themselves, practically applies the “SMART-Goal Formulation Technology”, is able to determine the best ways to achieve the formulated goals and implement them in their own activities.

In this context, we emphasize our vision of the essence of entrepreneurship as an initiative, innovative, independent activity, carried out at our own risk to generate income with a social effect, based on planning and calculations and focused on the most effective use of available resources and production factors, the desire to realize the creative potential of a person.

In view of this, the ability to entrepreneurial activity in future skilled workers is concretized by the presence of such strong character qualities as initiative; search activity and perseverance; the desire for success; self-belief; purposefulness; reliability and honesty; communication and recognition of the importance of business relations; a stable conscious desire for self-improvement; hard work, which is expressed through business activity; experience; self-organization; creativity and non-standard thinking; consistency as the ability to systematize labor activity in order to achieve the maximum possible useful effect, taking into account the specific conditions of this activity.

To form a holistic view of the ability of applicants for professional education to engage in entrepreneurship, it is best to apply a set of adapted psychological diagnostic methods to determine the levels of formation of the above qualities. Of course, you can also use comprehensive questionnaires from Internet sources (in particular, the official website of the State Employment Service (URL: <http://profi.dcz.gov.ua/business-test-info/00da099c-657a-4f43-be3c-bde0d052aa75/>), the portal “Build Your Own” (URL: <https://buduysvoe.com/content/proydy-test-i-diznaysya>), tests adapted for the level of high school students, placed in school textbooks (for example, the textbook “Technologies (Standard Level)”, the author I. Yu. Khodzitska et al., 2019) and others. However, we note that it is unacceptable to “blindly copy” questionnaires and use diagnostic methods that are not adapted to local conditions and the level of individual and personal development of students. Therefore, at the stage of identifying the Vocational (Vocational and Technical) Education Institutions students’ ability to do business, it is important to involve practical psychologists of Educational Institutions.

To clarify the ideas of applicants for Vocational Education about a successful person and further discuss them, it is advisable to use the method of heuristic or Socratic conversation, brainstorming, search methods (“map of knowledge of a successful person”, “hypermarket of financial and economic knowledge”, “term from the box”, “labyrinth of entrepreneurship”, “editor of a financial and economic magazine”, “gallery of businessmen and their projects”, “find out who it is?”, facilitated discussion, etc.), as well as methods of reflection (“feelings”, “selfie of business”, “associative series”, “method of finding analogies”, etc.), game methods (“auction of ideas”, “my own entrepreneur”, etc.), methods using information

technologies (“student TV debates”, “e-portfolio”, creating a startup, etc.). In order to form students’ beliefs about the fallacy of the stereotype of success spread in society, based on material and financial support, it will be successful to use the method of Group Discussion, case analysis, “sessions: question-answer”, the method of “decision tree”, “aquarium”.

In the context of familiarizing future specialists with the “SMART-Goal Formulation Technology”, it is advisable to focus on its essence. Note that each letter of the abbreviation SMART characterizes the criterion of effectiveness of the formulated goals (“Specific” – concreteness; “Measurable” – measurability, “Achievable” – reachability, “Relevant” – significance, “Time bound” – time limitation). Let’s highlight the content of each of these criteria. The characteristic of “concreteness” means that each target instruction should be clearly defined as a specific result that the student would like to achieve. You will be able to define the goal concretely and clearly if you provide answers to questions such as: “What result would I prefer to get based on achieving the goal and why?”, “Who else is involved in the goal fulfillment process?”, “Are there any restrictions or additional conditions necessary to achieve the goal?”. The main rule in the formulation of a goal is “one goal – one result”. If the formulation of the goal of a vocational education applicant provides for the achievement of several results, then, accordingly, it is necessary to define several goals. The characteristic of “measurability” allows you to determine whether the goal has actually been achieved and to what extent. The answers to the following questions will help you formulate a measurable goal: “Under what condition can you assume that the goal has been achieved?”, “On the basis of what indicator can we say that the goal has been achieved?”, “What value should this indicator have in order to consider the goal fully achieved?”. The characteristic of “reachability” is the formulation of a goal that is objectively possible to achieve. This implies an adequate assessment of internal and external resources and affects the motivation of the student’s activities. If a person formulates an unattainable goal, then the probability of its fulfillment will be zero. The reach of the goal is determined in accordance with the available internal and external resources of the individual, their experience, as well as possible or existing restrictions (time, labor resources, investment, knowledge and experience of the performer, access to information sources, and the ability to make decisions independently) or additional

circumstances. The characteristic of “significance” is specified in terms of relevance and realism, that is, the set goal should have further application of the corresponding result. To formulate a meaningful goal, it is necessary to clearly understand what contribution to achieving the global strategic goals of the enterprise will be made through the implementation of a specific task. If achieving a goal does not benefit the firm, it will be considered unnecessary and will only mean lost time and resources. The characteristic of “time limitation” of goal formulation means that each goal setting must have a clearly defined deadline for implementation, and its violation will indicate that the goal is not fulfilled. Defining the time frame and limits for achieving the goal allows you to make the activity management process controlling. At the same time, the time frame should be determined taking into account the possibility of achieving the goal in a pre-set time frame.

Conclusions. Thus, in Ukraine, large-scale training of entrepreneurs for entrepreneurship and the formation of entrepreneurial mentality on the basis of formal and non-formal education and training (training, coaching, consulting, online courses, discussions, competitions for the best business idea or the best business plan for startups, etc.). Applicants for higher education master creative entrepreneurship, participate in the pitching of business ideas, etc.

At the same time, the preparation of students to start their own business and successfully conduct business in a particular field of social production, services is unsystematic and sporadic. As a result, we have small changes in the levels of entrepreneurial competence of pupils and students. In addition, the lack of specialized knowledge in the field of market economy and lack of experience in entrepreneurship of teachers also reduces the

effectiveness of training students for entrepreneurship.

That is why the real acquaintance of students with the nature of entrepreneurship, according to the fair considerations of many modern researchers, takes place in the system of extracurricular and, in particular, non-formal education. The most important means of developing the ability of subjects to start their own business and successfully conduct business is their initial experience as a determining factor in the choice of graduates of general secondary education in such a field of professional activity that would be associated with entrepreneurship. The overarching idea of the methodology for the development of entrepreneurial competence of future professionals in vocational education institutions is the activation, manifestation and improvement of individual and personal qualities for successful entrepreneurial activity. As a result of shifting the emphasis from the actual teaching and learning activities of teachers to the activation of mechanisms of cognitive activity and creative independence of students in the educational process provides their mastery of algorithms and ways to independently construct the trajectory of personal growth.

Therefore, the mastering of the content and mechanisms of implementation of the “SMART-Goal Formulation Technology” by applicants for Vocational Education will contribute to their successful self-realization and starting their own business, since it is a powerful tool for formulating effective target guidelines. This technology will allow you to summarize the available information at the goal setting stage, set acceptable deadlines for completing tasks, find out the sufficiency of resources, and provide all participants with clear, accurate, clear and specific tasks.

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ПІДГОТОВКА МАЙБУТНІХ ФАХІВЦІВ ДО ПІДПРИЄМНИЦЬКОЇ ДІЯЛЬНОСТІ: РЕАЛІЇ І ПЕРСПЕКТИВИ

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Реферат.

Актуальність зумовлена об'єктивною потребою розв'язання проблемних питань підготовки майбутніх фахівців до підприємницької діяльності, що передбачає реалізацію інноваційних, а зокрема підприємницьких ініціатив громадян, формування «комфортного бізнес-клімату». Це сприятиме економічному поступу Української держави.

Мета: проаналізувати існуючий стан підготовки майбутніх фахівців неекономічних спеціальностей до підприємницької діяльності, виокремити основні її здобутки, перешкоди й спрогнозувати перспективи розвитку здатності до підприємницької діяльності в учнівської молоді ЗП(ПТ)О.

Методи: загальнотеоретичні методи аналізу і синтезу наукових праць, зіставлення й узагальнення концептуальних поглядів із досліджуваної проблеми.

Результати: на підґрунті осмислення ходу і результатів процесів демократизації й ринкової трансформації національної економіки в Українській державі *обґрунтовано* необхідність реформування підготовки здобувачів професійної освіти до підприємницької діяльності як фахівців, котрі повинні мати високий рівень сформованості професійних і ключових компетентностей, бути глибоко обізнаними з теоріями та практиками менеджменту, вільно володіти техніками і прийомами самоменеджменту й орієнтуватися в економічно-правовому просторі підприємницької діяльності, а також бути здатними прогнозувати й об'єктивно оцінювати ступінь ризиків кожної ситуації підприємницької діяльності; *узагальнено* необхідність урахування суспільних чинників у процесах реформування професійної і підприємницької освіти майбутніх фахівців: зниження активності населення та скорочення виробництва, внаслідок пандемії COVID-19 і запровадження карантинних заходів; зміна пріоритетів у мотивації ділової активності й поведінки громадян (визначальним мотиватором професійної діяльності фахівців став мотив обережності); *проаналізовано* реалії підготовки молоді до підприємництва, що пов'язані з розробленням за запровадженням: освітніх стандартів з конкретних професій, освітніх програм, навчально-методичних видань, організацією та проведенням масових заходів, онлайн-курсів, навчальних занять, конкурсів тощо; *констатовано*, що метою створення цих напрацювань передбачено забезпечення якісної підготовки здобувачів різних рівнів освіти до підприємництва, а також розвитку підприємливості як однієї з ключових компетентностей; *з'ясовано*, що підготовка здобувачів освіти до започаткування власної справи є епізодичною, і як наслідок, – маємо незначні зрушення в рівнях сформованості підприємницької компетентності учнівської і студентської молоді; недостатній рівень спеціальних знань у сфері ринкової економіки і відсутність досвіду підприємницької діяльності педагогів також знижує ефективність підготовки здобувачів освіти до підприємництва; реальне ознайомлення учнів із природою підприємницької діяльності відбувається здебільшого в системі позашкільної і, зокрема неформальної освіти.

Висновки: узагальнено, що в сучасному науково-освітньому просторі провідною метою підготовки здобувачів освіти до підприємницької діяльності вважається їх ознайомлення із сутнісною природою цієї активності, набуття первинних знань і відповідних умінь; встановлено, що найбільш значущим засобом розвитку здібностей суб'єктів навчання до відкриття своєї справи і успішного провадження підприємницької діяльності слугує набутий ними первинний досвід практичної діяльності як визначальний чинник у виборі випускниками закладів загальної середньої освіти такої сфери професійної діяльності, котра була б пов'язана з підприємництвом; *обґрунтовано*, що наскрізною ідеєю методики розвитку підприємницької компетентності майбутніх фахівців у закладах професійної освіти є активізація, прояв і вдосконалення індивідуально-особистісних якостей для успішної підприємницької діяльності; доведено, що в результаті зміщення акценту з власне викладацько-навчальної діяльності педагогічних працівників на активізацію механізмів когнітивної активності й творчої самостійності учнів, в освітньому процесі забезпечується опанування ними алгоритмів і способів самостійного конструювання траєкторії особистісного зростання.

Ключові слова: професійна освіта, підприємництво, підприємницька діяльність, підготовка до підприємництва.

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