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INNOVATIVE ASPECTS OF IMPLEMENTATION OF UNIVERSITY STUDENTS' PROFESSIONALLY APPLIED PHYSICAL PREPARATION

Annotation. The article describes the innovative aspects of the process of building of university students' professionally applied physical preparation. Specialties, which are taught at the university, are systematized into four groups according to psychological and physical features of professional work. The benefits of innovative educational technologies are presented. The level of students' professionally applied physical preparedness can be increased, using developed didactic materials in the process of physical training.

Keywords: students; professionally applied physical preparation; innovative educational technologies; health-improvement technologies.

Аннотация. Кузнецова Е.Т., Зубрицкий Б.Д. Инновационные аспекты реализации професионально-прикладной физической подготовки студентов университета. В статье рассмотрены инновационные аспекты построения процесса профессионально-прикладной физической подготовки студентов университета. Специальности, по которым ведется обучение в университете, систематизированы в четыре группы с учетом психофизических особенностей профессиональной деятельности. Представлены преимущества инновационных образовательных технологий. Доказано, что, используя разработанные дидактические материалы в процессе

физического воспитания, можно увеличить уровень профессионально-прикладной физической готовности студентов.

Ключевые слова: студенты; профессионально-прикладная физическая подготовка; инновационные образовательные технологии; оздоровительные технологии.

Анотація. Кузнєцова О.Т., Зубрицький Б.Д. Інноваційні аспекти реалізації професійно-прикладної фізичної підготовки студентів університету. У статті розглянуті аспекти побудови процесу професійноприкладної фізичної підготовки студентів університету. Доведено, що сучасна професійна діяльність випускника ВНЗ вимагає глибоких знань, володіння навиками комп'ютерних технологій, високого рівня психофізичної підготовленості. У зв'язку з цим, основними завданнями професійно-прикладної фізичної підготовки студентів слід вважати розвиток ключових професійно значимих фізичних, психічних і особистісних якостей, підготовку організму до успішної професійної діяльності. Спеціальності, за якими здійснюється підготовка фахівців в університеті, систематизовано у чотири групи відповідно до психофізичних особливостей професійної діяльності. Викладено сучасні уявлення про високий потенціал фізичної культури для зміцнення здоров'я, підвищення рухової активності, підготовки студентів до різних умов життєдіяльності. На сьогодні традиційні засоби, форми і методи фізичного виховання не можуть в повній мірі забезпечити високу ефективність навчально-виховного процесу на різних етапах навчання. Нові ж вимоги сучасного інформаційного суспільства диктують розробку і впровадження інноваційних підходів та нестандартних методів роботи, які передбачають використання комп'ютерних технологій, створення автоматизованих систем управління, використання інноваційних освітніх технологій. Надані переваги інноваційнім освітнім технологіям в контролі знань, демонстрації ілюстративного матеріалу показників фізіологічного стану студентів в динаміці, зіставленні його психофізіологічних характеристик з модельними, їх коригуванні, посиленні мотивації до навчання, обробці, оцінці та зберіганні інформації і документів планування та інше. Використання розроблених дидактичних матеріалів в процесі фізичного виховання дозволяє підвищити рівень професійно-прикладної фізичної готовності студентів.

Ключові слова: студенти; професійно-прикладна фізична підготовка, інноваційні освітні технології; оздоровчі технології.

Formulation of the problem. The crisis of the global and domestic educational system, caused by the lack of its effectiveness in the field of specialists' education, the state strategy of education development, aimed at improving the competitiveness of our country in Europe and world market of educational services, as well as the design and implementation of state educational standards of higher education of the new generation are the factors determining the relevance of the development and implementation of competence approach in higher education.

Changing the education paradigm, shift to competence education requires development of new values, objectives, content, forms, methods and educational facilities, realization of modern innovative approaches. Transformations must be based on appropriate pedagogical theory, permeated all parts of the educational process, reflected in the activities of its subjects (A.A. Verbitsky).

It is known that physical education in educational sphere, as a component of the general system of national education in different educational institutions, must promote the development of person's physical and moral health, must be important part of measures on forming of mental and physical qualities, improvement of psychological and physical preparation to the active way of life and professional activity on principles of individual approach, priority of health orientation, wide use of various facilities and forms of physical improvement, integrity of this process. Thus, the principle of organic connection of physical education with work activity is incarnated most concretely in professionally applied physical preparation (PAPP).

One of the most important modern trends in the implementation of tasks of PAPP is formation of students' motivation to regular physical exercises with the purpose of preparation to forthcoming work activity.

In this connection there is a task of development of methodical system of use of health-improvement technologies, the implementation of which in the educational process will allow forming the students' sports and health competencies, necessary for professional activity on innovative basis taking into account the priorities of the development of science and education

Analysis of the last researches and publications. It is been of interest information educational technologies, based on achievements of the software education and computerization of the educational process (V.O. Kaszuba, 2005–2014; Y.V. Yurchishin 2012; S.M. Futornyi, 2015 and many others).

At the same time, many authors are marked an absence of indicators and criteria for educational activities that characterize the quality of education, especially on the theoretical, methodological and practical sections of the educational program; absence of criteria and indicators of psychological and physical preparedness, depending on the specialty of the graduate student (G.P. Gryban, 2009–2014; L.P. Pilipei, 2009; N.N. Zavydivska, 2014; N.V. Petrenko, 2015 and others.).

Scientists emphasize that a necessity of objective estimation of educational activity in graduates' professional psychological and physical preparedness, their capacity and ability to healthy living due to the internal laws of society and state development (L.F. Kolokatova 2008; G.P. Gryban, 2009; M.O. Nosko 2014; S.I. Prysyazhnyuk, 2015; O.V. Tymoshenko, 2016, etc.).

An objective of the research is exposing the innovative aspects of realization of university students' professionally applied physical preparation.

Exposition of research material. The professionally applied and special preparation is organized according to the tasks of the professionally applied physical preparation, which, except for the tasks of general physical orientation, includes facilities and methods of preserving and maintaining the level of health and professionally important qualities, exercises for the prevention of professional diseases, recovery and rehabilitation after the carried diseases, that is the exercises and techniques aimed at the formation of graduates' professional psychological and physical preparedness [4, 8].

Under professional psychological and physical preparedness is understood the presence of necessary reserve of physical and functional capacity of the organism for timely adaptation to the quickly changing conditions of production and external environment, the volume and intensity of labor; the ability to complete renewal in the set limit of time and the presence of motivation and optimism to achieve the goal, based on the human physical, psychical and spiritual possibilities (V.A. Kovalenko, 2007).

Followers of the traditional approaches to professionally applied physical preparation, as core of physical education in universities, based on the fact that every separate specialty and type of professional activity produce specific and high requirements to physical and psychical qualities, applied skills. That is why, they say, there is a necessity of profiling of physical education at preparing students of various specialties to labor activity, a combination of general physical training with a specialized PAPP.

But how to be, when in such multidisciplinary university, which National University of Water and Environmental Engineering (NUWEE) is, there are ten of specialties, where bringing in PAPP is actually "drawn by the ears"? For example, it is clear that future graduates in the specialty "Agronomics" must have sufficient physical preparation to comply with the requirements of the primary «field» positions, which they may hold. But what about when they will work in services, where they will get busy exceptionally with an office work?

When discipline "Physical education" was included in educational program to the part of normative forming for the students' knowledge, abilities and skills, development professionally-applied psychological and physical qualities and organizational abilities was provided necessarily as an important social part of bachelors' professional education. Including of discipline "Physical education" to the block of selective disciplines means, actually, that the mastery of the indicated abilities can hatch outside maintenance of the professional preparation after almost all specialties. Analyzing the content of education and professional programs of graduates' preparation after selective specialties, which are ratified in 2016, the developer of which NUWEE is, we can say, that this assumption was confirmed.

However, the physical state of Ukrainian youth made it impossible to implement effectively potential, accumulated in higher educational establishments, in professional activity through:

- an absence in public consciousness of understanding of possibilities of health-improvement motor activity for the decision of many social and economic questions in Ukraine;
 - an unattractive consisting of public material and technical base of mass sports in Ukraine;
 - an insufficient level of students' welfare;
 - an absence of awareness and motivation of Ukrainian students to the active way of life.

Today higher educational establishments determine the list of disciplines and content of educational programs for the higher education applicants according to the standards of higher education within the limits of every specialty [6]. In the project of new generation standards in NUWEE, which is based on the competence model, note the following characteristic: section «Requirement to the results of education (as competency), to required minimum of maintenance and terms of a mastering of the educational programs». Requirements are structured in sections, which have a competence orientation ("general competency", "special professional competency" etc.). Thus, graduates must possess the row of cultural ("general competency") and special competencies ("special professional competency") as a result of education. Not only a preservation, but also improvement the content of bachelors' professional education in various specialties in part of preparedness to the health maintaining, is possible through the ground of content and structure of physical education competences, which allow students and graduates to support the optimum of their psychological and physical state and health consciously and effectively, to carry out effective self-control constantly [3]. Through perfection of professional preparation of future specialists it is possible to forming competences in physical education, including development of mechanism of introduction of modern pedagogical technologies to acquisition these competences by bachelors during studying at the university. Therefore, the roundtable participants at National University of Physical Education and Sport (Kyiv) on December 7, 2016 discussed the most actual issues in relation to subsequent development of physical education and sport and mass work in Ukrainian universities, involving students to active leisure and recommended the Ministry of Education and Science of Ukraine to accept exigent measures in relation to:

- introduction physical education classes at least during two years of education in the amount of 4 hours per week;
- —amendment to the projects of higher education standards, namely: to the requirements of mastering the graduates' general competences should include "the ability to use different types and forms of motor activity for active rest and healthy way of life"; to program results of education, which determine normative content of preparation of higher education applicants "to perform certain types of motor actions for going in for mass sports; to follow the recommendations on the duration and intensity of health motor activity during the week; to conduct the healthy way of life and to take the tests and standards of annual evaluation of population physical preparedness".

According to the priority directions of the educational process, which is directed on modernization of education, the use of competence approach, finding different forms of physical education in educational establishments, Committee for physical education and sport recommends ... "taking into account the existing requirements it is necessary to implement in practice innovative educational technologies with the traditional forms of physical education, which will provide individual's

physical, intellectual and spiritual development, will promote the students' activity in self-improvement and self-development' [7].

Currently, the implementation of pedagogical methods of physical education at high-quality new level, in the conditions that will lead to previously inaccessible didactic methods, involves the use of computer technologies.

The experimental physical education process was based on the fundamental features of innovative author methods – provide students with opportunities to produce their own line of education and capture knowledge, abilities, skills, ways to develop physical abilities etc., and take a position of their own responsibility for the results of their labor. Innovation is something new in an educational process (facts, methods, techniques) that improves the current educational system. Innovative educational technology is a set of forms, methods and facilities of education and management, integrated by the unique purpose; selection of operational actions of teacher with a student, which resulted in significantly improved students' motivation [1, c. 338].

Innovative facilities of diagnostics, development (improvement) of students' psychological and physical qualities, correlated with all components of the didactic system, are developed: personality oriented approach, presence of integration connections, diagnostics and evaluation of mental and physical indexes, simulations of professional activity.

The principle of a multistage presentation of educational material provided the decision of such fundamental pedagogical objectives:

- 1) **on the first stage** (adaptive, I course): comprehensive optimization of motivation, creation of base of different motor acts, taking into account the psychical, technical and functional requirements of the chosen specialty;
- 2) **on the second stage** (achievement of comprehensive development, II course): comprehensive forming of psychical, functional, physical and technical bases, taking into account the requirements of the chosen profession through extensive preparation;
- 3) on the third stage (forming of requirement in the healthy way of life, III–IV courses): improving and integrating all the optimal factors contributing to the best professional performance with maximum use of the students' individual characteristics [5, p. 28].

Analyzing the research in the spheres of psychology, biology, anatomy, physiology, biochemistry, professor L.P. Pilipey united practice, theory and methods of physical education with the object of labor in one unit, based on the subject of professional activity. He systematized and grouped different directions of specialists' preparation according to the standards of higher education as a result of analysis of similarities and differences of professional requirements in the groups of specialties [5, p. 54]. Considering variety of specialties in NUWEE, flexible process of university students' PAPP was carried out not for separate educational groups, which are homogeneous after specialty, but for the groups of specialties/specializations by recommendations of L.P. Pilipey (Fig.1).

Grouping and classification of specialties/specializations in universities, their systematization provided valid diagnostics of professional interests, aptitudes, abilities [5, p. 110] and included components, which comprehensively characterize the expert work from point of social and economic, psychological, technological, sanitary, physiological and special features. Development of models, which preceded the drawing of an integrated professiogramm, was performed by pedagogical observing the work of specialists and private empiric methods and techniques (questionnaires and interviews, testing, ranking).

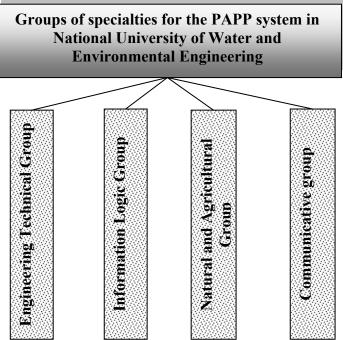


Fig. 1. Specialists' preparation by the groups of specialties/specializations in the National University of Water and Environmental Engineering

For exact determination of level of professionally applied physical preparedness computer informative databases were used.

Computer technologies of registration and evaluation of the results provide: report of knowledge and control over the course of their mastering; demonstration of illustrative material of indicators of students' physiological status in dynamics; comparison of their psychological and physical characteristics with a model and their correction; collection, evaluation and storage of information and planning documents; opportunity to strengthen motivation for education and others. Their brief composition which was used in our work is shown in Figure 2.

Components of psychological and physical preparedness to professional activity, selected in a structure: physiological and functional status, level of development of professionally important qualities, valeological education, willingness to use health-improvement technologies, were included a system of consistent indicators (criteria), content and goal orientation of which was determined by the basic features of specialists' professional preparation.

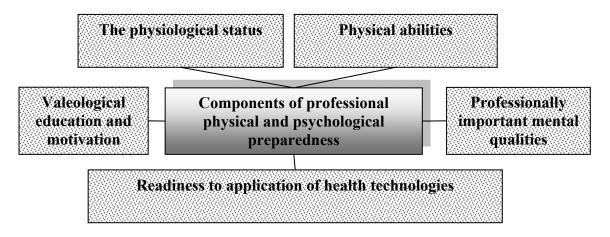


Fig. 2. General view of indexes of structure of psychological and physical preparedness to professional activity

Thus, development of innovative health-improvement technologies, which was instrumental in preparation to professional activity, conducted on the basis of results of psychological diagnostic methods. Complex research of students' mental capacity during the classes found out the features of dynamics of physiological qualities (volume, concentration and distribution of attention; speed and exactness of processing of visual information; coefficient of the productivity and efficiency of processing of visual information; work efficiency, level of psychical stability; level of concentration in the number of processed figures), that is important for specialists' professional activity in information and logic groups of specialties.

The estimation of quantitative and qualitative indicators of mental capacity was carried out at different times of the school year after the followings methods: method of A. Kozireva using tables Schulte, method of V. Anfimov, Pieron-Ruzer test using a form with geometric figures. Emotional processes influence on the various regulatory functions of psychics and are related to the management of student's psychological and physiological state.

The self-appraisal of students' personal and reactive anxiety was carried out after the method of Ch. Spilberg, Y. Khanin. Definition of level of extraversion, emotional stability and temperament type was conducted by the method of H. Eysenck. The estimation of state of health, activity, mood (SAM) was conducted by a questionnaire SAM. Methods of diagnostics of students' athletic and health-improvement competences after motivational criteria: a method "Valued orientations" (M. Rokich) and original author method.

The collection of indexes of the state of health, anthropometric characteristics, functional possibilities, physical preparedness was examined as integral components of the student's physiological status, was brought in an informative database and was estimated by the computer program – database «General estimation of students' level of health».

This method allows to estimate objectively the functional state of organism, current level of development of psychological and physical qualities, important for a capture professional skills. These information is used for the purposeful selection of physical exercises for development and correction of professional significant qualities. The dynamics of indexes is used for complex control of efficiency of students' physical education.

Three sections are foreseen in the program of educational discipline "Physical education": theoretical, practical, control. The universities focus on the practical section, and the two remaining sections get undeservedly little attention. This approach is one of reasons of low efficiency not only of the educational process, but also of quality of independent education. World history of high-quality specialists' preparation indicates that the most correct mean of measuring the individual characteristics of the educational subject are tests of achievements, what focused on the estimation of achievements after graduation. Only the properly geared-up set of tasks allows estimate students' knowledge by certain statistical methods reliably.

For the estimation of students' valeological education the test method was used including questions of theory of physical culture, organization of healthy way of life, facilities and methods of increase of capacity, prevention and rehabilitation of professional diseases and other by the computer programs «Test–I» or «Test–II» or defense of abstract on

the chosen theme.

Educational and methodical providing of specialists' preparation process was included educational programs to discipline "Physical Education" for students of special educational department, methodical recommendations, guidelines, description of the system of demonstration equipment, description of the system of didactic informative facilities.

The method of computer and information support of theoretical and practical classes on physical education is created, taking into account the specifics of the new information technology of education [2, p. 125]. PowerPoint is used for creation and giving presentations to improve practical abilities (Fig. 3).



Fig. 3. Slides of presentation «Health technologies in students' physical education»

The use of the developed materials in physical education process can increase the level of students' professionally applied physical preparedness.

CONCLUSIONS. Analysis of educational professional programs has allowed revealing the contradiction between the necessity of development, their introduction in an action on the basis of competence approach and an absence of conception of university graduates' competence. It is concluded that the permission of this contradiction supposes development of invariant structure and specific content of the university graduates' competencies, determination of their intercommunication.

Clear organization and establishment of certain stage of passing of the program, unity of theoretical and practical sections, introduction of interactive, information technologies in an educational process improves the level of students' physical education, provides motivational advantages for their independent work, raises the prestige and importance of the discipline on the whole.

Application of computer technologies in the process of physical education has solved a number of important and difficult tasks:

- 1) development the individual health programs taking into account the personality's psychosomatic features;
- 2) tracing the dynamics of the state of health-improvement and physical capacity during a certain period;
- 3) forming the system of correction and rehabilitation measures on the health preservation and creation of optimal conditions for the implementation of the goals;
 - 4) preparation of the necessary didactic materials for its introduction in an educational process.

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