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## SOME ASPECTS OF PROFESSIONAL TRAINING OF FUTURE TEACHERS OF NATURAL DISCIPLINES

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*The dynamism of modern social transformations causes the need to train a competitive teacher. The modern concept of natural science education is aimed at training highly qualified personnel capable of solving problems of teaching students on the basis of the competency-based approach.*

*Fundamental natural science training in the system of school education is of great importance in the formation and development of the scientific worldview of schoolchildren. In this context, the problem of the practice-oriented training of future teachers of Natural Sciences to the implementation of the content of the subject Biology and the integrity of the teaching of natural science education in basic school becomes a matter of particular importance.*

**Key words:** *natural science education, professional training, methodical competence, integration of knowledge, regional aspect.*

The main prerequisites for the formation of a new philosophy of school Natural Science education are the general tendencies of integration processes in the European educational space. An essential feature of the transformation of the natural component of general secondary education is its focus on the European experience in the formation of a scientific worldview as a result of all school education.

In this regard, the role of the teacher of Natural Sciences in the formation and development of the innovative thinking style of schoolchildren, in raising the general culture of the individual, is decisive. At the same time, there are growing demands for the professional training of pedagogical personnel for teaching schoolchildren the basics of natural knowledge in the New Ukrainian School.

The training of a highly professional specialist is an urgent problem of the national education system, especially in the context of the process of European integration. The professional formation of future teachers in the university directly depends on their professional training. In this context, the competence paradigm of vocational training of future teachers of natural sciences as a subject of personal and professional growth, which is capable of constantly expanding and updating the subject areas of its professional activity, becomes of particular importance.

All legislative and regulatory documents of modern Ukrainian education (National Doctrine of the Development of Education in Ukraine in the XXI Century, the Concept of the New Ukrainian School, the State Standard for Basic and Complete Secondary Education, the Law on Higher Education, etc.) renovate the request for teacher's professionalism and creativity, able to work successfully in modern educational systems in view of the priority of forming a pan-European educational space.

The conducted analysis of scientific studies shows that the fundamental researches of the problems of the introduction of the competency-based approach in the process of professional training of future teachers are systematically covered in the works V.I. Bondar, S.U. Goncharenko, V.M. Grinova, R.S. Gurevich, O.A. Dubaseniuk, I.O. Zymnya, I.A. Zyazyun, O.M. Mutovskaya O.I. Pometun, S.O. Sysoeva, V.O. Slastonina, A.V. Hutorsky, T.V. Furs, and others. Scientists are united in recognizing the competency-based approach as the basis for the modernization of vocational education.

Taking into account such an aspect of Natural Science education as continuity, based mainly on the application of the integrated approach, the problem of modernizing the methodology of teacher training for the implementation of natural science education in a first grade school is becoming more urgent.

Both the domestic and foreign scientists (I. Aleksashina, L. Burov, T. Vasyutin, B. Vorontsov-Velyaminov, V. Ilchenko, I. Klymyshina, T. Kreslavskaya, N. Nichkalo, I. Novikov, I. Opaleva, N. Rumyantseva, A. Stepanyuk, etc.) emphasize on the important propaedeutic role of the scientific component of the educational branch Natural History of the elementary school.

Considering this, the natural training of future Primary school teachers in accordance with the new version of the State Standard of Basic and General Secondary Education should be considered as a system-building link in the process of ensuring the integrity of teaching Natural Science education in Primary school. Achievement of this goal is ensured by implementing a new content of school natural education based on competency and activity approaches.

The identified trends in modern Natural Science education intensify the need to find effective ways and means of didactic and technological training of students. In particular, the issue of improving the natural training of future Primary school teachers in the context of the continuity of the content of Primary and Basic school was reflected in the scientific works of M. Baybari, N. Bibik, G. Beletskaya, A. Bogush, I. Gavrish, M. Golovko, O. Dusavitsky, M. Yevtukh, L. Koval, N. Lysenko, O. Ovcharuk, O. Savchenko, S. Strelets, S. Martynenko, A. Nisimchuk, D. Pashchenko, L. Khomich, L. Horuzhoy and others.

Analysis of the transformations of higher education makes it possible to state the appropriateness of the emphasis on the creative potential of the future teacher in his professional development (O. Akimova, N. Guzii, V. Zagvyazinsky, S. Konovets, N. Kichuk, M. Nikandrov, S. Sysoev, L. Rudenko). According to scientists, only a creative teacher can realize the task of the New Ukrainian School, which in general is the key to the success of the renovation of the educational sphere.

The scientific component of the Natural Science education of the basic school is the fundamental training courses in Physics, Chemistry, Biology and Geography, the content of which contributes to the formation of a holistic perception of the surrounding world. In this regard, attention should be paid to the works that reflect the multidisciplinary processes of professional training for future teachers of Natural Sciences, in particular biologists (K. Avramenko, O. Bida, O. Bogdanova, N. Burinskaya, T. Buyalo, M. Versilin, A. Grabovy, M. Grinev, A. Ivanetsov, K. Linevich, N. Mishchuk, I. Moroz, L. Nikitchenko, T. Ninova, V. Onipko, S. Strizhak, T. Sadovaya, N. Petrova, N. Chaychenko, G. Chernobyl, O. Yaroshenko and others).

The professional portrait of a modern biology teacher was the subject of research in the scientific works of N. Hrytsay, N. Moskaluk, N. Seleznev, M. Sidorovich, A. Stepanyuk, Y. Tatar, S. Trubachova, Y. Chernova, O. Tsurul, Yu. Shapran, S. Yalanskaya, Ya. Logvinova.

The analysis of scientific literature shows that the professional training of future teachers of Natural Sciences in the basic school implies mastering of biological knowledge as a scientific basis for obtaining professional competence and a compulsory component of the qualification of a modern teacher. The acquired professional knowledge on the basis of a competency-based approach, in turn, is the basis for the formation of professional skills and skills of future teachers of Natural Sciences.

It should be noted that the essential content component of the professional training of future teachers of Natural Sciences is appropriate to consider their personal and professional readiness to accomplish the objectives outlined in the Concept of Basic Biological Education in Ukraine.

The purpose of the paper is to highlight some of the most constructive, in our opinion, approaches to the professional training of future teachers of natural sciences, in particular teachers-biologists.

The new concept of pedagogical education has created new positions for the professional training of future teachers of Natural Sciences, namely the reorientation of the knowledge-based approach to creating a practical and creative orientation for the future teacher's training in teaching the «Natural Science» education in Primary school.

In the course of renewal of the system of school education and its orientation towards a person, as the highest value of society, Biology should be given the primary role. It is indisputable that biological literacy is now becoming socially necessary, because it is directly related to the formation of key vital competencies of the individual. Taking this into account, the problem of general scientific and subject readiness of the future teacher of biology as an integral part of his professionalism, in connection with the future transition to the profile general secondary education is actualized.

Analysis of the educational qualification characteristics of future Biology teachers made it possible to identify the following basic requirements: understanding the essence and social significance of their future profession, the main problems of disciplines that determine the specific scope of their activities; methodological awareness in the natural sciences field; psychological readiness to change the type and nature of their professional activities. In this regard, in modern natural science education, the practical aspect in vocational education takes priority, which involves qualitative changes in the system of professional training of future teachers of Biology. The main vision of the new concept of pedagogical education makes it possible to assert that the changes should concern, first and foremost, the content and technological filling of vocational and methodological training of future teachers of Natural Sciences.

It is logical to take into account the regional aspect in the outlined plane in the process of natural training of future Biology teachers as a specialist who is able to competently realize the educational potential of the region's natural environment.

It is indicated in the explanatory dictionary that the concept of «training» should be understood as providing, carrying out, preparing for something [1, p. 767]. In the dictionary of pedagogical terms by L. Savenkova, the definition of training (pedagogical, scientific) is considered from the standpoint of acquiring knowledge, skills, experience [5, p. 47]. Thus, the pedagogical training of future teachers of Biology can be regarded as a process and result of learning, which includes a combination of fundamental education and a deep mastering of the scientific basis of professional activity with the formation of practical skills and abilities.

It is well known that the professional development of future teachers in a higher educational institution directly depends on their professional and methodological training. The methodological component is the leading component in the vocational training system and has a clearly defined professional-oriented character.

In the context of our study, the definition of «vocational and methodological training» was specified by us on the basis of the analysis of scientific works of scientists (B. Bepalko, M. Yevtukha, L. Nikitchenko, V. Slastonina) as a system of interconnected and interacting structural and functional components, which envisage the mastering of fundamental, special and methodological knowledge, the formation of appropriate skills and purposeful actions aimed at the formation and development of students' natural competence, taking into account the regional needs and features of professional activity in the new Ukrainian school.

A.K. Markova's opinion is constructive that the vocational and methodological training of the future teacher is of the constituent indicators of suitability for teaching, along with the natural characteristics of a person and his motivation to carry out professional duties [1].

In the context of modern scientific understanding of the essence of pedagogical professionalism, the main purpose of professional training of the future teacher of Biology is the formation of its methodological competence of a specialist on its basis.

Taking into account the peculiarities of the reform of the national higher education, the transformation of its essence and content, we will highlight some aspects of the professional training of future Biology teachers in the parameters of the new concept of pedagogical education.

Modern professional training of the future teacher of Biology involves the study of subject-methodological disciplines during the entire period of study at the university, the content of which is aimed at understanding the actual problems of educational disciplines, which

determine the specific field of activity of the teacher, knowledge of the educational legal documents and the main directions of professional activity of subjects of the educational process.

The central place in the professional training of future teachers of natural sciences is the course of the theory and methodology of teaching biology, which integrates psychological and pedagogical, subject and methodological knowledge, which ensures the integrity and continuity of the formation of vocational and methodological competence of students. Moreover, future teachers should not only master the content of teaching activities, but also develop a coherent, systematic vision of the applied and interdisciplinary value of the course «Biology» in the system of school education.

The opinion of the scientist-methodologist L. Orlova is of current interest, which sees the professional training of future Biology teachers in purposeful mastering of effective ways of broadcasting educational natural materials [4, p. 6].

The scientific search for the indicated research problem revealed the existing contradictions between the traditional approaches to teaching the basic course of Biology teaching methods and the conceptual principles of the organization of biological education.

The new Ukrainian school needs not a subject, but a professional teacher who strives for pedagogical creativity. All this requires new approaches to the system of training future Biology teachers. Taking into account the outlined trends, it is obvious that the content of the curricula and the working programs of students' training in the specialty «Biology» need to be updated with an orientation to the contemporary demands of the school natural science.

In addition, it is possible to distinguish a part among students that focuses not on the profession of a teacher, but on subject specialization. This, in turn, leads to a leveling of the significance of the fundamental disciplines of the psychological-pedagogical unit of professional training, which ultimately affects the ability to generate new knowledge in practice.

Nowadays, when traditional forms of education are giving way to more productive ones, the leading role in the professional training of future Biology teachers is devoted to innovative technologies, among which the integration of knowledge plays an active role. Emergence in the school programs of independent integrated subjects «I explore the world», «Natural Sciences» actualized the problem of continuity of integration processes in the system «school – university» system.

It should be noted that the integrative approach in modern science and practice is considered as a general scientific methodology, on the basis of which integral pedagogical systems and their subsystems are formed. Therefore, in the theory and practice of higher education, there is a tendency for the integration of academic disciplines, which allows students to achieve interdisciplinary generalizations and the rapid assimilation of complex learning material [7].

The logic of the integrated approach, on which the content of school biological education is based, and accordingly the process of studying it, is fundamentally different from the traditional methods of natural education. In this regard, the content of the professionally oriented course «Methodology of Teaching Biology at School» should target future teachers to realize the practical significance of integrating knowledge both at both professional and personal levels.

It is worth noting that the current tendencies in the fundamentalization of vocational education are directly related to the integration processes. Since integration consists of separate elements of a holistic system, it refers to the most complex intellectual operations. It should be noted that the active involvement of integration links between educational disciplines will significantly increase the basic level of professional training of students to the level of a specialized school teacher.

The very idea of integration in the process of professional training is not new. There has already been a considerable long-term experience of its realization in the context of especially Natural Sciences. Moreover, it is the training of future biology teachers that requires the integration of content, forms and methods of teaching, as well as the use of a unified approach to the process of formation of basic natural concepts, which contributes to the development of a specific professional basis for the formation of a person's professional thinking.

Practice convinces that traditional disciplines of the natural science cycle, given the limited nature of the subject of each of them, cannot reflect the world as a whole, and therefore cannot effectively form a holistic worldview of students. In turn, the subject teacher with traditional vocational training is extremely difficult to master the teaching of new integrated natural school courses. Therefore, we need teachers of Biology, which is characterized by a fundamentally new type of natural science worldview.

Consequently, the professional training of future Biology teachers should be ensured by mastering the foundations of the classical natural sciences and sciences that arose on their joints. At the same time, the main task of higher education is not to copy the training of the subject teacher, but to train the future teacher in accordance with the requirements of modernity.

We associate the prospects of further research with the expansion of scientific ideas about the implementation of a regional resource in the content of professionally oriented disciplines for the training of future teachers of the natural sciences of primary and secondary schools.

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### **Грамастик Н. Деякі аспекти професійної підготовки майбутніх учителів природничих дисциплін**

*Динамізм сучасних суспільних перетворень викликає потребу в підготовці конкурентно спроможного вчителя. Наразі, нова парадигма природничої освіти спрямована на підготовку висококваліфікованих кадрів, здатних вирішувати завдання навчання школярів на засадах компетентнісного підходу.*

*Фундаментальна природнича підготовка в системі шкільної освіти має величезне значення в становленні й розвитку наукового світогляду школярів. У цьому контексті особливої ваги набуває проблема практико-орієнтованої підготовки майбутніх учителів природничих дисциплін до реалізації змістових ліній предмета «Біологія» і забезпечення цілісності викладання природничої освіти в основній школі.*

**Ключові слова:** природнича освіта, професійна підготовка, методична компетентність, інтеграція знань, регіональний аспект.