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PROBLEMS OF SELECTION OF THE CONTENT OF EDUCATION IN NATURAL SCIENCES IN SPECIALIZED HUMANITIES CLASSES

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Abstract
At present, the senior level of the school is supposed to be built on the basisof profile differentiation, which is reflected in the main directions of modernization of education. In the practice of secondary schools, the following profiles are most widely represented: humanitarian, mathematical, natural science.

Introduction

In the scientific, pedagogical and methodological literature, the issues of teaching major disciplines in classes with their in-depth study (physics in natural science classes, history in humanities classes) are studied to a greater extent. The problem of selecting the content of education in specialized classes for non-core disciplines (biology, chemistry for specialized humanitarian classes) is acute. We will consider some aspects of this problem in this article. In practice, the following approaches to solving issues related to specialized classes are being implemented. The first involves retaining or taking as a basis the current programs and educational and methodological literature, in the senior profile level of the school to preserve the invariant core of education for all classes, and to determine the variability depending on the profile. However, the program and textbook are available only for general education and natural science classes in ecology and biology). The second approach in general terms boils down to the transfer of the invariant core of the content to the basic school. So, in relation to the subject of biology, this is a concentric model that assumes the following sequence of courses: Grade 6 – Botany, Grade 7 – Zoology, Grade 8 – Anatomy, Grade 9 – General Biology, Grades 10–11 – Variable Study of General Biology depending on the profile. The main problem of such a passage of material is the lack of programs, textbooks and teaching aids for high school.

An analysis of the existing pedagogical reality (survey and questioning of students, attending lessons) suggests that often the selection of the content of natural science education in the humanities classes is reduced to the removal of the most complex material on the basis of an intuitive approach. All of the above allows us to talk about the need to determine the didactic grounds for selecting the content of education for specialized humanitarian classes.

It is known that the selection of the content of education is carried out at the highest levels of its representation: general theoretical, academic subject, educational material, pedagogical reality, personality structure (1). Let us consider some aspects of the problem

at the level of general theoretical representation. We believe that for classes of all profiles there is an invariant and variable component of the content of education.

The content of the invariant and variable components of the content of education is determined at the supra-subject level, depending on the needs of society in specialized training and is reflected in documents, directives, standards, recommendations of the Ministry of Education of the Russian Federation, the Russian Academy of Education, etc. including the ratio of certain areas of knowledge and academic subjects. The administration and teaching staff of the school draw up and concretize the curriculum for this educational institution, distributing hours within the areas of knowledge, hours of the school and regional component, depending on the individual typological characteristics of students and their cognitive needs, as well as on the qualifications and capabilities of the teaching staff. For example, at the moment, the school can independently determine the availability of general education or specialized classes and their orientation and provide students with the opportunity for standard or in-depth study of general education disciplines or the choice of additional academic subjects, So, the subject "ecology" can be studied as a separate discipline or integrated into subjects such as biology, chemistry, geography. In humanities classes, students are prone to the manifestation of feelings and emotions, they are happy to be involved in work related to emotional and evaluative activities. The introduction of ecology as a separate discipline in these classes can increase the motivation of learning to science disciplines.

For the selection of the content of education at the level of general theoretical representation, it is of particular importance to highlight the learning objectives, both general and specific. The general goals of the school are determined by the state, now work in this direction continues, reflecting the social evolution of our society. The other group includes specific goals, in this case, specific goals of profile differentiation, the development of which is also ongoing. We suggest considering the following goals:

–formation of students' worldview;

- development of special abilities and needs of students, taking into account their individualtypological features;

- formation of an environment conducive to satisfying the cognitive interests of students, strengthening the motivation of learning and, as a result, improving academic performance;

- education of certain personality traits that allow the process of self-determinationand self-realization with a focus on the choice of a certain field of activity.

The specific goals of profile differentiation determine the variable component of the content of education. Despite the commonality of specific goals, their application to different profiles provides different content of the content of education. Let's consider approaches to the implementation of the identified goals in filling the content of education.

One of the main goals is the formation of a worldview. With regard to natural science disciplines, the formation of a scientific picture of the world (2). In the humanities classes, it is necessary to promote the development of such analytical and synthetic methods of mental activity, in which students develop an idea of the natural sciences that study living and inanimate matter at different levels of its organization. It is as if we put together a single

picture from numerous facts and particular laws target. In addition, it is possible to demonstrate the general laws of nature and the ways of its cognition on several typical facts. and then reveal their specific manifestation in the natural sciences. For example, in the course "General Biology" in the topic "Fundamentals of Cytology", you can use the knowledge about the biological role of organic substances from the course "Organic Chemistry". Thus, in the formation of a scientific picture of the world in the humanities classes, an inductive approach (from individual facts to laws) and a deductive approach (drawing analogies with other natural sciences) are possible.

In addition to the listed learning objectives, important provisions at the level of general theoretical representation are both general principles of differentiation of training and particular principles:

–taking into account the specifics of learning objectives and individual typological features of students ofdifferentiated classes;

–focus on the development of general and special abilities of students;

–designing the nature of the educational and cognitive activity of schoolchildren (from reproductiveto creative) (3).

The implementation of these principles in the process of teaching students of specialized classes is as follows: the invariant component of the content of natural science education as a whole is highlighted, and then the variable component in academic disciplines is filled in accordance with the profiles of the classes. As a result, individual topics and the hours allotted for their study are redistributed for a comprehensive acquaintance with them. So, in humanities classes It is advisable to cover the issues of ecology more widely, the foundations of the evolutionary doctrine, and in matters of general chemistry it is necessary to rely on knowledge from the course of physics.

Let us formulate the didactic basis for the selection of the content of education in natural science disciplines in specialized classes at the level of general theoretical representation: The content of the invariant and variation in the content of education of specialized classes is influenced by general and specific learning objectives, the principles of didactics, the principles of differentiated education and the needs of society in specialized training.

Let's move on to the second group of didactic foundations offered by us at the level of the subject. When considering the subject, we rely on the "model of the subject" of I.K. Zhuravlev (4), which takes into account the leading component, the main block and the complex of auxiliary knowledge. Here is the didactic basis for selecting the content of education at this level and explain it: In the main block of the subject, with the obligatory consideration of the leading component, the role and depth of disclosure The main components (scientific knowledge, methods of activity, emotional-value relations of the individual) are determined depending on the profile of the class.

Let us illustrate this point with a concrete example. Biology belongs to the group of subjects with the leading component "scientific knowledge", i.e. the component "knowledge about the world" is of primary importance in a number of other components, regardless of the profile of the class. For the classes of the humanitarian profile, the "emotional-value relations of the individual" are of significant importance. This is due to such individual

typological features of students. As visual-figurative thinking, developed imagination, strong emotions. Let's give another example. In the humanities classes in the subject "fundamentals of ecology", the leading component is "emotional-value relations", and "methods of activity" and "scientific knowledge" complement it. Whereas in the classes of the natural science profile, the emphasis is on "scientific knowledge".

At the level of the academic subject, we also highlight the following didactic basis: Changes in the disclosure of a complex of auxiliary knowledge (logical, methodological, interdisciplinary, philosophical, historical and scientific, evaluative) should be carried out depending on the profile of the class. The complex of auxiliary knowledge allows the adaptation of the components of the main block of the subject in accordance with the individual typological characteristics of students. So, the section "Fundamentals of genetics" involves active use of logical structures and schemes. In the humanities classes, problems and logical schemes are needed as examples confirming the theoretical positions of the foundations of genetics, but their role and volume will be much smaller than in mathematical classes. At the same time, it is necessary for humanitarians to create conditions for practicing the techniques of logical thinking as a result of a detailed consideration of the main types of tasks. For example, the topic "Inheritance of sex-linked traits" can be illustrated with 2-3 tasks that are interesting in content and allow you to trace logical patterns (inheritance of the disease "hemophilia", inheritance of "color blindness" - color vision impairment).

We propose to establish the depth and positioning of interdisciplinary connections in accordance with the class profile. For humanitarians, we see special importance in establishing links with the subjects of the humanitarian cycle. So, in the topic "Fundamentals of Genetics" we rely on knowledge of a foreign language. This is both a decoding of the meaning of terms, and an approach to solving problems by analogy with the perception of a foreign text. Among other areas of knowledge, Essential in this process, we highlight historical and, in particular, historical and scientific knowledge, which contribute to increasing the interest of students by referring to unknown facts from the studied eras. A situation of successful self-realization of the individual is created due to the opportunity to attract deep knowledge from the field of another science. (Discovery of laws and stages of development of science-gentics in the context of a historical era).

Philosophical knowledge is organically included in all sections of biology, ecology, chemistry and involves the consideration of certain aspects of the global concepts of the meaning of life, matter and spirituality. Assessment knowledge is formed in classes of all profiles. For humanitarians, the issues of the relationship between the biological and the social in man are of particular importance.

Let's move on to the following, highlighted by us, didactic basis at the level of the subject: The ratio of invariant and variation at this level is determined both by the previous level of reflection of the content of education and the tasks facing the subject or field of knowledge, and their content has its own specifics. We offer the following tasks for the natural science cycle:

1. Formation of a scientific picture of the world.

2. Development of the ability to navigate the flow of incoming information.
3. Formation of a value attitude to science and scientific knowledge.
4. Development of the ability to use knowledge in practice.
5. Formation of creative thinking.
6. Education of ecological culture.
7. We will reveal the application of this didactic position in practice. The tasks facing natural science affect the selection of the content of education in accordance with the profile management. One of the most important tasks is the formation of a scientific picture of the world. In humanities classes, this task has the same relevance as in science classes. But due to the decrease in study time, more attention should be paid to fundamental concepts without detailing them. This process is comparable with the compilation of a giant mosaic according to a schematic drawing, the presence of which allows you to omit individual components, but understand the meaning of the drawing. So, in the course of organic chemistry we cover in detail the topic "Alkanes, or unsaturated hydrocarbons", and the topic "Alkenes" and "Alkynes" are given in comparison, showing their similarities and differences. In the section "Fundamentals of Genetics" we study in detail the topic "Mendel's Laws", and other forms of inheritance (linked inheritance, the phenomenon of crossing-over, inheritance linked to sex) are shown in comparison, highlighting the general and particular.

The task associated with the development of the ability to navigate in the flow of incoming and information echoes the previous one and includes worldview issues in a broad sense. In classes of all profiles, we conduct familiarization and discussion of modern achievements published in print media and electronic media (Internet, television, radio broadcasting). Students make the selection of actual problems of natural science independently, commensurate with the level of their own knowledge with the ability to reflect the essence of the problem. In the humanities classes, the development of science involves their emotional coloring (cloning of new organisms, the ecology of communities, etc.) The solution of the above problems is reflected in the formation of a value attitude towards science and scientific knowledge. In the humanities, such a system of value relations is determined in the disclosure of the elements of the system of axiological knowledge (the role of heredity and the environment in the development of the individual, anthropogenic impact on nature, etc.) In addition, applied aspects of natural science are important for students, which are practice-oriented problems of medicine (disease prevention, hereditary predisposition and its manifestation, sex ratio) – in general biology, environmental problems production of chemical compounds - in chemistry and ecology.

The latter provision resonates with the task of educating environmental culture. It is difficult to overestimate its relevance, but the ways to solve it in classes of different profiles have their own specifics. Thus, humanitarians are interested in the discussion of environmental problems. The topics of chemical synthesis (chemistry) and the mutation process (biology), which are difficult for students to assimilate, can be viewed through the prism of environmental problems. The solution of each of these tasks contributes to Formation of creative thinking. Thus, each task is implemented differently in the selection of the content of education in specialized classes at the level of the subject.

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