

GOALS, PROFILE AND LEVEL PLANNING OF RESULTS SCIENCE PROFESSIONALLY ORIENTED ADAPTIVE LEARNING (ON THE EXAMPLE OF A CHEMISTRY COURSE)

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ABSTRACT

Diagnostics of goals is a necessary condition for the design of a process, its technologization, but, alas, insufficient. The goal is set operational if the wording contains an indication of the means to achieve it. Only if the goals have both properties can we talk about designing a process that will lead to the achievement of these goals.

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INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

The goal is the system-forming factor of all, including educational activities. What is the purpose, such is the activity. What are the activities and the results (according to VV Guzeev).

The category of pedagogical goals has traditionally included a triad of learning, development and upbringing goals. In our opinion, such a separation of goals that is customary for practice is artificially and insignificant, since only a few subjects of the modern educational process feel differences in the goals of education, training and development. It makes sense to distinguish not so much development and upbringing as development internally determined and externally conditioned, which ultimately leads the study to the diagnostic and operational goal setting of the projected educational process. The goal is diagnostic [1] if there are available means of objective verification of its achievement. Diagnostics of goals is a necessary condition for the design of a process, its technologization, but, alas, it is insufficient. The goal is set operational if the wording contains an indication of the means to achieve it. Only if the goals have both properties can we talk about designing a process that will lead to the achievement of these goals.

In accordance with this, it is possible to distribute the planned results of natural science professionally oriented adaptive learning both horizontally - in the plane of the content of each academic discipline, and vertically - by the level of depth of immersion in this content, its development. So, we can talk about profile and level planning of the results of pre-profile training. "Ensuring the achievement of various planned learning outcomes for different groups of students within the framework of the same educational process is called its differentiation," says V.V. Guzeev [2, p. 30]. He recommends distinguishing between profile and level differentiation of the natural science educational process. The planning of learning outcomes and the differentiation of the educational process are closely interconnected.

Profile differentiation is most often realized as external - between classes, study groups. We can talk about the professional profile of chemical education, considering chemistry as a field of the student's future professional activity (for example, engineers from various sectors of the chemical, metallurgical, energy, light and food industries, etc.). You can also plan an applied

profile - the study of chemistry as an instrument of professional activity (for example, for a geologist, doctor, agronomist, specialist in the field of environmental economics or a teacher - teacher of chemistry, ecology, physics). Finally, it is possible to study chemistry as an element of general education and culture; in this case we are talking about a general cultural profile.

Regardless of the external conditions and the quality of the educational process, stratification of students by achieved results at the exit will be inevitable. The recognition of this objective law of nature is associated with the frequent use of the word “level” in pedagogy (level of success, level of assimilation, level of quality of training, etc.). In most of them, in essence, we are talking about measuring the results of the educational process at the end of the educational period, after the fact [ibid.]. But it should be the other way around! It is advisable to plan the levels of learning outcomes before the start of the process, to make them open to students, thereby providing them with the right to choose and democratically ensuring, at the same time, that each student exercises his right.

Designing the technology of professionally oriented adaptive training at the pre-profile stage, we plan three levels of results “at the exit”: minimal, general, advanced. The basis for distinguishing three levels of planned learning outcomes are three that have received widespread recognition of the theory of modern didactics:

1. In the theory of developing learning L.S. Vygotsky's educational activities are classified into three types [3]:

- 1) reproductive - reproduction of facts;
- 2) reconstructive - reproduction of methods for obtaining facts;
- 3) variable - reproduction of methods for obtaining methods, i.e. mental operations (analysis, synthesis, comparison, generalization, classification).

2. A new formation of three types of orientation of human activity can be planned on the basis of the theory of P. Ya. Halperin on the phased formation of mental actions [4]:

- 1) orientation to single, random signs characteristic of individual objects; its psychological mechanism is based on recognition and recall (there is no transfer of knowledge to other objects);
- 2) orientation to local signs inherent in groups of similar objects; its distinctive feature is analytical and synthetic activity (the transfer of knowledge to similar objects and situations is characteristic);
- 3) orientation to global signs and properties that distinguish wide classes of objects and phenomena (the ability to transfer knowledge to unfamiliar, new, non-standard situations).

3. The types of educational activities and types of orientation of activities are directly related to the division of educational tasks into three types based on the associative-reflex theory of thinking I. P. Pavlova, I.M. Sechenova, S.L. Rubinstein and the value approach to the content of educational information Z.D. Zhukovskaya [5, p. 194]:

- 1) template, which do not need the actual process of solving as such (they are solved at the level of subconscious automatisms);
- 2) non-standard, associative connections between subproblems of only an explicit type;
- 3) creative, between the subtasks associative connections of the latent type, formed from the previous connections of the explicit type.

Based on the above ideas about the planned results of natural science professionally oriented adaptive learning (using chemistry as an example), we can build a compact three-level graduation scale for the planned learning outcomes at the pre-profile stage, based on three types of educational tasks.

Levels of planned results of professionally oriented adaptive learning at the pre-profile stage of a comprehensive school (using the chemistry course as an example). Levels of planned learning outcomes. Types of educational activities. Orientation Types

The nature of training tasks Minimum Reproductive (reproduction of facts) Orientation to random signs Patterned (do not contain subtasks) General Reconstructive (reproduction of methods for obtaining facts) Orientation to local signs Unconventional (with one type of connections between subtasks).

Advanced Variable (mental operations: analysis, synthesis, comparison, generalization, classification) Orientation to global signs Creative (with two types of connections between subtasks)

To a greater extent, development, leading to positive changes in society, is the result of progress in the field of professional activity. It is the professional sphere that creates the context in which changes can occur. The education system can establish a connection between the universal and cultural aspects of development, on the one hand, and its professional and unique aspects, on the other.

Consequently, natural science professionally oriented adaptive learning should not only contribute to the development of cognitive interests, educate the individual by means of a separate academic subject, but also serve to develop creative activity abilities, the formation of professionally significant personality traits, which is an indicator of the quality of professionally oriented education at the pre-profile stage of a comprehensive school.

Hence the need arises for the development of pedagogical technology for natural science professionally oriented adaptive learning at the pre-profile stage of a comprehensive school.

CONCLUSIONS

1. Development trends of modern civilization, economic and political reforms leave their mark on the state of development of science education in Russia. The need for high-quality chemical education is determined by: a negative attitude in society to chemistry and its manifestations on the one hand and the general chemical illiteracy of society at almost all its levels on the other; the ripening choice and implementation of new educational technologies that allow us to fundamentally switch to personalized training aimed at entering the individual into the field of professional education and, as a result, began to transform the mentality of Russian society.

2. New trends in education have actualized the development of adaptive learning technologies based on highlighting the individual learning tasks that are optimal for the difficulty of mastering, which makes it possible to achieve the maximum developmental effect in learning for the minimum period of time at the pre-profile stage of a comprehensive school. The work of modern researchers on the organization of adaptive learning cannot yet compose a sufficiently holistic system of self-developing natural science professionally oriented adaptive learning at the pre-profile stage of a comprehensive school, as the basis of the system of continuing professional education. Adaptive learning can serve as an integrative basis of modern technologies of individualized and developing learning.

3. The goals and values of the natural science professionally oriented adaptive training at the profile stage correspond to the categories of international standardization objects.

Planning the results of adaptive learning (on the example of a chemistry course) is twofold: profile (professional, applied, general cultural) and level (minimal, general, advanced).

4. The main strategic direction of the development of the educational system lies in the way of solving the problem of personality-oriented and professionally personal learning, in which learning, the development of cognitive activity of students, would be the leading teacher-student tandem. The training of modern intellectually developed technical specialists as creative personalities cannot be carried out only within the framework of traditional teaching methods. Radically new approaches are required, both to building the organizational structure of such training, and to developing appropriate professionally oriented pedagogical technologies in a comprehensive school.

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