SECTION 16.
PEDAGOGY AND EDUCATION

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COMPONENTS OF THE MODEL OF DEVELOPING STUDENTS' NATURAL AND SCIENTIFIC COMPETENCY IN TEACHING BIOLOGY AND CHEMISTRY TO 7-9 GRADERS

In modern scientific research, insufficient attention has been paid to the issue of students' natural and scientific competency. The relevance of the problem is proven by the fact that developing the specified competency contributes to young people's capability to adapt and act independently in various (life, educational and other) situations and to solve problems based on natural knowledge and skills. Moreover, the natural and scientific competency is a component of individuals' ecological culture and an important factor in developing education seekers' citizenship skills.

Based on the study of the school practice in teaching Biology and Chemistry, the analysis of legal and educational methodological support of the educational process in teaching Biology and Chemistry to middle school students, the generalization of the scientific ideas of Ukrainian and foreign researchers on forming the natural and scientific competency and modern trends in school natural science education, the didactic model of developing natural and scientific competency of 7-9 graders in Biology and Chemistry has been developed and substantiated. The components of the model consist of four blocks: conceptual, content, procedural, and evaluative ones.

The conceptual block reflects the social needs and the state requirements for the level of students' science education [1]. Its methodological background is the unity of competence, personal activity and integrative approaches. The theoretical foundations are the regulatory framework, didactic principles of education and evaluation of its results [2, 3].

The content block covers the educational material, in which the invariant and variable parts are distinguished. The invariant part of the content is common to Biology and Chemistry, the variable part differs in each of those subjects. The content block includes a system of ways of learning about nature, identifying a problem or a task and finding an effective way to solve it in specific conditions. The block includes students' activities on processing, summarizing and using information about substances, bodies and natural phenomena.

The procedural block is related to joint activities of a teacher and students, aimed at achieving the result, i.e., developing the natural and scientific competency. It includes a didactic toolkit, which is a set of certain forms and methods, algorithms of pedagogical interaction between a teacher and students, as well as student-student interaction in the educational process. The procedural block is characterized by technological versatility due to the uniqueness of the subjects

of study, the possibilities of the educational environment to ensure the successful course of the educational process in Biology and Chemistry, and the variability of the learning format (for example, face-to-face, distance and mixed).

The evaluation block provides feedback on the effectiveness of the process of developing natural and scientific competency, criteria and indicators characterizing the formation of the investigated quality of secondary education students, assessment of the achieved results in teaching Biology and Chemistry according to the levels of formation of the investigated competency components achieved by each student (low, basic, optimal, and high).

The flexibility and adaptability of the proposed components of the model of developing 7-9 graders' natural and scientific competency in the educational process of teaching Biology and Chemistry enables the extrapolation of the model to other subject and thematic areas.

References:

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