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ISSUES OF USING INTEGRATIVE KNOWLEDGE IN FORMING STUDENTS' PROFESSIONAL COMPETENCE

Rakhmatov Uchkun Ergashevich,
Tashkent State Pedagogical University named after Nizami
Head of the Department of Biology and its Teaching Methodology,
PhD, associate professor
Tashkent, Uzbekistan
Artikov Suyun Mamayusufovich,
Independent researcher of
Tashkent State Pedagogical University,
Tashkent, Uzbekistan

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Abstract:

This article involves the methodology for using integrative knowledge in the formation of professional competence of future biology teachers.

Keywords: quality of education, integration, professional competence, biology, biology, biology, chemistry, physics, geography.

In the process of globalization of information, it creates a new need for integrated education in the formation of professional qualities of students. Because it is important to use the achievements of related sciences in order to thoroughly master the fundamentals of science, to fully understand the essence of the studied biological phenomena and processes. In the process of improving the quality of education and raising competitive personnel, interdisciplinary communication has risen to the level of state policy today. In this regard, the adoption of the decision by President Sh.M. Mirziyoyev on August 12, 2020 "On measures to increase the quality of continuous education and the effectiveness of science in the fields of chemistry and biology" is a practical proof of our above opinion[1].

In the context of this decision, "fundamental improvement of the quality of education in chemistry and biology, implementation of a completely new system of teaching these subjects in secondary schools, provision of educational institutions with modern laboratories, educational equipment, to create new generation textbooks based on foreign experiences and to attract qualified teachers-coaches to these areas, to train personnel and use the results of science, to ensure mutual integration between the fields of education, science and production" such important practical tasks are defined [4].

One of the main conditions for improving the quality of continuous education and the effectiveness of science during the implementation of the above-mentioned tasks is that it is possible to achieve high results by implementing integrative forms of education using the achievements of related sciences effectively.

In order for students to be able to design the lesson process correctly while studying the subjects of biology in the process of forming their professional competence, to be able to apply the knowledge they have acquired to their pedagogical activities in new unexpected situations. teachers should master the mechanisms of integration with chemistry, physics, mathematics and other natural and concrete sciences [1].

Giving the meaning of integration, embodiment, rounding up, it is an important tool that allows students to understand events and processes as a whole, to expand their scientific worldview, and to think actively based on the generalization of the knowledge they have received from the sciences.

Effective use of integrative knowledge in the process of improving the effectiveness of biology education and achieving the goals set by future biology teachers, developing basic and science-related competencies, and solving biological problems plays an important role.

By applying integrative knowledge to his pedagogical practice in the process of solving problems related to biology, students understand the essence of connections, causes and consequences between biological events and phenomena that occur in the life of nature and society, with new situations given in the conditions of the problem. gets to know, comes up with new ways to solve the problem by applying the laws and theories related to biology in practice in solving the necessary problem.

On the basis of integrative knowledge, the method of solving certain types of problems and by repeating it several times along with the formation of skills and competences, relevant competencies are formed in the student.

By solving biological problems on the basis of integrative knowledge, students will have the ability to separate their thoughts and make conclusions, identify information and scientific facts, compare and contrast information. When

solving a problem on the basis of integrative knowledge, it is important to focus on specific information, to avoid unnecessary generalizations, to fully cover the facts given in the problem, to pay full attention to the classification [3].

The conducted research shows that most students have difficulty solving the problems of the topics given in biology textbooks or cannot solve them at all, the main reason for this is that they cannot properly use the integrative knowledge that directly serves the formation of professional competence in the process of solving problems [1].

One of the important didactic requirements for solving biological problems in the course of the lesson is that future biology teachers should be able to choose convenient options for the statement of the problem for students in the process of implementing integrative knowledge. In the process of implementing these tasks, students should solve biological problems based on the principles of consistency in class, extracurricular and extracurricular activities, and in this process, they should harmoniously organize the theory and practice of implementing integrative communication.

Interdisciplinarity in the educational process can be effectively implemented through professional, scientific-theoretical and scientific-methodical training of the teacher and on the basis of his deep understanding of his subject. For this, the teacher should not only know the subject he teaches deeply and thoroughly, but also be aware of integrative knowledge related to it. It helps to master different types of knowledge and forms of communication between them. Connecting the biology textbook taught at school with chemistry, physics, and mathematics subjects is important in the development of students' practical and creative abilities.

Types of integration are based on the teaching of biology, which is considered a special field of factual and research knowledge, with natural sciences, in which synchronous and asynchronous connections between general and specific biological concepts and chemical and physical concepts are made.

Synchronous connection means parallel connections between classes (biology, chemistry, physics, mathematics, geography, etc.) based on the program and curriculum of academic subjects.

Asynchronous connection - topics of academic subjects are cross-class by using the knowledge acquired in previous classes based on the program and curriculum ("Biology" 5-6, "Biology" 7, "Biology" 8, "Biology" 9, " Biology" grades 10-11) is understood as the connection of academic subjects[4].

The commonality of all biological sciences creates favorable conditions for establishing consistent relations between them. If you follow the instructions, it creates a basis for deep and comprehensive study of the topics and strengthening of students' knowledge.

Integrative study of the object being studied allows to know the object in all its aspects - its individuality and relationship. It also requires the study of the studied object in the form of a holistic system, from the point of view of all-round connectivity [5].

The processes of integration of biology, chemistry, physics, and mathematics are rapidly entering all aspects of daily life. Therefore, the formation of professional competences by arming students with integrative knowledge is one of the urgent problems of today. In order to solve this problem, it is necessary for a teacher of biology to have the knowledge and skills of integration and integrated knowledge. Secondly, it is necessary to plan a work directed to this goal, methodically based, and having a scientific direction. Thirdly, it is necessary to be able to choose integrative materials that justify the scientific significance of educational materials, and have the competence to apply them to one's pedagogical practice. Therefore, a future biology teacher should not only be able to separate integrative materials related to the topics of the program, but also to systematize them, to find the necessary approaches and methods to use them in class and extracurricular activities.

Pedagogical observation and experience - our test work, as well as the existing methodical literature on this topic, showed that future biology teachers should have the following didactic criteria and characteristics when choosing integrative materials in the process of teaching biology:

- integrative knowledge selected in teaching biology should be suitable for the topic, clearly cover its essence and characteristics;
- the selected integrative knowledge allows students to comprehensively research the object being studied and thus helps students to form a scientific outlook, understanding of the wholeness of the universe, and interest in the basics of science;
- the selected integrative materials should have their own characteristics for each subject, the selected integrative materials in the teaching of biology should have a prospective content that meets the requirements of today's knowledge [2].

It is recommended that future biology teachers be guided by the following principles in the process of choosing integrative knowledge in the process of teaching biology:

appropriateness of teaching; taking into account the age, psychological and physiological characteristics of students; covers materials that are new to the student and increases their interest in creativity; be explained in a simple, simple language that the reader can understand; it should include the knowledge that serves the formation of scientific concepts in the minds of students [6].

In the process of forming the professional competence of students, topics in subjects with the same object of study, for example, chemical composition of the cell, molecular mass, light and dark phases of photosynthesis, density, substance and energy exchange, laws of conservation of energy in the food chain , the effect of the solar spectrum on living organisms, cell turgor state, protein denaturation, modification changes of organisms, laws of distribution of living organisms on the Earth, application of the structure of living organisms to the creation of technical systems, stages of

the emergence of life on Earth. they are required to master the mechanisms of integration of such subjects as biology, chemistry, geography, physics, mathematics, and informatics.

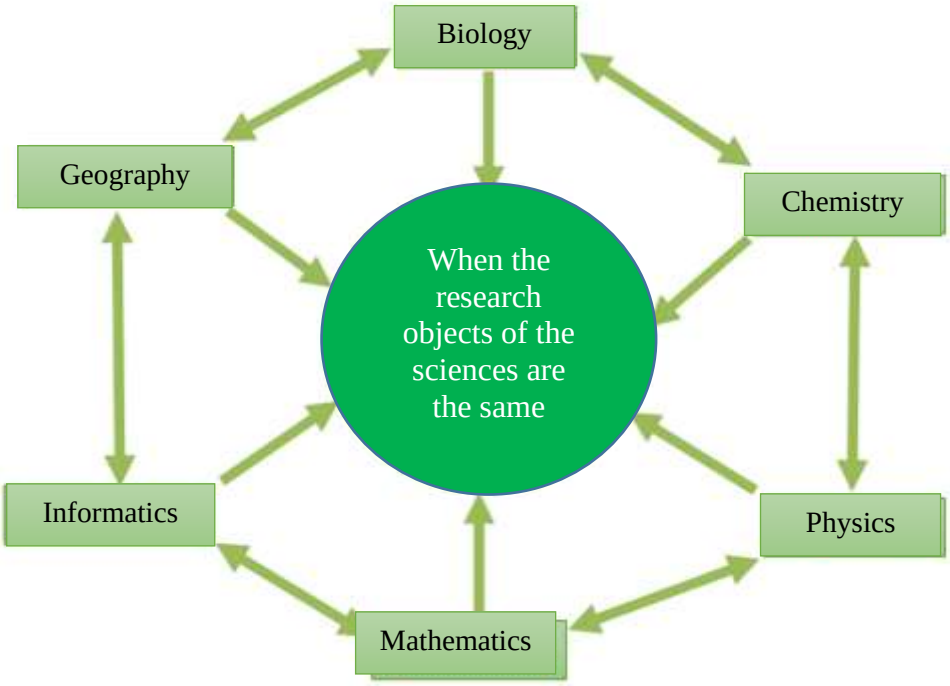

Figure 1. Use of integrated knowledge when the research objects of the sciences are the same.

When the research objects are the same, the integration is as follows is implemented in the scheme [3].

Students, on the one hand, form their professional competence as a result of solving integrated biological problems during the course of the lesson, and on the other hand, students develop their problem-solving skills and literally understand the essence of important physiological, biochemical and biophysical processes that occur in human life. prepares the ground for understanding and development of competences related to science based on the knowledge acquired at school.

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