



USE OF INTERDISCIPLINARY RELATIONSHIPS IN THE FORMATION OF COMPETENCES IN BIOLOGY STUDENTS

Qurbonov Utkirbek

*Head of the Department of the National Center
for Training Teachers in New Methods of Andijan
Region*

Annotation. *The article analyzes the ways and importance of interdisciplinary links in the teaching of biology in general secondary schools. There are also suggestions for using specific teaching methods.*

Keywords: *basic competencies, biological concepts, chemical concepts, physical concepts, ecological concepts, natural phenomena.*

Modernization of the education system, as well as all spheres of our life, remains one of the most pressing issues today. Creating an innovative educational environment, ensuring its full compliance with international standards is an important factor in the successful socialization of our youth in today's rapidly changing social life.

The implementation of the "National Training Program" involves improving the structure and content of the system of continuing education on the basis of modern science and social experience. The Action Strategy for the further development of the Republic of Uzbekistan for 2017-2021 sets the task of "educating a highly educated and intellectually developed generation, creating a reserve of competent scientific and pedagogical personnel in higher education institutions." In order to do this, first of all, it is necessary to provide the teaching process in all educational institutions with advanced, scientifically based modern methods. The purpose of educating the younger generation, tasks and content of it are one of the most pressing issues facing the system. In order to bring up well-rounded young people, of course, we need qualified, well-trained teachers. That is why there are so many tasks for teachers today. Special attention should be paid to the introduction of new pedagogical technologies at all stages of education, in particular, the effective and rational use of information and communication technologies and the achievement of high efficiency. In order to train competitive, qualified personnel in line with world standards, to raise the next generation to a high level of spirituality, to respond to changes in social life, to bring up harmoniously developed individuals who deeply understand the essence of our national values, teachers should show examples of creativity, inquisitiveness, dedication. One of our main tasks today is to teach students to effectively use the different types of skills they have acquired in their personal, professional and



social situations, to teach how to independently search for the necessary information about science, to increase the necessary knowledge as a result of analysis to distinguish relevant materials, to pay special attention to the skills that employ in the event of unforeseen uncertainties, that is, in problematic situations, and to cultivate the ability to apply the acquired knowledge in everyday life.

Of course, we also rely on physical knowledge in our laboratory work in biology. That is, the development of biology was greatly influenced by the discovery of the optical and electron microscopes of physics.

Microscopes have made it possible to study the cellular structure of living organisms and the complex processes that take place in the cell. Microscopy can determine the nature of heredity in living organisms, the role of DNA and RNA, the material basis of heredity, in the formation of specific properties, functions, and traits.

“Smart Greenhouse” for students in grades 5-9

What disciplines combine: computer science, mathematics, physics, chemistry, biology, technology (labor), engineering

Objective: To create a 100% automated greenhouse model

Duration: 1 year

Form groups of 4 students and suggest to each of them what plants to choose and grow in their greenhouses.

In biology classes, children learn all the information about the selected plant: the conditions under which the light falls, the irrigation regime. They know the information about its height and productivity.

Then encourage students to think about the condition of the irrigation system for each plant. The scheme is as follows: irrigation should be carried out only when the soil is dry. Students should know whether the soil is dry or wet before watering.

Once students have determined the soil moisture level in the greenhouse, they install a humidity sensor. They measure the resistance of the earth to changes in humidity. This requires sensor calibration. In chemistry classes, students learn about different soil composition and resistance changes depending on changes in soil composition. After gathering all the initial data, it is the turn of computer science: they program the work of sensors and print small parts of the greenhouse on a 3D printer.

They study the operation of humidity sensors for air and CO₂, as well as artificial lighting.



For the harvest, students learn the basics of a robotic manipulator, which uses a color sensor to detect the ripeness of a crop.

In conclusion, it can be said that the field of biology can be taught not only in geography, chemistry, physics, but also in computer science, mathematics and engineering. These students have a high level of interdisciplinary coherence and mastery in the study of biology. Encourages students to take an interest in biology and pursue careers.

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