SOME ASPECTS OF INTERDISCIPLINARY CONNECTIONS IN THE TEACHING OF BIOLOGY

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Annotation: *This article provides information on interdisciplinary connectivity in the biology teaching system. The information described is aimed at improving the teaching methodology by connecting the basic concepts used in the teaching of the" biology " course with the concepts used in the physics and chemistry courses. The article also covers information on cross-subject synchronous and asynchronous connections.*

Keywords: *education, knowledge, interdisciplinary connection, biology, physics, chemistry, synchronous, asynchronous.*

By the 20th century, new branches of science had emerged as a result of the development of all disciplines differentiated according to verification obects. By the 21st century, however, there was a need for integrated education, and integrated education was known to perform important functions. Because, in the process of thorough assimilation of the basics of science by students and activation of cognitive activity, interdisciplinary integration is important. In the process of radical reform of the educational system in terms of improving the quality of education, the implementation of interdisciplinary ties is even rising to the level of Public Policy. In this regard, a number of laws and resolutions have been adopted by our government. In Particular, Our President by Sh.M Mirziyoyev on 12thAugust, 2020year of the decision “on measures to increase the quality of continuing education in the areas of Chemistry and biology and the effectiveness of science” is a practical proof of our above opinion. Indeed, as a result of integrative education, students realize the meaning and essence of biological law, theory and hypotheses as a whole. On the basis of integrative knowledge, one learns the links between phenomena occurring in nature, the causes and consequences not only within one discipline, but also dies, analyzes, generalizes, analyzes and synthesizes within the framework of related disciplines, making conclusions. Fully comprehends the essence of the essence of the essence of the phenomena and processes occurring in nature. Therefore, in the process of mastering biology, it is important to study on the basis of integration with chemistry, physics, geography, cybernetics, matimatics, philosophy, logic. The correct Organization of interdisciplinary connection and its skillful use serve to form a system of students ' knowledge of nature.

Comprehensive research work on the teaching of subjects on the basis of integration is also carried out in our country. There has been some work done by Republican biologist Methodist scientists on the research of integration between

disciplines. In particular, professor A.T.Formation of general and private concepts in the teaching of Biology by Gofurov, S.S.Fayzullaev in teaching the basics of genetics and selection between chemical and physical processes, professor J.O.Tolipova is in the process of training pedagogical personnel, associate professor U. Rakhmatov studied the problems of using the integration of a number of disciplines in improving the professional competency of teachers.

In later years, it became customary to practice the connection between disciplines with the term integration. Integration-derived from the Latin alphabet “integration", meaning long, holistic, one whole. Interdisciplinary communication in the educational process can be effectively carried out through the Professional, Scientific and methodological training of the teacher and on the basis of his deep understanding of his own science. To do this, the teacher must be aware not only of the deep and thorough knowledge of the subject he teaches, but also of the integrative knowledge close to him. It helps to acquire individual types of knowledge and forms of communication between them[3].

Types of interdisciplinary connections in general secondary education schools are special knowledge or factual, research work is considered a special field of knowledge biology based on the teaching of educational subjects in connection with natural and Exact Sciences, in which synchronous (horizontal) and asynchronous (vertical) connections between general and private biological concepts and chemical and physical concepts are envisaged. Synchronous (horizontal) linkage refers to interclass parallel links (Biology, Chemistry, Physics, Mathematics, Geography V, based on the curriculum and curriculum of subjects.b). Asynchronous (vertical) linkage means that subjects of study science are based on the program and curriculum from knowledge acquired in previous classes through the use of interclass (6th grade natural science, 7-8-9-10-11 grade biology v.b) the connection is understood[4]. Examples of synchronous connection are the topics “cellular structure of the human organism”, “structure of the musculoskeletal system”, “achamity of the exchange of substances and energy”, “structure and function of the brain”, “structure of the auditory organs, auditory hygiene”, studied directly in the 8th grade of the physics training course “electrical phenomena in nature”, “electric current in liquids”, “magnetic field”. The topics " permanent magnet and its poles”, “current sources”, “work of electric current”, “electrical safety measures”, “composition of the atomic nucleus” in the textbook of Inorganic Chemistry of the 8th grade, “structure of Atomic electron chambers”, “current sources”, “Biogenic elements and their importance in living organisms” are based on horizontal bonding in teaching biology in connection with chemistry and physics. This type of connection is basically formed in a class-wide parallel in the course of the lesson[2]. In asynchronous bonding, interclass bonding is understood through the use of acquired knowledge in earlier classes. For example, Biology (Man and his health) will be an example in the 8th grade to explain the topics “the cellular structure of the human organism”, “blood and its function”, “the structure

of the musculoskeletal system", in the 7th grade "physics" educational textbook "the movement of bodies under the influence of gravity of the Earth", "frictional force", "potential energy", "kinetic energy". [2]

The processes of integration of biology, chemistry, physics, mathematics into all aspects of everyday life are rapidly entering. Therefore, arming students at school with integrative knowledge is one of the most pressing problems at the moment. Biology teacher in solving this problem:

– first of all, it is necessary to have knowledge and skills about integration, integrated knowledge;

secondly focused on this purpose, methodically based,

must have planned a work with a scientific orientation;

- thirdly, it is important that he is able to choose and practice integrative materials that are purposeful in content and essence, substantiating the scientific importance of educational materials[3]. Consequently, the teacher should not only collect integrative materials related to the topics in the program, but also systematize it, with which he will be able to trace the necessary approaches and methods of using students in classes and extracurricular activities.

Knowledge inversion covers the following processes:

- change in the description of the student in the transfer of knowledge from the formed science to another in order to activate his mental activity;

- teaching that scientific knowledge is inherently interdependent conversion to tasks;

- to determine the levels of acquisition of interdisciplinary knowledge and skills, which ensure that the abilities of the student's creativity are also composed of professional orientation.

In the development of independent thinking skills in schoolchildren, the use of the mechanism of interdisciplinary communication in the educational process is of significant practical importance. Generalizing the imagination and knowledge generated in the process of studying biology, students develop certain skills and qualifications based on interdisciplinary communication in the educational process of the socio-Humanitarian category, including:

1. The phenomenon of interdisciplinary communication in the educational process is a complex and complex didactic process;

2. The philosophical basis of interdisciplinary engagement, the development of Sciences and scientific concepts in an interconnected way, is revealed by famous scientists;

3. They noted that the laws of interdisciplinary communication in the educational process are a leading didactic phenomenon within methodological-didactic principles;

4. In ensuring interdisciplinary involvement in the educational process, the materials of educational subjects close to one in content are extremely demanding in coordination-resurrection;

5. An attempt is made to increase the scientific and practical level of the material under study;

6. Interrelated knowledge is rounded off as a didactic unit;

7. In the minds of students, ways to absorb stable and systematized knowledge are indicated;

8. Tools are defined that serve to expand the possibilities of mastering generalized knowledge;

9. Interdisciplinary communication in the educational process directly affects the main components of the educational process, that is, the content of the educational material, teaching methods and technical means are selected in accordance with this process.

On the basis of teaching educational subjects in interaction in secondary schools, the following results can be achieved:

- general education curricula and curricula are optimized;
- as a result of the reduction of a number of subjects in secondary schools, the school will have the opportunity to teach foreign languages or develop physically from a young age;
- independent and logical thinking, abstract thinking skills are formed in school-age students;
- students form holistic concepts and visions, life skills about nature, society and science.

One of the leading disciplines about nature is considered - biology is assumed by much more responsible tasks in the formation of the scientific worldview of students. For this reason, the content of the educational science of both school biology has great potential in the formation of a scientific worldview in students. In the teaching of biology, it was intended, above all, to introduce students to the basic concepts of biology, idea, theory, laws, the role of the national economy in various branches, the importance of mastering biological knowledge, to use the knowledge acquired by students from chemistry and physics in problematic situations.

On the basis of the interaction of biology, chemistry and physics, it is emphasized that it is advisable to use issues related to ecology when organizing classes. Focusing on interdisciplinary engagement in biology classes, that is, the use of physical concepts and laws in the process of teaching biology, leads to the formation of biophysical concepts in students, awareness and deep assimilation of the knowledge gained in the Natural Sciences. In this, a holistic system of scientific knowledge about nature and society, their interdependence, the laws of nature is formed. It is emphasized that it is advisable to use issues related to ecology when organizing classes based on the interrelationships of biology, chemistry and physics about nature.

In the process of studying biology in connection with chemistry and physics, students lead to an understanding of the laws of the structure, development and life activity of biological objects using the laws of physics. This knowledge forms a system

of students ' scientific worldview and beliefs. The scientific worldview of readers is based on the understanding of biological laws from the point of view of the historical development of the relationship “nature - man – Society”.

The main goal and task of environmental education in teaching biology in general secondary schools in connection with chemistry and physics is theoretical environmental knowledge (a complex of knowledge in the natural - scientific, natural - mathematical, technical and socio - Humanitarian category about the interaction of nature and society), valuable objects (understanding, understanding the material and spiritual value in meeting the needs of each person and society, his socially useful, productive activities, such as assessing his condition, promoting environmental knowledge), views and beliefs (being in a careful and caring attitude towards the natural environment, being an active Kura against any manifestations of economic attitudes towards him. The formation of ecological thinking based on theoretical environmental knowledge, practical skills and qualifications in the process of teaching students biology in connection with chemistry and physics is a dialectical knowledge that interprets the harmony of society (man) with nature as a natural - historical, evolutionary, social problem.

In the process of teaching biology in connection with chemistry and physics, it is important to rely on the hadiths, scientific views of our great compatriots such as Bukhari, Thermiziy, Samarqandi, Khwarazmiy, Farabi, Beruniy, Ibn Sina in determining universal moral and environmental values in the upbringing of theoretical environmental knowledge, practical skills and skills, environmental thinking and the attitude of environmental responsibility that is considered its basis[5]. In teaching biology in connection with chemistry and physics, the following was envisaged in the formation of the reader's ecological thinking, the attitude of responsibility to nature on its ground:

* reflection of the interaction of Nature, Society and technology in the information given to readers;

* universal and national values to the minds and hearts of students

impregnation;

* to acquaint readers with the positive and negative effects of humanity and civilization on nature, the activities being used to eliminate their consequences;

• vital processes that go in living organisms: explaining such as movement, breathing, metabolism, thermoregulation using knowledge acquired in physics.

In the content of scientific thinking in students by teaching biology in connection with chemistry and physics, first of all, the content of education plays an important role. The content of education prepares the ground for the acquisition of new knowledge, skills and competencies by applying the previously acquired knowledge, skills and competencies of students in new situations on the basis of the harmony and continuity of the two academic disciplines. In the process of teaching biology in connection with chemistry and physics, the selected educational content was sorted

according to the degree of purposefulness to be used in the course of teaching forms, extracurricular activities, extracurricular activities and the excursion process. Changes in educational content in the process of teaching biology in connection with chemistry and physics necessitate an effective choice of teaching methods, paths and tools[5].

In conclusion, giving the meaning of integration, embodiment, rounding, it is an important tool in that it allows students to comprehend phenomena and processes in a holistic way, expand the scientific worldview, actively think, based on the generalization of their knowledge from the sciences.

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