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Research Article

USE OF INTERDISCIPLINARY INTEGRATED APPROACHES IN THE EDUCATIONAL PROCESS

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ABSTRACT

This article contains information about intersubject relationships in the system of biological education. The presented information is aimed at improving aims to improve teaching methods by linking the basic concepts used in teaching the course with the concepts used in the natural sciences.

The article also provides information about intersubject communication of synchronous and asynchronous relationships.

KEYWORDS

Education, lesson, knowledge, interdisciplinary communication, biology, physics, chemistry, synchronicity, asynchrony, continuity.

INTRODUCTION

The upbringing of a healthy and harmoniously developed generation in our country is directly related to the education and upbringing of young people. The role of modern specialized Presidential schools, al-Khwarizmi, Ibn Sino schools is of practical importance in realizing the creative and intellectual potential of

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young people, in bringing up the youth of our country as competitive, well-developed talented people who fully meet the requirements of the XXI century. Specific measures are being taken to create conditions and opportunities in these educational institutions. The large-scale work carried out in the field of education in recent years will undoubtedly be a solid foundation for achieving our noble goals, building a prosperous life that is second to none by educating young people at the level of the world community. In particular, the introduction of innovations in the educational process is an important requirement of today.

THE MAIN RESULTS AND FINDINGS

Innovative technologies are used in the pedagogical process, as well as in the implementation of innovations and changes in the activities of teachers and students, mainly using interactive methods.

Interactive methods are called team thinking, that is, methods of pedagogical influence are an integral part of the content of education. The peculiarity of these methods is that they are carried out only through the interaction of the teacher and the student. The process of such pedagogical cooperation has the following specific features:

- To force the student not to be indifferent during the lesson, to think independently, to be creative and to explore;
- Ensuring that students' interest in learning is constantly high;
- To strengthen the student's interest in knowledge independently, creatively approaching each issue;
- Organization of constant joint activity of the teacher and the student.

The main basis for the use of pedagogical technologies is the approach chosen by the teacher and the student to work together to achieve a certain result from the set goal. In the process of teaching, every educational technology used to achieve a guaranteed result on purpose is a modern requirement for collaborative activities between teacher and student.

One of the most important tasks today is the effective use of innovative pedagogical technologies in the educational process, resulting in increasing the effectiveness of education, analysis and implementation. It is extremely important to broaden students 'horizons, minds, worldviews, turning them from a free listener to a free participant. The teacher should lead the class and the students become the participants. In the process of implementing this task, the predominance of innovative activities has a multifaceted effect.

Lessons based on innovative technologies will be closer to the child's psyche. Students will be motivated to achieve goals based on their interest, desire, and aspiration to master the learning materials, and will be the basis for teacher-student interaction.

It is well known that in the study of each lesson topic you have to choose your own technology, methods and tools. In order to achieve a high result in the teaching process, it is necessary to approximate the sequence of the lesson process. It is the teacher's skill to choose the specifics of the subject, the learning process and conditions, the scientific needs and capabilities of students, the level of knowledge, the technology used depending on the situation.

The development of students' learning motivation in the educational process plays an important role in the pedagogical process. Because the motive motivates students to the educational process, to actively participate in the lesson, to acquire knowledge. Interactive methods play a leading role in the process

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of developing students' learning motivation. More environmental-related activities expand the student's consciousness, worldview, compare objects, draw conclusions from what they see around them, think freely, articulate, and work independently. The introduction of the interdisciplinary integration we are researching into the teaching process also has an impact on the quality of education.

Interdisciplinary integration in the educational process serves the effective implementation of the teacher through professional, scientific-theoretical and scientific-methodological training, as well as on the basis of his deep understanding of the subject. To do this, the teacher must not only have a deep and thorough knowledge of the subject he teaches, but also be aware of the interdisciplinary knowledge close to it. It helps to master the different types of knowledge and the forms of connection between them. Teaching the course of developmental biology in higher education in conjunction with the natural sciences helps students to form practical and creative activities.

Types of interdisciplinary connections in higher education are based on the teaching of developmental biology, which is a field of special knowledge or factual research, in which the synchronous (horizontal) and asynchronous (vertical) connections between general and specific biological concepts and chemical and physical concepts. provided.

Synchronous (horizontal) connection is understood as an interdisciplinary parallel connection in a particular course based on the syllabus and curriculum of the subjects of the subject.

Asynchronous (vertical) connection is an interdisciplinary connection between the subjects of academic disciplines through the use of knowledge acquired in previous courses on the basis of the program and curriculum.

Examples of synchronous connections are "Chemical composition and physicochemical properties of the cell", "Cell morphology and biological membranes", "Cell division", "Cytoplasmic inclusions and hyaloplasm", "Cell physiology", "Reproduction of organisms", "Gastrulation". and the formation of pharmacological organs ",“ Tissues and their specificity ",“ Internal tissues ",“ Blood ",“ Power and its unity ",“ Diffusion phenomenon ",“ Law of conservation of matter and energy ",“ Magnet field ",“ Impulse of a system of bodies ",“ Movement of bodies in a viscous environment ",“ Fluid pressure ",“ Forces in nature ",“ Interaction of molecules ",“ Mass and its unity ",“ Temperature ",“ Mass of substances in the general chemistry textbook and energy conservation laws ",“ Exothermic and endothermic reactions ",“ Compounds ",“ Acids, bases, salts ",“ Chemical bonds and their types ",“ Ion, intermolecular and hydrogen bonds and their specificity ",“ Biogenic elements and their importance in living organisms ",“ Catalysts and their types. Inhibitors. "Enzymes", "Solutions and their properties", "Oxidation-reduction reactions" are based on the horizontal connection in the teaching of biology in connection with chemistry and physics. This type of connection is mainly formed in parallel between courses during the course.

In asynchronous communication, inter-course communication is understood using the knowledge acquired in the previous stages. It is even possible to make connections within the subjects of the high school stage and the mazuls given in them. For example, in the course of developmental biology, the topics of "Tissues and their specificity", "Internal tissues", "Blood" in 8th grade in the science of man and his health, "Cellular structure of the human body",

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"Blood and its function", "Basic-motor system" The structure of.

The course of developmental biology is relevant in the training of biology teachers in the higher education system. Information on the basic knowledge of the origin of cells now requires several references to concepts in the disciplines of biology (botany and zoology). This course is more complex than botany and zoology, but most importantly, in order to master developmental biology, students must have acquired knowledge in both physics and chemistry. In addition to cytological or histological knowledge, the study of concepts related to other natural sciences contributes to the in-depth study of the science of developmental biology. The fact that all biological sciences have in common creates favorable conditions for the establishment of consistent relationships between them. It is important for the teacher to determine in advance what general concepts need to be developed in the process of studying the cell or tissue, based on the content of the botany and zoology courses. The connection of the course of botany with the studied science is related only to some general biological (integrity of the organism, cell structure), the need to protect the environment, and is partially determined on some issues of local character.

The following concepts of botany are applied and developed in several topics of the course of developmental biology: the interpretation of information about the structure and importance of plant cells, tissues, organs, the composition of plants (proteins, fats, carbohydrates), as well as the role of plants in oxygenation of the atmosphere the concepts serve to form the same goal. The zoology course has a special place for a full study of the course of developmental biology.

During the study of zoology, students learn about the structure of animal cells, metabolism in animals, the relationship between the organism and the environment, the historical development of the animal world, the basic movement of animals, digestive, respiratory, circulatory system functions, the role of the nervous system, invertebrates and vertebrates. master the concepts of microscopic structure of organs.

The readiness of students to master the relevant concepts of developmental biology depends on how clearly the concepts of progressive nature are explained during the teaching of zoology, as well as the methodology of interpretation of anatomical-physiological and general biological concepts common to these subjects. In the study of vertebrates in 7th grade, concepts are formed in terms of revealing that the organism is an integral system, the anatomical and physiological features of several vertebrates are systematically compared. When given, it will be possible to better repeat the topics covered and reinforce students 'knowledge. In the course of cytology, histology and embryology, the generalization of material related to the basic general biological concepts will be continued. This course provides an opportunity to review the main stages in the historical development of all organ systems of vertebrates, as is well known from the best practices of teachers. In the example of animals, the formation and function of blood and blood circulation, respiration, digestive organs as a result of embryological development, as well as comparative-historical descriptions of nerve activity require students to systematically apply and develop relevant knowledge acquired in the course of zoology.

The anatomical-physiological description of organ systems prepares students to consciously master the

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problems of anthropogenesis, the similarities and differences between humans and animals. It is methodologically difficult to try to perform this task in a limited time on a single topic. Of course, this process is done step-by-step across several topics.

The fact that the course of developmental biology is properly connected with other disciplines of the natural sciences, the formation of students' understanding of the structure and development of organisms requires a basic knowledge of physics and chemistry.

In matters related to proteins, fats, and carbohydrates, the preparation of learners from chemistry is important. Substances such as fatty acids, glycerin, amino acids, glucose are necessary concepts for students. In the study of the processes of digestion in organisms and the study of its mechanism, the knowledge of the separation of urea and uric acid or the exchange of oxygen in tissues and organs, students also rely on physical (diffusion phenomenon) data. Therefore, it is necessary to explain to students as much as possible the unknown chemical and physical concepts.

CONCLUSION

Based on the above information, the teaching of developmental biology in the interdisciplinary relationship as a prerequisite for subsequent courses in botany (plant morphology, systematics and physiology), human anatomy and physiology, microbiology, biotechnology, genetics, problem solving and exercises in biology and biology teaching methods will be the practical basis. This will ultimately serve to prepare a future biology teacher.

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