

INNOVATIVE METHODS OF TEACHING BIOLOGY IN SECONDARY SCHOOL

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Annotation

At the present time of development of biology, when not only its structure, but also its content is changing, it is necessary to identify the most significant problems and outline ways to solve them. The goal of innovative methods in teaching biology in secondary schools is a qualitative change in the student's personality in comparison with the traditional system. This becomes possible due to the introduction into professional activity of didactic and educational programs unknown to practice, which involve the removal of the pedagogical crisis. The development of the ability to motivate actions; independently navigate the information received, the formation of creative thinking, the development of children by maximizing their natural abilities, using the latest achievements of science and practice - the main goals of innovation.

Keywords: pedagogy, biology, innovative technologies, problems of biological education, text books, specialized education, independence, responsibility, initiative, adaptability.

Introduction

In the age of rapid development of science and technology, it is important not to accumulate knowledge, but to be able to learn, that is, to find information, integrate and apply it, make predictions and solve problems, which means having a certain level of development of system-network thinking and a holistic vision of the world, such personality traits as: independence, responsibility, initiative, adaptability to changes. Such a wide horizon of development is capable of providing biological education due to its dynamic development and introduction into wide integration with other technical natural sciences and the humanities [10].

Literature Review

Education is a key tool for Uzbekistan's transition to sustainable development, ensuring the formation of citizens' knowledge, skills, attitudes and values necessary for their active participation in socio-economic life. [13].

The quality of the teacher's work, his readiness to solve complex problems, such as the introduction of new methods and technologies, updating the content of education, overcoming school failure, are the determining factors in improving the quality of school education in general [5]. Throughout the history of education, the knowledge of wildlife by schoolchildren served not only to develop thinking, logical thought, but also contributed to the formation of a scientific worldview, and also prepared a young person for life for many years to come. A person deprived of active knowledge of not only nature, but also himself, is not capable of compassion, he does not understand the colors and processes of nature, he does not realize his own dependence on nature, on ecology, the concept of love and respect even for himself is alien to him, not to mention already about the people around him, relatives and friends.

Theoretical analysis of the literature allows us to identify the following problems in teaching biology, which can be divided into several types: in the field of educational policy, methodology, subject content, teaching methods, teacher training, and some others. [10]. The works using data from international studies of the quality of education analyze the factors of low educational outcomes: characteristics of families of students (level of education and material well-being, cultural capital) and schools (social composition, resource base, textbooks, teaching quality, teacher qualifications). [4]

School performance is the main criterion for evaluating a child as an object on the part of parents, peers and teachers. Own observations and special studies in this regard showed that the reason for poor mastering of the material is the monotony, stereotype of methods and forms of teaching. Underestimation of emotions, ignorance by the teacher of the physiological and psychological characteristics of the age of schoolchildren, neglect of monitoring the development of the student, orientation of schoolchildren to the mechanical memorization of educational material, or the teacher's simple indifference to his subject and students. The modern development of Internet communication means is not taken into account, where the student draws a lot of information and perceives it incorrectly, or simply does not know how to use this information.

School educational material is thematically reduced, which leads to an incomplete perception of information, while tests for admission to universities are built on the principle of "Analysis and logic of data".

Reducing the number of hours for teaching biology at school will inevitably lead to a decrease in the level of biological education and, as a result, to a negative perception of the surrounding reality on the part of the younger generation, which is not

concerned about the problems of ecology, demography, the extinction of animal and plant species, the problems of global warming. These and other problems are not widely covered in textbooks. [7]. Pedagogy is increasingly being expelled from the school: its place is taken by reports, solving the problem of material and technical equipment, requests from regulatory authorities, and so on. The external environment of the school has changed and sometimes, unfortunately, not for the better: children who have grown up in the digital world are less attentive and concentrated, bureaucratic control over the school is becoming more and more difficult, and it is becoming more and more difficult to talk with parents.

The level of school preparation is not great and parents who are interested in the good passing of the entrance tests of their children are forced to look for tutors in several academic subjects. Other school subjects suffer from such an educational process, students simply often ignore attending lessons, do not pay due attention to studying material in other subjects. In addition, historically, the national school prepared schoolchildren for the development of logical thinking, the ability to logically express their thoughts, and prove their opinion. Currently, students are studying in two subjects and, of course, logical thinking is very lame, for the majority it is simply not developed. The entire academic year is aimed at developing the ability of schoolchildren to answer tests. When preparing, one should avoid mechanical training of students to memorize tests. This is not very effective and develops a complex of uncertainty in their knowledge. Students experience psychological stress when taking entrance tests. Gosstandart should focus on the development of knowledge and skills acquired by students in basic school.

Any significant change (in or out of school) begins with taking responsibility for what happens. It is necessary to focus on improving the knowledge of the teacher. Every teacher must understand that the most important goal of the school is to teach students to independently acquire knowledge and develop the ability to use it in the changing conditions of reality. A modern teacher is obliged to know the psychological and pedagogical essence of teaching methods, to know the methods and teach students the methods of analysis, synthesis, comparison, generalization, classification; be able to plan learning situations for the formation of logical thinking techniques and much more. The teacher needs to be more creative in the lesson, show imagination and be interested in the learning process. It is necessary to cover the younger generation as much as possible with the pressing problems in biology and medicine. This is due to the poor environmental situation in the world and the sanitary and hygienic education of the population. This function should be taken over by biology.

The main criterion for the quality of student training should be the degree of compliance of the content of education with modern requirements imposed by society on the personality and professional activities of a biology teacher.

The fulfillment of the tasks assigned to the modern methodology of teaching biology is possible only if the content of knowledge, their structures, teaching methods and forms of organization of training are aimed at the continuous formation of the pedagogical culture and pedagogical skills of future teachers. We need such forms of organization of the educational process that stimulate them to find a solution and form their own position, the desire to express and defend it.

At present, such components of the material base of teaching as: an educational and experimental site, a corner of wildlife, a greenhouse are not available in schools, while on their basis it is possible to organize the implementation of the practical part of the programs: organize excursions, observations and experiments, prepare materials for conducting laboratory and practical work.

I would like to separately note the laboratory and practical classes. This important educational event gives the child tremendous opportunities in the knowledge of nature, inspiration to learn and learn. Develops curiosity and pushes it to new discoveries. To organize such a learning process allows an individual-collective form of learning. As experience has shown, with this form of organization of the educational process, all students are included in the perception and comprehension of the educational process, in mutual discussion in solving the tasks. Cognitive activity is activated, the ability to communicate with each other is formed, independence, a responsible attitude to learning develop. Several times more often, students express their thoughts aloud than in the traditional organization of study, which contributes to the development of a sociable personality. The functions of the teacher are changing - He is no longer the only source of knowledge, but plays the role of an organizer of educational activities and the role of a consultant.

As a result, the results of such work will be:

- 1) Awareness of the common goal of the activity, which requires the unification of the efforts of each member of the group;
- 2) Establishing relationships of mutual responsibility and dependence in the performance of work;
- 3) Monitoring, correcting and evaluating the results of activities by the students themselves under the guidance of a teacher;
- 4) the main process of cognition, assimilation of educational material, its control and correction take place in the course of group work, but the assessment of knowledge, skills and abilities is individual for each student.

It is necessary to reduce the quantitative composition of the class, divide the class into subgroups in the study of specialized subjects such as biology, chemistry, physics. Update the technical base of training, it is currently outdated. Conduct retraining of teachers in order to expand basic knowledge of the theory of the subject, methods of teaching biology, psychology and practical exercises. An important problem of modernization of biological education is the transition to specialized education, focused on the individualization and socialization of students. In the standard for high

school, 2 directions are distinguished - basic and specialized. In the basic direction, much attention is paid to the students' knowledge of the worldview aspects of biological education. In the natural science direction, a deeper study of materials on biological systems by schoolchildren is provided. In the practice of teaching a number of schools, such a planning of a course in general biology is observed, where the content differs little from university courses. These are mainly specialized institutions. At the present stage of development of school education, the problem of using computer technology in the classroom is of great importance. Information technology provides a unique opportunity to develop not only the student, but also the teacher. The computer will not be able to replace the living word of the teacher, but new resources make the work of the modern teacher easier, make it more interesting, effective, and increase the motivation of students to study biology. Students are required to have a tablet or smartphone. This is dictated by the modern requirements of the educational process. Advanced video filming technologies and the use of specially designed computer graphics make it possible to follow the work of organisms, as it were, "from the inside", to discover their features and mysteries. That causes a great emotional upsurge and increases the level of assimilation of the material, stimulates initiative and creative thinking. And the result is winners at olympiads and rallies, or just passing the next exam with excellent marks. Thus, the use of ICT in the process of teaching biology increases its efficiency, makes it more visual, rich (the intensification of the learning process increases), contributes to the development of various general educational skills in schoolchildren, improves the quality of education, and facilitates work in the classroom [6].

It is known that for a more complete understanding of the structure and functioning of biological objects, the use of various visual aids is recommended. At the same time, it is taken into account that the development of abstract thinking occurs through images. Children with imaginative thinking have a hard time assimilating abstract generalization, without a picture they are not able to understand the process, to study the phenomenon. It is necessary to pay attention to the ratio of texts and graphic design. The graphic image should be enlarged as much as possible. Multimedia animation and 3D models make it possible to form a complete picture of the biological process in the student's mind, interactive models make it possible to "design" the process on their own, correct their mistakes, and self-learn [1,2,14].

Online testing can be the main criterion for assessing the quality of teachers' knowledge. This procedure must be carried out every year in the month of August before the start of the school year, and every teacher must undergo it. Salary increases should be significant. The number of teachers in each of these groups is decreasing from year to year, as the natural course of the processes of creative growth and the development of teacher potential has been seriously disrupted. Ways to improve educational outcomes are considered in the context of the reorientation of the

education system towards developmental learning technologies, which requires updating teaching methods and teaching kits, providing systematic professional development for teachers, and introducing comprehensive monitoring of the quality of education using tools similar to PISA [3].

The school, as the most important socio-cultural institution, is called upon to correspond to its educational practice in real life and work ahead of the curve, developing thinking, independence, worldview, enriching students with knowledge and experience. Attention to education in all its manifestations, by all sectors of society remains a guarantee that "the school will teach not for school, but for life" - said the great sage Seneca [10].

If the methods of teaching biology succeed in successfully coping with the solution of these problems, then there will be confidence that the system of biological education will be at the forefront, allowing the preparation of a younger generation with biological thinking and ready for practical activities.

Problem Analysis Results

In the near future, methodology teachers will have to solve a number of tasks and problems focused on the development of school biological education.

The first task is related to the selection of the content of education and the construction of the logic of the learning process based on the professional and qualification characteristics of a biology teacher.

The second is the organization of educational and cognitive activity of schoolchildren. In practice, it has a fact - with explanatory and illustrative teaching, the cognitive activity of students increases several times and becomes more productive. It is necessary to prepare future teachers of biology to work in the system of organizing the collective educational and cognitive activity of schoolchildren. All available methods must be used. The third problem is related to the availability of computer technology and the creation of high-quality programs, which, depending on specific didactic tasks, can be controlling, training, modeling, gaming, etc.

But it should be remembered that with all the possibilities, computer programs are only a means of increasing the efficiency of activity, an assistant to the teacher, not replacing the teacher himself [7].

There is a need for a center for the methodology of natural sciences, which will coordinate and guide all those interested in the development of methodology, in improving the system of continuous education of teachers. Control of training centers. Evaluation of teacher training should be carried out objectively.

For the successful organization of pedagogical activity, certain conditions must be observed:

1. A clear presentation by the teacher of the level of students' skills to work independently.

2. Correctly indicate the sequence of actions of students when performing work.
3. A clear definition of the list of knowledge and skills that students should know and have after studying a particular topic.

Conclusion

The general teaching methodology considers the main issues of all biological courses at the school; concepts of biological education, goals, objectives, principles, methods, means, forms, implementation models, content and structures, education in the country and the world; ideological, moral and eco-cultural education in the learning process; unity of content and teaching methods; the relationship between the forms of educational work; integrity and development of all elements of the biological education system, which ensures the strength and awareness of skills and abilities.

Based on the above:

1. Reduction of hours in biology is unacceptable;
2. Biology should be studied at school throughout all years of study as an independent subject; the program that is approved by the Ministry of Education must be implemented.
3. The teaching of the subject should be progressive, qualitative, at a higher technical modern level;
4. The transfer of knowledge must be carried out with the active participation of students, this requires the creation of clear, unified textbooks, teaching aids, the development of programs for laboratory, practical, independent, tests and seminars.
5. Multi-level, step-by-step training and retraining of biology teachers in advanced training courses should be assessed objectively;
6. Creation of a modern material base, including the provision of modern technological devices that meet international standards.
7. It is necessary to build new schools according to modern standards.

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