



DEVELOPMENT OF COGNITIVE ACTIVITY OF STUDENTS WHEN USING AN INTERACTIVE BOARD IN THE PROCESS OF TEACHING BIOLOGY

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ABSTRACT

This article substantiates the methodological conditions for enhancing the cognitive activity of students, in addition to the system of tasks using an interactive whiteboard, first of all, it includes methodological support that equips the teacher with knowledge in the field of the subject being studied and makes the lessons more interesting and information-filled.

One of the problems of studying biology in a secondary school is the decrease in the educational and cognitive interest of students in the subject at the senior level, due, on the one hand, to the limited number of hours allocated by the curriculum. On the other hand, there is a fairly high complexity of theoretical material that must be mastered in order to form the necessary competencies and apply them in action, as required by the competency-based approach in education

In the course of working on the research problem, sets of interactive lessons using an interactive whiteboard were developed. The lessons were developed according to the program in the 10th grade on the topic "Reproduction and development of living organisms", in the 11th grade on the topic

"Human Evolution". The typology of lessons was different: from lessons on learning new material to lessons on generalizing and systematizing knowledge.

At various stages of the lesson, various techniques were used to enhance cognitive activity using interactive tasks. So at the stage of perception and comprehension of knowledge when studying a topic "Meiosis", a "novelty device" was used, which includes not only facts about the reproduction of organisms, but also a task in which students need to correctly correlate the stages of development of germ cells and the characteristics of these stages, as well as a drawing

At the beginning of the lesson on the topic "Mitosis", a problematic situation was proposed, the solution of which would lead to the topic of the lesson. At the time of birth, a child weighs on average 3 - 3.5 kg and has a height of about 50 cm, a brown bear cub, whose parents reach a weight of 200 kg or more, weighs no more than 500 g, and a tiny kangaroo weighs less than 1 gram. A beautiful swan grows from a gray, nondescript chick, a nimble tadpole turns into a sedate toad, and an acorn planted near the house grows into a huge oak



tree, which a hundred years later delights new generations of people with its beauty. Question: Thanks to what processes are it possible all these changes? An indicator of cognitive interest can be the ensuing silence or surprise, which indicate absorption in what has just been heard. In particular, in the “Meiosis” lesson, in order to repeat the material already studied, the task was proposed to insert the missing letters into the given words. In this case, the technique of semantization was used, which is based on increasing cognitive interest in revealing the essence of these concepts. Revealing the semantic meaning of a word or name helps students understand the meaning inherent in it, contributes to the establishment of interdisciplinary connections, the development of imagination, ingenuity, and fantasy. Surprise, the desire to learn more about the object being studied with the help of additional literature are characteristic indicators of cognitive interest in this technique.

In the lesson on human evolution, questions were asked at the beginning of the lesson, which created an attitude towards the need to study the material in connection with its biological and practical significance for students. What position does man occupy in the animal world? What evidence could you name of the origin of man from animals? Why does this topic occupy an important position in the study of the evolution of the organic world? The lesson creates a kind of psychological

“a situation of expectation” (attitude), when students positively adjust themselves to the perception of new knowledge and strive for a deep assimilation of the material being studied. The teacher’s manner of detailing and concretizing the textbook material encourages students to think more deeply about the knowledge they are acquiring and gives rise to many questions.

At the stage of understanding new material, the main techniques for enhancing cognitive activity are: creating a problem situation. In a lesson in 10th grade, when studying the topic “The influence of nicotine, alcohol, drugs on human embryonic development,” students were a problem situation is given: Let's imagine that you graduated from school a long time ago, you 30-35 years old. You are at a parent meeting. The teacher, talking about the successes of your children, notes that some have difficulty reading, fidget, are disorganized, inattentive, they cannot keep up with the others, and they do not succeed in everything in physical education lessons. And parents complain that they don’t have time, that their son or daughter is lazy, you can’t force them to read, they won’t spend an extra minute in their homework, they’re waiting for us to do their homework.

The teacher speaks differently about others: they are friendly, sociable, easily “grasp” new things, solve problems with pleasure, physical education is one of their favorite lessons, homework is always completed.

Questions arise: Why are children so different? Parents, what kind of children would you like to be at this meeting? During the discussion, everyone expresses their opinion on this situation.

Also, a research technique can be used in the lessons; in a lesson on studying the process of mitosis, students performed laboratory work during which they needed to correctly determine the type of cell division, division phases and formulate conclusions on the work performed. Students performed the work using microscopes; an electron microscope was also



used, with which a photograph of a micropreparation was taken and the phases of mitosis were labeled on the interactive board

In 11th grade lessons, the technique of scientific argument was very often used. When studying the “Ecology” section, the topic “Environmental offenses: responsibility or impunity?” was studied. In this lesson, students were not only able to show their knowledge of biology, but also applied their knowledge rightfully, since all the material was based on it. Students were given 5 problems for which they had to find a solution. The class was divided into 5 groups and each group, through discussions and arguments, was able to solve the tasks assigned to them. Collision different points of view in which you need to make a decision in order to then take your own position, stimulates an active search for evidence and arguments to defend your point of view. This is an incentive for overcoming difficulties, for intense mental activity, for straining the mind, for intensifying cognitive activity.

At the stage of consolidating and generalizing the material, the interactive whiteboard allows you to create numerous tasks for mastering the material already studied and apply them in practice. Consolidation of material is to a certain extent associated with a phenomenon that in psychology is called knowledge transfer. Its essence lies in the fact that in the process of educational work, students have to transfer the acquired mental operations, abilities and skills, that is, apply them in other conditions. So, for example, in the binary lesson “Bioelectric Phenomena”, as a reinforcement, it was necessary to distribute the objects presented on the board into two groups and say on the basis of what characteristics we combine them.

Also an example is one of the techniques used at the consolidation stage in grade 10 on the topic “Embryonic development of organisms.” This is drawing up a diagram with the correct location of the main stages of embryo development. In the topic “Evidence of the evolutionary origin of man”, tasks were used, designed using the SMART lab program in which it is necessary to correlate the characteristic features of a person and which systematic groups they belong to.

In the topic “Methods of cell division,” students had to correctly fill out part of the table indicating the method of vegetative propagation of plants. The process of acquiring new knowledge is not limited to the usual transmission of knowledge. It is based on improving the independent work of schoolchildren, on a deep logical analysis of the factual material that underlies the formation of scientific

concepts. For example, when studying the topic “Meiosis” after studying the topic a task is used to fill out a diagram of the similarities and differences between the two processes of mitosis and meiosis. This task allows you to correlate these two processes with each other, as well as identify differences.

Also, during the experiment, an interdisciplinary lesson “Bioelectric Phenomena” was designed, in which two disciplines were combined: biology and physics. In this lesson, various techniques were used to enhance cognitive activity; one of the techniques was working with the distribution of images into groups at the stage of understanding knowledge. For example, when updating knowledge, students were given the task of distributing objects related to physics and biology and identifying their general properties of work In this lesson, we were able to conduct laboratory work on the conductivity of vegetables and fruits in fresh and



canned states, as well as consolidate knowledge in a special program Plikers. The lesson allowed students to intensify their activities not only in biology, but also in physics, which allowed students to see the relationship between the two disciplines. So, after laboratory work, students were given a test to consolidate the main points of the lesson.

The success of the lesson, of course, does not completely depend on the new technologies and equipment that the teacher uses. But in some cases, an interactive whiteboard can be a good assistant, and it is important to understand that the effectiveness of working with it largely depends on how the teacher uses its various capabilities.

Thus, based on all the techniques studied, we can conclude that the use of techniques that activate cognitive activity at different stages of lessons stimulates students' desire to independently complete tasks and is characterized by concentration and increased attention when learning new material. The use of interactive tasks allows you to increase the level of cognitive activity at all stages of learning, enhance the cognitive interest of both strong and weak students.

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