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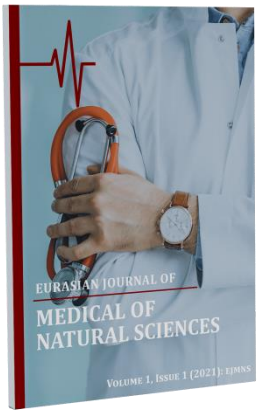

METHODS OF TEACHING BIOLOGY IN HIGHER EDUCATION

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ABSTRACT

Modern education can be developing and educating only if it belongs to the activation of students' thinking. The more active the student's cognitive processes (sensation, perception, representation, memorization, imagination, thinking), the higher the effectiveness of his/her learning. Therefore, the teacher's ability to activate, i.e. awaken, stimulate, direct thinking and other cognitive processes of students, is one of the most important signs of pedagogical mastery.

Activation of thinking plays a major role in improving the quality of students' knowledge, in intellectual development and the formation of their scientific worldview, in the education of activity as a positive character trait. Problem-based learning, in particular, contributes to the activation of students' thinking [1].

Since the 1960s, schools have been transitioning from less active reproductive (communicative, verbal-illustrative) teaching to more active problem-developing (productive-search, inductive, transductive) [2]. This change in approaches to methods and forms of teaching pursues the main goal - to more actively develop independent creative thinking activity in students, since lessons only for the assimilation (reproduction) of ready-made educational material for students became increasingly boring, uninteresting, and discouraging any desire to learn [3]. The peculiarity of problem-based learning is that students are not given ready-made knowledge, but are given a problem (difficulty, complication, obstacle) to solve on their own, during the solution of which they come to conscious knowledge.

The central concepts of problem-based learning are the concepts of a problem situation and a problem. The process of thinking, the process of the most difficult activity, which is mental activity, begins in problem situations. Consequently, a problem situation is a situation in which a person finds himself when he encounters some difficulty or obstacle on the way to achieving the goal of his activity. Only in this case do students develop active mental activity.

Depending on the age of the students and the content of the material, problem-based learning can be carried out using different methods at different levels. Of these, the most common are the following 4 levels [4]:

– Problem-based presentation of educational material (inductive, revealing, creative approach);

– The teacher deliberately, intentionally creates problem situations, and the students, together with him, are involved in their resolution;
– The problem situation is only created by the teacher, but it is resolved in the course of independent activity of the students (partial search approach) [5];
– Students themselves create a problem situation from the material offered by the teacher and themselves independently resolve it (research approach).

Levels of problem-based learning

1. Problem-based presentation of material (PPM)

Inductive, question-and-answer presentation

"Plants", "Animals" [6]

2.The teacher creates a problem situation (USPS)

The teacher and students jointly resolve a problem situation (game "Chain", guessing riddles) - the teacher helps to guess riddles, answer questions

"Animals", "Man and his health" [7]

3. The teacher creates a problem situation (USPS)

Students solve the problem themselves (game "Chain", guessing riddles), here students independently guess riddles using additional literature, answer questions (partial-search approach)

"Man and His Health", "General Biology"

4. Students themselves create a problem situation based on the teacher's material

Students independently solve the problem (game "Chain", guessing riddles), here students independently guess riddles using additional literature, answer questions (partial-search approach) [8]

"General Biology"

As an example, we can cite riddles in the lessons of the "Plants" section for students in grades 6-7. Such work contributes to the development of observation, intelligence, and resourcefulness in students. To successfully complete this work, you need to know the educational material well and be sure to read additional specialized literature. The technique of using riddles can be used to consolidate new material, when checking and assessing knowledge, especially in generalizing lessons. Here are some of the riddles.

Family of cruciferous [8]:

– A stalk has grown into a ball in the garden bed behind the barn (kohlrabi).
– A white-faced maiden cannot stand the sun, she asks for an umbrella (cauliflower).
– Ignashka has forty-three shirts on her shoulders (white cabbage).

A problem situation can and should be created not only when studying new educational material, but also at other stages of the lesson: when checking and assessing knowledge, consolidating new material, generalizing what has been studied.

A problem situation can be created by questions, deeds, actions, tasks, tasks and other techniques. But not just any questions, but those that cause difficulty, tension, and extremeness. Such questions may be: 1. Name the breeders who developed the apple variety "Sinap Severny", the wheat variety "Mironovskaya 808", etc. No less interesting and difficult will be the students' questions about why watermelons are usually striped, and birch trunks

are white? No less valuable examples of creating emergency problem situations are the TV shows "What? Where? When?", "KVN", "Field of Miracles", etc [9].

Stages of problem resolution

Problem situations are usually resolved in stages, and the process of understanding is carried out through 3 levels: awareness, comprehension, and insight. With awareness, the superficial content of individual words, terms, thoughts is revealed, i.e. the most general idea of facts, events, phenomena - at the factual level.

When comprehending, the inner essence of phenomena, facts, processes is revealed, i.e. at the conceptual level. This thought process ends with judgment and practical action, since the student himself chooses, approves or rejects the material being studied [10].

Insight occurs where students are put in a difficult situation and they need to independently find a way out of it - this is the creative level. This step-by-step approach can be more clearly represented by a diagram:

Levels of resolving a problematic situation

– Awareness (factual level)
– Comprehension (conceptual level)
– Insight (creative, heuristic level) [11].

Independent discovery of truth brings students extraordinary intellectual satisfaction. This is one of the brightest feelings in the learning process. But, unfortunately, school very rarely provides an opportunity to experience these strong and joyful emotions. At the same time, it is known that the more and more successfully difficulties are overcome in class, the faster and better students develop: independence, initiative, creative activity. These character traits contribute to better preparation of students for life [12]. The emotional upsurge that accompanies the solution of biological, genetic and other problems, overcoming difficulties, bringing the started business to the end contribute to the education of purposefulness, cognitive independence and the development of many other best personal qualities. Mechanical memorization without understanding, cramming - these are the relics of the past in school practice.

The most important components of the process of assimilation of knowledge include conscious memorization and meaningful reproduction of new educational material. Memorization is carried out throughout the entire process of acquiring knowledge. Three features of the memorization stage should be distinguished: primary imprinting, incidental memorization, and consolidation. Here, a special role belongs to the primary imprinting of observed objects, phenomena, processes, thoughts, and concepts. First impressions are most strongly and firmly fixed in memory. The first impression largely determines the correctness or incorrectness of memorization of educational material [13]. Therefore, the first lesson plays a special role in the initial imprinting, in arousing interest in the biology course. The interest in the entire course and the success of subsequent lessons largely depend on how interestingly the teacher presents the material, how convincingly he shows the importance of biology. First impressions are the most persistent and if they are unfavorable, it will be difficult to change them later. Therefore, it is necessary to prepare especially carefully for the first lesson. Students always look forward to the first meeting with the teacher on a new

subject, wanting to hear from him new, hitherto unknown things. And it is important not to deceive their expectations, to satisfy the cognitive need [14].

Problem-based learning is understood as such an organization of classes that involves the creation of problem situations under the guidance of the teacher and active independent activity of students to resolve them, as a result of which creative acquisition of knowledge, skills, abilities and the development of thinking abilities occurs.

Cognitive processes in problem-based learning are transformative (productive, creative) in nature. In traditional learning, cognitive processes are of a reproducing, reproductive nature: the student reproduces in his memory only what he perceived and remembered from the teacher's words. Consequently, in traditional learning, the cognitive activity of students relies mainly on memory and thinking. This is the internal difference between the two methods of learning.

The external sign of problem-based learning is the presence of an educational problem and a problem situation. An educational problem can be called any educational question that students cannot answer immediately due to insufficient previously acquired knowledge, therefore requiring a search and acquisition of missing knowledge.

A problem question, unlike an informational one, necessarily contains an area of subjectively new knowledge that students have not yet discovered. The same question can be both informational and problematic, depending on when it is asked: before the teacher communicates the relevant knowledge or after.

A problem situation is a situation of intellectual difficulty, i.e. such a state in the classroom when students, having understood the educational problem, try to solve it independently, but feel difficulty due to the insufficiency of their existing knowledge. A problem situation creates a special mental “field of intellectual tension” in the classroom, induces active mental activity of students aimed at overcoming educational difficulties. A problem situation is not only a special state, but also a process that has its beginning, development and end. It usually begins from the moment the teacher poses a learning problem, sometimes even before that, if the teacher conducts deliberate preparatory work (for example, an introductory conversation). It is important not only to create a problem situation, but also to include all students in it. In this regard, it is necessary to identify.

References:

1. Zvereva N.M. Practical Didactics for Teachers: Manual, - M. Pedagogical Society of Russia, 2021. - 256 p.
2. Leontiev A.A. Technology of Developmental Learning: Some Considerations // "School 2000.." Concepts, Programs, Technologies, Issue 2 - M., 2018,
3. Lerner I.Ya. Teach Creatively, Educate a Person // Biology at School. 2008, No.4
4. Tasheva Dilorom, Djanzakova Matluba. The role of literary text in teaching the Russian language. International Multidisciplinary Conference. Manchester, England. 25th December 2023. -p.19. https://conferencea.org
5. Kholbaeva D.D., Tasheva D.S. Pedagogical techniques and methods of forming interest in the lessons of the Russian language. Web of scientist: international scientific research journal, ISSN: 2776-0979, Volume 3, Issue 3, Mar., 2022. -p.238

6. Kholbaeva, D., & Tasheva, D. (2022). Theoretical And Practical Aspects Of Monitoring The Acquisition Of Knowledge, Skills And Abilities By Students In The Russian Language In Universities. Евразийский журнал социальных наук, философии и культуры, 2(11), 115-118.
7. Tasheva, D. (2022). Methods Of Using Didactic Materials To Enhance Activities In The Russian Language Lessons. Ta'lim Va Rivojlanish Tahlili Onlayn Ilmiy Jurnali, 2(1), 325-328.
8. Mukhtarovna, K. D. (2023). Modern Approaches to Teaching A Foreign Language Based On The Use Of Multimedia Programs. Conferencea, 13-17.
9. Mukhtarovna, K. D. (2023). Information And Communication Technologies in The Russian Language Lessons. Conferencea, 39-41.
10. Mukhtarovna, K. D. (2023). A Cycle of Integrated Lessons of Literature and World Art Culture Dedicated to The Work of SA Yesenin. Periodica Journal of Modern Philosophy, Social Sciences and Humanities, 18, 106-108.
11. Mukhtarovna, K. D. (2024, March). CHARACTERISTICS OF THE LINGUISTIC COMPONENTS OF THE EMOTIONALITY OF A LITERARY TEXT. In E Conference Zone (pp. 40-43).
12. Matyushkin A.M. Problem Situations in Thinking and Learning. - M., 2022.
13. Makhmutov M.M. Problem-Based Learning. M.: Pedagogy, 2015. 367 p.
14. Melnikova E.L. Problem Lesson, or How to Discover Knowledge with Students: Manual for Teachers. - M., 2022.