

WAYS TO IMPROVE THE EFFECTIVENESS OF BIOLOGICAL EDUCATION

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ANNOTATION: This paper involves the information on the specific aspects of the formation of creative thinking between students and schoolchildren, one of the most important tasks, facing the system of continuous education. It also outlines the problems of improving the teaching of biology and ways to solve them.

KEY WORDS: continuous education, creative thinking, reflexive, synergistic and systematic approach, professional competence, biology, biological assignments and tasks, diet ration, proteins, fats, carbohydrates.

INTRODUCTION

One of the important tasks facing the system of continuing education is the formation of creative thinking of students and students. Creative thinking is innovative (new, innovator, original, non-standard, unusual, etc.k) and efficient (practical, consequential, cost-effective, optimal, etc.k.) is the ability to find solutions, acquire new knowledge, develop ideas aimed at impressively expressing the imagination, evaluate and actively participate in the process of improvement.

Creative thinking can help you find an unusual solution to problems. All discoveries in human civilization (from simple to the most complex) are considered the result of creative thinking. In creative thinking, the main task of education is to form the skills that will be necessary today and in the future for students to live a successful life in society.

Main part. Education is a systematic process aimed at providing deep theoretical knowledge, skills and practical skills to education learners, as well as the formation of their universal and professional knowledge, skills, skills, development of abilities. The main goal of organizing education: to train qualified specialists who have a competitive level and specialization in the labor market, who are responsible, master of their profession, freely master related professions, can effectively work at the level of world standards in their specialty, work on them continuously. The competence of the trained personnel directly depends on the degree to which the professional competence of the teacher teaching them has been improved[1, p.7].

In the current era of information globalization, the changes taking place in the field of Education directly require educators to work on themselves regularly, actively changing their activities and adapting to this process of globalization. The main task of the teacher is to mature the personality of the student by providing quality education and the formation of competencies that he will be able to apply in his future life[4, 24 p.].

Several factors are contributing to the occurrence of problems that are noticeable in the professional competence of teachers of biology of secondary schools. It is worth noting to them the following:

- the lack of consistent enrichment of knowledge and the slowness of their study of new information;
- Not being able to use the internet system enough;
- the fact that knowledge in the textbook intended for students is limited to the amount of time;
- to find new information in science, to process them and not be able to effectively apply them in their activities;
- lack of systematic organization of laboratory and practical training;
- the rational use of pedagogical and information technology in the process of teaching;
- non-acquisition of integrative knowledge between the exact and Natural Sciences;
- failure to fully form Genetic Literacy;

- solving issues related to biology sufficient improvement of competencies-it is worth noting such aspects as the importance [1, 34-42-b.].

Among the lessons listed above, the solution of issues related to biology is considered essential in the process of improving professional competencies.

The necessary condition for the use of issues related to biology in improving the professional competence of teachers of biology at schools of general secondary education is the following:

- first of all, the abundance, breadth and rapid development of information volume in the field of science;
- secondly, the speed of technical progress, the rapid progress of modern laboratory equipment;
- thirdly, various technical means of teaching are progressing;

fourth, external influences, interesting phone for students from the hardened knowledge of the teacher, Internet, social networks, etc.k.there are.

Research work has shown that solutions to issues brought from different areas of biology make it possible to study in depth biological laws, the correct use of the gifts of nature, the biology of individual animals and plants, and the specific aspects of their ecology. Solving issues from biology is considered important in the processes of generalization, analysis, conclusion of students' scientific worldview, creative thinking, knowledge gained from the entire biology course.

Solving issues from biology – universal education is considered one of the most important competencies of school teachers, which will be necessary in practical life. Solving issues related to biology is of great practical importance in the process of fully understanding the essence of biological concepts, theories, laws, rules. These issues are the basis for the teacher's ability to know the level of theoretical training of students much easier, deepen their perception of flora and fauna, put theoretical knowledge into practice, expand the scientific worldview of students, form biological thinking in students [3, 76 P.].

Issues of a certain type are followed by biological knowledge, in addition to the formation of skills and abilities in the student by the method of solution and its repetition several times. Teachers are able to comprehensively provide students with competencies of solving a problem from biology only if they have developed issues from biology in a specific order during the teaching of the entire course of Biology on the basis of consistency, and not in certain lessons.

As a result of the application of biological issues in the course of the lesson, at first the professional competence of teachers of biology of secondary schools is improved and the comprehensive education of students is achieved. Scientists note that in the process of learning students should not be limited only to theoretical knowledge in the textbook. Together with theoretical knowledge, it is known that it is effective to carry out the solution of issues and exercises on biology in a harmonious state. By solving direct issues in the educational process, it causes understanding of the fundamental essence of the knowledge being studied. Improving professional competence in biology teachers requires building on creative, reflexive, synergistic and systematic approaches.

The creative approach assumes the ability to increase knowledge, learn the latest science by analyzing news, be able to understand the requirements that are relevant, find out the Science News, effectively apply them in analysis and in its pedagogical activities. The results of the study showed that the conditions for creating a system for improving the professional competence of a biology teacher are necessary to rely on a modern approach and special principles. The system of training biology teachers should embody an educational, educational and developmental goal. At the same time, in biology teachers today, it is necessary to content important professional quality – innovation thinking and mathematical literacy competence[3, p.93.].

With the methodology of solving several biological issues based on the given considerations above, the practical expression of the opinions expressed is considered.

Issue 1. The total amount of protein, fat and carbohydrates in the student's diet is 700 g, and the energy released from the protein is 410 kcal. If the energy generated by the fat contained in the food is 520 kcal more, determine how much of the total energy (kcal) generated overnight was generated from dinner? (A

high percentage of rational nutrition was followed)

Solution to the issue: It assumes creative thinking, relying on integrated knowledge from the teacher or student, when solving issues of this type. It is known that the textbooks emphasize the energy separation of 1 g of proteins and carbohydrates from 4.1 kcal each of their breakdown, and 9.3 kcal from the breakdown of 1 g of fat [2, 104-105-b.]. The Masala condition states that the energy released from the protein is 410 kcal. Accordingly, the following actions are performed.

1) initially, the total mass of the protein is determined, for which:

$$410: 4.1 = 100 \text{ g protein so it turned out that the protein is } 100 \text{ g.}$$

2) Now, taking into account that the energy released from the oil is 520 kcal more than the energy released from the protein, the total value of the energy released from the oil is determined: $410 + 520 = 930$ kcal of energy is separated from fat.

3) Based on this information, the amount of fat is found:

$$930: 9.3 = 100 \text{ g fat}$$

4) when we subtract the mass of fat and protein from the total mass, the mass of the carbohydrate is derived:

$$700 - 200 = 500 \text{ g of carbohydrates. So it turns out that the mass of the carbohydrate is equal to } 500 \text{ g.}$$

5) relying on the Masala information, the value of the energy generated by the breakdown of the carbohydrate is found: $500 \cdot 4.1 = 2050$ kcal

6) and then, by adding the energy generated by each of the proteins, fats and carbohydrates, the total energy generated by the breakdown of organic matter was determined: $410 + 930 + 2050 = 3390$ kcal total energy.

7) a proportion is formed as follows, with dinner accounting for 15-20% of the calories of a one – night meal and following a high percentage of rational nutrition:

$$100 \% \text{ — } 3390 \text{ if it makes up kcal,}$$

$$20 \% \text{ — } = X = 678 \text{ kcal.}$$

Answer: it turned out that the reader received 678 kcal of energy from dinner. Issue 2. The athlete has a body mass of 70 kg, and the total energy generated from one day of consumed carbohydrates is equal to 2050 kcal. The daily amount of protein and fat in the feed is equal, and the carbohydrate content is 2.5 times higher than them. Find the amount of energy spent on digestion and work performed overnight, calculated in kcal? Solution to the issue: This issue belongs to the topic “Energy Exchange”, which is contained in the textbook of the 8th grade of a person and his health, and in the process of its work, the educator must perform the following actions in sequence [2, 104-b.].

1) initially, it is necessary for the educator to determine how many g of carbohydrates is 2050 kcal. To do this, from the data given in the textbook, we divide the energy of 2050 kcal by 4.1 kcal, based on the fact that 4.1 kcal is formed from the oxidation of 1g carbohydrates, and it is necessary to determine how many G the carbohydrate is. $2050: 4.1 = 500$ g carbohydrate content.

2) now the amount of protein and fat unknown in the content of the matter is found. $500: 2.5 = 200$ g which is the total amount of protein and fat.

3) through the third action, a separate mass of protein and fat is found, each of which is calculated how many kcal of energy it generates.

a) from 200: 2 = 100 g it is determined that there is protein and fat, which is how much kcal energy they generate;

$$\text{b) } 100 \cdot 4.1 = 410 \text{ kcal (protein)}$$

$$\text{v) } 100 \cdot 9.3 = 930 \text{ kcal (Fat)}$$

4) is the sum of the total energy of protein, fat and carbohydrate.

$$410 + 930 + 2050 = 3390 \text{ kcal total energy.}$$

5) as we know from the textbook, energy exchange goes in three stages namely: the first stage: energy spent on the exchange of basic substances; second stage: energy spent on digestion; stage three: energy spent on work performed overnight. The body mass of iron 70 kg is given in the content of the issue, relying

on this information to determine the amount of energy spent on the exchange of basic substances: (Note: 1 kcal of energy is spent on 1 kg of body mass in 1 hour)

$70 \cdot 24 = 1680$ kcal energy when the energy spent on the exchange of basic substances is determined, subtracting from the total energy, the amount of energy spent on digestion and work performed overnight comes. $3390 - 1680 = 1710$ kcal A: Timur energy of 1710 kcal per day was spent on digestion and work performed overnight[5, 63-p.].

In the process of working out the given Masas, it is necessary to apply and creatively think in new situations from the knowledge acquired by the teacher or student first. Because, in the first issue, it was stated that the total amount of protein, fat and carbohydrate is 700 g, the energy released from the protein is 410 kcal, and in the second issue, the athlete's body mass is 70 kg, and the total energy generated from the carbohydrate consumed per day is 2050 kcal. It will be necessary to extract an unusual and optimal solution from the data provided. As a result, knowledge, skills about nutrition ration and energy expenditure are formed.

Conclusion. In the process of improving the quality and effectiveness of biological education, along with innovative and information communication technologies, it is important to introduce biological issues and exercise solutions to educational practices. As a result of solving a biological issue and exercises, the application of the knowledge gained from the teacher or student earlier in New unforeseen situations prepares the ground for the improvement of competencies.

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