



DEVELOPING STUDENTS' CREATIVE ACTIVITY IN THE PROCESS OF IMPROVING THE PROBLEM-BASED TEACHING METHODOLOGY FOR TOPICS FROM THE "ECOSYSTEM" SECTION OF BIOLOGY

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ABSTRACT

This article provides information on developing students' creative activity and forming their skills in expressing independent thoughts during the process of improving the methods of problem-based teaching of topics from the "Ecosystem" section of biology.

KEYWORDS

Ecosystem, producers, consumers, food chain, creative thinking, creative activity, problem-based methods, creativity, intellectual development.

INTRODUCTION

Today, an education system aimed at integrating into the new global information and educational environment is being established in our country. This is accompanied by significant changes in organizing the educational process to meet modern technical capabilities. The introduction of modern information technologies in education enables the qualitative optimization and transformation of teaching methods

and approaches. One of the main goals of ongoing reforms to modernize the education system in our country is to develop students' creative thinking activity, enhance their information literacy, and expand their opportunities to use modern electronic educational tools. Achieving this goal involves practical solutions such as teaching students with modern knowledge, fostering independent learning skills,



encouraging the creative application of acquired knowledge, and ensuring its regular use in educational processes.

In the 21st century, education is recognized worldwide as a key factor ensuring sustainable development. UNESCO's International Education Concept for 2030 highlights the urgent task of "providing opportunities for lifelong quality education." In particular, improving problem-based teaching technologies for the "Ecosystem" section of biology plays a crucial role in training secondary school students in creative thinking and logical reasoning. For example, experiences from countries such as Russia, Finland, the United States, South Korea, and Germany demonstrate systematic work on introducing interactive methods and innovative technologies, selecting appropriate problem-based questions and tasks, and developing educational resources for virtual laboratory work to enhance the methodological support for teaching the "Ecosystem" section of biology.

Globally, the focus on problem-based teaching of the "Ecosystem" section of biology primarily emphasizes the use of modern teaching methods and innovative technologies to improve the learning process and develop logical thinking and reasoning skills. Many studies explore these aspects. Enhancing problem-based teaching methods and technologies by employing a competency-based approach, interactive methods, and innovative technologies specific to the "Ecosystem" section, as well as developing methodological and didactic support for logical thinking and reasoning, receives significant attention. In our country's general secondary schools, creating problem-based scenarios while teaching the "Ecosystem" section of biology, utilizing modern teaching technologies and methods effectively, and applying foreign experiences to build problem-solving competencies have become priorities in recent years. The resolution on "Measures to Improve the Quality of

Education in Biology and Develop Scientific Research" designates improving teaching quality as a priority task. Consequently, the pedagogical and didactic possibilities for conducting research aimed at enhancing modern teaching technologies based on problem-based methods to develop students' creative activity are expanding.

To fully understand the general essence of developing creative qualities in individuals, it is essential to first comprehend the meaning of the term "creativity." According to Ken Robinson, creativity is "a collection of original ideas that have value" (Azzam, 2009). Gardner describes it as "practical actions undertaken by an individual that reflect novelty and have practical significance." Emebayl (1989) defines creativity as "the combination of profound knowledge in a specific field with highly unconventional skills."

Studies comparing creativity with personality and intellectual traits are of great importance. J. Guilford conducted research on this comparison, emphasizing that creativity is a personal characteristic related to self-improvement and development. Creativity, derived from the Latin and English words "create" (to create) and "creative" (creator, innovator), refers to an individual's ability to produce new ideas and is an independent component of talent. Creativity manifests in thinking, communication, emotions, and specific activities. To develop creativity in students, the following should be emphasized:

1. Encouraging frequent questioning and supporting this habit.
2. Promoting student independence and enhancing their sense of responsibility.
3. Creating opportunities for organizing independent activities.
4. Paying attention to students' interests.

Factors that hinder the development of creativity include:

1. Avoidance of risks.



2. Allowing crudeness in thinking and actions.
3. Underestimating imagination and creativity.
4. Subordination to others.
5. Focusing solely on achievements in all situations.

For instance, in teaching the topic "The Structural Composition of Ecosystems" from the "Ecosystem" section of 10th-grade biology, both the teacher's ability to explain the topic and the students' creative thinking abilities significantly enhance their knowledge, skills, and competencies. Using modern educational technologies and problem-based teaching methods effectively fosters students' creative activity. Hence, interest in applying interactive methods and modern information technologies in education is steadily growing. Unlike traditional education, which focuses on acquiring ready-made knowledge, modern technologies enable students to independently seek, study, analyze, and draw conclusions from the knowledge they acquire. The terms "producers," "consumers," and "decomposers" discussed in this topic require creative engagement to understand fully.

Producers (from Latin *producens* – "creator") are autotrophic organisms that synthesize organic compounds from inorganic substances. This group includes green plants, photosynthetic and chemosynthetic bacteria.

Consumers (from Latin *consume* – "I consume") are heterotrophic organisms that feed on ready-made organic compounds and transfer energy along the food chain. Consumers include all animals and parasitic plants.

Decomposers (from Latin *reduco* – "I return") or destructors (from Latin *destruo* – "I destroy") are heterotrophic organisms that break down organic compounds into inorganic substances.

CONCLUSION

In conclusion, improving the methods of problem-based teaching for topics from the "Ecosystem" section of biology plays a significant role in developing students' creative activity. The collected data ensure the formation of competencies that help students become independent thinkers, capable of competing with peers from developed countries, mastering knowledge, engaging in logical thinking, and solving problems independently. Testing the selected materials in pedagogical practice was the primary goal of our research.

In conducting pedagogical trials at selected general secondary schools, the following were examined:

1. Testing the content of the selected educational materials for teaching the "Ecosystem" section of biology.
2. Assessing the scientific and methodological feasibility of using problem-based methods in teaching the "Ecosystem" section in general secondary schools.
3. Evaluating the theoretical and practical understanding of the selected materials by 10th-grade students during the teaching of the "Ecosystem" section.

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