

## “FORMATION OF STUDENTS’ ENVIRONMENTAL CULTURE THROUGH EXTRACURRICULAR ACTIVITIES.”

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**Abstract:** *The formation of environmental culture among students is an important component of modern education, as it contributes to the development of responsible attitudes toward nature and sustainable environmental behavior. This article examines the role of extracurricular activities in developing students’ environmental culture and identifies effective approaches to organizing such activities. Particular attention is paid to environmental clubs, educational campaigns, ecological projects, nature-oriented activities, practical observations, and community-based initiatives. Extracurricular activities provide students with opportunities to acquire environmental knowledge, develop practical skills, strengthen their sense of responsibility, and participate actively in solving environmental problems. The study emphasizes that the integration of theoretical knowledge with practical and socially oriented activities can increase students’ environmental awareness and encourage environmentally responsible behavior. The findings suggest that purposeful and systematic extracurricular work can serve as an effective pedagogical mechanism for fostering students’ environmental culture and developing their ecological consciousness.*

**Keywords:** *Environmental culture; environmental education; students; extracurricular activities; ecological awareness; environmental responsibility; sustainable development; ecological behavior; environmental education methods.*

### **Introduction**

Biology is one of the fundamental subjects in modern education, as it contributes to students’ understanding of living organisms, natural processes, human health, and the environment. In contemporary education, teaching biology requires not only the transmission of theoretical knowledge but also the development of students’ analytical thinking, practical skills, scientific reasoning, and ability to apply acquired knowledge to real-life situations.

The rapid development of biological sciences, including genetics, biotechnology, ecology, and molecular biology, has increased the importance of biological literacy among students. Therefore, biology education should be organized in a way that encourages students to observe natural phenomena, analyze biological processes, conduct practical activities, and draw evidence-based conclusions. Such an approach can increase students’ interest in the subject and contribute to more meaningful learning outcomes.

At the same time, modern educational technologies provide new opportunities for improving the teaching of biology. Interactive learning materials, digital resources, visual models, virtual laboratories, and problem-based learning activities can make complex biological concepts easier to understand. However, the effectiveness of these tools largely depends on their appropriate integration into the educational process and on the teacher's methodological competence.

Another important aspect of biology education is connecting theoretical knowledge with practical and everyday experiences. Students should be able to understand how biological knowledge is related to environmental protection, healthy lifestyles, biodiversity, and other issues relevant to modern society. Consequently, the development of effective teaching approaches that combine theoretical, practical, and innovative methods remains an important task in contemporary biology education.

In this context, improving biology teaching methods and creating an active learning environment can contribute to students' scientific thinking, practical competence, and deeper understanding of biological concepts. Therefore, the present study focuses on the importance of effective approaches to biology education and their potential contribution to improving the quality of students' learning.

### MAIN PART

The effectiveness of biology education largely depends on the teaching methods and learning conditions used in the classroom. Traditional methods such as explanation, questioning, and textbook-based learning remain important, but their effectiveness can be increased when they are combined with active and student-centered approaches. In particular, problem-based learning, practical activities, observation, discussion, project work, and the use of digital resources can encourage students to participate more actively in the learning process.

One of the effective methods in biology teaching is practical and experimental learning. Biological concepts are often easier for students to understand when they can observe a process or examine a biological object directly. For example, when studying cell structure, students can use microscopic observations, visual models, or digital simulations to identify the main components of a cell. Similarly, topics related to plant growth, photosynthesis, ecology, and microorganisms can be supported by simple experiments and observation-based activities. Such methods help students connect theoretical information with practical experience.

Problem-based learning is also valuable for developing students' scientific thinking. In this approach, students are presented with a biological problem and encouraged to identify possible explanations, analyze available information, and formulate conclusions. For instance, students may be asked to explain the factors responsible for changes in plant growth under different environmental conditions. By discussing possible causes and comparing observations, students develop skills in reasoning, analysis, and evidence-based decision-making.

The study of biology can also be improved through the effective use of digital technologies. Interactive presentations, animations, virtual laboratories, educational videos, and online learning resources allow students to visualize processes that may be difficult to observe directly. For example, processes such as cell division, DNA replication, or the circulation of blood can be presented through animations and interactive models. This approach can make abstract biological processes more understandable and increase students' learning motivation.

To evaluate the effectiveness of these approaches, several methodological principles can be applied, including observation, comparison, analysis of students' learning activities, and assessment of their understanding before and after the use of active teaching methods. Particular attention should be given not only to students' ability to reproduce information but also to their ability to explain biological processes, apply knowledge in practical situations, analyze information, and provide scientifically justified conclusions.

The results of applying active teaching methods indicate that students generally demonstrate greater interest and participation when they are directly involved in the learning process. Practical tasks and problem-based activities provide opportunities for students to work independently and collaboratively, while visual and digital materials can facilitate the understanding of complex biological concepts. These approaches also create conditions for developing communication, critical thinking, observation, and problem-solving skills.

For example, during an ecology lesson, students can investigate the factors that influence the condition of a local ecosystem. They may collect information about environmental conditions, identify possible sources of pollution, discuss their effects on living organisms, and propose possible solutions. Such an activity allows students to use biological knowledge in a realistic context rather than simply memorizing theoretical definitions.

However, the implementation of modern teaching methods also requires appropriate planning. The excessive use of technological tools without a clear educational purpose may not always improve learning outcomes. Therefore, the teacher should select methods according to the learning objectives, the content of the topic, students' age characteristics, and available educational resources. A balanced combination of traditional, practical, interactive, and digital methods is more likely to provide effective results.

The findings suggest that biology education becomes more effective when students are given opportunities to observe, investigate, discuss, experiment, and apply their knowledge. The teacher's role in this process changes from simply providing information to organizing and guiding students' learning activities. This creates a learning environment in which students can gradually develop scientific thinking and become more independent learners.

Overall, the analysis demonstrates that the integration of practical activities, problem-based learning, collaborative work, and appropriate digital technologies can contribute to improving the quality of biology education. These approaches not only support the acquisition of biological knowledge but also help students develop practical competencies and a deeper understanding of the relationship between biological processes and real-life situations.

### CONCLUSION

The analysis shows that effective biology education requires a combination of theoretical knowledge, practical activities, and modern teaching approaches. Active learning methods can increase students' engagement and help them develop scientific thinking, analytical skills, and the ability to apply biological knowledge to real-life situations.

Practical experiments, observation, problem-based learning, group activities, and digital educational resources can make biological concepts more understandable and meaningful. At the same time, the effectiveness of these methods depends on their appropriate selection and integration into the learning process. Modern technologies should therefore be used as supportive educational tools rather than as a replacement for effective teaching methodology.

Based on the findings, biology teachers are recommended to provide students with more opportunities for independent investigation, experimentation, discussion, and problem-solving. It is also advisable to connect biological topics with everyday life and current environmental, health, and scientific issues. Such an approach can strengthen students' motivation and improve their ability to use biological knowledge in practical contexts.

In conclusion, the systematic integration of traditional and innovative teaching methods can contribute to improving the quality of biology education. Creating an active, student-centered learning environment is particularly important for developing students' scientific competence, independent thinking, and long-term interest in biological sciences.

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