

PAPER

EDUCATIONAL, SCIENTIFIC AND PRACTICAL EFFECTIVENESS OF ZOOLOGICAL CLUBS

Usmonova Gulshodaxon Ikromjon qizi^{1,*}

¹Postdoctoral fellow at Kokand State University

* usmonovagulshodaxon@gmail.com

Abstract

The purpose of this article is to explain biology to students of higher education institutions the practical significance of classes in a zoological circle and the main pedagogical tasks solved with their effective organization, the work carried out within the framework of the circle, the activity areas of it, the essence of the content and expected results.

Key words: group exercises, logical thinking, cognitive, research competence, scientific activity, 5E model.

INTRODUCTION

In modern education, one of the important tasks is not only the acquisition of theoretical knowledge, but also the development of students' cognitive activity, their involvement in scientific research, and their orientation toward independent research. In this regard, zoological clubs are becoming increasingly important as an effective form of extracurricular activity [1]. In psychological and pedagogical research, particular attention is paid to Piaget's theory of cognitive development[2], Vygotsky's social-constructive approach[3], and Dewey's ideas of "experiential education"[4], which substantiate the formation of knowledge based on the active experience of the learner. Zoological clubs

are based on these approaches, developing students skills of independent thinking, observation, and experimentation[5].

MATERIAL AND METHODOLOGY

From a scientific point of view, zoology clubs engage students in scientific research and experiments, which is consistent with the principles of "deep learning-oriented education" developed by P. Ramsden [6]. At the same time, the 5E model proposed by R. Bybee is an effective method for developing research competencies in zoology classes [7]. From a pedagogical point of view, zoology clubs develop students' independent cognitive activity, directing them toward creative

Compiled on: December 17, 2025.

Copyright: ©2025 by the authors. Submitted to *Advances in Science and Education* for possible open access publication under the terms and conditions of the [Creative Commons Attribution \(CC BY\) 4.0 license](#).

thinking and problem solving [8]. At the same time, they play an important role in developing environmental awareness and increasing responsibility for environmental protection [9].

In practice, group work provides students with the opportunity to apply theoretical knowledge to real-life situations through fieldwork, laboratory experiments, and observations. This strengthens students' critical thinking and enhances their professional arrangement[10].

The essence of group work in zoology is to develop students' cognitive activity, develop scientific research skills, and strengthen their independent thinking, observation, and problem-solving skills. This process helps students develop a conscious approach to their professional field and prepare them as future specialists in their field.

From a pedagogical perspective, group work is aimed at individualizing the learning process and developing students' creative potential, taking into account their individual capabilities and interests. While in a traditional lesson all students complete the same assignment, group work allows students to independently conduct research, experiment with various biological objects, and conduct experiments.

The main pedagogical goals of the club are:

- introducing students to theoretical and practical issues in zoology;
- developing students' habits of independent study, research, and systematic knowledge enrichment;
- activating students' cognitive activity through the use of interactive methods (cluster methods, brainstorming, problem-based learning, and modeling) in the educational process;
- fostering environmental responsibility and a conscientious attitude toward nature.

Therefore, zoology clubs are pedagogically important not only in terms of knowledge transfer but also in cultivating students' respect for national and universal values and environmental conservation.

From a scientific perspective, zoology clubs serve as a primary venue for developing students' research competencies. In these classes, students are presented with scientific problems, and they seek solutions using methods such as observation, experimentation, and modeling.

The club's activities include:

- Observing the external and internal structure of animals, preparing specimens using laboratory equipment;
- Observing various animal species in the field and analyzing their ecological characteristics;
- Independent analysis and summarizing using scientific articles, electronic sources, and international scientific experiments;
- Developing scientific creativity through the preparation of short research projects and papers.

Through the step-by-step organization of scientific activities, students master the methodology of scientific research, acquire independent work skills, and learn to present research results in written and oral form. Therefore, zoology clubs serve as a basis for preparing required coursework, final, and master's theses. This enhances the scientific significance of the clubs.

In practice, organized zoology club activities allow students to connect theoretical knowledge with real-life activities. Students learn to work with real biological objects through laboratory and fieldwork, which contributes to the development of professional skills.

The practical significance of the club is seen as follows:

- developing skills in working with laboratory equipment and preparing biological materials;
- developing skills in collecting zoological specimens, preparing specimens, and classifying them scientifically;
- practical study of environmental issues and assessing the importance of wildlife in human life;
- developing students' observation skills, analytical thinking, and creativity, essential for professional work.

Furthermore, the club's activities provide students with the opportunity to use modern information and communication technologies, work on distance learning platforms, and effectively utilize electronic resources. This helps students consolidate their current knowledge and skills.

The club is open to first- to fourth-year students majoring in Biology, active, research-oriented students.

The club's activities include:

1. Theoretical focus – lectures and discussions on current topics in zoology.
2. Practical focus – laboratory experiments, field

trips, visits to museums and nature reserves.

3. Research focus – small student research projects (e.g., observing the adaptive characteristics of fish, the role of birds in the ecosystem, etc.).

4. Creative focus – preparing posters, presentations, displays, and electronic textbooks.

Expected results of the club's activities:

- developing students' competencies for independent scientific research.
- increasing their interest in zoology.
- increasing students' participation in research projects, conferences, and competitions.
- developing environmental and ecological thinking and responsibility.

Study groups serve as an important educational and practical platform for developing students' research competencies. The main pedagogical advantage of such activities is that they transform students into active participants in learning process, encompassing all stages of cognitive activity. In this process, students do not passively absorb information, but rather independently research, ask questions, interpret events from a scientific perspective, and apply the necessary strategies to solve problems.

RESULTS

The development of research competence is directly linked to students' cognitive activity, and this process is systematically implemented during study group classes. In particular, practical activities such as observing biological objects, setting up experiments, collecting data, systematizing, analyzing, and summarizing it develop students' scientific research skills. In each class, students are given the opportunity to make independent decisions, evaluate results, work with hypotheses, and draw scientifically sound conclusions. This enhances their scientific thinking.

Another important aspect of the cognitive-based approach is the development of analytical and reflective thinking in students. During study group classes, students analyze their observations, connect existing theoretical knowledge with practical situations, compare results, and attempt to substantiate their scientific views. This process gradually develops skills such as high-level cognitive operations—abstraction, modeling, and conceptual generalization. Through club activities,

students develop not only research competencies but also skills in logical thinking, working with scientific evidence, planning independent activities, conducting experiments, and presenting scientific results. Furthermore, these activities enhance students' interest in science, realize their individual intellectual potential, and prepare them for future scientific endeavors.

CONCLUSION

Overall, group classes create a favorable scientific and methodological environment for the consistent, systematic, and effective development of research competencies through the activation of cognitive activity. This improves the quality of the educational process and ensures that students acquire in-depth knowledge of the subject.

REFERENCES

1. Жолдасов Х.Ж., Абдуллаев Н.Х. Зоология.- Тошкент: Ўқитувчи, 2016.-432 б
2. Piaget J. The Science of Education and Psychology of the Child.—New York: Orion Pres, 1970. 178 p
3. Выготский Л.С. Мышление и речь. –Москва: Педагогика, 1982. 350 с
4. Dewey J. Experience and Education. –New York: Macmillan, 1938.-116 p
5. Hickman C. P., Roberts L. S., Keen S. L. Integrated Principles of Zoology. -17th ed.- New York: McGraw-Hill, 2020. – 915 p
6. Ramsden P. Learning Teach in Higher Education. – London: Routledge, 1992. – 262 p
7. Bybee R. W. The BSCS 5E Instructional Model: Creating Teachable Moments.-Washington DC: NSTA Press, 2015.-110 p
8. Bruner J. The Culture of Education. – Cambridge, MA: Harvard University Press, 1996.-224 p
9. Мирзаев У.З. ,Холмуродов Т.А. Ҳайвонот олами биологияси.-Тошкент: Фан, 2018. -368 б.

10. Biggs J., Tang C. Teaching for Quality Learning at University. – 4th ed.-Maidenhead: Open University Press, 2011.-418 p.