THE SIGNIFICANCE OF INDEPENDENT WORK IN TEACHING ZOOLOGY

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Annotation: *The article examines the significance of independent work in the process of teaching zoology. Their functions in forming students' cognitive activity, research skills, and environmental thinking are revealed. The necessity of systematically utilizing independent activities in the study of zoology sections is substantiated.*

Keywords: *zoology, independent work, research activity, biological education, cognitive activity.*

Modern education is focused on forming individuals capable of independent learning and practical application of knowledge. In teaching zoology, this is especially important because students must observe, analyze, and generalize biological phenomena.

Zoology studies the diversity, structure, life processes, and evolution of animals. However, these topics cannot be effectively mastered through memorization alone; they require active independent cognitive activity.[1]

According to educational standards, students are expected to acquire competencies such as critical thinking, problem-solving, and knowledge application. However, classroom instruction alone is often insufficient for achieving these goals. Therefore, teachers must organize additional forms of learning such as homework, extracurricular activities, and field-based learning.

Independent learning becomes a key pedagogical strategy in developing these competencies. It encourages students to explore knowledge independently and develop analytical thinking skills.

The concept of independent learning has been widely discussed in pedagogy.

Comenius emphasized that students should learn through direct observation of nature rather than memorization from books.[3] He argued that education must be based on real-life observation and experience.

Ushinsky considered independent activity as the "solid foundation of all effective education," highlighting that students must actively engage in the learning process under teacher guidance.[4]

Disterweg also stressed the importance of independent thinking, stating:

"A bad teacher presents truth, a good teacher teaches how to find it."[5]

Pidkasistyi defines independent learning as a structured educational activity performed by students with minimal teacher assistance, including knowledge acquisition, processing, and application.[6] Independent cognitive activity differs from general learning activity. Activity may exist without independence, while independence always implies initiative, self-regulation, and internal motivation.

This research is based on theoretical analysis of pedagogical literature and existing teaching practices in biology education.

Methods used include:

- theoretical analysis of pedagogical sources
- comparative analysis
- systematization of independent learning types
- interpretation of didactic principles in zoology education

The study aims to identify effective forms of independent student work and their impact on cognitive development.

Independent work in zoology can be classified according to didactic purpose and student activity level:

- Educational-methodical work
- Training exercises
- Reinforcement tasks
- Repetition tasks
- Developmental tasks
- Creative work
- Control tasks

Each type contributes differently to students' cognitive development and knowledge formation.

Homework includes textbook work, reading additional literature, drawing biological structures, and conducting observations.

However, effective homework should not rely on memorization. Instead, tasks must be formulated as questions that encourage students to search for information and think critically rather than reproduce text mechanically.[7]

Extracurricular activities are essential for strengthening students' biological knowledge. These include research tasks, project work, biology clubs, and thematic events.

Such activities develop students' curiosity, creativity, and ability to apply theoretical knowledge in practice.

Biological excursions are an important form of teaching zoology. They allow students to study organisms in their natural environment.

Excursions may be:

- short-term (schoolyard observations)
- one-day trips (zoos, farms, botanical gardens)
- multi-day interdisciplinary field trips

These activities help students understand biodiversity, ecological relationships, and adaptation mechanisms in real ecosystems.[8] Independent work contributes to:

- development of critical thinking
- improvement of analytical skills
- strengthening knowledge retention
- formation of creativity
- preparation for lifelong learning

Pedagogical research confirms that independent learning increases students' academic performance and intellectual development.[9] Independent learning is a fundamental component of modern zoology education. It helps students develop cognitive independence, practical skills, and scientific thinking. The effectiveness of independent work depends on the teacher's ability to design meaningful, problem-based, and structured learning tasks. When properly organized, independent learning transforms students into active participants in the educational process.

Therefore, independent work should be considered an essential pedagogical strategy in biology education.

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