PEDAGOGICAL ESSENCE OF RESEARCH ACTIVITY IN TEACHING ZOOLOGY

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ANNOTATION: In this article, the pedagogical essence of research activity in teaching zoology, the features of its effective implementation in the educational process, and the educational and upbringing significance are analyzed from a scientific and theoretical point of view. In the research process, the role of research activity in the formation of independent thinking, scientific thinking, an analytical approach, and professional competencies in students is substantiated. Based on the substantive and practical possibilities of zoological science, the pedagogical aspects of organizing research activities through laboratory classes, field research, problem tasks, and project-based learning are highlighted. The educational significance of research activities in the conscious and stable acquisition of knowledge by students, the formation of an ecological culture, and the development of personal qualities is also shown. The materials of the article are of practical importance in improving the methodology of teaching zoology and in the process of training future biological specialists.

KEY WORDS: teaching zoology, research activities, pedagogical essence, competency-based approach, scientific thinking, problem-based learning, project-based learning, laboratory and field research, environmental education, educational effectiveness.

INTRODUCTION

Today, the process of teaching subjects in the education system is not limited to the acquisition of ready-made knowledge, but is also aimed at the formation of students' competencies in independent thinking, conducting scientific research, and a scientific approach to problems. In particular, the integration of research activities into the educational process in the teaching of natural sciences in higher educational institutions is one of the priority areas of modern pedagogy. This process serves to increase the cognitive activity of students, to connect theoretical knowledge with practical activity, and to develop scientific thinking.

Zoology is one of the main sciences in the field of biology, studying the structure, life processes, diversity, and laws of evolutionary development of the animal world. Due to the fact that this discipline is based on observation, experience, and analysis, it has favorable pedagogical opportunities for organizing research activities. The use of research elements in the process of teaching zoology teaches students to understand natural phenomena on a scientific basis, to work with facts and evidence, and to draw conclusions.

At the same time, according to the requirements of modern education, it is not enough for future specialists to have only theoretical knowledge, but they also need to have the skills to identify scientific problems, conduct research, and analyze the results. These aspects necessitate a deep study of the pedagogical essence of research activities in teaching zoology, determining its educational and upbringing potential.

This article analyzes the pedagogical essence of research activities in teaching zoology, its role and significance in the educational process, and its possibilities in developing students' scientific activity.

The pedagogical essence of research activity. Scientific research activity is an important component of the educational process, which serves to activate the cognitive process of students, develop scientific thinking, and form professional competencies. From a pedagogical point of view, research activity includes the process of a student conducting scientific research on a specific problem, deepening theoretical knowledge through practical activity, and drawing independent conclusions. This type of activity, unlike

the traditional educational model, focuses on the student's personal activity and creative potential.

The pedagogical essence of research activity is characterized, first of all, by raising the student's cognitive activity to a qualitatively new level. In the research process, the student acts not as a recipient of ready-made information, but as a subject identifying a scientific problem, putting forward a hypothesis, collecting evidence, and analyzing it. This corresponds to constructive and active educational approaches and ensures conscious and stable acquisition of knowledge.

From a pedagogical point of view, research activity forms in students the skills of the main components of scientific thinking - analysis, comparison, generalization, identification of cause-and-effect relationships, and drawing logical conclusions. Especially in the study of natural sciences, these skills are of great importance and help the student to deeply understand the content of the subject. Knowledge acquired through research activities is long-term and effective because it is based on experience.

The pedagogical essence of research activity is also determined by the change in the relationship between the student and the teacher in the educational process. In this process, the teacher acts not as a source of knowledge, but as a guide, consultant, and scientific advisor. The student learns to make independent decisions, justify their opinion, and defend their scientific results. This increases the responsibility of students and prepares them for scientific cooperation. Research activity is inextricably linked with the competency-based approach to education, in which knowledge, skills, and abilities are formed in a unified system. In the research process, the student acquires competencies in working with information, analyzing scientific sources, processing experimental results, and drawing conclusions. These skills are important in the professional activity of the future specialist and increase their competitiveness. Also, the pedagogical essence of research activity is manifested in its educational significance. In the research process, students develop such important personal qualities as discipline, patience, accuracy, critical thinking, and academic integrity. In addition, scientific research teaches students to work in a team, exchange ideas, and work together towards a common goal.

The pedagogical essence of research activity manifests itself in the educational process as a complex and multifaceted process aimed at ensuring the personal development, scientific thinking, and professional training of the student. Its effective application in teaching zoology increases students' interest in the subject, serves for the deep and conscious acquisition of knowledge and preparation for independent scientific research.

Features of organizing research activities in zoology. The organization of research activities in the process of teaching zoology is directly related to the content, objects, and methods of studying this subject. The study of the structure, vital activity, development, and ecological adaptations of the animal world is based on observation, experiment, and analysis, which creates favorable pedagogical conditions for the effective organization of research activities in zoology. This activity serves to strengthen the theoretical knowledge of students with practical experience, to form a scientific worldview.

One of the important features of organizing research activities in zoology is its practical orientation. Students perform elements of scientific research directly in practice by studying the morphological and anatomical structure of animals, observing physiological processes, and analyzing their life cycles. Laboratory classes, field research, work with biological collections, microscopic observations, and experiments are the main forms of scientific research activity.

In the organization of research activities, the creation of problem situations is of great importance. In zoology, problem questions and assignments arouse scientific interest in students and encourage them to conduct independent research. For example, by studying the mechanisms of animal adaptation to the environment, forms of behavior, or the influence of environmental factors on life activity, students develop skills in identifying a scientific problem, putting forward a hypothesis, and testing it experimentally.

Another important aspect of organizing research activities in zoology is adherence to the principle of phasing. In the initial stages, students engage in simple observational and descriptive work, while in the subsequent stages they are oriented towards more complex research tasks, conducting experiments, processing data, and drawing scientific conclusions. This approach allows for the consistent and systematic

formation of students' research skills.

The role of the teacher in organizing research activities is of particular importance. The teacher, as a scientific advisor, guides students in choosing the research topic, setting goals and objectives, defining methods, and analyzing the results. At the same time, the teacher should encourage students' independence and support their initiative. This situation increases the effectiveness of research activities.

The use of modern pedagogical and information technologies in the organization of research activities in zoology is also an important feature. Digital microscopes, virtual laboratories, biological databases, and interactive educational platforms make the research process more interesting and effective for students. In addition, project-based learning, working in small groups, and interactive methods develop skills in scientific collaboration.

Also, the organization of research activities in zoology includes ecological and educational aspects. In the process of studying the animal world, students understand the need to treat nature with care, preserve biodiversity, and understand environmental problems. This further increases the educational significance of research activities.

The peculiarities of organizing research activities in zoology are characterized by its practical orientation, problem-based and phased organization, cooperation between the teacher and the student, as well as harmony with modern technologies. These features serve to develop the scientific potential of students, turning research activities into an effective tool of the educational process.

Educational and upbringing significance of research activities. Research activity is an important pedagogical tool that ensures the deep and conscious acquisition of knowledge by students in the educational process. Through this activity, the student connects theoretical knowledge with practical experience, masters scientific concepts and laws on the example of real objects. As a result, the acquired knowledge is solid, systematic, and long-term, serving the formation of the student's scientific worldview.

The educational significance of research activity is manifested, first of all, in the development of scientific thinking and cognitive activity in students. In the research process, students acquire skills in identifying problems, setting goals and objectives, putting forward hypotheses, analyzing scientific sources, and evaluating the results of experiments. This process, unlike the acquisition of knowledge in a ready-made form, ensures its acquisition through research and increases the student's intellectual activity.

Research activity forms in students the competencies of independent work and self-involvement in the educational process. In the process of completing research tasks, the student learns to search for information sources, critically analyze them, and draw scientifically based conclusions. This develops self-development skills, which are important in the context of continuous education.

The educational significance of research activity is manifested in the social and moral development of the student's personality. In the process of research, such important personal qualities as responsibility, discipline, patience, and accuracy are formed in students. The process of conducting experiments, processing the results, and drawing conclusions requires careful planning and diligence from students.

Also, research activities teach students to follow the principles of academic integrity. In the process of working with scientific sources, providing references, and substantiating their opinion, students develop a sense of scientific ethics, honesty, and responsibility. This aspect will be of great importance in future scientific and professional activities.

The educational aspect of research activity is also manifested in the formation of teamwork skills. Group research, projects, and discussions teach students to collaborate, exchange ideas, and work together towards a common goal. This develops a culture of communication and social activity.

In addition, research activities in zoology form a conscious and responsible attitude towards nature in students. In the process of studying the animal world on a scientific basis, such values as ecological culture, preservation of biodiversity, and not being indifferent to environmental problems are instilled. This further increases the educational significance of research activities.

The educational and upbringing significance of research activity is manifested in the deepening of students' knowledge, the development of scientific thinking, and ensuring their personal development. The

effective use of research activities in teaching zoology, along with improving the quality of education, serves to train specialists with a responsible, scientific worldview before society.

In conclusion, the pedagogical essence of research activity in teaching zoology is directly related to the personal development of the student, the formation of scientific thinking and professional competencies. Systematic and purposeful implementation of research activities in the educational process increases the effectiveness of teaching zoology, strengthens students' interest in sciences, and prepares them for independent scientific research. Therefore, one of the urgent tasks of modern education is the pedagogically substantiated organization of research activities in the teaching of zoology.

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