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Preparation of Future Physics Teachers for Research Activities

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Abstract. *The article describes the basic concepts of methodology and methodological knowledge, as well as research activities of future physics teachers. The preparation of future physics teachers for research activities is a crucial aspect of modern pedagogical education. This article explores effective methods and strategies for developing research competencies in physics teacher training programs. It highlights the importance of integrating scientific inquiry into the curriculum, fostering critical thinking, and enhancing experimental skills. The study also examines the role of research projects, collaboration with scientific institutions, and the use of modern technologies in shaping future educators capable of conducting independent research and implementing innovative teaching approaches.*

Key words: *methodology, philosophical methodology, general scientific methodology, exact scientific methodology.*

Introduction.

"Methodology ("method "and" logic") is the doctrine of methods and means of activity [1]. In a broad sense, the methodology constitutes a necessary component of any activity. Methodological knowledge is manifested in the form of norms that determine the content and sequence of certain types of activity (normative methodology) and the description of the activity performed in practice (descriptive methodology). In both cases, the main function of this knowledge is the internal organization and regulation of the process of knowing or practical transformation of some object [6].

In modern literature, methodology is understood primarily as the methodology of scientific knowledge, that is, the doctrine of the principles, forms and methods of construction of scientific and cognitive activity. The methodology of Science describes its object, the subject of analysis, the task (or problem) of research, the components of scientific research, the sum of the research tools necessary to solve this type of problem, and also forms an idea of the sequence of research. The most important points of application of the methodology are the formulation of the problem, the construction of the subject of study and the construction of scientific theory, as well as the verification of the correctness of the result [1].

Materials.

The philosophical encyclopedic dictionary further states that in describing methodology, activities can be theoretical and practical: "methodology is a system of principles and methods of organizing and constructing theoretical and practical activities, as well as. as a doctrine of this system " [4].

In other encyclopedic publications, definitions of the concept of "methodology" are as follows:

"Methodology 1) a set of research methods used in any science; 2) the doctrine of the method of scientific knowledge and transformation of the World" [3]. The subject of the methodology of science, its methodological analysis covers various methods, techniques and operations of scientific research, its norms and ideals, as well as forms of Organization of scientific knowledge [5].

"Methodology-the doctrine of methods of organization and construction of theoretical and practical human activities" [2].

"Methodology is the doctrine of method, the science of the construction of human activities. Traditionally, the most developed area of methodology is the methodology of cognitive activity, the methodology of science".

Research and methods.

The most typical approaches to determining the concept of methodology are I.A.Lipsky believes: "some researchers consider methodology to be a doctrine of the structure, logical organization, methods and means of theoretical activity; about the principles and procedures for the formation and application of methods of knowledge and transformation of reality, others about the most general principles of solving complex practical problems, about research methods; the fourth is about the system of principles and methods of organization and construction of theoretical and practical activities, as well as the doctrine of this system; the fifth is about the initial (Basic) Rules, structure, functions and methods of scientific and pedagogical research; the sixth is the system of principles and methods of organization and construction of theoretical and practical activities, as well as

So, in the concept of" methodology " it has two main meanings:

1) a certain system of methods used in a particular field of activity (science, politics, art, etc.;

2) this is the doctrine of the system, the general theory of the method, the theory in motion [1].

Results.

The methodology of science, as an independent field of research, seeks to clarify the content, possibilities, boundaries and interactions of scientific methods. E.V.Ushakova develops a system of methodological concepts that reflect the conditions, means and principles of scientific knowledge in a general sense. Its task involves clarifying and studying already existing research tools, finding ways to improve them, that is, an active, critical approach to scientific knowledge in the development of scientific methods [6].

L.A.Mikeshin describes the methodology of scientific cognition as a philosophical doctrine about the established system of principles, criteria and methods of scientific-cognitive activity, about the forms, structure and functions of scientific knowledge, emphasizing the growing role of methodology in modern knowledge [2].

L.A. Mikeshina identified three levels of methodological analysis:

- a clear scientific methodology deals with its methods with techniques, standards, forms the principles, methods of specific scientific activity, describes and substantiates them;
- general scientific methodology the doctrine of the principles, methods and forms of cognition, which operates in many disciplines, corresponding to their subject and object of study;
- -philosophical analysis of knowledge, followed by philosophical ideas, approaches, methods of reasoning, which can be used in the study of scientific-cognitive activity under certain conditions.

Discussion.

YE.G. Yudin distinguishes four levels of methodology:

- philosophical methodology-general principles of gnoseology as a theory of cognition, dialectical method of cognition and the content structure of Science in general;
- general methodology-general concepts, theories that affect all or most scientific disciplines associated with solving a wide range of methodological problems;
- exact-scientific methodology-set of methods, approaches, research of Special Scientific science;
- scientific research methods as a set of procedures that ensure the extraction of empirical material and its primary processing [6].

Thus, today there is no single, generally accepted, established and complete system of views on understanding the methodology. The methodology is at its initial stage [3].

Hence, the general concept of methodology as a level of philosophical knowledge is the doctrine of method, which is aimed at the formation of a system of necessary conditions for the cognitive activity of a person. At the philosophical level, the essence of methodology is considered by various researchers as a doctrine of the structure, logical organization, methods and means of human activity in the field of theory and practice.

Conclusion.

Scientific research methodology (scientific knowledge) denotes the general scientific level of methodological analysis and is the doctrine of the principles, methods and forms of cognition, which operates in many disciplines corresponding to the subject and object of research. The methodology of Science describes the components of scientific research, and also forms an idea of the sequence of the researcher's action in the process of solving a scientific problem, distinguishing the statement of the problem, defining the subject of research, constructing the subject of research.

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