METHODOLOGICAL BASIS OF TRAINING STUDENTS OF HIGHER PEDAGOGICAL EDUCATIONAL INSTITUTIONS FOR THE ORGANIZATION AND CONDUCT OF SCIENTIFIC AND PEDAGOGICAL RESEARCH

Abstract. Renewal of educational processes requires raising the level of methodological culture of young researchers in the field of pedagogical knowledge, their mastery of scientific and pedagogical scientific tools. First of all, let's draw the attention of young researchers to the peculiarities of the methodology of pedagogical research. At the same time, the opinion of scientists should be taken into account, in
particular the position of the leading methodologist in this field, V. Kraevsky, who noted that the methodology of pedagogical research, unlike didactics or methods of teaching school subjects, is designed to investigate the methods and means of not practical, but research activities in the field pedagogy.

The scientist singles out a number of issues related to the general characteristics of the modern state of the methodology of scientific knowledge, since such characteristics are necessary for young researchers to orient themselves in the field of pedagogical research.

The first of these questions is about the normative nature of modern methodology. Two types of methodology are distinguished as the teaching of methods of scientific knowledge. Young researchers need to realize that any methodology performs regulatory, normative functions. This, in fact, is its purpose. But methodological knowledge can appear either in a descriptive (descriptive) or in a prescriptive (normative) form, that is, in the form of orders, direct instructions for activities.

Note that when we talk about the description, we mean the scientific-cognitive description - a set of knowledge in a certain field of phenomena, including here also a theoretical explanation, when it is not only about the experience under consideration, but also about the inner content (essence) of the investigated processes.

Keywords: methodological foundations of students, conducting scientific and pedagogical research, young researchers, scientific and cognitive description, descriptive methodological knowledge, methodological knowledge.

Introduction. Descriptive analysis deals with a retrospective description of already completed processes of scientific knowledge.

Researchers in the field of pedagogy should draw attention to the fact that the normative aspect of pedagogy is now emphasized, which is reflected in such materials as specific recommendations, training manuals and methodical guidelines. Accordingly, the methodology of pedagogical science, which justifies its own scientific pedagogical activity, should also strengthen its normative part, embody its results in certain norms, prescriptions related to the logic and procedures of pedagogical research [1, p. 222].

The modern stage of the development of the methodology of scientific knowledge should include not only the substantiation of the obtained result, but also the starting points, the logic of the research, the planned result and the method of obtaining this result. Development of ways of such justification is a direct task of methodological research, in particular, in the field of pedagogy.

Thus, the methodology of pedagogy acquires a normative orientation and its primary task becomes the development of methods of methodological support of pedagogical research.

At one time, V. Sadovsky noted: "In its essence, the methodology of science
is a set of epistemological problems that emerged from the general theory of knowledge and have as their goal a special analysis of scientific knowledge. P. Kopnin emphasized that "the logic of scientific research is not a simple application of the method of materialistic dialectics, but appears as a special theoretical field of knowledge that has its own object and its own basic concepts." It distinguishes general philosophical methodology, on the one hand, and partial methodology, on the other, which allows to prevent excessive expansion of the problems of philosophy at the expense of methodological problems that concern special areas of research.

We focus the attention of researchers on the concept of levels of methodology by E. Yudin, who singles out four such levels. The content of the first, higher, level - philosophical methodology - consists of the general principles of knowledge and the categorical system of science as a whole. Methodological functions are performed by the entire system of philosophical knowledge [2, p. 112].

The second level is general scientific methodology. This is the level of substantive general scientific concepts affecting all or a sufficiently large set of scientific disciplines. They include, for example, the system approach or theoretical cybernetics, which is, according to E. Yudin's definition, a type of system approach.

The third level is specifically scientific methodology, that is, a set of methods, principles of research and procedures used in one or another special scientific discipline. The methodology of a special science includes both problems specific to scientific knowledge in this area, and questions raised at more "higher" levels of methodology, such as, for example, problems of a systemic approach or modeling in pedagogical research.

The fourth level - methodologies form research methods and techniques, i.e. a set of procedures that ensure obtaining the same and reliable empirical material and its primary processing, after which it can only be included in the array of available knowledge.

At the same time, the philosophical level acts as the substantive basis of any methodological knowledge [3, p.444].

**Aims.** Young researchers should realize that scientific and pedagogical research has several levels, namely:

1. The empirical level of research, which is aimed directly at the object of study (phenomenon, process) and is based on observation and experimental data. At the empirical level, new facts of science are recorded and based on their generalization, empirical regularities are formulated.

2. The theoretical level is related to the improvement and development of the conceptual apparatus of pedagogy and is aimed at comprehensive knowledge of the object of research. At the theoretical level, basic, general laws are proposed and formulated, which allow explaining previously discovered facts, as well as predicting future events and facts.
The methodological level at which, based on the analysis and generalization of the results of previous studies, general principles and methods of researching pedagogical phenomena are formulated, theories are built [4, p. 234].

Therefore, research work is a creative matter, so young researchers should master the basic rules and procedures, as well as methods of evaluating their scientific activity and, first of all, learn certain methodological characteristics of pedagogical research. They include the following methodological categories: problem, topic, relevance, object of research, its subject, goal, task, hypothesis and proposition to be defended, novelty, theoretical significance for science, significance for practice.

**Methodology.** Pedagogical science cannot develop fruitfully, especially in the conditions of the modern scientific and technological revolution, without due attention to the problems of the methodology of scientific knowledge, methods of scientific research. Without a deep understanding of the state of pedagogical theory and practice, it is impossible to forecast the development of educational policy and the science of human education. This knowledge is acquired during specially organized scientific and pedagogical research.

Scientific-pedagogical research is a special form of the process of learning about pedagogical reality, a systematic purposeful study of its phenomena and processes, in which the means and methods of science are used and which ends with the formulation of knowledge about the researched object. The main goal of pedagogical research is the discovery of objective patterns of learning, education and personality development, the conscious and purposeful application of already known laws in the practice of educational work [5, p. 123].

**Results.** The logic of building scientific and pedagogical research consists of several stages, namely:

- The first stage includes a general introduction to the research problem, justification of its relevance, level of development; definition of the object, subject and topic of research; formulation of the general and intermediate goal of the research, correlation with the goal of the tasks.
- The II stage consists of the choice of methodology - the initial concept, supporting theoretical provisions, a single idea and a research approach, which determine the course and expected results of the research.
- The III stage involves building a research hypothesis - a theoretical construction, the validity of which should be proven.
- The IV stage covers the choice of research methods; conducting a ascertaining experiment with the aim of establishing the initial state of the research subject.
- Stage V consists of organizing and conducting a transformative experiment.
- The VI stage includes the analysis, interpretation and design of the research results.
- Stage VII involves the development of practical recommendations [6, p. 321].

So, the process of scientific research can be roughly represented in the form...
of the following logical scheme:

1. Justification of the relevance of the chosen topic.
2. Setting the goal and specific tasks of the research.
3. Definition of the object and subject of research.
4. Selection of research methods (methodology).
5. Description of the research process.
6. Processing and discussion of research results.
7. Formulation of conclusions and evaluation of the obtained results.

Research, as is known, begins with the definition of a problem that is singled out for special study. At the same time, the researcher must determine the degree of development of the problem.

Among the scientific problems that arise in connection with the renewal of our society, the attention of young scientists should be drawn to the relationship between the processes of humanization and democratization in education. Problems (a practical task) related to the creation of a system of continuous education are also becoming relevant. In the process of solving it, a number of questions arise that require research, for example, about the specificity of didactic principles in each link of continuous education: which of them permeate the entire system. To solve a practical problem by the means of science means to identify the relationship between this problem and the field of unknown in scientific knowledge and as a result of scientific research to obtain knowledge, which will then be laid as a basis for practical activities aimed at solving this problem. This area of the unknown in scientific knowledge is a scientific problem. The problem should be reflected in the topic of research, which in one way or another should reflect the movement from what has been achieved by science, from the usual to the new, contain the moment of collision of the old with the new [7, p. 432].

**Literature review.** Proposing the problem and formulating the topic presupposes a justification of the relevance of the research, an answer to the question: why should the identified problem be studied today? It is necessary to distinguish the relevance of the scientific direction as a whole (for example, the formation of students' communication skills or ways of implementing the educational function of learning), on the one hand, and the relevance of the topic itself within the specified direction - on the other. The relevance of the direction, as a rule, does not require a complex system of evidence. Another thing is the justification of the relevance of the topic. It should be sufficiently convincingly proved that it is the most urgent among the others that have already been studied. At the same time, in works of a theoretical and applied nature that have a normative part (which include pedagogical research), it is important to distinguish between the practical and scientific relevance of the topic.

The organization of research is understood as the relationship between the constituent elements of research work. Let's analyze the constituent elements of the
The direct characteristics of research activity are the purpose and task of research. A goal is an idea of a result. Setting a goal, the researcher imagines what result he intends to get, what this result will be.

**Results.** Pedagogical reality is infinitely diverse. The researcher must obtain certain final results in her research. Therefore, it is necessary to distinguish, on the one hand, the entire objective sphere to which the researcher's attention is directed, and on the other hand, the purpose for which he undertakes to acquire new pedagogical knowledge. To solve specific research tasks, other already acquired scientific knowledge is involved. But the new word will be said only about something that is considered as a special and original subject of study, and it will be a real contribution to pedagogical science. When this condition remains out of the researcher's attention, it turns out that his conclusions repeat well-known provisions [9, p. 321].

Determining the relevance, the researcher thinks about how acute the need of science and practice is for new knowledge of a certain kind, and the place and specificity of the missing knowledge is determined by posing the problem. The subject, as noted, indicates that aspect of the object of research, regarding which new knowledge will be obtained. Finally, at the end of the research, it is necessary to describe and briefly present the new knowledge. When defining the object of research, the researcher should answer the question: what is being considered? And the subject - denotes the aspect of consideration, gives an idea of how the object is considered, what new relations, properties, aspects and functions of the object are considered by this study. So, for example, in the object, which is the mental education of students in the learning process, the following subject is highlighted: research and heuristic methods of learning as a means of mental education of students.

Therefore, the object represents a whole set of elements of pedagogical reality or knowledge about it, which is part of the pedagogical process, and which is subject to research. The object of pedagogical research can be pedagogical systems, phenomena, processes, facts that make up pedagogical processes (upbringing, education, development, formation of personality, team) [10, c. 543].

The subject of pedagogical research is a set of elements, connections, relations in a specific field of a pedagogical object, in which a problem that needs to be solved is singled out (what is being studied is the formation of qualities, characteristics of the process, phenomenon, identification of the essence, conditions, trends, external and internal prerequisites for raising children in a certain area). That is, the subject is what is contained within the object. The object and subject of research are related to each other as general and partial. In the object, its part, which is the subject of research, stands out. It is on him that the main attention of the researcher is directed.

One of the methods of development of scientific knowledge, as well as the structural elements of the theory, is a hypothesis - an assumption in which, based on
a number of facts, a conclusion is made about the existence of an object, connection or cause of a phenomenon, and this conclusion cannot be considered completely proven.

A scientific hypothesis is a scientifically based assumption that requires further theoretical and experimental verification. Proposing a hypothesis requires a lot of knowledge about the researched object. Only then can you put forward an assumption or some theoretical idea that needs to be proven. The task of the researcher developing a hypothesis is primarily to show what is not obvious in the object, what he sees in it that others do not notice. Scientific truths are always paradoxical. A hypothesis, being a means of transition from old knowledge to new, inevitably comes into conflict with existing ideas. In any case, what is already obvious to everyone, which does not require evidence, is not a hypothesis [11, p. 225].

Therefore, the purpose of the research (the purpose of the research, the scientific result that should be obtained during the research) is aimed at studying the subject of the research.

The task of research is a program of research processes that reflect the logic of scientific research, specify goals taking into account the subject of research, scientific problems under investigation.

**Conclusions.** The subject and tasks of the research determine the choice of scientific research methods. Methods of scientific and pedagogical research are ways of studying and mastering complex psychological and pedagogical processes of personality formation, establishing objective regularities of the processes of education and training; methods, procedures and operations of empirical and theoretical knowledge and study of the phenomena of pedagogical reality; a set of methods or operations of practical or theoretical development of reality, subordinated to the solution of a specific problem.

Research methods in pedagogy are divided into general scientific and specific scientific (theoretical and empirical). General scientific: general theoretical methods (abstraction and concretization, analysis and synthesis, comparison, contrast, structuring, induction and deduction, etc.), sociological (questionnaires, interviews, expert surveys, rating, etc.), social-psychological (sociometry, testing, training, etc.), mathematical (ranking, scaling, indexing, correlation, factor analysis, cluster analysis, etc.) [12, p. 329; 13-15].

The obtained results of the study were compared with the previously developed benchmark, which made it possible to determine the deviation of the actual state from the expected hypothetical: systematic monitoring of the progress of each student and the group as a whole, recording of difficulties encountered in mutually determined actions of teachers and students; compilation and analysis of tables and graphs, which allowed to compare the effectiveness of the work of individual students, both control and experimental groups, and to make appropriate corrections in a timely manner.
References: