

The essence and content of scientific research methodology

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Abstract

The article analyzes the essence and content of the concepts "methodology", "methods of scientific research". The content of general and special methods of conducting scientific research is disclosed. It has been established that the methodology of scientific research is a conceptual statement of the content, purpose, and methods of research that allow obtaining the most objective, systematized and accurate information about phenomena and processes. The methodology systematizes the methods, methods and methods of learning objective reality, ensuring the reliability of the obtained knowledge about the object of research, their compliance with the subject of research, and is also a means of substantiating the results and conclusions of the conducted scientific research.

The methods of scientific research mean a set of cognitive rules and techniques, implemented in the form of interconnected operations, designed to obtain new knowledge, consisting of three stages: research, proof and explanation. Methods are a set of techniques and methods of activity that allow a person or organization to achieve set goals. The choice of

methods depends on the nature and content of the problem, the terms and resources allocated for its study, the amount and quality of available information. The authors characterized the content of empirical, theoretical and special methods of scientific research. It has been established that general scientific methods provide an opportunity in the process of scientific research to determine only general approaches to the defined scientific problem. Special methods allow obtaining specific knowledge, answers to questions from the subject area of research.

Key words: scientific research; methodology; methods; knowledge.

СУТНІСТЬ ТА ЗМІСТ МЕТОДОЛОГІЇ НАУКОВИХ ДОСЛІДЖЕНЬ

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В статті проаналізовано сутність та зміст понять «методологія», «методи наукового дослідження». Розкрито зміст загальних і спеціальних методів проведення наукових досліджень. Встановлено, що методологія наукового дослідження – це концептуальний виклад змісту, мети, методів дослідження, які дозволяють забезпечити отримання максимально об'єктивної, систематизованої і точної інформації про явища та процеси. Методологія систематизує методи, способи і прийоми пізнання об'єктивної дійсності, забезпечення достовірності отриманих знань про об'єкт дослідження, їх відповідність предмету дослідження, а також є засобом обґрунтування результатів і висновків проведеного наукового дослідження.

Під методами наукового дослідження розуміється сукупність пізнавальних правил і прийомів, реалізованих у вигляді взаємопов'язаних операцій, призначених для отримання нових знань, що складається з трьох етапів: дослідження, доказу та пояснення. Методи – це комплекс прийомів і способів діяльності, що дозволяє людині

чи організації досягти встановлених цілей. Вибір методів залежить від характеру і змісту проблеми, термінів і ресурсів, виділених для її вивчення, кількості та якості доступної інформації. Авторами охарактеризовано зміст емпіричних, теоретичних та спеціальних методів наукового дослідження. Встановлено, що загальнонаукові методи, дають можливість у процесі наукового дослідження, визначити лише загальні підходи до окресленої наукової проблеми. Спеціальні методи дозволяють отримати конкретні знання, відповіді на запитання з предметної області дослідження.

Ключові слова: наукові дослідження; методологія; методи; пізнання.

The statement of the problem. In modern conditions of the development of civilization, knowledge about the phenomena and processes of the surrounding world is rapidly changing and being updated. The development of science in the 21st century is characterized by the emergence of new technologies, a variety of innovative teaching methods, the use of more modern forms and means of organizing and conducting scientific research. Computers and the Internet have become indispensable tools of sociological, psychological, pedagogical, economic and other types of research. At the same time, it is the methodology that remains the basis for conducting scientific research. Methodology is a conceptual statement of the content, purpose, and research methods that allow obtaining the most objective, systematized, and accurate information about phenomena and processes. The methodology of scientific research is not conservative and does not stand still, it develops in accordance with the development of scientific knowledge.

Analysis of previous research and publications... Many domestic scientists were engaged in scientific research on the definition of the essence and content of the methodology of scientific research, in particular: R. Akhmetov, V. Bodrov, V. Bulavynets, V. Horyn, O. Kvasnytsia, S. Koval, Yu. Kostin, T. Kutek, L. Lazebnyk, M. Miroshnichenko, S. Onyshko, S. Osadchiy, T. Polozova, L. Rebukha, V. Samsonov, A. Silvestrov, G. Tymoshenko, I. Sheiko and others. In their works, the theoretical aspects of the essence of the theory, methods, methods and methodology of scientific research are characterized.

The aim of the study To analyze the essence and content of the methodology of scientific research.

Main body The basis of science is the collection of data about the object of research, updating and systematization of the received information, critical analysis of facts, synthesis of new knowledge or generalizations that characterize the studied natural or social

phenomena, establishing cause-and-effect relationships between phenomena and predicting their course in the future .

Most scientists under the methodology of science interpret this concept as the teaching of a scientific method of cognition or a system of scientific principles, on the basis of which research is based and the selection of means, techniques and methods of cognition is carried out in accordance with the specifics of the object. There is also another, more narrow view of the methodology of science, when it is considered as the theoretical basis of some special, partial techniques and means of scientific knowledge.

As noted by V. Bulavynets and others. "methodology is the teaching of a system of scientific principles, methods and forms of research activity, which has a four-level structure. There are general scientific, fundamental principles that form the actual methodology, and specifically scientific principles that lie in the plane of theory of any discipline or scientific field, as well as a system of specific methods and mechanisms that are used to solve special research tasks" [4].

Therefore, methodology is a complex dialectical, integral, subordinate system of principles, methods, methods, techniques, forms, means, contents and structure of organization of scientific research. A meaningful understanding of the methodology comes from the fact that it implements the search function of the subject area of research. Any theoretical system of knowledge makes sense when it not only describes and explains some subject area, but at the same time is a tool for finding new knowledge. It is the methodology that determines to what extent the collected facts can serve as a real and reliable imperative of knowledge [5].

The definition of "methodology" contains two substantive meanings: the first meaning characterizes methodology as a system of certain knowledge, techniques and methods used in one or another field of activity (in economics, sociology, pedagogy, management, etc.); the second meaning characterizes methodology as a general theory of methods, a system that makes it possible to know the real reality or as a teaching about the use of principles, methods, categories, laws of dialectics and science regarding the process of cognition and practice in the interests of acquiring new knowledge [2].

Domestic scientists consider "research methodology" as the teaching of:

- scientific method of cognition;
- system of scientific principles, on the basis of which the research is based and the selection of means, methods and methodological techniques is carried out [1, 5];
- basics for developing a plan for scientific research [9];

- selection of principles, methods and means of organizing scientific research [6];
- the conceptual basis of obtaining reliable information for conducting scientific research [10].

Methodological soundness, clear structure, meaningfulness and logic of construction of researches will make it possible to obtain new useful knowledge and to form imagination and ways of further development of social, economic, comparative relations, to offer new mechanisms and tools for strengthening such relations in the specified field of activity.

Therefore, the methodology systematizes the methods, methods and techniques of knowing objective reality, ensuring the reliability of the obtained knowledge about the object of research, their correspondence to the subject of research, and is also a means of substantiating the results and conclusions of the conducted scientific research [6].

In order to successfully conduct scientific research, as well as to obtain a reliable result, a necessary condition is the choice of means, methods, methods, methodical methods of research for solving scientific problems. The effective conduct of scientific research largely depends on the timely provision of information about new achievements in the field of science and its effective use for scientific, research and project purposes [10].

The methods of scientific research mean a set of cognitive rules and techniques, implemented in the form of interconnected operations, designed to obtain new knowledge, consisting of three stages: research, proof and explanation.

The methodology of selection of methods of scientific knowledge is in the circle of scientific interests of many politicians, civil servants, managers, scientists, practitioners, economists, teachers and other specialists at the conceptual level.

Methods are a set of techniques and methods of activity that allow a person or organization to achieve set goals. The choice of methods depends on the nature and content of the problem, the terms and resources allocated for its study, the amount and quality of available necessary information. The methods of scientific research represent a set of methods for establishing the relevant parameters, structure, other characteristic features and differences of the studied objects. These include: description of objects of knowledge and recording of observation data, analysis, synthesis, modeling, generalization, induction, hypothesis, explanation, deduction, experiment, constructive-genetic method, method of scientific conventions, etc.

It is important to distinguish general and special research methods. Among the general methods, it is necessary to consider:

- 1) empirical methods;

- 2) methods used at the theoretical and empirical levels;
- 3) theoretical methods (descent from the abstract to the concrete);
- 4) special methods.

Among empirical methods, an important place is given to observation, which consists in the systematic, purposeful, active study of the research object in its natural state or in the conditions of a scientific experiment in order to obtain primary data as a set of empirical statements [1]. The main problem that arises when using this method is ensuring the objectivity and reliability of the necessary information. The cognitive summary of the observation is a description - recording using visual means (diagrams, graphs, tables, drawings, etc.) of empirical information about the object of research [7].

An important component of this method is comparison - it is the process of establishing the similarity or difference of objects and phenomena of reality, as well as finding the common characteristic of two or more objects. With the help of this method, the quantitative and qualitative characteristics of the object under study are revealed, and the content of phenomena and processes is also classified, organized and evaluated.

An equally important empirical method of research is measurement, which means determining the numerical value of a certain value using units of measurement, a system of recording and recording the quantitative characteristics of the object under study. Its results are expressed in numbers, which makes it possible to carry out their statistical and mathematical processing.

A component of the empirical method is an experiment - it is a research method based on an active and purposeful influence on the object of knowledge by creating controlled and managed artificial conditions or using natural conditions necessary to identify relevant properties and relationships [12].

Experiments are divided into natural and mental. Natural ones are accordingly divided into: natural, when the research object is in natural conditions that can be changed at the will of the experimenter; model, when the research object is replaced by its model; social, aimed at studying social phenomena. Mental experiments are a system of procedures that are carried out with idealized objects. They are considered as a theoretical model of real experimental situations, while the researcher operates with conceptual models of real objects.

Among the theoretical methods (descent from the abstract to the concrete) is a method of scientific research, which involves the movement of theoretical thought to a more complete, comprehensive and holistic mental reproduction of the object. According to this method, the learning process is divided into two relatively independent stages. The first

consists in the transition from the concrete in real reality to its abstract definitions. A single object is dismembered, described with the help of concepts, judgments, definitions, that is, a set of fixed mental abstractions is formed. The second stage consists in the advancement of thought from abstract definitions of the object, that is, from abstract in cognition, to comprehensive, multifaceted knowledge about the object, to concrete in cognition. These stages are closely related and cannot exist in isolation from each other [8]. Thus, this method is a way of scientific research, according to which thinking goes from the concrete in real reality to the abstract in cognition, and from it to the concrete. Obtaining specific knowledge is the goal that, as a law, determines the researcher's method of action. Therefore, the method of going from the abstract to the concrete is widely used in the process of cognition, in the construction of scientific theories and concepts.

So, theoretical methods have two inextricably linked aspects:

- they are ideal schemes of real experiments;
- at the same time, they serve as a systemic image of the subject of research, an expression of the essential connections of the investigated reality.

Among the methods used at the theoretical and empirical levels of research, it is necessary to highlight: analysis and synthesis; induction and deduction; abstraction; generalization; analogy; formalization; idealization; interpretation. One of the most important methods of research used at the theoretical level is the method of scientific abstraction. It consists in highlighting the most essential aspects of the process being studied, abstracting from everything secondary, accidental. First, a general description of the phenomenon is given, its inherent contradictions are determined, and then specific manifestations of this phenomenon are considered [3]. Abstract thinking with its inherent techniques of dialectical, but not formal, logic includes other methods of knowing production relations, in particular, analysis and synthesis. Analysis and synthesis are two inseparable factors of the process of scientific knowledge of reality, the use of which contributes to the identification of cause-and-effect relationships of individual phenomena.

Methodological analysis of theoretical and empirical knowledge involves the study of scientific texts, but is not limited to it, because science is not only a system of knowledge, but also research activities in relevant subject areas organized according to certain methods.

An important component in scientific research is the use of special methods. Among them:

- a) methods of collecting and summarizing the necessary information about the research object;

- b) methods of statistical and economic analysis;
- c) methods of strategic forecasting;
- d) modeling methods;
- e) program-target method;
- f) system method;
- g) comparative method;
- h) problem-oriented method.

Based on the above, general scientific methods make it possible in the process of scientific research to determine only general approaches to the outlined scientific problem;

special research methods allow obtaining specific knowledge, answers to questions in pedagogy, psychology, tourism, medicine, physical culture, etc. That is, research methods that are used in specific research allow obtaining specific knowledge, they are the basis of scientific knowledge.

The use of a group of general and special methods allows you to determine the essence of scientific research: whether this or that research is exploratory and has the characteristics of research, whether it is descriptive or explanatory. All this depends exclusively on the methodological tools.

Conclusions The conducted analysis of the essence and content of the methodology of scientific research proves that the choice of methodology based on the methods of scientific research allows to establish to which field of knowledge this or that research belongs. After all, in the modern scientific world, the same subject of research can be in the field of view of several sciences. A feature of general scientific research methods is that they are used by all branches of science and at a specifically defined stage of scientific research. Special research methods make it possible to obtain specific knowledge on the subject of scientific research.

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