

# Research Methodology As A Systemic Factor In Ensuring The Reliability Of Scientific Results

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## Abstract

The article examines research methodology as a system-forming component of scientific activity. It clarifies the relationship between the concepts of “methodology,” “method,” and “research methodology,” and analyzes the structure of research methodology, its fundamental principles, and its main types. Special attention is given to the organization of research and the interpretation of obtained results. The author proposes a structural-logical model of research methodology and demonstrates its application through a pedagogical case study. It is concluded that the methodological culture of a researcher is the most important condition for scientific reliability and professional competence.

**Keywords:** research methodology, philosophy of science, hypothesis, scientific experiment, principles of scientific research, research activity.

## INTRODUCTION

**Introduction.** The contemporary development of science is characterized by the increasing complexity of research tasks, the strengthening of interdisciplinary connections, and the growing requirements for the validity of scientific conclusions. The information society, digitalization, and the globalization of the scientific space necessitate strict methodological regulation of research activities.

Today, scientific research is considered a systematically organized activity that includes problem identification, hypothesis formulation, selection of methods, and interpretation of results. Methodology serves as a connecting link between theoretical principles and the practical actions of the researcher.

As Vladimir Stepin notes, “scientific cognition represents a complex system of theoretical activity in which the methods and means of research are determined by the nature of the object and the level of development of scientific knowledge.” This statement emphasizes the systemic nature of scientific research and the importance of

methodology as its organizational foundation.

### Scientific Novelty of the Research

- a structural-logical model of research methodology has been developed;
- the correlation between the concepts of “methodology,” “method,” and “research methodology” has been clarified;
- the role of the methodological culture of the researcher in the context of the digitalization of science has been substantiated;
- an integrative approach to the organization of research has been proposed.

### Materials and Methods

The methodological basis of the study consists of the works of domestic and foreign scholars in the field of philosophy of science and the methodology of scientific cognition.

As Evgeny Yudin emphasizes, “the methodology of science acts as a system of principles and methods for organizing theoretical and practical activity, ensuring the integrity and direction of research.”

The study employed methods of theoretical analysis, systematization, comparative comparison, and generalization.

## Results and Discussion

**1. Theoretical Foundations of Research Methodology.** Research methodology is defined as a system of interconnected methods and procedures aimed at solving a scientific problem. It ensures the implementation of methodological principles in the practical activity of the researcher and gives the study logical completeness.

**2. Structure of Research Methodology.** The structure of research methodology represents a system of interconnected components that ensure the consistency and logical coherence of scientific inquiry. Its foundation is the step-by-step organization of research activity.

First of all, the object and subject of the research are determined, which makes it possible to specify the direction of scientific analysis. Then the purpose and objectives are formulated, which define the general strategy and stages of the study. An important place is occupied by the hypothesis, which acts as a scientific assumption and guides the research process.

The next stage is the selection of research methods, which ensure the collection and analysis of the necessary information. A significant role is played by the organization of the research process, including planning, data collection, and compliance with scientific standards.

The final stage is the analysis and interpretation of results, during which patterns are identified, the hypothesis is tested, and conclusions are formulated.

**3. Principles of Methodology.** Research methodology is based on a number of key principles that ensure its scientific validity and reliability.

The principle of scientificity presupposes reliance on verified theoretical provisions and scientific facts.

The principle of systemacity requires considering the object of research in the interconnection of its elements.

The principle of objectivity excludes the influence of subjective factors on the research results.

The principle of reproducibility ensures the possibility of repeating the study and verifying its results by other scholars.

The principle of ethics presupposes compliance with the norms of scientific and professional responsibility during the research process.

**4. Author's Model of Research Methodology.** Within the framework of this study, an author's model of research methodology is proposed, including several последовательных stages. The conceptual stage предусматривает problem identification, goal definition, and hypothesis formulation. The methodological stage is associated with the selection of scientific approaches and research methods. The empirical stage is aimed at collecting factual data, while the analytical stage involves their processing and interpretation. The final stage is the reflective stage, which includes the evaluation of the obtained results and the formulation of conclusions.

The proposed model makes it possible to structure the research process and increase its effectiveness.

**5. Example of Methodology Application (Original Case).** As a practical illustration, let us consider a pedagogical study.

Problem: a low level of formation of text-production skills among primary school students.

Hypothesis: the use of an integrative approach (reading + analysis + writing) contributes to the development of textual competence.

The study used such methods as pedagogical observation, experiment, and analysis of students' written works. To test the hypothesis, control and experimental groups were formed. In the experimental group, teaching was carried out using integrative methods.

**Research Results.** The research results showed positive dynamics: the coherence of texts increased, their logical structure improved, students' vocabulary expanded, and the level of their independence in completing tasks also increased.

The practical significance of research methodology lies in its regulatory function, ensuring the orderliness and consistency of the research process. In the context of the digitalization of science, the requirements of reproducibility and transparency of results become especially important, which contributes to increasing their reliability and scientific validity.

**Conclusion.** Research methodology is a key instrument for ensuring the reliability of scientific results. It unites all stages of scientific inquiry into a single system. The proposed model makes it possible to increase research efficiency and improve the quality of data interpretation. The methodological culture of the researcher acts as the most important factor of scientific objectivity and professional competence.

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