

GENERAL SCIENTIFIC RESEARCH METHODS

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Abstract: General scientific research methods are fundamental tools used across various disciplines to systematically investigate phenomena, gather data, and generate knowledge. These methods provide structured approaches to formulating research questions, designing experiments, collecting and analyzing data, and drawing valid conclusions. The use of rigorous research methodologies ensures objectivity, reliability, and reproducibility of scientific findings. This paper explores the key types of general scientific research methods, including qualitative and quantitative techniques, experimental and observational approaches, as well as the importance of selecting appropriate methods based on research goals. Understanding these methods is essential for researchers to effectively address complex problems, contribute to the advancement of science, and apply findings in practical contexts.

Keywords: pedagogy, scientific research methods, research, process, content, personality.

Introduction

Every discipline has its own scientific research methods. Through these methods, it enriches and renews its content. In life and in the theory of understanding the objective world, there are questions about what to teach and how to teach, and whom to educate, which are interconnected. Pedagogy studies existing pedagogical phenomena and processes with methods that correspond to its goals and tasks in order to enrich and renew its content. The more perfect, reasonable, and appropriately chosen the scientific research methods of pedagogy are, the better the content of education and upbringing is renewed and improved, and the pedagogy discipline develops. Pedagogical scientific research methods are ways of specially investigating and understanding the internal essence, communication, and regularities of the pedagogical process, which determine the principles of educating the personality, providing it with deep and thorough scientific knowledge in certain directions, as well as its objective and subjective factors. [2, 11]

In modern conditions, the following methods are used in pedagogical research:

1. *Pedagogical observation method.*
2. *Interview method.*
3. *Questionnaire method.*
4. *Interview (in-depth) method.*
5. *Analysis of educational institution documents method.*
6. *Test method.*
7. *Pedagogical analysis method.*
8. *Method of studying children's creativity.*
9. *Pedagogical experiment method.*
10. *Mathematical-statistical method.*

Pedagogical observation method.

During its application, the educational and upbringing processes of educational institutions are studied to identify the state of the researched phenomenon. Information is obtained about the difference between the indicators achieved before and after the experiment. Pedagogical observation is complex and has unique characteristics. If the observation is conducted based on a clear purpose, continuously, consistently, and systematically, the expected result can be achieved. When the conducted pedagogical observation serves to improve the quality of education and upbringing and

contributes to the formation of the student's personality, the significance of this method increases even more [1, 35]. It is important to avoid errors when organizing pedagogical observation. For this, the researcher is required to:

1. *Have a clear goal during the observation process;*
2. *Conduct observation systematically;*
3. *Solve specific tasks at each stage of observation;*
4. *Thoroughly study the essence of each case;*
5. *Avoid rushing to conclusions.*

Interview Method.

This method enriches the information obtained during pedagogical observation, allows for an accurate assessment of the current situation, helps create pedagogical conditions that facilitate problem-solving, and involves the participants of the experimental work in resolving the issue. Interviews are conducted purposefully, either individually, in groups, or in mass form. It is important during the interview process to fully reveal the respondents' capabilities [4, 106].

Questionnaire Method (from French, meaning "survey").

This method enriches the evidence collected during pedagogical observation and interviews. The questionnaire method is based on organizing communication with respondents through a system of questions. Answers to questionnaire questions are often collected in written form. Depending on the nature of the studied process, questionnaire questions are as follows:

1. Open-ended questions (allowing respondents to give free, detailed answers);
2. Closed-ended questions (respondents answer by choosing from options such as "yes," "no," "partly," or "positive," "satisfactory," "negative," etc.).

Interview Method (In-depth interview).

This method ensures that the respondent expresses their attitude toward certain aspects of the studied problem or phenomenon. The interview is conducted by submitting a series of questions to the respondent. The researcher's feedback to the answers received during the interview enhances its effectiveness [3, 41].

Method of Analyzing Educational Institution Documents.

To study pedagogical phenomena and evidence, it is appropriate to examine information reflecting the activities of educational institutions. This method is used to study the implementation of the requirements of the Law of the Republic of Uzbekistan "On Education" and the "National Program for Personnel Training" in the practice of educational institutions, assess the level of activity, identify achievements and shortcomings, disseminate advanced experience, and improve pedagogical practice in educational institutions [5, 75].

Documents that reflect the essence of educational institution activities include:

- *Timetable of lessons,*
- *Curriculum,*
- *Group (or class) composition lists,*
- *Students' personal records,*
- *Orders,*
- *Minutes books of Pedagogical Council meetings,*
- *Decisions of the Pedagogical Council,*
- *Budget and passport of the educational institution,*
- *Plans for educational and upbringing work,*
- *Reports on the organization of educational and upbringing activities,*
- *Registers of educational institution equipment (desks, tables, chairs, soft furniture, etc.), and others. [7, 102]*

Test Method.

This method serves to determine the level of theoretical knowledge, practical skills, and competencies acquired by respondents in a specific subject area or activity (including professional activity). When applying the test method, it is advisable to present the knowledge, skills, and competencies to be assessed in a structured manner by categories. The advantages of this method include the ability to analyze respondents' answers according to clear criteria and the saving of time. However, the method is not without some drawbacks. For example, in most cases, answers are collected in written form, and respondents must choose one of the proposed answer options. Therefore, respondents do not have the opportunity to express their thoughts in detail.

Pedagogical Analysis Method.

The goal of using this method during research is to determine the degree to which the chosen problem has been studied from philosophical, psychological, and pedagogical perspectives. It serves to theoretically substantiate the validity of the idea put forward by the researcher.

Method of Studying Children's Creativity.

This method is used to identify students' abilities and talents in specific areas, as well as their level of knowledge, skills, and competencies in certain subject fields. When applying this method, students' creative works—such as diaries, essays, written assignments, reports, and presentations—serve as important tools. The advantage of this method lies in its ability to recognize, assess, and create a foundation for the development of individual capabilities specific to a particular student [8, 66].

Conclusion

General scientific research methods form the backbone of systematic inquiry across disciplines, enabling researchers to explore, analyze, and understand complex phenomena with rigor and clarity. By employing appropriate methodologies—whether qualitative, quantitative, experimental, or observational—scientists can ensure the validity and reliability of their findings. Mastery of these methods not only advances knowledge but also supports informed decision-making and practical applications in diverse fields. Ultimately, the continual refinement and thoughtful application of general scientific research methods are essential for the progression of science and the betterment of society.

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