

## **PEDAGOGICAL RESEARCH METHODS AND THEIR PRACTICAL SIGNIFICANCE IN THE EDUCATIONAL PROCESS**

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### **Abstract**

This article examines the main scientific research methods used in modern pedagogical inquiry, including observation, interview, questionnaire, document analysis, tests, pedagogical analysis, children's creative work analysis, pedagogical experiment, and mathematical-statistical methods. The theoretical foundations and practical significance of these methods are analyzed based on pages 15–20 of the textbook *Umumiy Pedagogika*. The study argues that these methods play a crucial role in improving the quality of education, understanding learners' development, and organizing pedagogical processes on a scientific basis.

**Keywords:** Pedagogical research, observation method, questionnaire, interview, experiment, statistical analysis, educational diagnostics.

### **Introduction**

Organizing the modern education system on a scientific basis requires identifying the internal essence of the pedagogical process as well as its objective and subjective factors. This, in turn, is achieved through an in-depth study of pedagogical reality and a consistent, systematic analysis of its laws. Pedagogical research must be carried out relying on a dialectical approach, which necessitates drawing scientific conclusions based on the interconnectedness of pedagogical phenomena, their continuous development, and the unity of processes linked to an individual's physiological, psychological, and intellectual maturation.

Pedagogical scientific research is a complex process that requires a clear purpose, a well-founded scientific hypothesis, properly chosen research methods, observance, consistency, and objectivity. The effectiveness of pedagogical research depends on the following conditions: the relevance of the problem and precise definition of the research topic, correct formulation of the hypothesis, an objective approach to the system of methods used, consideration of respondents' age,

psychological and personal characteristics, and the anticipation and validation of research outcomes.

The methods used in pedagogical research each have unique significance. For instance, pedagogical observation enables the identification and analysis of the state of the educational process, while interviews and conversations serve to study respondents' individual opinions in depth. Document analysis helps determine the level of performance of an educational institution, and testing is an important diagnostic tool for assessing students' knowledge, skills, and competencies [5, 26]. Moreover, the pedagogical experiment method examines the practical effectiveness of newly proposed methodologies or technologies, while mathematical–statistical methods allow for scientifically grounded re-analysis of the obtained results.

Therefore, thoroughly studying pedagogical research methods from a theoretical perspective, determining their role in the educational process, and substantiating their practical efficiency are among the priority tasks of modern education—aimed at improving quality, ensuring personal development, and organizing pedagogical processes based on contemporary approaches.

## Methods

This study focuses on revealing the theoretical foundations of methods used in modern pedagogical research and their practical role in the educational process. The classification of methods presented in academic literature served as the basis. During the research, the scientific foundations of pedagogical observation, conversation, questionnaire survey, interview, document analysis, testing, pedagogical analysis, studying children's creativity, pedagogical experiment, and mathematical–statistical methods were examined.

## Results

The conducted analyses showed that pedagogical scientific research methods function as complementary scientific mechanisms in identifying the content, effectiveness, and factors influencing personal development within the educational process. First and foremost, the pedagogical observation method proves to be one of the most reliable practical tools in determining the real state of the learning process. When the observation is carried out consistently and with a clearly defined purpose, it fully reveals students' active participation in lessons, the pace of



knowledge acquisition, and the quality of pedagogical communication between teacher and student [2, 35–39]. According to the results, it is precisely the data obtained through observation that make it possible to identify the strengths and weaknesses of the learning process.

The interview and conversation methods play a particularly important role in identifying respondents' internal motivations, personal attitudes toward the learning process, and the psychological aspects of the problem [9, 27–29]. When comparing the views of students and teachers during the conversation process, it became evident that in many cases the root of the problem lies not only in external processes but also in the individual's psychological readiness, the teacher's communication skills, and the student's intrinsic desire for knowledge. The results of the interviews further revealed deeper individual differences in students' activities—specifically their level of motivation, psychological adaptation, and the nature of learning difficulties.

The data collected through the questionnaire method made it possible to determine students' general attitudes, their level of satisfaction with the learning process, their opinions about the teacher's performance, and the factors influencing the effectiveness of a lesson [3, 42–46]. The responses obtained through a set of open and closed questions showed that students' perspectives on the learning process are not uniform, and that their educational needs and expectations vary significantly. This once again confirms the necessity of individualizing and adapting the learning process.

Through the analysis of educational institution documents, the implementation of curricula, the effectiveness of pedagogical council decisions, plans for educational activities, student attendance and academic performance, and other indicators related to the organization of the learning process were systematically examined. The results showed that, in certain cases, discrepancies exist between the content of official documents and the actual situation observed in the classroom. Most of these inconsistencies were found to be connected with organizational-technical shortcomings or a lack of precision in planning pedagogical activities.

The test method provided clear diagnostic information regarding students' theoretical knowledge, practical skills, and competencies. The test results revealed differences in students' levels of mastery: in some students, theoretical knowledge was sufficient but practical skills were underdeveloped, while in other cases,

practical performance exceeded theoretical preparation. This once again substantiates the need to ensure an integrated relationship between theory and practice in the educational process [5, 18].

Using the pedagogical experiment method allowed for a detailed evaluation of the effectiveness and practical value of newly introduced methodologies. When comparing indicators such as academic achievement, level of independent thinking, activity in the learning process, and the quality of teacher–student interaction between the control and experimental groups, significant improvement was observed in the experimental group. This clearly demonstrates the role of pedagogical experimentation in validating theoretical ideas through practical application.

Through the mathematical-statistical method, all collected data were processed, and the relationships between variables, the dynamics of change, and the reliability and accuracy of the results were scientifically verified [10, 13–15]. The statistical findings showed, through concrete numerical data, the students' level of knowledge, the strength and effectiveness of pedagogical influence, and the actual impact of the applied methodology on the educational process.

Overall, the research results demonstrated that each pedagogical method has its own unique place in deeply studying and scientifically substantiating the educational process. The harmony among the methods contributes to drawing comprehensive scientific conclusions and improving the quality of education.

## Discussion

The analysis of the obtained results indicates that pedagogical research methods hold significant importance in the modern educational process. The study proved that organizing the learning process on a scientific basis does not rely on a single method but requires the harmonious combination of multiple methods. The reason is that the pedagogical process is a complex, multifactorial, socially and psychologically interconnected system of activity, and its comprehensive study can only be achieved through the combined results of several methods.

The significance of the pedagogical observation method lies in its ability to examine teacher–student interaction, classroom dynamics, and students' active participation in a real and natural setting [9, 47]. Its effectiveness is rooted in the fact that it allows researchers to observe the learning process without artificial

interference, thereby providing objective evidence about the nature and causes of changes that occur during instruction. However, observation alone is not sufficient; it becomes scientifically stronger only when combined with interviews, conversations, and document analysis.

The results obtained through interviews and conversations serve to reveal the internal aspects of the pedagogical process. In particular, students' motivation, the teacher's communicative competence, and individual approaches to learning become clearly evident during conversation. These methods uncover psychological states, internal barriers, personal needs, and the subtle aspects of pedagogical interaction that cannot be seen through observation alone [1, 9]. This conclusion confirms what is highlighted in the textbook: the scientific value of the conversation method lies in its ability to identify the depth of respondents' thoughts.

The results of the questionnaire method show that students' overall attitudes toward the educational process differ significantly. Detailed answers to open-ended questions reveal that students' expectations from the learning environment, their attitudes toward teaching methods, and the difficulties they face during lessons vary widely. This provides scientific justification for the need to individualize the educational process.

Document analysis enables a deeper study of the actual functioning of an educational institution. In certain cases, discrepancies are discovered between the planned activities and the processes observed in practice [6, 78–79]. This indicates the need to further improve pedagogical management, lesson quality monitoring, and the system of educational activities. These findings align with the textbook's assertion that document analysis is one of the most effective methods for identifying organizational quality indicators in the educational process.

The results of the testing method clearly reveal actual differences in students' learning performance. Some students demonstrate strong theoretical knowledge but weak practical skills, while others display the opposite pattern—well-developed practical competence but limited theoretical preparation. This proves the necessity of ensuring an organic unity between theory and practice in education. This conclusion was further reinforced through mathematical–statistical methods, which verified the reliability of the obtained data.

Evidence from the pedagogical experiment demonstrates that newly introduced teaching methods and technologies can indeed lead to significant improvements in the educational process [4, 51]. Higher learning outcomes, enhanced independent thinking, and increased active participation among students in the experimental group once again confirm the practical value of this method.

In summary, a comprehensive understanding of the pedagogical process from both scientific and theoretical perspectives is possible only when all methods are applied in an interconnected manner. The combined use of these methods revealed the dynamics of student development, the effectiveness of the institution's educational performance, the teacher's professional competence, and students' psychological and intellectual growth. Such methodological integration enables the formulation of scientifically grounded conclusions that directly contribute to improving educational quality.

## Conclusion

A thorough analysis of pedagogical research methods shows that enhancing the effectiveness of the educational process, ensuring the holistic development of the individual, and organizing pedagogical activity on a scientific basis can be achieved only by relying on a combination of these methods.

Observation, conversation, interviews, and questionnaires uncover the psychological and organizational aspects of the pedagogical process, while document analysis, testing, and pedagogical evaluation methods play an essential role in determining educational effectiveness. The pedagogical experiment method allows for the scientific verification of the practical value of new teaching technologies. In addition, mathematical–statistical methods help process all data, thereby strengthening the reliability and accuracy of scientific conclusions.

The results of the study confirm that the integrated use of methods allows for a comprehensive examination of the educational process, improvement of teaching quality, identification of individual differences in student activity, and reorganization of instruction based on scientifically grounded principles. Furthermore, pedagogical research methods serve as a decisive factor in identifying real problems in the education system, developing mechanisms for their resolution, and ensuring the effective implementation of pedagogical innovations.



Overall, pedagogical research methods provide both theoretical and practical foundations not only for scientific inquiry but also for improving everyday educational practice, supporting students' holistic development, and enhancing teachers' professional competence. Their complex application stands as a scientifically proven mechanism for achieving high-quality educational outcomes.

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