Global Scientific Review
A Peer Reviewed, Open Access, International Journal
www.scienticreview.com
Volume 14, April 2023 ISSN (E): 2795-4951

Results of pedagogical experiments and their mathematical-statistical analysis

Sunnatullo Do'stov
Independent researcher of the Denov Institute of Entrepreneurship and Pedagogy

Annotation: This article describes in detail the results of pedagogical experiments and their mathematical and statistical analysis, the general principles of pedagogical research, the methodology of developing the program of pedagogical experiments, and the criteria for determining the effectiveness of pedagogical scientific research.

Key words: pedagogy, experimental work, mathematical-statistical analysis, effectiveness of scientific research, experimental work.

Introduction:

Organization of pedagogical experiment-trial work is complex and responsible in its own way. Especially in the human subject, experiment-testing is organized on the basis of a specific program, the program takes into account all pedagogical and psychological laws and conditions. The content of the scientific research program is determined by the purposeful, consistent implementation of experimental work. Pedagogical experiment-test program is a guide for determining the relevance of the topic, socio-economic significance, and substantiating the validity of the scientific hypothesis.

Experiments are an important component in substantiating scientific hypotheses. Experiments are organized based on scientific hypotheses, and scientific hypotheses become theoretical ideas only when they are tested in practice. If scientific hypotheses are not based on experiments, the direction of scientific research is changed, experiments are carried out again. The concept of scientific research is the historical development of the study of the problem, its typical manifestations in life are tested in the experiment. Practical experience complements research theory. Therefore, the program of experimental work is a system and mechanism for the consistent implementation of scientific research.

Literature analysis and methodology:

Practical testing of research theory; introduction, generalization of the scientific-practical possibility of research; check the result of the research in different conditions in several options; will consist of areas such as mathematical statistical analysis and evaluation. It is known that practice is the criterion of scientific knowledge. Scientific research can be either temporary, sometimes iterative, defining the perspective of science, clarifying classical laws. That is why experimental work consists in determining the expression of these possibilities in life.

Research theory and experimental work are inextricably linked. The connection between theory and practice is the methodological basis of experimental work of the philosophical category. In determining the scientific and practical significance of the research, the experimental work performs the function of expertise. The argument of the research is based on the results of the experimental work. Argumentation of

scientific research, ideological axioms depends on the fact that experimental work has been carried out in different variants and under different conditions.
Subjective recommendations in pedagogical research led the education system to crisis in the last century. Argumentation of pedagogical research is a component of the experimental work program. In several options, experimental works on increasing the effectiveness of education and training are tested in experimental and control groups. In a long-term experiment, the order of observation and experimental work performed at each stage is determined.
According to the nature of the experimental groups, one or more stages of experimental work are planned. Mathematical statistical analysis along with logical conclusions in summarizing the results of experimental work increases the possibility of creating argumentative concepts and practical applications. The direction of research can be the components of pedagogy, the creation of a program of experimental tests on the topic, and creativity in the organization of experimental tests.
Effective research can be done by modeling the pedagogical scientific research process and results, systematic research, expression, widespread introduction of pedagogical and information technology, and modeling of complex, abstract features of the educational process. Due to its complex complex nature, modeling belongs more to research methods. It is a research method in which the object of interest to the researcher is replaced by another similar object. In this case, the first object is the original, and the second is the model.
Modeling can be shown in graphic, mathematical, logical, symbolic form. In the modeling of pedagogical scientific research, the similarity and compatibility between the object of research and its logical model provides an opportunity to express the idea and increase the theoretical level of the research. Wide use of the modeling method facilitates the process of scientific research and becomes a convenient tool for studying the object of education. Modeling is also used to explain the features of the pedagogical object.
Modeling is always used in conjunction with other scientific methods and is closely related to experimentation. A model experiment is used in the research of the pedagogical system. The use of various forms of logical modeling in pedagogical scientific research provides an opportunity to systematically express the educational process. A model experiment is an effective method in the design of educational institutions and in the development of educational tools. The experiment model is also used to create methods, forms, and systems of distance education.
Modeling has a decisive opportunity in the idealization of the educational process. The ideal form of the pedagogical process is expressed through systematic modeling, conceptual conclusions and recommendations are developed. It is a requirement of science that the research of every pedagogue should follow such stages of scientific research, and that each stage is integrally connected with each other.
Each stage of scientific research has its own principles. It is necessary for the initiator of scientific research to take into account these features and acquire the culture of research. In addition to the above requirements, each scientific research task is tested taking into account specific social and historical conditions. Also, the researcher takes into account the complexity, content and methodological possibilities of the scientific research task.
Pedagogical experience can be based on a specially organized experiment. The methodological principle has a special place in the analysis of the results achieved by

the creative pedagogue. In the scientific analysis of advanced pedagogical experience, time saving and economic activity of the experience have a special place. It is known that the scientific organization of pedagogical work means getting high results with less work.
Studying advanced pedagogical practices and discovering creative teachers enriches the theory and importance of education. A scientific researcher can create new experiences with a creative teacher, organize research together, experience can be individual or team. The best practices of the team can be targeted, complex, planned. In recent years, methodical councils and associations have become centers of generalization of best practices in educational institutions. In scientific seminars, the results of best practices, innovative projects receive a scientific practical evaluation and recommendation.
Pedagogical experience is a unique set of research methods, which provides a scientifically objective and proven verification of the correctness of the hypothesis based on the beginning of the research. Also, unlike other methods, it allows to check the effectiveness of one or another innovation in the field of education and training, to conduct a deeper study of new, more effective means, methods and ways of organizing training.
Pedagogical experience compares the importance of various factors in the structure of the educational process, chooses the most optimal combination of them for a given situation, and creates the basis for determining the necessary conditions for the implementation of certain pedagogical tasks. The different aspect of the experiment from the pedagogical observation is that it also allows to study the phenomena in different conditions, in addition, in the process of the experiment, to check the same phenomenon several times in exactly the same or slightly different conditions, and, finally, to study the subject more clearly by means of the experiment. it will be possible to divide it into separate components, among which the most interesting parts of the researcher can be distinguished.

Results:
At one point or another in the research process, the hypothesis may encounter an unexpected flaw. To correct these shortcomings, to choose the right path in the research, and to achieve the goal, the researcher needs courage. Any unsuccessful attempt to find a convenient way of scientific research, most importantly, to find a priority main idea, to create a methodology that determines the solution to the entire problem. Research attempts to create a new system based on the starting rule. Forming the feeling and ability to strive for new things, being aware of the development of new concepts increases the power of research.
regular study of new literature, synopsis, especially analysis of abstracts and articles, improvement of research methodology, creative thinking, promotion of new ideas ensure consistency of pedagogical research. There are specific criteria for determining the effectiveness of scientific research and the veracity of the achieved results. Certain scientific criteria are used to achieve scientific truth. All the signs of scientific research are interrelated. Only in a systematic way, in its unity, they can realize the scientific truth. In this respect, scientific truth differs from the truth of everyday knowledge or from other forms of knowledge.
Mathematization of pedagogical research depends on the exact level of scientific quality. The hypothesis is based on the fact that the theory is created only in the

analysis of the results of a certain reality, and that theoretical concepts are expressed in mathematical language. Qualitative analysis is more effective than quantitative analysis. The basis of effective use of the mathematical method is related to the development of the system of special methods.
The development of special methods prepares a source for the mathematical method, and in harmony increases the result of the interpretation of the result of scientific research. Mathematization is a complex and effective process, the subject of every science, which is fundamentally related to its historical development. The quantitative approach to the results of theoretical research in pedagogy was introduced at the end of the 19th century and the beginning of the 20th century.
The method of quantitative assessment has become one of the main methods of theoretical, experimental research and didactics. But this methodology was opposed by supporters of hermeneutic pedagogy, cultural pedagogy, philosophical pedagogy, and existentialist pedagogy. Nevertheless, experimental pedagogy has developed, the mathematical statistical method has remained one of the effective methods of pedagogical research.
Today, the wide development of information technologies has increased the possibilities and necessity of mathematization of pedagogical research. Quantitative analysis of the quality of educational process development is widely used. The formation of mathematical language and linguistics of pedagogical research has become an expressive tool of educational theory. This increases the level of specificity of pedagogical reality and research results. Therefore, mathematization of pedagogical research is becoming an effective tool for expressing scientific concepts and theories rather than research methods.
Improving the characteristics of mathematical methodology, creating innovations in pedagogical research, creative research, increasing the efficiency of thinking. Therefore, the culture of mathematization of pedagogical research of future scientists ensures the intensity of scientific research. When applying the method of mathematical analysis:
- justification of the need to express the evidence with quantitative numbers; - clarifying the purpose of summarizing with numbers;
- summarize tables in simple, understandable language;
- presentation of the most important amount, schedule;
- principles such as horizontal and vertical analysis of tables are followed.

Discussion:
In the analysis of the results of the pedagogical test-experiment, the projects developed by the students and the evaluation of the created educational portfolio were analyzed using the mathematical-statistical method according to the above criteria.
987 students took part in the experiment, from which the results of 175 students of the experimental class and 165 students of the control class were taken as a basis for the convenience of calculation. The brief essence of the problem is as follows: Given two prime sets. One is the average knowledge scores of the students in the experimental class and the other is the average knowledge scores of the students in the control class. The scores are assumed to have a normal distribution. This assumption is reasonable because the conditions for approximation to a normal distribution are simple and they are satisfied.

The development of the science of pedagogy is ensured by the idea, content and results of research conducted for the purpose of researching specific pedagogical problems. The rapid development of the social and production process requires the identification of factors and pedagogical conditions that allow the individual to develop in all aspects, and the elimination of situations that harm the morale of the society and the individual. Understanding the nature of educational processes, studying them in a broad or narrow scope, studying the reasons for their occurrence by means of available indicators, determining the necessary measures, creates the need to organize scientific research. The effective course of pedagogical research depends on a number of objective and subjective factors.

Appropriate and acceptable in this process. At the same time, it is important to be able to choose effective methods. Pedagogical scientific-research methods are methods of special examination and knowledge of the inner essence, communication and laws of the pedagogical process, which determine the principles, object and subjective factors of educating a person, providing him with deep and thorough scientific knowledge in certain directions.

At the same time, the scientific research conducted in the pedagogical direction in the Republic of Uzbekistan is based on the dialectical approach. Such an approach to the definition of pedagogical phenomena, reality and their laws, the common connection of pedagogical phenomena and processes, their consistent, continuous development, the child's physiological development, ensuring his psychological and intellectual improvement, the place and role of contradictions in ensuring personal maturity, as well as the importance of dialectic categories admits.

Conclusion:

In conclusion, it should be said that the widespread use of the mathematical-statistical method in scientific research is one of the characteristics of modern science. The application of the mathematical-statistical method increases the effectiveness of the research, the accurate representation of the pedagogical reality, the determination of the laws of internal dependence of the existing reality, its effectiveness in different conditions, the knowledge of the levels of development, and the possibility of evaluation.

The development of specific features of mathematization of pedagogical research guarantees the effectiveness of scientific work. Quantitative assessment in pedagogical research is the essence and method of expressing educational reality in mathematical language. The clarity of the pedagogical concept, its expression in mathematical language, facilitates the generalization of research results.

References:

1. Bordovskaya, N.V. Systematic methodology of modern pedagogical research / N.V. Bordovskaya // Pedagogy. - 2005.
2. Saifnazarov, B. Kasimov "Scientific Research Methodology". T.: "New century generation", 2000.
3. Belukhin D.A. Foundations of person-oriented pedagogy. - Voronezh: MODEK, 2005.
4. J. Yuldashev and others. Fundamentals of pedagogical technology. Study guide. T.: "Teacher", 2004.

Volume 14, April 2023 ISSN (E): 2795-4951

5. N.S. Atayeva, F. RasuIova, M. Salayeva, S. Hasanov. General pedagogy. Educational guide. Book I. -T.: "Science and technology", 2012.
6. B. Kh. Khodzhayev Theory and practice of general pedagogy. Textbook. - T.: "Sano-standard" publishing house, 2017.
7. Do'stov, S., Egamberdiyeva, R., Xushboqova, S., & Ubaydullayeva, S. (2023). TA'LIM JARAYONIDA MATEMATIKA FANINI TAKOMILLASHTIRISH VA O'QITISH. TA'LIM VA RIVOJLANISH TAHLILI ONLAYN ILMIY JURNALI, 3(3), 137-140.
8. Do'stov, S., Egamberdiyeva, R., Xushboqova, S., & Jumayeva, H. (2023). THE ROLE AND IMPORTANCE OF MATHEMATICS IN MODERN EDUCATION. International Bulletin of Applied Science and Technology, 3(3), 106-109.
9. Do'stov, S., Egamberdiyeva, R., Xushboqova, S., & Ubaydullayeva, S. (2023). RAQAMLI IQTISODIYOT SHAROITIDA BIZNES VA TADBIRKORLIKNI RIVOJLANTIRISHNING DOLZARB MUAMMOLARI. Центральноазиатский журнал образования и инноваций, 2(3), 40-42.
10. Sunnatulla, D. (2023). SOME UNIQUE PSYCHOLOGICAL ASPECTS OF THE FORMATION OF THE STUDENT'S ECOLOGICAL THINKING IN THE TEACHING OF" NATURAL SCIENCE" IN THE 4TH GRADE. International Bulletin of Applied Science and Technology, 3(2), 191-195.
11. Dustov S.R., Yusupov A.A., Azamkulov A. (2023). "Methodology Of Teaching Mathematics In Primary Grades". Journal of Pharmaceutical Negative Results, 7480-7485.