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Concept Of Scientific Hypothesis

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Abstract. This independent work analyzes the concept of a scientific hypothesis, its role in the development of science and its importance in the scientific research process. A scientific hypothesis is a tentative solution put forward to solve a specific scientific problem, which is tested on an experimental or theoretical basis. The work covers the stages of the formation of a hypothesis, the requirements for it, and methods for proving and refuting a hypothesis. It also discusses the creation of new knowledge based on scientific hypotheses and its role in scientific methodology.
Keywords: Scientific hypothesis, scientific assumption, research methodology, scientific method, experiment, theory, scientific analysis, proof, development of science.

Introduction. A scientific hypothesis is a scientific probability that is used to describe the phenomena and processes under study. A scientific hypothesis is either proven or disproven.

The preliminary formulation of a scientific hypothesis determines the internal logic of the research process. Therefore, a scientific hypothesis is a clearly or vaguely expressed probability about the characteristics of the problem under study and the causes of its occurrence.

For example, if the low level of mastery in a university is studied, the following possibilities are put forward: 1) inefficiency in teaching a number of subjects, 2) students' distraction by processes outside the educational process; 3) the administration's low demand for mastery of subjects; 4) errors in admission to higher education institutions. It is precisely these hypotheses that must be tested in the study.

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Main part. Scientific hypotheses must be clear, unambiguous, understandable and formulated within the scope of the research subject. Depending on the degree of formulation of scientific hypotheses, research methods are clarified. For example, the hypothesis of low teaching quality requires an expert survey. The hypothesis of students' distraction to other activities is best studied through a questionnaire survey.

Before formulating a scientific hypothesis, it is necessary to have preliminary information based on the results of previous studies. Descriptive and pilot studies do not require a scientific hypothesis. However, analytical studies rely on scientific hypotheses about the exact aspects of the relationship in the issues of cause and effect, functional dependence. For example, as a type of working hypothesis, labor discipline depends on the degree of influence of the foreman on the organization of labor.[1]

Scientific hypothesis is an important component of the development of science, new inventions. No scientific invention has been possible without induction, foresight, and experience. Especially in pedagogical research, a scientific hypothesis is of particular importance in order to avoid mistakes and to ensure the comprehensive validity of the result. A scientific hypothesis (hypothesis accepted in science) is a clear prediction. After determining the goal and task of scientific research, a specific scientific hypothesis is used to conduct experiments (experiments), and each time relying on the hypothesis is the criterion of research activity. A scientific hypothesis is a preconception, a mental experiment, an internal system of research, and the driving force of research.[2]

One of the main goals of acquiring science is to gain knowledge. In all areas of human activity, knowledge is a special means of achieving the goal. Scientific knowledge has a theoretical, conceptual nature, it is rational and proven, that is, verified. The uniqueness of scientific knowledge is manifested in the formation of science as a special field and the uniqueness of the ways of studying it. The cumulative, accumulating nature of knowledge is one of the most important factors in the development of science.

According to the theoretical level of the concepts being interpreted, scientific hypotheses are divided into main and complementary types (causal hypotheses and consequential hypotheses). They thus form a hierarchical chain that repeats the theoretical interpretation of concepts. For example, the main hypothesis is assigned the degree of correlation between job satisfaction and staff dissatisfaction. This hypothesis reveals the following issues: a) the

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formation of an attitude to work based on current activity (high or low probability of finding another job); b) subjective opportunities that cause such behavior (is the employee aware of them and is he capable of such behavior); c) is the relationship between the employee's attitude to work and personal interests and needs correctly understood; d) is his true attitude to work reflected in the answers to the questionnaire questions. These scientific hypotheses have equal opportunities and describe the structure of the relationship between the two indicators.

The ability to formulate scientific hypotheses is as essential for a practical sociologist as it is for an academic researcher. This is not a simple formality, but a scientific development that strengthens the logical structure of sociological research. If a scientific hypothesis is well-formed by a sociologist, then empirical data will serve to confirm or refute it. If a hypothesis is not formulated in the early stages of research, the scientific value of its results will decrease.

The main requirement for the formation of a scientific hypothesis is that it is subject to empirical verification. This means that the concepts included in the scientific hypothesis describe social events and phenomena that are convenient to observe, record, analyze, and measure.

Results and discussion. Hypothesis (ancient Greek: – hypothesis – basis, assumption) – an approximate opinion about the legal (causal) connection of phenomena, a hypothesis. A hypothesis is the basis for the development of scientific knowledge. A hypothesis has such stages as the transition to direct knowledge based on logical analysis (comparison, analysis and synthesis, abstraction and generalization), and the discovery of laws based on causal connections. A general hypothesis is an assumption about the nature and cause of a group of phenomena, processes, and a private hypothesis is an assumption about the cause of individual, individual phenomena, processes. Any hypothesis requires verification. As a result, its probability increases or decreases, its truth is proven or refuted. When new facts cannot be explained by old theories, a hypothesis is needed to explain a limited number of facts and observations. It opens the way to further knowledge, verification, and new theories give rise to another hypothesis. A hypothesis is important as an integral part of the process of knowledge.

Scientific prediction is the ability to predict and foresee events and phenomena, processes of nature and society that are currently unknown, but may occur or be studied in the future, based on scientific laws. I.b. is a creative

process, based on the foundations of the objective laws of the development of nature and society studied in science. I.b. are scientifically based conclusions drawn based on accumulated knowledge and experience about reality, the laws of change and development of reality. This takes into account the necessary connections in reality, periodic changes, and random probabilities. Scientists, as a result of measuring the periodic movements of celestial bodies, predicted the times of eclipses of the Sun and the Moon, and compiled tables of planetary movements (in 585 BC, the Greek scientist Thales predicted a solar eclipse. The star table compiled by Ulugbek clearly reflected the periodic movement of celestial bodies). By observing the periodic changes in nature, they were able to predict weather changes based on the change of seasons, wind direction, and cloud formations. Such knowledge was of great importance in agriculture and animal husbandry. Some elements of prediction are also found in animals. Birds and some insects are known to predict weather changes.

Scientific style is the division of language according to its functions related to a particular sphere of human activity. People differ from each other to a certain extent in the choice and use of lexical, phraseological, grammatical and phonetic means of the language in the process of communication in all spheres of activity. Such a selection of language means within the framework of the national language leads to the emergence of various forms of speech. The style of speech is directly related to the function of the language. Therefore, they are called functional (functional) styles. By functional style is meant not something separate from the language, but an auxiliary system that is considered within a specific literary language structure, differing from each other in its specific features and scope of service. Functional style is divided into different parts according to the main functions of speech forms, that is, as a means of communication, information, and influence. There are the following functional styles of the literary language: 1) colloquial style; 2) official style; 3) scientific style; 4) journalistic style; 5) artistic style. The naming and designation of functional styles are also determined by the context in which they are used.

Scientific research is the process of developing new knowledge, one of the types of cognitive activity. Scientific research is a creative and systematic work aimed at increasing existing knowledge. It is characterized by objectivity, reliability, and accuracy. Scientific research, when repeated under all conditions, must always give the same result, proving the issue under discussion. Scientific research consists of two interconnected parts - experiment and theory. The

main components of scientific research are: defining the topic, preliminary analysis of existing information, conditions and methods in the field of research, scientific hypotheses, conducting experiments, analyzing and summarizing the results obtained, testing the hypotheses based on the evidence obtained, expressing new facts and laws, and making scientific predictions. The division of scientific research into fundamental and applied, quantitative and qualitative, unique and complex research is widespread. The methods and experiments of scientific research are widely used not only in science itself, but also in solving many economic and social problems.

Theory is a system, scheme of knowledge that explains and predicts phenomena and facts. Theories are discovered and formed using the scientific method, a form of knowledge that gives a holistic picture of the laws of reality and important relationships in it. Theory is based on generalized data from experiments related to a particular area of being. The main task of Theory in scientific knowledge is to explain the evidence provided by experiments, at the same time, to delve deeper into the essence of things and phenomena, and to be able to foresee new things and phenomena that will arise. Although any Theory is a form of knowledge as a result of scientific knowledge, it should not be considered as complete, unchanging, absolute knowledge. Theory is not only the result of the knowledge we accumulate in the process of knowledge, but also the initial basis for creating new knowledge. Theory is always inextricably linked with practice, and only then does it become a tool for action and development. The initial form of theory is a hypothesis. If the hypothesis is proven to be correct and true in practice, a new theory can emerge on this basis. Theory In the process of scientific knowledge, people are armed with scientific theories, which gives them the opportunity to make scientific predictions. This, in turn, leads to the formation of new laws and new theories.

Evidence (in law) is the activity of the inquiry, preliminary investigation bodies, prosecutor and court in criminal proceedings to collect, verify and evaluate factual information about the circumstances necessary for the correct resolution of the criminal case. It is carried out on the basis of criminal procedural law with the participation of other subjects of criminal justice.

Conclusion. A scientific hypothesis is an important component of the scientific research process. It is a tentative solution put forward to solve a specific scientific problem, which is tested on a theoretical or experimental basis. Studies show that scientific hypotheses are the basis of scientific progress,

the creation of new knowledge, and the main tool of scientific methodology. The success of any scientific research is closely related to the accuracy, validity, and empirical verification of the hypotheses put forward. When forming a scientific hypothesis, first of all, existing scientific sources and the results of previous studies are analyzed, the problem is clearly defined, and possible causes for it are put forward. The requirements for a hypothesis are accuracy, clarity, testability, and relevance to the scope of the research subject. As a result of research conducted on the basis of scientific hypotheses, it is possible to enrich existing theories, identify new scientific laws, and develop practical recommendations. In this work, it was emphasized that a scientific hypothesis is not just a guess, but a methodological tool that guides scientific research. Also, scientific predictions are developed on the basis of hypotheses, which creates the basis for the formation of new scientific approaches and theories. As was considered in the example of pedagogical research, the role of the hypothesis in identifying factors affecting the level of student learning is invaluable, and it serves as an effective tool in improving the quality of education. The final conclusion is that the correct formulation of a scientific hypothesis and its verification based on scientific criteria are the main factors in the reliability, effectiveness and approximation of scientific research to scientific truth. Therefore, every researcher must have the skills to formulate a hypothesis based on scientific logic and thoroughly substantiate it.

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