



Journal Website:
<https://theusajournals.com/index.php/ijp>

Copyright: Original content from this work may be used under the terms of the creative commons attributes 4.0 licence.

HYPOTHETICAL-DEDUCTIVE METHOD AND ITS ROLE IN THE DEVELOPMENT OF ANALYTICAL THINKING OF MODERN EDUCATORS

Submission Date: August 20, 2023, **Accepted Date:** August 25, 2023,

Published Date: August 30, 2023

Crossref doi: <https://doi.org/10.37547/ijp/Volume03Issue08-07>

Aliyev Nizomiddin Maxmasaitovich

Researcher Of Fergana State University, Uzbekistan

ABSTRACT

In this article, the theoretical-methodological foundations of the development of analytical thinking in future pedagogues through the hypothetical-deductive method, and the effectiveness of the dialectical method in the development of analytical thinking are considered high. In the pedagogical process, it is important to teach the common use of thinking styles.

KEYWORDS

hypothetical-deductive, new development, thinking skills, innovative ideas, logical thinking, individual qualities, perfect person, educational standards, type of mental activity, scientific-methodical.

INTRODUCTION

The hypothetico-deductive method involves the creation of a system of hypotheses that are deductively related to each other. As a result, conclusions about empirical facts are drawn from these hypotheses. This method is based on drawing conclusions (deduction) from hypotheses and other hypotheses whose true meaning is unknown. Consequently, the conclusion drawn using this method will inevitably have a probabilistic nature.

The basis of the hypothetical-deductive method, which is considered the most effective theory in the

development of analytical thinking, is the method of theoretical knowledge.

Hypothesis is derived from the ancient Greek language and means "hypóthesis" - "assumption" and plays an important methodological role in the scientific-theoretical study of processes in nature and society. According to the general opinion of scientists engaged in scientific research and pedagogical activities, a hypothesis exists between truth and falsehood, and depending on the results obtained as a result of its application or based on it, it becomes true or false. At the same time, the hypothesis plays a controlling role

in scientific research processes and it is mixed with scientific features. Because of this, the hypothesis is of great importance in determining the future state of events and relationships in nature and society. And putting a hypothesis encourages scientificity, and thus it is mixed with the concept of forecasting.[1] Forecast is based on scientific laws based on hypotheses. Using them together in determining the future state of the studied process provides important methodical guidelines, and they are the basis for forming joint plans.

LITERATURE ANALYSIS AND METHODOLOGY

Forecasting is an important and necessary element of the management system. As a result of forecasting, in the management process, the future state of the management object and the directions of the factors affecting it are determined.[2] From the implementation of management, tactical directions for achieving the intended goal and the possibility to change it will appear. Russian economist N.N. Moiseyev, the forecasting of any economic object has three characteristics: systematicity, objectivity and knowability (poznayemost), in this respect, the process of forecasting any object should be viewed from a fundamental point of view. .

Planning and forecasting processes are mainly explained by the term "Futurology". "Futurology" (lat. futurum - future and ...logy) - in a broad sense, a general concept or set of ideas about the future of humanity, universal problems; in a narrow sense - a field of science that provides an opportunity to consistently study and predict the future of social processes and processes in the fields of scientific and technical development.

There are many types of forecasting. Because the process of development continues in every process

and phenomenon in nature and society, the desire to know their future state is carried out through the process of forecasting. In order to study the concept of forecast and its essence, based on the study and analysis of approaches to its types in economic and other literature, we divided them into groups based on certain criteria of our approach. Covering socio-economic processes in order to study the nature of the forecast in depth; It is advisable to study them in groups according to their scope and functional characteristics.

The general structure of the hypothetico-deductive method:

— getting to know the material that requires theoretical explanation and trying to explain it using existing theories and laws. If this is not possible:

- make assumptions (hypotheses, guesses) about the causes and laws of these events using various logical methods;
- to evaluate the validity and seriousness of hypotheses and to choose the closest to the truth among them;

Acquaintance with the general structure of the hypothesis method helps to learn that the knowledge aimed at studying laws, principles and theories in science is based on complex and complex methods of various forms.

Sometimes a hypothesis is a method, a hypothesis is always an empirical one. An explanatory hypothesis is not the only type of hypothesis in science as an assumption about a law. There are also existential hypotheses, that is, assumptions about the existence of elementary particles, genetic units, chemical elements, new biological types, etc. unknown to science. Justifying and advancing such hypotheses is different from explanatory hypotheses. There may also

be auxiliary hypotheses that allow the main hypothesis to be experimentally tested. There are also so-called working hypotheses, which make it possible to know empirical evidence well, but do not claim to explain it and then to preserve it as permanent knowledge.

One of the important types of hypothesis is the mathematical hypothesis, which is typical for higher mathematical sciences. The method described above is the meaningful hypothesis method. In its framework, assumptions about the laws are first based, and then they get a suitable mathematical expression. First, an equation suitable in the field of mixed sciences is selected to explain quantitative relationships, and then an attempt is made to give meaning to this equation. Describing the mathematical hypothesis, S.I. Vavilov wrote: let's assume that the mathematical phenomenon studied in the experiment depends on a number of variable and constant quantities connected by an equation close to each other. Other relations can be obtained by changing this equation. This is what a mathematical hypothesis or extrapolation is all about. It leads to ideas that match or diverge from experience and are re-applied or discarded accordingly.

The hypothesis method demonstrates the creative character of scientific research in the process of discovering new laws, principles and creating theories. This methodological rule does not uniformly explain the research results and does not guarantee the truth of the obtained knowledge. It is creative intuition that leads a scientist to a new theory by creatively choosing among many ways to solve a problem. A theory is not calculated logically, it is created by the creative genius of a scientist, and it always shows the talent of a creative person.

Beruni's hypothesis has another wonderful aspect: the reason why the falling body moves to the east is to maintain its initial high speed, which Beruni concluded

was the historical foundation of this law of inertia before Galileo and Newton.

Ibn Sina considered the hypothesis to be the basis of science. He said that there may be doubt in the hypothesis. One's hypothesis may or may not be accepted by others, but it is good to have it. A hypothesis becomes a theory after it has been proven.

Ibn Sina gives a special place to fantasy in the field of knowledge. He said that in order to know something, it is necessary to separate it from others and compare it, then the commonality and difference are determined, and now the way is opened for any kind of imagination and fantasy. For example, imagine splitting an elephant in two. So, the weapons of fantasy are comparison, association and imagination.

Results (Results). In order to define a hypothesis, the object is studied, a possible prediction is expressed, and the consequences of the prediction are shown. When the consequences are shown to be true, the hypothesis is either accepted or rejected. If recognized, the hypothesis becomes a theory. It is possible to prove that a certain hypothesis is true either by direct experience or by comparing it with another proven theory. For example, let's take the hypotheses about the formation of the solar system. While living in Tashkent in 1942, N.N. Pariysky compared Kant-Laplace, Gins, Multon and several other hypotheses, which had prevailed until then, to the law of conservation of angular momentum, which is an idea whose truth has been determined. He was disappointed that all the hypotheses did not meet the requirements of this law. A.B. Krat, O.Yu. Schmidt and V.G. Fesekov's hypotheses correspond to this law. But they have not gone beyond the hypothesis yet. Later, several hypotheses appeared in molecular genetics. Mathematical statistics are used to determine which of them is correct.

In the process of analysis (the activity of analysis), thought moves from complexity to simplicity, from coincidence to necessity, from diversity to specificity and unity. The purpose of the analysis is to know the parts as elements of a complex whole and to determine the relations and laws between them. Synthesis, on the other hand, consists of the process of uniting the parts, properties, and relationships separated by means of analysis into a single whole. Synthesis is directed from unity to difference and diversity, and unites commonality and individuality, unity and diversity into a certain living whole.[7] Analysis and synthesis are closely related.

Analysis and synthesis together provide complete knowledge. They should not be separated from each other. Integral cannot be imagined without differentiation, life without dissimulation or assimilation. The unit of analysis and synthesis must not be understood as dividing a whole into parts, and then mechanically joining them again. In both analysis and synthesis, a new idea or a new substance arises, always a differential equation is created and integrated, and the problem is solved. If alkaloids are analyzed and added as needed, a new drug can be discovered. In the works of Beruni and Ibn Sina on pharmacognosy and pharmaceuticals, the methods of preparing medicine from plants are based on this principle. Chemicals can be analyzed and then collected according to certain rules to create a synthetic fiber or baloney. Cotton and hemp are analyzed, separated into elements, and as a result of the appropriate synthesis, several dozen important substances are formed.[7] To know science, it is divided into parts, mathematics, physics, chemistry, biology, etc. They are studied separately, then synthesized and philosophically discussed.

In the objective world, things and events are diverse, they are unlimited both quantitatively and qualitatively. Each thing or event is considered concrete. And each object, in general, is multi-faceted, has several properties, and is multi-faceted. That is the complexity of concreteness. Now, if he considers each of the complex objects not individually, that is, not concretely, but one side, one property of all of them - this is called abstraction. Therefore, abstractness is not concretely felt, but only a product of thinking. For example, the events that occur in our life: the fall of an apple, the movement of a car, the movement of the Moon - are concrete, the law of their movement represents the abstract.

The task of abstraction is to see the object under investigation in isolation. Abstraction is just getting rid of unnecessary, uninteresting things. An example: when it comes to science, reasoning is broader, when it comes to mathematics, it abstracts from physics, chemistry, biology, and other sciences, and does not talk about them.

Expression of the hypothesis in a mathematical form is taking more and more place in modern science. In creating such a hypothesis, it is important to compare the results of experiments, empirical considerations, mathematical extrapolation formulas that take into account the consequences of the development of matter. Mathematics is now entering linguistics, medicine, sociology.

Abstraction is the process of thinking away from several properties and proportions of the phenomenon under study, and at the same time separating the properties (first of all, important, general properties) that are of interest to the researcher. Various "abstract objects" are obtained as a result of this process. In this case, "abstract subjects" mean separate concepts and categories

("development", "contradiction", "thinking", etc.) and their systems. Mathematics, logic, dialectics and philosophy are the most developed systems.

DISCUSSION

Determining which of the considered properties are important and which are secondary is the main problem of abstraction. This issue is solved in each specific case, first of all, depending on the nature of the studied subject, as well as specific tasks of the research.

Generalization is the process of determining the general properties and characteristics of an object, which is closely related to abstraction. In this case, any general (abstract-general) or important (specific general, law) signs can be distinguished.

Induction - mental movement from individual (experience, fact) to general (summarizing them and drawing a conclusion);

Deduction is the rise of the cognitive process from the general to the individual. Induction and deduction are interconnected and complement each other. Since experience is always infinite and imperfect, inductive conclusions are always problematic (probabilistic). Inductive generalizations are generally considered empirically known truths (empirical laws).

Types of inductive generalization include mass induction, incomplete induction, complete induction, scientific induction, and mathematical induction. Logically, inductive methods of determining causal relationships - laws of induction (Bacon-Mill rules of inductive research) differ. These include the unique similarity, unique difference, similarity and difference, dependent variable methods, and the method of residuals. Deduksiyaning o'ziga xos xususiyati shundaki, tadqiqotchi deduksiya vositasida bir sinf, bir

jins, bir guruh narsa yoki hodisa to'g'risidagi umumiy bilimlardan ularning har biri haqida alohida bilimlarni hosil qiladi. Insonning bilish tajribasidan shu narsa ma'lumki, agar biron xususiyat bir toifa yoki bir jinsdagi hamma narsa yoki hodisalarga xos bo'lsa, bu xususiyat shu toifa yoki jinsga oid har bir narsa yoki qodisaga ham xos bo'ladi.

Analogy (compatibility, similarity) - identification of similarities in some aspects, properties and relations of dissimilar objects. Based on the identified similarity, a conclusion is drawn on the relevant analogy.

Modeling is a method of indirect study of existence. It is to reproduce the properties of an object in another object specially designed for their study. Modeling is based on the similarity and compatibility between the object under study and its model. This method facilitates the process of scientific research, in cases where direct research of the location of the object is impossible, expensive, and time-consuming, a model is needed.

Also, we should not forget that the effectiveness of the hypothetico-deductive method in scientific knowledge is based on the cooperation of general methods of knowledge.

Observation is a direct form of knowledge. New information is received through the senses. While observing, the object or event being observed is not actively affected.

An experiment is a method of research in which the object under investigation can be changed as necessary, in any case, it is influenced to a certain extent. The experiment requires certain conditions. If such conditions do not exist, and this experiment is "done", it is called a "thought experiment".

Elements of a scientific experiment: getting rid of interfering factors, artificially realizing the desired phenomenon, observing and documenting with the help of appropriate tools.

The role of equipment in observation and scientific experiments is increasing. Measuring the characteristics of natural phenomena is part of the cognitive function of the instrument to help the sensory organs performing their tasks, to create the necessary conditions for the pure examination of the object. The performance of this task is based on the effect of the object on the device. At the same time, the effect of the device on the object is taken into account, especially in modern scientific research.

Theory is the thinking part of knowing. Theory can be compared with practice on the one hand, and hypothesis on the other. Theory begins with practice, that is, it is based on practical life and experience. The results of the experiment are directly or indirectly involved in the theory as an element. A theory is a practice embodied in the minds of people.

Conclusion (Zakluchenie/Conclusion). In conclusion, the hypothetical-deductive method is an approach that helps to understand the essence of things and events, deeply analyze social relations and find truths based on this, and develops analytical and logical thinking in the learner.

Thinking is the highest form of human mental activity, mental intelligence, conscious movement, and the tool for knowing the environment, social environment, and reality, as well as the main condition for the rational implementation of a wide range of human activities.

Analytical thinking is the art of analytical thinking, the ability to come to a detailed, clear, deep, deep, meaningful, solid conclusion about a problem, issue,

information, event. A person with an analytical mind carefully studies the object under analysis in every way: divides complex information into parts, thinks seriously about every word, sentence, detail, thing, logically connects the parts, comes to an acceptable conclusion and makes the necessary makes decisions. Therefore, if attention is paid to the existence of conflicts between different views, approaches, and concepts in the development of this analytical thinking, it will be possible to develop critical thinking in the student.

REFERENCES

1. Фалсафа: қомусий луғат (Тузувчи ва масъул муҳаррир Қ.Назаров). – Т.: Шарқ, 2004. – Б. 390.
2. Ғозиев Э.Ғ. Тафаккур психологияси. – Т.:Ўқитувчи, 1990. – Б.3.
3. Conley, David T. Toward a More Comprehensive Conception of College Readiness. Educational Policy Improvement Center. 16 May 2011. <http://epiconline.org/files/pdf/Houston%20A+%20Friday%202-15-088.pdf>
4. Фалсафа қомусий луғат. Тошкент.:Ўзбекистон файласуфлари миллий жамияти. 2004, -Б. 26.
5. Фалсафа қомусий луғат. Тошкент.:Ўзбекистон файласуфлари миллий жамияти. 2004, -Б. 26.