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Research Article

THE PRACTICAL SIGNIFICANCE OF THE DEVELOPMENT OF ANALYTICAL THINKING IN FUTURE EDUCATORS THROUGH THE HYPOTHETICAL-DEDUCTIVE METHOD

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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

Today, the tasks of improving the system of training future pedagogues, forming a new way of thinking in them, and educating them as personnel providing quality education are becoming urgent. For this, the need to form analytical thinking in future pedagogues will always remain one of the important socio-pedagogical tasks. The effectiveness of the hypothetical-deductive method in the development of analytical thinking in future personnel is considered high, and therefore it is important to consider its possibilities.

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.

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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 (literature and methodology /Methods). 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. According to Moisev, the forecasting of any economic object has three characteristics: systematicity, objectivity and knowability (poznavayemost), in this respect, the process of forecasting any object should be viewed from a fundamental point of view. .

A hypothesis talks about a reason or a law of relation related to the object under investigation, but this idea does not yet have its result. In order to define a hypothesis, it is necessary to study the characteristic features, conditions and connections of the phenomenon to a certain extent. Not every guess is a hypothesis. The hypothesis must meet the following requirements: it must not contradict the acquired knowledge, and the probability of the truth of this prediction must be based.

A hypothesis is needed mainly in the following cases: when a person was not directly involved in the process being studied, or when it was difficult to understand the essence even if he was involved.[4]

In scientific activity, the term "hypothesis" is used in two meanings: as a form of existence of knowledge, it expresses problematic, unreliability, or as a method that explains, shapes and substantiates ideas, it is a way to establish laws, principles and theories. Acquaintance with the structure of the hypothesis gives a good idea about this method. The first stage of the hypothesis method is familiarization with empirical evidence that needs to be theoretically explained. At first, an attempt is made to explain these facts with the help of laws and theories known to science. If this is not possible, the scientist moves to the second stage, that is, to put forward assumptions and hypotheses about the causes and laws of phenomena. In doing so, he tries to use various research methods such as inductive targeting, analogy, and modeling.[5] At this stage, it is also possible to put forward a number of conflicting explanatory hypotheses.

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Geocentrism prevailed in Beruni's time. Copernicus' heliocentrism was still a long time away. The transition from geocentrism to heliocentrism lacked theoretical knowledge, such as celestial dynamics. There was only the geometry and kinematics of the movement of celestial bodies. In this context, Beruni proposed a new idea: if a heavy object falls to the east while falling freely on the Earth, it can be assumed that the Earth rotates around its axis.

This idea was stated as a hypothesis. It is known that some of the hypotheses of scientists are not confirmed, some of them are erased from history, and some of them are later confirmed and become theories. Beruni's hypothesis is confirmed, it has been proved in practice by the laws of theoretical mechanics that the thing that falls freely from the top does not fall straight to the Earth, but moves a little to the east.

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

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 been ruling 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. Fesenkov'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.

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

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their systems. Mathematics, logic, dialectics and philosophy are the most developed systems.

Results. 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.

The peculiarity of deduction is that the researcher creates specific knowledge about each of them from the general knowledge about a class, a genus, a group of things or events by means of deduction. It is known from the human experience that if a certain characteristic is characteristic of all things or events of a category or genus, then this characteristic is also characteristic of every object or event belonging to this category or genus.

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.

DISCUSSION

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: avoiding interfering factors, artificially realizing the desired

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phenomenon, observing and documenting it 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.

All knowledge is divided into two phases - theory and practice. The unity of theory and practice is the unity of spiritual and practical knowledge. This unity involves not only studying the objective world, but also changing it. A theory is a systematic thought that represents new knowledge. Theory can be expressed in various forms: axiom, theorem, law, principle, formula, graph, number, etc. Sometimes an idea is formed in a theory. Depending on its essence, this idea, which is generally described about a phenomenon or a system of phenomena, has a certain relationship with a law, principle, theory. The theory is evolving. Historical conditions, high level of production, technology and science, production relations are the source of theory development.

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

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.

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.

Getting to know the material that requires a theoretical explanation of the general structure of the hypothetical-deductive method and trying to explain it theoretically with the help of existing theories and laws, making hypotheses (hypotheses, guesses) about the causes and laws of these phenomena using various logical methods, assessment of validity and seriousness and choosing among them the closest to the truth, deriving consequences from the hypothesis (usually by deduction) and clarifying its content, testing the consequences derived from the hypothesis in an experiment.

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