



Methods of Activation of Cognitive Activity in the Works of Medieval Thinkers

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ABSTRACT

The article reveals the General pedagogical and didactic ideas of scientists-encyclopedists of the Near and Middle East. Special attention is paid to methods of activating cognitive activity and developing logical thinking.

Key words: Eastern middle ages, methods of cognitive activity, method of teaching

INTRODUCTION

The Eastern middle ages, as well as the Western ones, were characterized by the undifferentiated development of scientific problems inherited from the ancient world. At that time there was no differentiation of the Sciences, and natural science contained a significant element of philosophical reasoning, and in the depths of philosophy contained the results of concrete research in the field of widely interpreted physics and the germs of all modern Humanities. It is natural that in this state of scientific knowledge to speak of literally understood development by scientists-encyclopedists of pedagogical, in particular didactic, problems.

However, as already noted, the scientific treatises of that time served simultaneously as textbooks – and not only for students, madrassas, but also for everyone who wants to join the scientific knowledge. This circumstance was taken into account, of course, by the authors of scientific works, which was reflected both in their statements about the ways of teaching, and in the ways of presenting and argumenting scientific positions, in the nature of setting educational questions in the texts. The analysis of the works of scientists of that time makes it possible to find out, using modern terminology, the principles and approaches of their authors to teaching methods that correspond to the General laws of knowledge.

There are several groups of General teaching methods that have been used by almost all encyclopedia scientists. This is clearly experienced methods, various ways of presenting knowledge, question and answer, methods of forming skills, methods of testing knowledge. At the same time, it is noteworthy that all of them were intended to activate the cognitive activity of the student, the development of logical thinking.

Thus, the analysis of Khwarezmi's arithmetic treatises shows his extensive use of the method of sequential presentation of knowledge in order to develop logical thinking. When I "looked at what people need when counting," he wrote, " I found that all this is a number. I found that all numbers are made up of ones, and one is part of all numbers. I also found that all numbers greater than one and up to ten are called ones. Then the ten is doubled and tripled, just as it is done with one, and you get twenty, thirty, and so on to the full hundred. Then the hundred is doubled and tripled, similar to how it is done with one and ten, to a thousand. Then the thousand is repeated in the same way in each combination until the end of the known number" [1].

The question-and-answer form was used when commenting on scientific papers. As an example, you can point to the comments to the "Zij" ("Astronomical tables») Khorezmi. Their author, the famous Madrid astronomer X V. Musanna, noted that for a clearer presentation of khwarezmi's thoughts, they used a question-and-answer method that makes it easier to understand and remember the material.

Kindi paid special attention to the methods of activization of informative activity and the development of logical thinking. In his opinion, human cognitive activity proceeds from ignorance to knowledge. Mind, according to his teaching, is an active, creative force, an instrument of knowledge of the universe. But knowledge is impossible without prior experience, since the human mind forms concepts of the General by comparison, observation, and experience. This led to the pedagogical conclusion that a person can multiply their knowledge only by enriching sensory perception. Therefore, methods based on the experience of the students themselves should be used as widely as possible in teaching:

"After all, learning is easy when it concerns familiar things. This is evidenced, in particular, by the vividness with which students perceive sermons, stories, poems or fairy tales, that is, everything that is told due to the habit they acquired at an early age, to listen to various kinds of narratives and fables. It is the same in their consideration of natural phenomena, for they have recourse to the preachy method of consideration, and this is only necessary in the investigation of what is without a mother; for matter experiences action and is therefore in motion, and nature is the primary cause of all that is mobile and at rest."

Farabi also paid great attention to the use of experimental and visual teaching methods. As the primary sources of knowledge about external objects that connect a person-subjects with an object, Farabi considered five types of sensation: touch, sight, hearing, smell and taste; and "if there is a desire to know a tangible thing through sensation, then by which this desire is achieved, it will be an act that consists of bodily and mental actions. For example, we want to see an object, raise our eyelids and direct our gaze to the object we want to see. If the item is deleted, we go to it. If we are separated from it by an obstacle, then we remove this obstacle with our hands. All these actions are bodily actions, but the sensation itself is a mental act. And so it is with all the senses [2]." These bodily actions should be used in the learning process. Knowledge of a subject, according to Farabi, can be formed by either thinking power, imagination, or sensation. The consequence of this is that the forms of "various kinds of intelligible objects of intelligence" are preserved in consciousness.

Farabi paid great attention to visual methods of learning, such as observation and experience, which, according to his definition, are the beginnings of knowledge and the foundations of knowledge. Thanks to the knowledge gained from experience and verified again by experience and observation, the soul of a person becomes intelligent, and he himself becomes more perfect. "We say," Farabi wrote, "that the child has a knowing soul in potency. It has feelings, i.e. means of comprehension. Only individual things are perceived by the senses, and from individual things universals are obtained. Universals are experiments on reality."

These ideas of the outstanding thinker of the East follow organically from the statements of his great predecessor, Aristotle, that induction is impossible without sense perception, since individual things are known by sense perception, because otherwise it is impossible to get knowledge about them. What is sensually, inevitably, perceived only as separate, while scientific knowledge is the knowledge of the General.

Said accurately and far sighted: "Reason is nothing but experience." This shows how extremely important Farabi attached to practice as a source of scientific abstractions and as a criterion of truth. This makes them an understandable and highly valued learning method based on experience.

Using any method of learning, Farabi believes, first of all, you should think about where to start, what exactly is the subject of study, and what degree of study should be achieved. This approach provides a person with scientific knowledge that is based on experience and reason, rather than blindly following certain dogmas and traditions. The teacher, checking the degree of assimilation of knowledge by the student, should always pay attention to the causes of errors in the answers, lead to the correct conclusions.

Farabi constantly emphasized that it is necessary to teach reliable knowledge, which a person can not refuse, and in which he does not feel doubt, misleading, as well as distrust and suspicion in any field of knowledge and for any reason. This is achieved by training that is based on the life practice of the student.

Farabi considered exercise to be one of the most important General methods of teaching. "As a result of long diligent exercises in the art of writing, a person acquires perfection in this art, and the longer he does it, the stronger and more perfect he becomes in this art, and his skill increases from the constant repetition of these actions, the pleasure that flows from this state of mind increases, and the person himself with even more joy and love This is the case with those actions by which happiness is obtained; the more and more often they are fulfilled, and the more perseverance a person shows in them, the stronger, more virtuous and more perfect they make the soul destined for happiness , so that it, more and more perfected, turns out not to need matter and free from it, and this soul does not collapse with matter and does not need it for its existence.

Similar methodological considerations are found in Beruni's statements. He also recommended using methods based on the personal experience of students, the question-and-answer method, experience and observations, in his opinion, are the most reliable means of obtaining new knowledge about nature and human life. "The masters," he wrote, "have many ways and opinions about the composition of the base and the proportions of coloring substances, but you can not learn anything reliable from them except by observing the work of experienced masters (personally), participating in it and conducting experiments on the compositions" [3].

The repetition and the message of new knowledge in the form of catechetical talks also received a high rating Beruni: "knowledge of the universe and what is the figure of heaven, earth and what is between them, with the help of training, perceived through repetition, is very useful for the art of astronomy, for the student thus acquires a skill and get used to the words used by the people of this art, so it is easy to imagine these words and understand their meaning. When he returns to them, studying the various causes and proofs of this art, he will approach it with a free mind, not tired of learning both.

Therefore, I compiled this memo for the Khwarezmiyka Raykhana, daughter of al-Hasan, at her request, in the form of questions and answers, which is better and easier to understand" [4].

The "Canon of medical science" of Ibn Sina reflects widely used by him in teaching medicine such methods as systematic and consistent presentation of knowledge, logically coherent reasoning, leading to an understanding of ancient Greek and Eastern medical science. It is thanks to the brilliantly thought-out methodical construction of the "Canon of medical science" has become the most common textbook of medicine and has been used for five centuries not only in the East, but also in Europe. This monumental work has been published about 40 times in its entirety and countless times in excerpts.

The Canon consists of five books. The first book is devoted to the theory of medicine. It defines this science, provides information about the human body and a General overview of treatment methods, and specifies preventive measures to prevent diseases. In the second book, simple remedies and their application are discussed. More than 780 medicinal substances are described here. The third book contains information about diseases of individual organs of the human body and ways to treat them. The corresponding anatomical and physiological introduction is placed at the beginning of each section. Diseases of the head, mental illnesses, diseases of the eyes, nose, ears, mouth, throat, lungs, etc. are considered. The fourth book deals with General diseases of the human body and specifies ways to treat them. The fifth book is devoted to medicinal remedies that are not found in nature in a ready-made form, but produced by doctors. It is interesting to note that in the "Canon" Ibn Sina devotes a significant place to the issues of physical education of children. About the construction of this work and the method of presentation of the content, Ibn Sina himself wrote: "And I decided to talk first about General all-encompassing issues in both parts of medicine, that is, in part theoretical and in part practical; then, after that, to talk about the General laws of action of simple drugs, and then – about the particular (manifestations) of these laws. Then, after that, I talk about diseases that occur in each organ in particular, and first I start with the anatomy of this organ and its usefulness. As for the anatomy of individual simple organs, it is mentioned in the first, General book, as well as their benefits.

When I have finished with the anatomy of this organ, in most cases I begin with instructions on how to keep it healthy, then I point out, without regard to the General diseases of this organ and their causes, and touch, also speaking generally, on ways to recognize and treat such diseases. After these General data, I turn to specific diseases and in most cases also specify the General rule for determining the distinctive features, causes and manifestations of the disease, and then go to the specific rules. After that, I give the General law of its treatment, then I explain the particular methods of therapy with various drugs, simple and complex. Simple medicines and their use in the treatment of diseases are also mentioned earlier, in the book of simple medicines, in the sections and headings that I consider it advisable to use in this book, as you yourself, o student, will see when you get to it. Here I repeat only a little of this."

According to Ibn Sina, teaching methods should be based on the logical thinking of students, their personal observations and experience. When forming concepts as a tool for finding the truth, he considered it necessary to proceed from knowledge about the real world, and not from speculative scholastic reasoning. Observations, experience, experiment, and practice as methods of learning and learning, according to Ibn Sina, reveal the laws of nature and thus contribute to the power of man on earth.

"When one says that there is something theoretical and something practical in medicine," he wrote, " one should not think, as many researchers imagine, that this means that one part of medicine is knowledge and the other part is action. On the contrary, you should know that this means something else. Namely, each of the two parts of medicine is nothing but a science, but one of them is the science of the basics of medicine, and the other is the science of how to apply it. The first of these parts is given the name of science and theory, and the second – the name of practice. Under the theory of medicine we understand the part that teaches only the basic rules and are not included in the statement of any procedures And practices in medicine, we understand not only the physical action and space some of the movements, but also the part of medical science, the teaching of which is useful by the Council and the Council is associated with the statement of any procedure... When you study both these parts, you will acquire scientific knowledge and practical knowledge" [1, p. 94].

This explanation of Ibn Sina is striking in its clarity and didactic clarity. It reflects the closest connection between theory and practice, following from the General to the particular, relying on experience. The logic of building a multi-volume "Canon of medical science", accessibility of presentation, versatile argumentation. Clear explanations of practical rules for the diagnosis and treatment of diseases, the desire to constantly disclose cause-and-effect relationships - all this can now serve as a good example for the authors of textbooks.

But perhaps the most important thing that any teaching method should provide is the disclosure to students of the causes of the things and phenomena being studied. "These causes are obvious, and there are also hidden, comprehended not by feeling, but by inference on the basis of accidents; therefore, in medicine, it is also necessary to know the accidents that occur in health and in disease. In the true Sciences, it is explained that the knowledge of a thing is acquired through the knowledge of its causes and beginnings, if they are inherent in it, and if they are not, then through the knowledge of its accidents and mandatory essential features" [1, p. 98].

Summarizing the main considerations of scientists-encyclopedists about teaching methods, we can make a fairly reasonable conclusion that these methods were based on a certain system of principles, which was discussed above.

Whatever methods are used in teaching various Sciences, arts and crafts – oral types of presentation and explanation of knowledge, conversations of various types, experiments, etc. - they should equip students with true knowledge, develop independent logical thinking, teach practical application of the knowledge obtained.

Thus, many didactic ideas that have become the subject of special development in modern pedagogy, especially thanks to the efforts of the great Czech teacher Ya. a. Komensky, have already been outlined in the works of Eastern scientists and have received a well-known disclosure

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