ЗНАЧЕНИЕ ОБРАЗНОГО МЫШЛЕНИЯ В ОБУЧЕНИИ ХИМИИ

Аннотация: В этой статье обсуждается значимость образного мышления в обучении химии

Ключевые слова: химия, мышление, метод, образование, обучение

IMPORTANCE OF IMAGE THINKING IN TRAINING OF CHEMISTRY

Abstract: This article discusses the importance of figurative thinking in teaching chemistry

Keywords: chemistry, thinking, method, education, training

Recently, the thesis about the need to implement a person-centered approach in school education, which involves taking into account the student's psychological resources, is increasingly being put forward. In other words, the logic of the educational process should be determined not only by the content of the studied subject (as a projection of the corresponding field of scientific knowledge), but also by the psychological characteristics of the trainees. The main and fundamental contradiction of the modern education system - the proclamation of high humanistic goals and the inability to ensure achievement of these goals in practice - is associated with the phenomenon of development of human thinking. A significant influence on the success of the student's learning activity is provided by the features of his figurative thinking.

Thinking is divided into theoretical and practical. Theoretical, in turn, can
be conceptual and figurative, and practical - visually-figurative and visually-effective. Theoretical conceptual thinking (verbal-logical, abstract) is a kind of thinking, using which in the process of solving a problem a person does not turn directly to the experimental study of reality, does not take practical actions aimed at real transformation of reality. He discusses and seeks the solution of the problem in the mind from the very beginning to the very end, uses knowledge expressed in concepts, judgments, inferences.

In contrast to the conceptual process, the process of visual-effective thinking is a practical transformative activity carried out by a person with real objects.

Visual-figurative thinking is a combination of ways of imaginative solution of the problem, presupposing visual observation of the situation and operating images of the constituent objects without real practical actions with them. It allows you to fully reconstruct the entire variety of different actual characteristics of the object. An important feature of this type of thinking is the establishment of unusual correspondences between objects and their properties. In this capacity, visual-figurative thinking is indistinguishable from imagination. Thinking clearly-figuratively, a person is attached to reality, and the images necessary for thinking are represented by short-term and operational memory.

This form of thinking is most fully and fully represented in preschool and primary school children, and high brain activity is required to formulate attitudes to the logical perception of the world.

The main minus of logical thinking is its narrowness. Logic provides an opportunity to get to the truth, only following the chain of logical reasoning. In the case of a misconception about one of the links in this chain, the vision of the real world becomes incomplete. Developed logic not only does not help, but significantly hinders the perception of the subtle nuances of reality surrounding us.

The right hemisphere is directly engaged in the opposite task. It is responsible for intuition, imaginative thinking and regulating activity, is able to
fully perceive the polysemy, the surrounding world, integrating all the numerous and even contradictory links between its objects, operating with whole images. It "grasps" reality in all its richness, contradictoriness and ambiguity of connections and forms a multi-valued context. The formation of such a context requires less physiological costs than the formation of an unambiguous, ordering context, which is proved experimentally.

Visual thinking reveals the essence of the subject at a single point in time, with characteristics that coincide with reality as much as possible. It is not in a position to express such a context, because it is built according to the laws of left hemisphere thinking. Without the right hemisphere, we would turn into highly developed computers, trying in vain to adapt a polysemantic world to their limited programs. All attempts to create artificial intelligence were not sufficiently successful precisely because the authors represented the brain only as one left hemisphere and tried to model only it.

Traditional pedagogical psychology considers logical thinking as the most perfect, as the highest form of reflection of reality. In school practice, much attention is paid to logical processes. For a long time in the age and pedagogical psychology, the opinion prevailed that the formation of logical thinking occurs on the basis of the displacement of the genetically earlier (lower) types of thinking: visual-efficient and figurative. Unfortunately, such a view has not been overcome so far: the figurative component of the subjects of the natural-science cycle often goes to the background. Visual-effective, imaginative, intuitive thinking is considered secondary. At present, there is a lag in the study of the majority of figurative phenomena: representations, imaginations, figurative thinking, etc.

Explaining the notion of "valency", almost all teachers immediately talk about the ability of atoms of an element to attach a certain number of other atoms to itself. Formulate the definition of valence, draw for example several structural formulas, report the rule for the formulation of formulas for valency and to assimilate the new material, students are asked to perform a number of tasks to
develop a skill in the formulation of formulas of substances. Pupils actually manipulate only letter symbols. This approach, based on the use of logical thinking, is implemented in the logic of ascent from the particular to the general, allows us to apply the standard algorithm - the method of compiling the formula of the substance by valence. The disadvantage of this approach is that for right-hemisphere children it will be unacceptable - sensory-motor and symbolic stages, as we see, are absent.

Observations show that in this case many pupils have a rule for composing formulas of substances for a very short time, and then have to remind it again and again. As a result, it takes quite a long time for this rule to remain in the long-term memory, i.e. formed the skill of composing formulas of substances.

The teacher interacts with students who have different styles of thinking in the educational process, and the traditional approach immediately directs to the operation with symbolic symbols, does not allow the student to "see" the various aspects of this chemical phenomenon at the macro and micro levels. In the logic of the right hemispheric approach, one must go from the general to the particular, operating not only logical, but also imaginative types of thinking. First, you must either draw on the board a mix of atoms, or work with models, speak with words, put forward various hypotheses - create a perceptual image. Atoms of different chemical elements in a model or figure must necessarily differ in size, color, designation.

Then, students should be encouraged to visualize what is being studied (to create a mental image of the phenomenon), to clothe the actions performed in chemical terms, to speak (to create a verbal image), only then can we refer to a sign description (a symbolic image) and consider possible ways of composing a formula. This approach will not be algorithmic, but based on holistic thinking.

Logic children can use the standard proposed algorithm, but, with this approach, the right-hemisphere children will have their own way of composing formulas - through a comparison with the memory image.
Literature:

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