

Teaching methods

The classification of teaching methods developed by Lerner I.Y. and Skatkin M.N.

The classification initially developed for secondary school is applicable to higher school.

1. Explanatory-illustrative method.

The teacher gives information to students using various ways and means .

Students perceive information and keep it in their memory.

The teacher gives ready-made information in the oral form (by using narration, lecture, explanation). He uses printed material (a textbook, additional material). The teacher also uses visual material (pictures, schemes, documentaries, movies, videos, real objects, etc.). The teacher demonstrates ways of acting. He demonstrates, for instance, how to operate a machine, shows the way of solving a mathematical problem, the way of proving a theorem, etc.

Students perform activities necessary for acquisition of knowledge on the first level. They listen, watch, touch objects and manipulate with them. They read, observe, relate new information with previously acquired knowledge and get it remembered.

Explanatory-illustrative method is a very economical way of transferring social experience to the younger generation because social experience is transferred in generalized and systematized form.

2. Reproductive method.

Knowledge received as the result of explanatory-illustrative method does not form skills in application of such knowledge.

To ensure acquisition of skills by students the teacher organizes their activity on repeated reproduction of knowledge and ways of acting by giving them a system of assignments (or tasks).

The teacher gives assignments to students. The students do the assignments. They operate machines using a manual, reproduce chemical and physical experiments, perform standard grammar exercises, etc.

The complexity of a skill and individual characteristics of a student determine how long and how many times the student has to repeat his work.

Therefore, reproduction and repetition of a way of acting according to the teacher's assignments are the main characteristics of this method.

A lot of attention is paid to improving ways of instructing students. Teachers use oral explanations, manuals, visual material, etc.

3. Problem exposition.

When this method is used the teacher presents a problem to students, solves the problem himself and shows the way to the solution of the problem.

After presenting a problem the teacher proposes a hypothesis, then shows contradictions arising in the process of its validation, describes applied ways of thinking. Students control if arguments of the teacher are persuasive, they follow his logic and perceive stages of investigation.

Teachers very often use examples from history of science.

The teacher gives information in the oral form, he uses printed material, visual material.

Students listen to the teacher, follow his logic, the arguments used to verify conclusions made as the result of a research. They may have doubts about the validity of conclusions and ask questions.

Eventually students get to understand that every assertion, concept put forward by a scholar or scientist need to be verified. Their genuineness need to be proved. Therefore scientists build rationale for their concepts and assertions.

4. Heuristic method

To bring students closer to independent solution of problems it necessary to teach them how to perform separate steps of such solution and separate stages of research or investigation.

In one case the teacher teaches them to see problems. Therefore he offers them to ask questions to the painting, a document, a certain content.

In other case students have to construct proof found by them independently.

In the third case they have to make conclusions from facts presented to them.

In the fourth case they have to make an assumption.

And in the fifth case they need to develop a plan to verify their assumption.

Another version of this method is to break down a complex problem into series of sub-problems. Each of such sub-problems brings students nearer to the solution of the main problem.

The third version is heuristic discussion. Heuristic discussion is a series of closely connected questions. They are small problems which together lead students to the solution of the main problem.

5. Research method

Research method ensures creative use of knowledge and acquisition of methods of scientific research and their application by students. It also develops creativity as well as interest in research.

Therefore, research method is a way of organizing creative research activity of students to solve problems which are new to them.

Students solve problems which were already solved by human society and science. They are new only to students. The teacher presents a problem to a student for independent research and knows about the results, the approaches to the solution of such problem and characteristics of creative activity which the student needs to use in the investigation process.

Research assignments ensure development of students' creativity.

Forms of assignments may be different. There are assignments quickly solvable in class and at home. There are also assignments requiring a certain period of time for their implementation (a week, a month, etc.).

Any research assignment shall require from students to pass all or the majority of research stages.

They are: 1. observation , study of facts and phenomena;
2. identification of incomprehensible phenomena which need to be investigated (problem statement);
3. making a hypothesis;
4. development of research plan;
5. implementation of the above plan, identification of ties of the phenomenon under investigation with other phenomena;
6. formulation of solution, explanation;
7. verification of the solution;
8. practical conclusions on possible and demandable application of received knowledge.

The characteristics or content of creative experience according to Lerner:

1. Intrasystem and cross-system (intersubject) transfer of knowledge and skills into new situation.
2. Combination and modification of known ways of acting in solving a new problem.
3. Seeing and identifying a problem in a traditional situation.
4. Seeing the structure of an object.
5. Seeing a new function of the object different for the traditional function.
6. Taking into account alternatives when solving a problem
7. Rejecting all known ways and creating absolutely new way of solving a problem.

Lerner created technology for designing cognitive tasks which includes criteria and scale of difficulty of cognitive tasks. The technology is applicable to any discipline studied in higher school education institutions.

Cognitive tasks* are designed based on the characteristics of creative experience identified by Lerner.

*Cognitive tasks – познавательные задачи, развивающие творческие способности.