



## DEFINITION OF THE CONCEPT OF "ALGORITHMIC COMPETENCE"

Nilufar Akhmedova

Senior Teacher of Kokand State Pedagogical Institute

ahmedovanilufar72@mail.ru

### Abstract

This article theoretically analyzes the algorithmic competence of students as an object of pedagogical analysis.

**Keywords:** competence, paradigm, competence-based education, competence-based approach, integrative, dynamism, personal character, multidimensionality

The main direction in the development of the algorithmic style of thinking is the development of the cognitive abilities of students. Authors A.I. Gazeikina and I.N. Slinkina identified the components of algorithmic thinking:

- The ability to formalize the task;
- The ability to break the task into separate composite logical blocks;
- The ability to determine the relationship of these blocks;
- The ability to build a solution to the problem based on blocks using the design method "bottom-up" or "top-down";
- The ability to analyze each block of solving the problem and suggest ways to optimize it.

In the works of M.V. Kondurar "algorithmic competence" is studied as the professional competence of college students, which is "the ability to create an algorithm and implement it in the form of a software product".

The process of forming algorithmic competence assumes the student's successful activity in data structuring, algorithmization and modeling.

The development of algorithmic competence is proposed to be carried out in the course of integrated study of discrete mathematics and computer science in college. Exploring algorithmic competence as a component of intellectual competence, the author points out the need to develop the components of algorithmic competence by transforming knowledge about algorithms into a thinking tool.

Exploring the educational activities of schoolchildren, V.Ya. Vilenkin introduced the concept of "algorithmic line" into consideration: he revealed the algorithmic nature of educational actions and proposed to introduce actions with algorithms when working with younger schoolchildren. We consider it appropriate to note that in the course of school mathematical training, the leading content-methodical lines are: the computational line, the functional line, the graphic line, the line of identical





transformations, the line of inequalities, the line of equations and the algorithmic line. The characteristic features of any content-methodical line, including algorithmic, are described in the works of L.N. Udovenko and I.G. Sheina:

- Permeating the entire course of study;
- Development of a system of concepts that reveal the content of the line;
- The presence of connections within the line.

The algorithmic line in the course of mathematics is a content-methodological aspect of teaching, oriented in a special way, penetrating into all mathematics teaching and receiving the greatest development when mastering the methods of algorithmization. In accordance with the stages of algorithmization, the movement in learning along the algorithmic line involves the implementation of a sequence of actions for the use of algorithms in educational activities:

- An algorithm in the sense of a prescription or a guide to action (algorithmic skills act as a subject of training, the development of algorithmic activity within the framework of an algorithmic line);
- An algorithm in the sense of performing mental actions (algorithmic skills act as a means of obtaining knowledge, the penetration of an algorithmic line into other content-methodical lines).

The most important components of mathematical learning activities are operational and algorithmic actions. Performing these actions, the student follows a certain sequence in accordance with the planned result, while the main goal of his activity is the solution of a mathematical problem. In the process of teaching mathematics, the content of the algorithmic line is determined by the concepts of "algorithm", "auxiliary algorithm", "algorithm properties", "algorithm implementation" and is carried out by studying the main algorithms of the course and performing actions according to the algorithm, as well as (higher level) compiling and combination of known algorithms. When studying mathematics in the process of vocational education, the algorithmic line is a content-methodological component of education, covering all teaching mathematics and developing in the study of practical methods of algorithmization using modern information technologies.

Significant for this study is the emphasis by researchers of the algorithmization of its following characteristics: intersubjectivity and oversubjectivity, activity character, personal quality and representation of the component of intellectual activity.

Based on the analysis of related concepts, we have defined the essential characteristics of the concept of "algorithmic competence": the integrative quality of the personality, the activity and dynamic characteristics of the subject, which manifests itself in a



personally significant relation to algorithmization and includes a set of competencies for the effective application of algorithmization in various fields.

In the mathematical training of future specialists in the HPE system, it is advisable to form algorithmic competence as a component of the professional competence of these specialists, in which algorithmization is presented as a stage in solving a mathematical problem. The generalization of the above allows us to clarify the concept of algorithmic competence: the algorithmic competence of a future ICT specialist is an integrative, dynamic quality of a person, revealed in the ability to use ready-made algorithms to solve a certain range of problems, combine them, compose new ones and choose the optimal algorithm, as well as the willingness to implement algorithmization in solving various problems of the professional sphere.

The presented definition of the concept of “algorithmic competence” is consistent with the considered adjacent concepts (knowledge in the field of algorithmization, the ability to develop and debug effective algorithms, the use of algorithms in solving problems, the use of software and application packages for mathematical calculations, etc.) and complements these definitions, in accordance with the goal of the study, (enrichment of the categories of skills and abilities to the categories of ability and readiness).

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