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Research Article

THE ROLE OF SYSTEMATIC ANALYSIS IN THE DEVELOPMENT OF STUDENTS' TECHNOLOGICAL COMPETENCE

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ABSTRACT

This article deals with organizing the development of students' technological competence on the basis of systematic analysis and systematic approach. Systematic analysis, systematic modeling and construction, the views of western scientists related to systematic practice, the characteristics of the system, interpretations of the concept of systematic analysis, classifications of the concept of analysis, and classification of systems are also highlighted.

KEYWORDS

System, analysis, system analysis, system problem, system approach, system thinking, system model, system task, higher education.

INTRODUCTION

In all the speeches of the President Sh.M. Mirziyoev, he emphasized the systematic approach to the problem, critical analysis, raising the quality of the works in all areas to a new level, increasing the efficiency of the existing system, raising the state management system to the level of the modern requirements based on today's and tomorrow's requirements attention is paid to issues such as raising, improving the entire system of working with personnel. From this point of view, it is appropriate for every person who is responsible for the training of personnel to meet the requirements of the time, to systematically approach the problem, to systematically organize his pedagogical and scientific activities.

Systematic analysis is a relatively young and, at the same time, rapidly developing science. The reason for its rapid development is the growing need for science to solve complex tasks and develop systematic projects.

The development of systematic analysis appeared in the middle of the 20th century with the emergence of scientific and technical tasks. The main place in this is

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occupied by the processes of analysis, knowledge and practical application of complex objects.

Systematic analysis as an independent research direction in the 1950s and 1960s in the United States, such as the technical development of the armed forces, the development of space, the improvement of the state administration apparatus, the distribution of production capacities, the determination of the demand for manpower and equipment, and the determination of needs for various products. used in large business tasks. However, in the 1960s and 1970s, the introduction of systematic analysis methods into computers made it possible to create theoretical models as tools for performing complex tasks.

Targeted and planned software management methods were created as the conditions for intensive use of systematic analysis opportunities expanded. In particular, in order to solve this or that problem, special programs are developed that take into account human and material resources in organizing the organization's activities. As a result, different schools of systematic analysis appeared, aimed at researching the activities of various fields.

The development of a systematic approach in the form of a concept in the modern sense is carried out in parallel in two directions - theoretical and practical.

In the course of its development, systematic analysis has become a range of methods that help the leader choose the preferred path in problematic situations, and is currently developing as an interdisciplinary scientific direction.

The views related to systematic analysis, systematic modeling and construction, and systematic practice have also been thoroughly studied in the works of Western scientists. In particular, as we mentioned above, Ludwig von Bertalanffy, the founder of the "General Systems Theory", worked in Canadian and American universities in 1934-49, and then in 1949 as a professor at the University of Vienna. Author of the works "Biological Landscape of the World", "Theoretical Biology", "Mind, People, Actions", "Systems Theory". In 1954, he founded the General System Theory Analysis Society. His scientific achievement is the discovery of the theory of open systems in biology. In it, the individual characteristics of the cells determine the overall unity of their activity, and again independent, but connected elements. Defines the difference between open systems and closed systems. L. Bertalanfi suggests the development of an interdisciplinary general program of system theory. Its main task:

- development of general principles and laws that ensure the functionality of the system, regardless of the specific type;

- use in determining the characteristics of non-physical theory;

- creation of synthesis methodology of scientific knowledge.

This program led to the development of cybernetics and synergetics. Later, L. Bertalanfi tries to apply the system theory to the analysis of human thinking and physiology.

One of the most basic concepts of systematic analysis is the concept of system. Many definitions have been given to the concept of system. L. Von Bertalanffy considers the system as "a complex of parts that are in a certain relationship with the environment and each other." Next, the concept of purpose enters the definition of the system. For example, F.E. Temnikov considers that "a system is an organized collection"

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(that is, a collection subordinated to some goal). And finally, the goal-specific system was interpreted as: "a set of finite functional elements and relationships between them, isolated from the environment within a specific time frame within a specific goal."

A system is an object or a set of objects composed of elements.

A system is an object or a set of objects consisting of interrelated and ordered elements, striving towards a common goal.

A system is a set of interconnected, controllable elements with a certain structure, each of which performs separate tasks, is directed to a single goal.

This definition is specific to complex systems. This definition is more suitable for us, and the objects that require study in society are complex systems. For example, an institute is a complex system, because it consists of interrelated and mutually structured elements: rector, vice-rector, faculties, departments, students, etc. These elements are united in a hierarchical order and strive towards a single goal.

The system will have the following features:

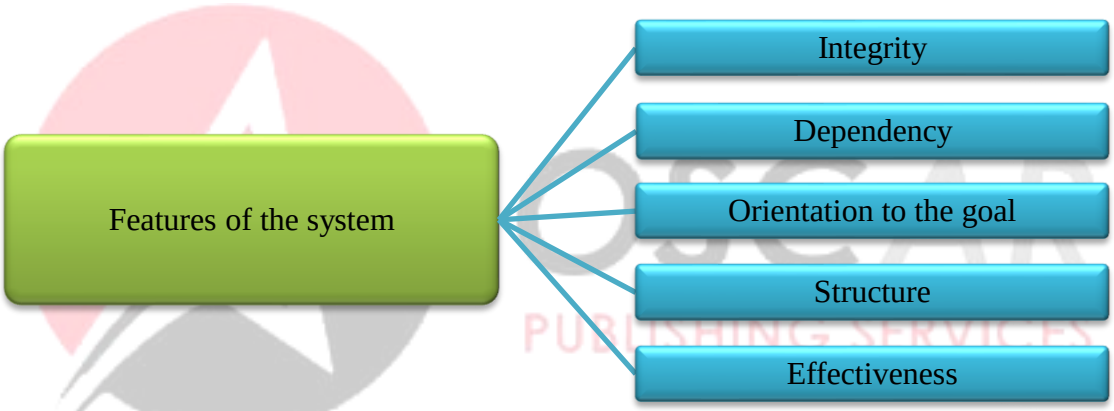

Figure 1. Features of the system

Integrity - when the system is viewed as a whole process, event or thing, its properties lose their essence when divided into elements. For example, by the term "institute" we understand a system that prepares qualified specialists, but when we divide it into elements, that is, a rector, a department, etc., the integral nature of this system disappears.

Dependency - the degree of interdependence of the elements that make up the system and the fact that the power affecting the system is stronger than the elements that are not included in the system. For example, the Ministry of Higher Education, Science and Innovation is a management apparatus for the training of highly qualified specialists and has a side of dependence on the system, but its influence on the processes within the institution is stronger in its internal parts.

Target orientation means that the system and its subsystems are oriented towards a single goal. That is, in our example, the institute and its constituent elements strive for a single goal - the training of highly qualified specialists.

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Structurality - it is understood that the elements that make up the system are organized in accordance with some law and rule. That is, they operate in a hierarchical, functional relationship.

The feature of effectiveness (efficiency, usefulness) is one of the conditions for the existence of the system. If the system doesn't work, the system will disappear altogether, or the existence of such a system will only lead to unnecessary costs, useless behavior.

In pedagogy, the concept of "system" is very widely used, for example, educational system, educational system, system of forms and methods of organizing the educational process, etc. Pedagogical system, which is one of the types of social system, consists of a set of various structurally and functionally related components that serve the purposes of education and upbringing of people and the young generation, organization and management of the educational process.

The concept of "system" in its essence is a hierarchical process, because it is a collection of concepts about the system, as well as the interaction of the system with the external environment, some part of the larger system, some of its integrity and individual parts looks forward to it. An important aspect of the system is the fact that it has internal components, the emergence of stepwise subordination between these parts, and the relative independence of these parts.

According to the methodological understanding of the essence of the system, systematicity is defined not as the property of the object and phenomenon, but as the orientation of activity to a specific goal, the organization of thinking.

Table 1

Classification of systems.

Classification criteria	Systems class
According to the connection with the external environment	Open Closed A mix
According to the structure	Simple Complicated Big
According to the nature of tasks	Special Multipurpose (universal)
According to the nature of development	Stable Developing

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According to the level of organization	Well organized Not well organized (diffuse)
According to the complexity of behavior	Automatic Self-Organizing Forecaster Shapeshifter
According to the relationship between elements	Deterministic Stochastic
According to the management structure	Centralized Decentralized
By appointment (purpose)	Manufacturer Manager Service provider

Classification of systems depends on several factors. Systems organized with human participation are called artificial systems, and systems existing in nature are called natural systems.

The analysis of the artificial system begins with the analysis of all the components that make up the system, that is, what components the system is made of, what are its internal and external connections, what is the purpose of this system, where, how, why is it used.

Material systems mainly consist of a set of material objects. In turn, the material system is divided into inorganic (mechanical, chemical) and organic (biological) systems or mixed systems. Among the material systems, the main place is occupied by the social system. One of the features of such a system is the reflection of relationships between people.

Due to the connection with the external environment, systems have strictly fixed boundaries. Its actions are relatively independent of the environment surrounding the system. A clock is an example of a closed system. As soon as its interrelated parts are connected to a power source, the clock starts to move continuously and accurately. Since the clock has a source of stored energy, its system is independent of the environment.

An open system is explained by its interaction with the outside world. Energy, information, materials are objects of communication with the outside world through the boundary of this system. Such a system cannot support itself. It needs energy, information and materials from outside. In addition, an open system has the ability to adapt to changes in the external world, otherwise it cannot continue to function. For example, political government as a system must be open.

Analysis has a special place in pedagogical activity. "Analysis is a complex type of activity that requires special scientific training, purposeful selection and appropriate application of various scientific methods, and knowledge of the studied problem."

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Analysis is considered a complex thinking operation, with the help of which subjects and processes (phenomena) determine the level of relationship of objects and processes (phenomena) in a holistic way or their separate parts according to various signs and characteristics by means of methods that have a specific unit of measurement.

The concept of analysis has the following classifications:

The work of examining and studying things, events and the like from their essence, legality and other aspects;

Studying and evaluating something, information, etc. from a certain point of view;

Determining the composition of something and researching its essence.

In the improvement of pedagogical activity, the analysis acquires practical content and serves to ensure the quality of education. In order to determine the causes of an emerging pedagogical problem (for example, a pedagogical conflict), to know the periodicity of its occurrence, it is necessary to know the factors that influenced the emergence of the conflict, which laws (can be natural or artificial) are followed. .

Analysis is considered a higher stage of intellectual activity and is manifested in determining the level of relevance of events, processes (including pedagogical processes), numbers and evidence.

Analysis (including systematic analysis) is now viewed as a separate activity. After all, reviews, references, comments, reports, notices, instructions, appeals, etc., which are the product of analytical activities at different levels (quick, tactical and strategic) management, are used in order to ensure the development of various areas of our life. The product of analytical activity serves to divide the development process of social development into stages, determine its positive and negative aspects, and determine the tasks to be performed. Systematic analysis has a special place in this as a relatively perfect type of analysis.

Systematic analysis is a field of science formed on the basis of several sciences (mathematics, cybernetics, synergetics, etc.) It is a field that includes knowledge that helps to form and choose the optimal option based on them.

Systematic analysis refers to the type of analysis performed with the help of analytical tools (methods) used to study complex social, political, military, economic, and scientific issues.

Systematic analysis is a type of scientific research activity with a specific purpose, in which the researcher's attention is focused on creating an acceptable picture of scientific knowledge in accordance with its form, content, as well as the level of detailed examination, accurate understanding and promotion of confirmations.

Systematic analysis - studies the general laws of the formation, functioning, disintegration processes of complex systems, the processes of emergence, development and resolution of contradictions, as well as the laws of synthesis of goals in complex systems.

There are different interpretations of the concept of systematic analysis:

- a complex form of studying the problem;
- type of analysis based on a systematic approach;
- the method used in public administration;
- interdisciplinary science;
- methodology based on systems theory.

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In general, systematic analysis is understood as a set of methodological tools that provide solutions to general and practical difficult problems based on a systematic approach.

As you can see, this is a complex that serves to determine the way to carry out a systematic analysis. There are a number of functions (tasks) of systematic analysis, having a clear understanding of them serves to ensure the meaningfulness of analytical activity. The cognitive-mental function of systematic analysis serves to understand the essence of the situation that occurred during the activity, to change the methods, approaches, values used in the implementation of management, in a word, management mentality.

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