THE IMPORTANCE OF USING TRIZ TECHNOLOGY METHODS IN IMPROVING THE QUALITY OF EDUCATION

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Abstract: This article analyzes the role of TRIZ technology in the education system, its potential for developing students' thinking, and its use as an innovative approach in the pedagogical process. Also, the methods created on the basis of TRIZ and their effectiveness in the teaching process are considered on a scientific basis. Because TRIZ technology (theory of creative problem solving) brings new approaches to the pedagogical process. TRIZ technology is an important methodological tool for the modern education system. It teaches students to think creatively, approach problem situations in a new way, and think flexibly in unexpected situations during the lesson.

Keywords: TRIZ, innovative technology, creative thinking, problem solving, pedagogical approach, methodology, innovative education, personality formation, innovative thinking.

Introduction.

In a situation where modernization of the education system has become a requirement of the times, paragraph 2 of the “Concept for the Development of the Higher Education System of Uzbekistan until 2030” stipulates the need to ensure the strong integration of modern information and communication technologies and educational technologies, and to create additional conditions for the continuous development of the professional skills of pedagogical personnel in this regard.

The main condition for strengthening the political and economic role of Uzbekistan and improving the well-being of its population is to ensure the growth of the country's competitiveness. The main competitive advantage of a highly developed country is associated with the ability to develop its human potential, which is largely determined by the state of the education system, which is the source of the country's sustainable economic growth.

Main Part.

The modern educational process aims not only to impart knowledge, but also to develop students' creative thinking, analyze problems and find innovative solutions. From this point of view, TRIZ technology (theory of creative problem solving) brings new approaches to the pedagogical process. The author of TRIZ (Russian: Теория решения изберательских задач) is G.S. Altshuller, and initially this technology was used in the field of engineering. However, later its universal principles were adapted to the educational process. Today, TRIZ technology is widely used as a pedagogical methodology in the innovative education system. The role of this technology in the innovative education system is increasing, as it develops students' creative thinking,

problem analysis and non-traditional solutions. In educational practice, the TRIZ methodology is used, relying on the characteristics of human thinking based on research and research-based teaching methods. The TRIZ approach is focused on the application of algorithms and models to research education, the implementation of problem-oriented projects. In this case, the acquisition of knowledge is aimed at facilitating a person's thinking, memorization and practical use of them. The goal of pedagogical technologies based on TRIZ is to teach creative methods. The purpose of application:

- search for ideas,
- identification and solution of many creative problems;
- selection of promising solutions,
- development of creative thinking,
- formation of a creative personality.[1]

In lessons using TRIZ, the formation of knowledge and skills is manifested in practical actions. Creativity provides an opportunity to express oneself, create, strive for something new, develops the need for knowledge. This allows for the study and implementation of promising technological, modern standards-compliant directions, the formation of students' abilities for systematic thinking, sociability, self-organization, creative abilities, design-technological and research culture. Research is the description and explanation of certain events and processes, the discovery of the mechanisms and laws of their operation. [2]

Creative thinking is the ability to effectively participate in the process of developing, evaluating and improving projects aimed at finding innovative (new, innovative, original, non-standard, unusual, etc.) and effective (practical, effective, economical, optimal, etc.) solutions, acquiring new knowledge, and effectively expressing imagination.[3]

Creative thinking helps us find unusual solutions to problems. However, we should not confuse it with critical thinking, but rather see it as complementary to each other in solving impossible problems. The main verbal methods for implementing the goals of TRIZ technology are: “Visual learning”, “Conversation”, “Dialogical”, “Trial and error”, “Brainstorming”, in which the teacher sets a well-thought-out system of questions and guides students to understand new material. During the heuristic conversation, the teacher, relying on the knowledge and practical experience of students, leads them to understand and assimilate new knowledge, to form rules and conclusions. In TRIZ technology, special attention is paid to such forms of discussion as “Trial and error method”, “Brainstorming”, because these concepts bring them closer to the theory of solving inventive problems.

[1] Ganieva N., Ergasheva M. TRIZ technologies for the development of educational institutions // Pedagogik innovatsiyalar jurnali. – 2021. – №2. – P. 35–39.
[2] Asanova G. Zh. Innovative technologies in education // Bulletin of pedagogical sciences. – 2020. – №3. – P. 45–50.
[3] Polovinkin V. N. TRIZ solution standards. – M.: TRIZ-Shans, 2001. – 96 p.

This technology uses a number of methods for working with information sources, sources of information and independent work. The main ones are: taking notes, making a text plan, quoting (output data), annotation (abridged summary of the content), review (writing a short review expressing your attitude to what you read), formal logical model - creating a verbal-schematic representation of what you read, thematic set of abstracts (an organized set of basic concepts on a section, topic), creating a matrix of points (a comparative description of the same objects, phenomena in the works of different authors), reference book (information about things obtained after research), etc.

The "Brainstorming" method is a method in which a group of people tries to find a solution to a given problem by collecting a list of ideas created by group members. This term was popularized by Alex Faickney Osborn in his 1967 book "Practical Imagination". "Brainstorming" is a method that collects free thoughts and opinions expressed by students on a given problem and uses them to come up with a specific solution. In this case, students think freely and offer as many new ideas as possible. All ideas are accepted by the teacher without criticism and then summarized. When using the "Brainstorming" method, it is possible to involve all students, including the formation of a culture of communication and discussion among students. They develop the ability to freely express their opinions. The lack of evaluation of the expressed ideas leads to the formation of various ideas. This method serves to develop creative thinking in students.

The "mind map" method is an effective way of thinking, remembering, solving creative tasks, and processing them on paper. It is also called a mental map and mind map. The mind map was founded by the British psychologist T. Buzan, and students can use texts, linear forms, schemes, tables, and lists to write their thoughts. In the educational process, a mind map can be used in various ways: when writing basic concepts; when solving a problem situation; when finding a possible solution to a specific task; when solving a collective problem; to summarize the topic; and can be used in control work.

"Visual teaching" method. In this method, visual teaching is carried out, that is, students must demonstrate visual aids (tables, pictures, reproductions of works of art, sketches on the board, etc.). Demonstration includes the demonstration of tools, experiments, technical devices, films, presentations, etc. related to the topic being studied and the content of the inventive tasks. When teachers demonstrate technical means, visual aids, videos, biological objects, etc. to form inventive tasks, students themselves find the necessary information.

Conclusion

TRIZ methods serve to form a high level of thinking activity in a person. Especially in finding effective solutions in complex, conflicting or ambiguous situations, identifying existing alternative options and choosing the most optimal one from among them, TRIZ technology activates the critical and creative thinking potential of students. Through the TRIZ approach, a person

acquires the skills to: systematically analyze complex problems, identify opposing aspects as conflicts, imagine the ideal final result in each situation, develop various alternatives based on available resources and evaluate them functionally, economically or socially. Also, working on the basis of the TRIZ methodology forms the competencies of students to justify their opinions, support their decisions with evidence and promote innovative approaches through unconventional decisions. This is an important tool in the modern education system in educating a competitive, analytical and creative thinking person.

References:

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