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THE CONTENT, STRUCTURAL FRAMEWORK, AND DEVELOPMENT STAGES OF THE IMYEN TECHNOLOGY

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ABSTRACT

The study is aimed at systematizing teachers' knowledge and forming an integrated understanding of unity and contradiction in the surrounding environment among educators. The primary focus is on the practical development of a creative personality in teachers and on enhancing their ability to find effective solutions in any problematic situation. An interdisciplinary approach, in particular the use of elements of TRIZ (Theory of Inventive Problem Solving), contributes to the development of teachers' creative and critical thinking.

KEYWORDS: Pedagogical systematization, TRIZ, creativity, creative personality, education.

INTRODUCTION

Contemporary changes in the education system require teachers not only to possess deep theoretical knowledge but also to be able to systematize it, apply it creatively, and analyze it critically. Under conditions of rapid scientific and technological development, the formation of a new type of teacher becomes especially important—specialists who can integrate scientific knowledge with practical skills and effectively solve complex educational tasks.

Today, pedagogical activity should be based on a systemic and innovative approach, which ensures the development of educators' abilities for analysis, independent thinking, and the search for unconventional solutions. One of the effective tools for forming such competencies is TRIZ (Theory of Inventive Problem Solving) technology. It promotes the development of teachers' creative and critical thinking, as well as a creative approach to solving pedagogical problems.

The relevance of the research stems from the need to update the content of pedagogical training in accordance with the modern requirements of society and the labor market. Developing teachers' ability to understand unity and contradiction in the surrounding environment not only enhances the quality of the educational process but also contributes to fostering learners' sustainable motivation for self-development and learning.

Thus, this article is devoted to analyzing the conditions and methodological approaches that ensure the systematization of pedagogical knowledge, as well as to the formation of a creative worldview in teachers based on the principles of integrity, harmony, and innovative thinking.

At present, the development of science, engineering, and technology, along with the growing needs of society, is exerting a significant and positive influence on the education process. In particular, the increasing demand for technical programs and tools is leading to the renewal of educational curricula and fostering the development of skills related to applying theoretically

acquired knowledge in practice and adopting creative approaches in the learning process. In Uzbekistan, improving the quality of personnel training, creating the necessary conditions for preparing highly educated and qualified specialists in accordance with international standards, establishing close cooperation between each higher education institution and internationally highly ranked universities, widely introducing advanced pedagogical technologies, curricula, and teaching-methodological materials based on international educational standards into the learning process, developing creative competencies as an integral part of the professional competence of students and academic staff, and effectively using interactive methods in education have been defined as key tasks for qualitatively enhancing and fundamentally modernizing higher education in line with the priority areas of the Action Strategy.

What is the TRIZ method? The Theory of Inventive Problem Solving (TRIZ) is a set of algorithms and methods developed by the Soviet inventor Genrich Saulovich Altshuller and his followers to improve the creative process of scientists.

Initially, it was designed to assist in solving technical problems and to promote the development of thinking, flexibility, consistency, logical structuring, and originality. The main objective of this method is to teach students to think independently and to develop self-awareness.

Application of the TRIZ Method

According to the author of this theory, the main task of TRIZ is to help inventors and researchers quickly find solutions to creative problems in various fields of knowledge. TRIZ enables users to solve a wide range of creative problems. According to users who have studied Altshuller's theory, knowledge of TRIZ provides the following advantages (based on the book Fundamentals of TRIZ):

- the ability to identify the essence of a task;
- the ability to correctly determine the main directions of search and not to overlook ideas that are often missed;
- the ability to systematize information searching when selecting problems and exploring directions for their solution;
- learning how to move away from conventional solutions;
- the ability for logical, consistent, and systematic thinking;
- a significant increase in the efficiency of creative work;
- a reduction in decision-making time;
- a new way of looking at objects and phenomena;
- TRIZ stimulates inventive activity;
- TRIZ broadens a person's worldview.

Some people argue that the Theory of Inventive Problem Solving is useful only in the exact sciences. This is partly true, since the theory was developed and initially applied within specific technical fields. However, knowledge of TRIZ undoubtedly facilitates its application in the humanities and business as well, due to the universal nature of the TRIZ methodology for solving any creative task.

A student who masters this method acquires the ability to solve problems that arise in particular life situations creatively (creativity). Skillful use of TRIZ techniques and methods (Theory of Inventive Problem Solving) helps develop inventive thinking, creative imagination, and dialectical reasoning in students. The goal of TRIZ is not only to develop students'

imagination, but also to teach them to think continuously while understanding ongoing processes, to provide practical means for cultivating the qualities of a creative personality capable of understanding the unity and contradiction of the surrounding world, and to enable them to solve even minor problems.

"TRIZ, as its founder G. S. Altshuller and his followers believed, is a controllable process of creating something new by combining precise calculation, logic, and intuition. The main operating mechanism of TRIZ is the algorithm for solving inventive problems, which proceeds through clearly defined logical stages: the initial formulation of the problem is refined; a model is constructed; and the available substance–field resources are identified.

The use of TRIZ methodology dramatically accelerates the search for innovative solutions, significantly increases the probability of solving complex problems, and enables anyone who has mastered its tools to find solutions to such problems."

Over many years, the following scholars have made significant contributions to the study of this method: V. N. Druzhinin, S. L. Rubinshtein, E. L. Soldatova, as well as J. P. Guilford, E. P. Torrance, A. Maslow, and others. The works of G. S. Altshuller, M. M. Zinovkina, and others are devoted to the conscious formation and management of creative activity.

A number of studies focus on the development of creativity based on TRIZ technology. For example, E. A. Fedorova's research entitled "Developing Students' Creative Activity by Means of TRIZ Pedagogy." In this study, TRIZ tools (techniques, analogous tasks, information funds, the system operator, and others) were adapted to solving creative problems in computer science. Presentation of the main material. In her view, first of all, it is necessary to understand the well-known concept of "creativity." When characterizing a creative person, we usually refer to someone who thinks in an unconventional and original way. The term "creativity" originates from the Latin word meaning "creation" and denotes the act of creating; it is considered in several senses. First, it is a stable personal characteristic that determines the ability to engage in socially significant creative activity—the level of creative ability or creative capacity. Second, it is a person's ability to generate diverse original ideas under conditions of unregulated activity, rejecting stereotypical ways of thinking and introducing something new into experience. Third, it represents an individual's unique creative potential, which may manifest itself in thinking, communication, and certain types of activity. Fourth, creativity is understood as a relatively stable personal characteristic—creative ability as the level of creative capacity.

All these components of creativity can be developed through the innovative pedagogical technology of TRIZ—the Theory of Inventive Problem Solving. It represents a system of laws, algorithms, and methods that make it possible to find non-standard solutions to various situations. TRIZ is a science of creativity that teaches how to think in order to find the best and most effective solution. The founder of the Theory of Inventive Problem Solving (TRIZ) was Genrich Saulovich Altshuller—an engineer and science fiction writer. Altshuller began by studying the methods most frequently used by inventors.

Modern TRIZ pedagogy is a pedagogical system aimed at developing children's creative thinking in order to solve problems effectively. TRIZ pedagogy is based on the Theory of Inventive Problem Solving. The structural content of modern TRIZ pedagogy can be expressed as the interconnection of such areas as the development of creative thinking, the cultivation of creativity, and the formation of a creative personality. TRIZ pedagogy is focused on shaping strong thinking capable of solving complex problems in various fields of activity and on

educating a creative individual. Other innovative systems of modern education often address a number of problems separately. The success of TRIZ training lies in the fact that students who are required to solve any complex problem demonstrate an increased motivation to acquire new knowledge.

The use of TRIZ pedagogy makes it possible to unlock a child's creative potential by solving a wide range of problems, not only engineering-related but also everyday ones. The main principle of this method is "Solve the problem yourself." The teacher only suggests the direction of thinking, while the child reasons independently. Each age group has its own specific TRIZ methods. Children of primary school age invent riddles, proverbs, games, and puzzles. As they grow older, the tasks become more complex. Let us briefly consider modern TRIZ methods.

In the implementation of TRIZ technology, problem-search exercises that develop students' systems-based and logical thinking skills play a special role. These include:

Brainstorming—a method of formulating an inventive problem and finding ways to solve it by identifying available resources and selecting the ideal solution. It is a process of generating ideas, forming concepts, and developing creativity in thinking.

The Focused Objects Method—a technique in which the properties and characteristics of other, unrelated, and spontaneously arising objects are applied to a variable object. It is aimed at developing analytical skills, imagination, and creative thinking.

Modern TRIZ pedagogy is designed for children and adults of all ages. Relevant courses are available both for preschool children and for university students. TRIZ pedagogy teaches not only how to solve creative problems, but also how to consciously manage one's time. All the qualities formed in a person through TRIZ technology constitute the core components of creativity. Thus, it can be concluded that TRIZ technology helps develop the ability to find new solutions and to use existing resources effectively, as well as the ability to quickly adjust one's thinking depending on the situation; the capacity to generate new and unconventional ideas; and the ability to solve complex problems. All of these are integral components of creativity.

Through TRIZ technology, a specific style of thinking is formed—one oriented not toward the passive acquisition of ready-made knowledge, but toward its independent generation; the ability to identify, formulate, and solve problematic tasks within one's field of activity; the ability to detect hidden meanings, to perceive life as a dynamic space of open-ended tasks, and to cultivate a worldview-based attitude toward reality. The modern task of education is to nurture a competitive creative individual.

CONCLUSION

The conducted research demonstrates that systematizing pedagogical knowledge and introducing elements of TRIZ methodology into the professional training of teachers contribute to the development of their creative, analytical, and critical thinking abilities. Such an approach enables teachers to perceive the educational process as an integrated whole, to understand the interrelationship between theory and practice, and to develop skills for effectively solving emerging pedagogical problems. The research results confirm that the use of interdisciplinary methods and creative teaching strategies significantly enhances teachers' professional competence and innovative activity. The implementation of TRIZ principles contributes not only to the development of teachers as creative personalities, but also to fostering learners' cognitive initiative, independence, and non-standard thinking abilities. Thus, the findings

substantiate the necessity of integrating systemic and creative approaches into modern pedagogical practice. Prospects for further research are associated with the development of specific methodological models for applying TRIZ in educational programs and with evaluating their effectiveness across different levels of pedagogical education systems.

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