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THE CONTENT OF USING TRIZ TECHNOLOGY IN THE TRAINING OF FUTURE PRESCHOOL TEACHERS IN HIGHER EDUCATION

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Abstract: This article analyzes the theoretical and methodological foundations, content, and essence of using TRIZ (Theory of Inventive Problem Solving) technology in the professional training of future preschool teachers at higher education institutions. The paper examines the structural components of TRIZ technology, its role in developing the creative, critical, and systems thinking of future educators, and the pedagogical conditions for integrating this technology into the educational process of higher education institutions.

Keywords: TRIZ technology, Theory of Inventive Problem Solving, future preschool teacher, creative thinking, preschool education, educational technology, higher education, professional competence.

Introduction. The accelerating pace of development of modern society and the growing complexity of socio-economic relations set the education system the task of raising human capital to a qualitatively new level. The reforms being carried out in the field of education in the Republic of Uzbekistan, in particular the state policy aimed at fundamentally renewing the preschool education system, further increase the requirements for the quality of professional training of future preschool teachers. Today a preschool teacher is expected not only to possess pedagogical and psychological knowledge, but also to be a specialist who can develop creative, independent and systemic thinking skills in children and resolve problem situations in original ways.

TRIZ technology (from the Russian “Teoriya Resheniya Izobretatelskikh Zadach”, the Theory of Inventive Problem Solving) is recognized as one of the important means of carrying out this task effectively. Although this technology, developed by G. S. Altshuller, was initially created to systematize inventive activity in engineering, its didactic potential was later identified, and it has since been successfully applied in pedagogy, including preschool education practice. The main idea of TRIZ is to solve any problem not through random search (“trial and error”) but on the basis of a consistent algorithm grounded in objective regularities.

Teaching the fundamentals of TRIZ technology to future preschool teachers in higher education makes it possible, in their future professional work, to organize creative and exploratory activities with children, to develop children’s natural curiosity, and to form in them the ability to see a problem and find several ways of solving it. Therefore, a thorough analysis of the scientific-theoretical and practical aspects of this problem is one of the pressing pedagogical tasks.

Main part. TRIZ technology is a pedagogical-technological approach based on the systematic analysis of problem situations, the identification of contradictions, and the achievement of a solution by means of standard methods of eliminating them. The theoretical basis of this technology consists of the following principles:

• **Principle of systemicity** — any object or phenomenon is studied not in isolation but as an interrelated system;

• **Principle of identifying and positively resolving contradictions** — the essence of solving a problem lies not in finding contradictions and “softening” them but in eliminating them completely;

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• **Principle of maximum use of resources** — searching for and using the available internal and external resources when solving a problem;

• **Principle of striving for the ideal final result** — the solution should be presented in the simplest, most economical and most effective form.

These principles develop in the future preschool teacher not merely the mastery of ready-made knowledge but the skills of independently seeking knowledge, analyzing it and applying it in practice. The pedagogical value of TRIZ technology lies in the fact that, through the game-based methods used in work with children (for example, "little men" modeling, the focal object method, morphological analysis, the system operator, "browsing questions"), it makes it possible to cultivate creative and exploratory skills from an early age.

It is advisable to organize the content of teaching the fundamentals of TRIZ technology to future preschool teachers in higher education institutions as a three-stage system:

The first stage is theoretical-preparatory. At this stage students learn about the history of TRIZ technology, its basic concepts (technical and administrative contradiction, ideal object, resources, system operator, etc.), and the place of pedagogical TRIZ in preschool education practice. Students are also introduced to the "TRIZ for Little Ones" approach, that is, versions of TRIZ theory adapted to child psychology, as distinct from the classical inventive methods.

The second stage is technological-practical. At this stage students learn to independently develop lesson plans for work with preschool children using TRIZ elements and to design didactic games and tasks. In particular, practical sessions are organized such as reworking fairy tales on the basis of TRIZ principles ("ending the tale differently", "swapping the characters' traits"), analyzing natural and environmental phenomena with the help of the "system operator", and finding alternative functions of objects (the "focal object method").

The third stage is reflective-project. At this stage students test the lesson projects they have prepared on the basis of TRIZ technology in real groups during teaching practice, analyze the results, and reflect on (self-analyze) their own activity. This stage serves to strengthen the professional and creative position of the future specialist.

The following TRIZ methods are widely used in the training of future preschool teachers:

• **Brainstorming** — students, working in groups, propose as many solution options to a problem as possible within a short time; no time is allotted to criticism;

• **Synectics** — finding a new solution to an unfamiliar problem by comparing it with familiar objects (analogy);

• **Morphological analysis** — systematizing all possible structural variants of a problem in the form of a table;

• **Focal object method** — creating new ideas by transferring the properties of one object to another, randomly chosen object;

• **System operator (the "nine screens" method)** — analyzing an object from the point of view of the past, present and future, as well as of smaller and larger systems;

• **"Little men" modeling** — representing substances and phenomena in a figurative and symbolic form that children can understand.

The future preschool teacher should master these methods theoretically and later be able to apply them, adapted to the educational process with children. In this, the task of the instructor (professor-

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teacher) is not only to explain the methods but also to involve students in independent creative activity and to develop in them the skill of analyzing pedagogical situations from the standpoint of TRIZ.

Applying TRIZ technology in higher education makes it possible to achieve a number of pedagogical results. First, systemic thinking is formed in future preschool teachers: they develop as specialists who can see pedagogical situations as a whole system and identify cause-and-effect relationships. Second, creative and exploratory activity develops, since TRIZ methods encourage the student to look for non-standard solutions. Third, psychological readiness for problem situations increases: instead of avoiding difficulties, the student acquires the skill of analyzing them and solving them step by step.

In addition, TRIZ technology enables future preschool teachers to ensure an individual approach in work with children, because most of its methods are based on open questions, and each child has the opportunity to express their opinion freely. This, in turn, serves to cultivate in children such social and personal qualities as free thinking, the ability to justify their own point of view, and respect for the opinions of others.

An analysis of practice shows that, for the effective use of TRIZ technology in training future preschool teachers, the following pedagogical conditions must be observed:

• a separate module or interdisciplinary integrated topics on the fundamentals of TRIZ technology should be allocated in curricula;

• the instructors themselves should undergo special training in TRIZ methodology;

• theoretical knowledge should be closely linked with practice — conditions should be created for students to try out TRIZ elements in real groups during teaching practice;

• interactive and project-based educational technologies (case study, the project method, game technologies) should be used in combination with TRIZ;

• criteria should be introduced into the assessment system that take into account not only the student's level of knowledge but also the results of their creative and project activity.

Ensuring these conditions in a comprehensive way lays the groundwork for future preschool teachers to master TRIZ technology thoroughly in theory and to apply it freely and creatively in their future professional work.

In conclusion, the use of TRIZ technology in training future preschool teachers in higher education should be recognized as one of the pressing directions of the modern pedagogical education system. TRIZ technology makes it possible to form systemic, critical and creative thinking in the future specialist and to develop the skills of solving problem situations with the help of a scientifically grounded algorithm. The content and essence of this technology are manifested in a three-stage system of theoretical, practical and reflective-project training, and its effectiveness is high only when the relevant pedagogical conditions are ensured.

Conclusion. Thorough mastery of the fundamentals of TRIZ technology by the future preschool teacher not only increases their personal professional and creative potential but also helps to form creative, independent and systemic thinking skills from an early age in the generation of children they will educate. Therefore, it is advisable for higher education institutions to pay special attention to teaching the fundamentals of TRIZ technology in their curricula and programs, and to continue developing methodological manuals and practical recommendations in this area.

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