

## THE IMPORTANCE OF TRIZ TECHNOLOGY IN DEVELOPING THINKING SKILLS

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### Abstract:

Formation of skills such as inventiveness and modeling in elementary school students is becoming a modern demand. TRIZ technology is the technology that is suitable for the development of these two abilities. This article talks about the methods and methods of using TRIZ technology in elementary school students.

**Keywords:** Class, lesson, system, technology, TRIZ, student, teacher, inventiveness, creativity, thought, innovation.

### Introduction

The International Education Concept for 2030, adopted by countries worldwide, outlines a number of important objectives. Notably, the development of innovative thinking alongside a solid foundation of knowledge is highlighted as a crucial issue. Such initiatives, implemented in collaboration with UNESCO, emphasize the need for focused attention on these goals.

Globally, numerous studies are being conducted to address the challenges of teaching children how to think critically. Analysis of these scientific studies demonstrates that fostering innovation and creating opportunities for comprehensive development aligned with children's intellectual abilities, interests, needs, age characteristics, and conducive pedagogical conditions can significantly contribute to developing innovative thinking skills among primary school students. Organizing educational activities through integrative approaches, adaptable curricula, and methods aimed at shaping children's innovative thinking abilities is of paramount importance. This approach serves as a foundation for cultivating creative and intellectual capabilities in young learners.

### Systematic Reforms in Primary Education: Enhancing Innovation in Learning

The comprehensive reforms in primary education have led to significant advancements in the education system, reflecting global trends and modernization processes. In Uzbekistan, the material-technical base, legal and regulatory framework, and methodological support of primary education institutions are progressively improving. Several laws of the Republic of Uzbekistan emphasize the priority of "introducing modern innovations and information communication technologies" to create alternative forms of education and foster comprehensive development. In this context, adopting a creative approach in primary education is essential for enhancing children's innovative thinking abilities.



### Discussion and Results

The primary goal of TRIZ pedagogy is to develop flexible thinking and imagination, enabling learners to solve complex problems skillfully and effectively.

In modern pedagogy, the use of unique methods for working with students, unconventional teaching techniques, and the TRIZ program represent an innovative solution for achieving high results.

### Program Implementation Details

- **Target Group:** The program is designed for children aged 7-10 years and is implemented over four years.
- **Class Size:** 34 students.
- **Schedule:**
  - Year 1: 1 hour per week (33 hours total).
  - Year 2: 1 hour per week (34 hours total).
  - Year 3: 1 hour per week (34 hours total).
  - Year 4: 1 hour per week (34 hours total).
- **Additional Hours:** The program is executed through supplementary learning hours.

#### Classroom Environment:

Lessons are not limited to traditional classrooms. They can also take place in sports halls, activity centers, and playgrounds, depending on the type of educational activity. This diverse learning environment fosters creativity and enhances the educational process.

By integrating TRIZ pedagogy into primary education, the development of innovative thinking and problem-solving skills in children can be effectively cultivated, laying a solid foundation for future intellectual growth.

#### Activity Types:

- **Game Process:** Activities involving movement games.
- **Literary-Artistic Process:** Engaging with literature and creative arts.
- **Visual Process:** Activities involving drawing and visualization.
- **Relaxation Exercises:** Activities to develop creative thinking, dialectical systems, associative, logical, and innovative thinking, along with project-based actions.

#### Effectiveness of Applying the Theory of Inventive Problem Solving (TRIZ) in Grades I-IV:

The success and effectiveness of implementing the TRIZ program depend on several conditions:

- Voluntary participation and the desire to express oneself.
- The novelty and engaging format of the methods used.
- The teacher's role in fostering students' initiative and collaboration.
- Harmony between individual, group, and collective activities.
- Opportunities to participate in various levels of projects, festivals, and competitions with clear and effective actions.
- Encouraging open and independent thinking among children.

#### Outcomes and Plans for Extracurricular Learning Activities:

The TRIZ program sets specific requirements for knowledge and skills acquisition. These align with the general educational standards of schools.



Requirements for Year 1 Students:

Knowledge:

- What is the Development of Creative Thinking (DCT)?
- Why is the Development of Creative Thinking important?
- Games for developing creative minds.
- Methods for imagination through visual arts.
- Algorithms for depicting fantastical objects.
- Using algorithms to create objects and fantastical items.
- Writing the history of these objects using pictograms.
- Narrating fairy tales using pictogram-based models.
- Expressing one's own opinion.
- Respecting others' opinions.
- Applying the acquired knowledge and skills in life under the slogan "Do no harm."

Requirements for Year 2 Students:

Knowledge:

- What is a complex?
- The algorithm for creating complexes.
- Gianni Rodari's imagination method.
- The fundamental concepts of the TRIZ theory, including fantasy methods.

Skills:

- Writing events in the form of comics.
- Playing games aimed at developing creative minds.
- Crafting fairy tales and fantastical stories using previously learned methods.
- Describing processes from an object's perspective.
- Sharing personal viewpoints and respecting others.
- Implementing knowledge in life under the "Do no harm" slogan.

Requirements for Year 3 Students:

Knowledge:

- Understanding terms like "System Operator," "Magic Screen," "Nine Screens," "System," "Subsystem," "Supersystem," "Function," "Past System," "Future System," "Antisystem," and "Non-System."
- Algorithms for crafting riddles.
- Story and event crafting using the "Morphological Box" method.
- Logical analysis of the "Yes-No" game.

Skills:

- Listening attentively, expressing ideas clearly, and avoiding interruptions.
- Asking questions to address unknown areas.
- Using the "Morphological Analysis," "Nine Screens," and "Morphological Box" methods for crafting tales and events.
- Developing new games through "Morphological Analysis."
- Respecting others' opinions while expressing personal viewpoints.
- Applying knowledge in life following the "Do no harm" slogan.

The structured application of the TRIZ methodology in educational activities fosters innovative



thinking and equips students with problem-solving and creative skills essential for future success.

Requirements for Fourth-Year Students in the TRIZ Program for Inventive Problem Solving: Knowledge:

- Define the concepts of "Contradiction" and "Principles for Resolving Contradictions."
- Provide a definition for "Creative Problem."
- Explain the concept of "Field-Object Resources."
- Understand methods such as "Inversion," "Heavenly Transition," "State Transition," "Predefined Cushion," "Matryoshka," "Fragmentation-Integration," "Jumping," and "Turning Harm into Benefit," as well as contradiction resolution techniques.

Skills:

- Establish logical connections between phenomena and objects.
- Solve "Creative Problems" and eliminate contradictions under the slogan "Do no harm."
- Strive toward goals, apply acquired knowledge and skills to real-life situations effectively.

Student Qualities Developed Over Four Years (Grades 1-4):

1. Cognitive and Creative Skills:
  - Ability to act in non-standard situations.
  - Readiness to think independently when making decisions.
2. Teamwork and Responsibility:
  - Skills to collaborate with others and take responsibility for decisions.
  - Demonstrate respect for oneself and others.
3. Communication:
  - Enhanced interpersonal and communication skills.
4. Personal Responsibility:
  - A strong sense of individual and collaborative responsibility.

### Conclusion:

In conclusion, TRIZ technology is a universal tool that can be applied across various activities, including educational processes, games, and routine moments. This technology enables the development of a harmonious and scientifically grounded model of the world in a school-aged child's mind.

It creates favorable conditions for decision-making, where the results of one decision inspire others. This process broadens the scope of imagination, encourages development, and motivates further learning. TRIZ allows each child to showcase their uniqueness and fosters their ability to think beyond conventional boundaries.

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