INCREASING THE EFFICIENCY OF EDUCATION THROUGH TRIZ PEDAGOGY

Kayumova Shoxsanam To‘lqin qizi
Teacher of Gulistan State University
Doctor of Philosophy in Pedagogical Sciences (PhD)

Khujamurodov Odiljon Marufboy ugli
Teacher of the presidential school in Gulistan

Markabayev Farkhod Tukhtamishevich
Teacher of the presidential school in Gulistan

Abdullayev Khurshid Abdusalom ugli
Teacher of the presidential school in Gulistan
Email: shoxsanamkayumova0523@gmail.com

Annotation. *In modern life, TRIZ pedagogy is relevant because it provides individuals with the skills and mindset needed to thrive in today’s dynamic world, fostering innovation, critical thinking, and adaptability, while also addressing real-world problems across diverse fields and industries. This article discusses the significance of TRIZ pedagogy within the educational system, its components, and its role in enhancing the efficiency of education.*

Key words. *TRIZ pedagogy, innovation, integration, problem situation, critical thinking, creative approach, creativity, competence, mechanism, technology.*

Introduction. In today’s rapidly evolving world, problem-solving skills have never been more essential. Whether in education, industry, or daily life, the ability to tackle complex challenges with innovative solutions is highly valued. To cultivate these skills, educators and organizations are turning to TRIZ pedagogy. TRIZ, which stands for Theory of Inventive Problem Solving, is a powerful methodology for problem solving and innovation. Its application in education, known as TRIZ pedagogy, plays a pivotal role in nurturing creative thinkers and problem solvers. This article explores the significance of TRIZ pedagogy in today’s educational system.

The "Incheon Declaration," accepted at the "World Education Forum 2015," with the theme "Education 2030: Towards inclusive and equitable quality education and lifelong learning for all," outlines the following tasks: "We commit to quality education

and to improving learning outcomes, which requires strengthening inputs, processes, and evaluation of outcomes and mechanisms to measure progress"[2], which means establishing the process of assessing the quality of education and improving resources, procedures, and outcome evaluation, along with the implementation of mechanisms to measure progress.

Furthermore, the declaration emphasizes the importance of "the provision of flexible learning pathways, as well as the recognition, validation, and accreditation of the knowledge, skills, and competencies acquired through non-formal and informal education"[2], highlighting the need for assessing acquired knowledge and competencies in education and reiterating the importance of lifelong learning.

Research Object and Applied Methods

The process of identifying the effectiveness of developing the creative thinking and problem-solving skills of primary school students through TRIZ pedagogy as a research subject has been studied, and in this regard, the main focus has been on effective assessment, with didactic requirements for assessment being taught. In outlining the research topic, classification, description, contextual, complex, and functional analysis methods have been used.

Obtained Results and their Analysis.

Ta’lim soahasida TRIZ TRIZ pedagogikasidan foydalanish bo‘yicha Leonid Chechurin and Elena G. Popov("Teaching and Learning with TRIZ: New Directions in Education"), Karen Gadd, Denis Cavallucci, and James Moultrie (TRIZ for Engineers: Enabling Inventive Problem Solving), Lilly Haines-Gadd("TRIZ for Dummies") kabi olimlarimiz tadqiqot ishlari olib borishmoqda

"Teaching and Learning with TRIZ: New Directions in Education" - Edited by Leonid Chechurin and Elena G. Popov, this book presents the transformative experiences and insights of TRIZ pedagogy in the field of education.

"TRIZ for Engineers: Enabling Inventive Problem Solving" - Authors: Karen Gadd, Denis Cavallucci, and James Moultrie, this book focuses on the practical application of TRIZ in engineering.

"TRIZ for Dummies" - Author: Lilly Haines-Gadd, this user-friendly guide provides an introduction to TRIZ’s fundamental principles and how to apply them in practice.

"TRIZ Journal" - The TRIZ Journal is an online publication that features articles and resources related to TRIZ pedagogy and its practical applications.

"TRIZ: The Right Solution at the Right Time: A Guide to Innovative Problem Solving" - Author: Yuri Salamatov, this book offers a comprehensive overview of TRIZ, its practical applications, and problem-solving techniques.

"Inventive Thinking through TRIZ: A Practical Guide" - Author: Michael A. Orloff, this book provides a hands-on approach to teaching and applying TRIZ concepts.

"TRIZ – A New Approach to Innovative Engineering and Problem Solving" - Author: Anthony D. Sims, this book offers a practical introduction to TRIZ and its use in engineering and innovation.

"TRIZ Principles for Information Technology" - Author: Alan Williams, this book focuses on applying TRIZ principles to the field of information technology.

"TRIZ: The Theory of Inventive Problem Solving" - Author: Genrich Altshuller, the founder of TRIZ, this classic book provides insights into the foundational principles of TRIZ.

These resources cover a range of topics related to TRIZ pedagogy, from its theoretical foundations to practical applications in various fields. You can use them to deepen your understanding of TRIZ and how it can be effectively integrated into education and problem-solving processes.

TRIZ is Theory of Inventive Problem Solving, which founder is the inventor, writer-fantast – Henry Altshuller. TRIZ has been tested for the first time in 60-s of the twentieth century in the courses of technical creativity, where engineers and teachers, who have been trained at Altshuller's workshops, were educated. During these classes the children were taught the creative process: create new, unseen planes, cars, ships, and then make their models[4,5]. These creations have participated in various competitions throughout the world. However, they often became winners in exhibitions and received patents for invention. That was when the assertion that creativity is a natural talent was first called into question. TRIZ – teachers claimed that any child can be taught the creative process. Today TRIZ is included not only to the school programs, but is also used as a method of teaching in individual subjects in secondary schools. Such popularity of TRIZ – pedagogy is due to the need of developing a new type of person, who would correspond to the modern information age, which is cannot be provided with the classical system of education, formed at the dawn of the industrial age

Features of TRIZ pedagogy:

Encouraging Creative Thinking: TRIZ pedagogy stimulates students' creative thinking by introducing them to a structured framework for problem solving. It encourages them to break away from conventional thinking patterns and explore unconventional solutions.

Problem-Solving Competence: TRIZ equips students with a toolkit of problem-solving techniques that can be applied across various domains. This competence is highly transferable and valuable in addressing real-world challenges.

Identifying Contradictions: TRIZ emphasizes the identification and resolution of contradictions within a problem. This skill is particularly relevant in engineering, product design, and process optimization.

Enhancing Critical Thinking: TRIZ pedagogy encourages students to analyze problems from multiple angles, fostering critical thinking skills. It requires them to question assumptions, seek root causes, and explore innovative alternatives.

Innovation and Inventiveness: TRIZ is centered around the concept of innovation. By teaching students the principles of innovation and inventive problem solving, TRIZ pedagogy prepares them to be future innovators and inventors.

Cross-Disciplinary Application: TRIZ is not limited to a specific field; it can be applied across disciplines. This versatility makes it a valuable addition to educational programs in diverse fields, from science and engineering to business and the arts.

Real-World Relevance: The skills acquired through TRIZ pedagogy are directly applicable to real-world challenges. This prepares students for success in their careers and equips them to contribute positively to society.

While the benefits of TRIZ pedagogy are substantial, there are challenges to its implementation. These include the need for specialized training for educators, curriculum integration, and the adaptation of TRIZ principles to the specific needs of different educational levels and contexts. However, the long-term benefits outweigh these initial hurdles.

Conclousion. In a world where innovation and creative problem solving are paramount, TRIZ pedagogy offers a strategic approach to education. By introducing students to the principles of inventive problem solving, TRIZ pedagogy equips them with valuable skills that are essential for success in the 21st century. It encourages students to think outside the box, challenge the status quo, and contribute meaningfully to a rapidly changing world. As educators and institutions increasingly recognize the significance of TRIZ pedagogy, it has the potential to become a cornerstone of modern education, empowering individuals to tackle complex challenges with ingenuity and creativity.

REFERENCES

1. O‘zbekiston Respublikasi Prezidentining 2019-yil 29-apreldagi ‘O‘zbekiston Respublikasi Xalq ta’limi tizimini 2030-yilgacha rivojlantirish konsepsiyasini tasdiqlash to‘g‘risida’gi PF-5712-sonli farmoni.

2. Incheon declaration // Education 2030: Towards inclusive and equitable quality education and lifelong learning for all (Word Education Forum, 19-22 may 2015. Incheon, Republic of Korea). – 48 p.

3. Kayumova Sh.T. Development of methodological training of future primary school teachers based on the international assessment program TIMSS. Berlin Studies Transnational Journal of Science and Humanities ISSN 2749-0866 Vol.2 Issue 1.5 Pedagogical sciences http://berlinstudies.de./

4. Sh.Qayumova “Bo‘lajak boshlang‘ich sinf o‘qituvcchilarini TIMSS xalqaro baholash dasturi asosida metodik tayyorgarligini rivojlantirishda multimediya vositalarining o‘rni // SAI. 2022. №B4. URL: https://cyberleninka.ru/article/n/b-lazhak-bosshlan-ich-sinf-ituvcchilarini-timss-hal-aro-ba-olash-dasturi-asosida-metodik-tayyorgarligini-rivozhlantirishda (дата обращения: 15.09.2023).

5. Z.M.Makhmudjonov. B.K.Xolyigitova, R.A.Azamatov, B.E.Chutanov. THE ROLE OF MANAGEMENT IN THE ORGANIZATION OF THE EDUCATIONAL PROCESS. The way of science. 2023 №6 (112).