DEVELOPMENT OF MATHEMATICAL EDUCATION IN PRESCHOOL CHILDREN USING TRIZ-TECHNOLOGY METHODS

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Annotation

TRIZ technology will allow you to educate and train a creative child. The purpose of using this technology in kindergarten is to develop, on the one hand, such qualities of thinking as flexibility, mobility, consistency; on the other – search activity, the desire for novelty; the development of speech and creative imagination. The article emphasizes that TRIZ contributes to the formation of mathematical representations, allows children to develop thinking, mathematical abilities by solving entertaining problems.

Keywords: preschool children, mathematical education, TRIZ technology, entertaining tasks, DARIZ, creativity.

Аннотация

ТРИЗ-технология позволит воспитывать и обучать креативного ребенка. Целью использования данной технологии в детском саду является развитие, с одной стороны, таких качеств мышления, как гибкость, подвижность, системность; с другой – поисковой активности, стремления к новизне; развитие речи и творческого воображения. В статье подчёркнуто, что ТРИЗ способствует формированию математических представлений, позволяет детям развивать мышление, математические способности посредством решения занимательных задач.

Ключевыеслова: дети дошкольного возраста, математическое образование, технология ТРИЗ, занимательные задачи, ДАРИЗ, креативность.

Introduction

One of the main tasks of all educators is the education of a new generation with a high creative potential. In recent years, a new direction in the development of children's creativity – TRIZ (Russian: теория решения изобретательских задач) – the theory of solving inventive issues (abbreviated in Uzbek: IMEN) – has spread.

For the first time TRIZ was founded by the Russian inventor-engineer and writer Henry Altshuller as a result of the analysis of large arrays of patented information. This theory was originally applied only to solve engineering and technical problems. However, later, TRIZ showed its effectiveness in solving problematic issues in various spheres of human activity. TRIZ soon began to be widely used in the educational system, since it is incredibly effective and very interesting for the development of creative abilities of those who study. The essence of creativity technology is that new information is given in the form of problematic and inventive issues and situations, and in order to solve them, knowledge of both scientific disciplines and the logical system of ways of solving them is required, that is, knowledge of TRIZ technology.

Methods and Methodology

N.Isaxodjaeva in her presentation, which she added to the "Знанио" portal [6]: "Starting from the first lessons, it is necessary to give the children the appropriate problem character issues". The issues presented in the presentation are based on TRIZ and DARIZ technologies, but the slides prepared by the author do not mention TRIZ technology. The technologies described by N.U.Bikbaeva, Z.Ibroximova, X.I.Kosimova are classified into two types according to the level of effectiveness of mental development: the method of imitation and the evristic method of understanding the legal models [2, page 32]. These authors also did not think about TRIZ and DARIZ technologies. To the technologies of mathematical modeling, the use of ready-made models, the issues of creating models independently N.U.Bikbaeva and others [2, page 18], G.E.Djanpeisova [4], M.Jumaev [5] touched upon. In her article A.N.Mirzakarimova emphasizes the effectiveness of TRIZ technology, however, translates the abbreviation TRIZ as the theory of determining the ability of creativity to the Uzbek language [7, page 78].

About TRIZ, ARIZ, DARIZ technologies from the internet we found articles, lectures and other works of mainly Russian teachers and Methodists, kindergarten teachers, primary school teachers. For Example, in the methodological manuals published by educators such as A.V.Belashistaya, R.M.Khamidulina, there are scenarios of issues and lessons for teaching mathematics on the basis of TRIZ and DARIZ technologies [1; 10].

The methodology for the application of DARIZ technology was also developed and illuminated by Russian educators and Methodists. For Example E.L.Pchyolkina in her manual [8] recommends the algorithmic methodology of solving children's inventive issues. This technique contributes to the active creative development of

the child. The methodology is structured on the basis of ARIZ, designed for preschool children and small school-age children and enriched with auxiliary didactic materials that facilitate the perception of the algorithm. Belarusian pedagogue and Methodist S.I.Gin cited methods of training on TRIZ for kindergarten children [3]. In his article, V.Furman explained ways to use TRIZ technologies in the mathematical development of children [9]. Well, the use of TRIZ technology in mathematical education for preschool children has not been practically covered until today in Uzbek language, so this problem is urgent, and it is worthwhile to prepare and introduce TRIZ technology-related applications in preschool institutions of our republic.

Results

The TRIZ application helps in the development of preschool children development of creative abilities in them teaches them to think, to find solutions to problems. It seems interesting to children of preschool age, especially solving the problems of fairy-tale heroes. In this case, it will help them with the algorithm of solving children's inventive problems (детский алгоритм решения изобретательских задач - DARIZ). The Russian translation of the phrase algorithm for solving children's inventive problems that is детский алгоритм решения изобретательских задач is an abbreviation – DARIZ. This algorithm is included in the popular TRIZ, that is, the technology of the теория решения изобретательских задач. DARIZ helps to solve issues not by the method of "finding answers", but by the means of reasoning, and as a result of this it is achieved to get new, interesting, diverse ideas.

When TRIZ-technology, ARIZ and DARIZ technologies are used, direct educational activity is aimed at the systematization, consolidation of mathematical imagination in kindergarten children and educates in each child such characteristics as personal qualities, interest in mathematical knowledge, aspiration to achieve the goal, focusing his attention on mathematical knowledge, aspiration to knowledge. The use of TRIZ, ARIZ, DARIZ technologies in mathematics classes in the preparation groups for school in kindergarten has attracted attention, development of social skills, such as logical thinking, the development of psychological processes such as the development of fine motor skills of hands, the ability to work in a group, the consideration of a partner's opinion, the commitment to each other.

We want to give examples of assignments based on TRIZ technology. It strengthens the names and consistency of weekdays with the standard assignment, keeps the

names of geometrical figures in memory, strengthens the signs ">", "<" and "=", it serves to develop logical thinking, attentiveness and alertness.

Assignments based on TRIZ technology are performed using question-and-answer, conversation, explanation, measurement, modeling methods of devices. Some types of assignments were cited in the article. Questions of playfulness, resourcefulness and awareness were recommended to be used in the organization of children's activities. Also, in the organization of training, various visual aids (letters with assignments, digital housing, crates, etc.) are used, handout materials (ball, counting sticks, tambourine and pen) and information and communication tools (laptop, video projector, screen and others) will be used.

The educator should try to educate children on the stagnant interest in mathematical knowledge, the skill of their use and the desire to independently master them. Especially important is the development of independent place of thinking, spatial imagination in children [6].

As the educator prepares for the training, he or she will study the contents of the program meticulously. Mathematical knowledge is given to children in a strictly defined system and consistency, or by the method of the algorithm, in which new materials must be in such a way that children can absorb. Each task is divided into a number of small tasks. These small assignments are studied in a row.

When the amount of exercise is sufficient, a thorough qualification and skills can be formed in the trainees. It is necessary to train children to count (recount, count, separate counting) the images on parts, toys, geometric shapes, cards and pictures, to determine the quantities of objects by sensing them. The child (6-7 years) engaged in the pre-school preparation group should have mastered relatively more knowledge of the shape and size of the objects, be able to obtain a landmark in Space (2 and 3 dimensional) and in time.

In the lesson of mathematics, the following assignments based on TRIZ technology can be proposed [3; 8; 9].

1 – Assignment. Children stand in a circle and alternately answer the questions of the educator. To whom the educator throws the ball, this child will be answer.

Questions: What season of the year is it now? What month is it now? How many months in the year are there? What day of the week is today? How many days a week are there? The list of working days. List the days off. What day will come before Wednesday? What is the fourth day of the week called? And others

Children learn the days of months and weeks. In them, intelligence and meticulousness are developed, the qualification of a quick answer to a question.

2 – Assignment. In front of the children are poured counting sticks on the table. Count three sticks and make a triangle; take two more sticks and make one more Triangle, how many triangles were formed? Answer: 2. How many polygons were formed? Answer: 3. Count two more sticks and make one more Triangle. How many triangles has it become now? Answer: 3. Polygons? Answer: 6. Where to find them and show them. Children show.

3 – Assignment. Children ">", "<", "=" familiarize yourself with the characters and strengthen their knowledge. On the table are laid out napkins made of paper. Numbers are written on the slots. Children come out with a turn-by-turn marker, compare the numbers and put the desired mark.

5 7 7 1; 3 5 6 8; 6 6 2 5

7 4 8 8; 4 0 5 6; 1 7 9 10

8 6 4 8; 4 4 6 0; 2 3 2 2

4 – Assignment. The task is to quickly answer the questions in order to test the resourcefulness and vigilance of children.

1. How many ears do two mice have? (four)
2. How many legs of two bears? (eight)
3. At the end of January, apple trees blossomed. First 3 apple trees blossomed and then another apple tree blossomed. How many apple trees have blossomed in total? (one also did not bloom, because in January the apple tree does not bloom)
4. The dog has two left legs, two right legs, two front legs, two hind legs. How many legs does the dog have? (four)
5. How many ears do two hedgehogs have? (four)
6. How many tails do four cats have? (four)
7. How many noses do three elephants have? (three)
8. How many nuts are in an empty bowl? (no)

Discussion

The use of TRIZ, ARIZ and DARIZ technologies in teaching mathematics to preschool children is of great benefit. Children will be able to give an expanded answer to the question, learn geometric figures and their features, distinguish and apply many, few and equal signs, will be able to cope with logical tasks. Each child is directly involved in educational activities, demonstrates his own initiative, independently solves examples and is able to communicate with peers.

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