

THE OTSM-TRIZ INSTRUMENTS IN PRESCHOOL EDUCATION: WHAT AND WHAT FOR TO TEACH?

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*«The ship not knowing her course will never enter a harbour».
Oriental wisdom.*

Educational process at any educational establishment is aimed at solving certain pedagogical problems. These problems, first of all, issue from educational programmes. For their successful implementation a teacher chooses various methods of teaching.

In OTSM (general the Theory of Powerful Thinking) -TRIZ pedagogics there has been already created an extensive fund of trainings, principles, techniques, allowing to develop a child's ability to perceive a systemic picture of the world, to operate on contradictions, and at an older age to overcome psychological inertia and solve creative problems from various fields of knowledge and people's activity.

Practicing teachers very often find it difficult to choose the most optimal techniques which can allow to solve didactic problems. This can be very often observed in preschool education. Such a situation has its reasons:

- unlike in school education there haven't existed any educational standards in preschool education for a long time. So as a result the main emphasis in didactic work with children is laid not on defining goals but on attractive form of organising this work;
- educational process in a nursery school is diversified. It doesn't only include activity in class but also various children's activity during a day: playing, working, communicating, walking, solving everyday problems. So it's necessary to organise these activities in such a way which can allow to develop a child's ability to solve arising problems independently. However, in a personal activity of a teacher there are numerous problems which only few teachers analyse and solve;
- Attractiveness and availability of games and trainings on RTV frequently provoke substitution of concepts: though a teacher claims that s/he uses TRIZ-techniques in fact s/he only develops the skills of directed imagination but doesn't teach to solve problems. At the same time certain models are very often used only because they are created in TRIZ pedagogics;
- for a long time it has been difficult to work out a technique of teaching younger children to analyse and solve creative problems and also a

technique of working with pedagogical problems, as the technical variant of ARIZ was unacceptable and the adapted variant didn't exist.

On the basis of all above-mentioned we made an attempt to systematize the accumulated knowledge of how to teach children to solve creative problems. As a basis we chose the algorithm of creative problems solving by N.N. Khomenko and T.A. Sidorchuk adapted for working with preschool children, the practices of experimental playgrounds supervised by T.A. Sidorchuk (Ulyanovsk, Samara, Tolyatti), and also the research in the field of professional training done by the author of the article.

The work was organized according to the following scheme:

1. On the basis of the above-mentioned algorithm of creative problems analysis a table was made. In this table there was described each of the steps, means of their implementation, and also the obligatory minimum of intellectual skills necessary to work at each of these steps.
2. We defined the goals for OTSM-TRIZ-RTV models which nursery school teachers have at their disposal nowadays and distributed them according to the contents of the first part of the table.
3. We analysed the list of the tools we had and minimized it having excluded some so-called "monotrainings". These are models which are used to form a single skill, but at the same time this particular skill can be formed by other means.

Table 1.

Steps of working on a problem	Main means	Skills necessary for preschool children to work at a given step	Techniques of OTSM-TRIZ pedagogics aimed at forming these skills
Step 1. Preparatory description of a problem situation. Using various means to describe some vague, undefined problem situation which can take place in real life, be taken from a literary work or	Verbalization of a given problem field (to verbalize the situation, to formulate possible problems). Visualization through pictures, photos, video and other images (to imagine visually a particular situation).	The skill to single out objects' attributes, to define their meaning in a certain situation, to operate with the model "Element – Attribute – Meaning of an attribute"	Method of focal objects. Morphological analysis. Games intended for forming systematic dialectical thinking. Games intended for forming sensitivity to contradictions: selection of antonyms, modifications of games "Good or bad"
		The skill to determine cause-and-consequence relationship.	Making up comparisons, riddles, metaphors, proverbs

made up by a teacher.		The skill to assess the certain situation at "+-", "important – not important ", "necessary – not necessary" levels.	using ready-made aids (methods of I. Murashkovski, A. Nesterenko, T. Sidorchuk).
Step 2. Singling a specific task out of a problem situation.	Specifying The purpose of problem solving (what for is the problem solved.) Specifying the resources available in a given situation. Specifying the reason why it is impossible to get the necessary result using available resources. The three basic questions: What do I HAVE? What do I WANT? WHY can't I get what I want out of what I have?	The skill to single out objects, mark their attributes and meaning of the attributes.	SPI (standard principles of imagining) ("Magicians"), games intended for forming systematic dialectical thinking, morphological analysis. Making up comparisons, riddles, metaphors, proverbs using ready-made aids (methods of I. Murashkovski, A. Nesterenko, T. Sidorchuk).
Step 2a (intermediate) Generation of ideas (it is necessary in order to reduce the dominating tendency to guess the answer by examination of options)	Brainstorming, trial-and-error method, analogies from real life.	The skill to draw analogies between the situation and life experience.	Direct and personality analogies, Brainstorming (as a form of organization).
Step 3. Designing an Abstract model of a Specific task.	Abstraction. On the basis of the data of the specific creative task one needs to design an abstract model of this task.	Sensitivity to contradictions; The skill to formulate contradictions.	
Step 4. Designing an Abstract model of a problem's solution.	Presentation of the ideal final result: • the object itself solves the problem,	The skill to present ideal systems with respect to certain objects' attributes.	Method "The gold fish", eurorithm, standard principles of imagining ("magicians", first of all universal magic), fantastic analogy.

	<ul style="list-style-type: none"> • negative effect is summarized with another negative effect and they obliterate each other, • the object doesn't exist, but its functions are carried out, • the situation changes so that there is no need to solve a problem at all. <p>Principles of combination of opposites (principles of solving contradictions)</p>	<p>The skill to use accumulated life experience, formulated in a form of abstract standart solutions.</p> <p>The skill to use the principle of combination of opposites or principle of solving contradictions.</p>	<p>Various types of analogies: empathy, direct one, fantastic one.</p> <p>Games intended for forming sensitivity to contradictions.</p>
<p>Step 5. Revealing the object's resources and coming up to a concrete solution.</p>	<p>Concretization of an abstract solution.</p>	<p>The skill to reveal the object's resources (absence of stereotypes for describing specific object in a specific situation).</p>	<p>Games intended for revealing resources, method of Robinson Cruso.</p> <p>Games intended for forming systematic thinking.</p> <p>.</p>
		<p>The skill to concretize abstract points.</p>	<p>System operator (system and group elavator), "Little Men" method,</p> <p>Methods of encoding the sense of fairy-tale plots using the situational game "Yes-No" (methods of T. Sidorchuk, N. Khomenko)</p>
<p>Step 6. Formulating subtasks, which are necessary to solve for realization of a suggested solution.</p>	<p>The use of a multidisplay scheme for evaluating the recieved decision and revealing subtasks which are necessary to solve for realization the selected conceptual decision.</p>	<p>To create a new text using the text of a solved problem.</p>	<p>Methods of encoding the sense of fairy-tale plots using the situational game "Yes-No" (methods of T. Sidorchuk, N. Khomenko)</p>
		<p>The skill to connect the solved problem with initial problematic situation.</p>	<p>System operator, games intended for forming systematic dialectical thinking.</p>

		The skill to determine cause-and-consequence relationship, to work with outer memory (the experience of the mankind: various reference information (card-indexes, data bases, books, etc.) and means of working with it)	Making up proverbs using ready-made models (methods of I. Murashkovski) Making up riddles using ready-made aids (methods of Nesterenko).
Step 7. Reflection	Verbalization (pronouncing) of realized process of solving.	The skill to introspect intellectual process.	"The different point of view".

The participants of a pedagogical club of TRIZ-teachers in Minsk, and also listeners of advanced training courses on the problem “Implementantion of basic programme of preschool education using means of OTSM-TRIZ-pedagogics” got acquainted with the above described approach. The preschool teachers picked out the following advantages:

- materials stimulate understanding the necessity of applying different instruments;
- the above described approach gives a system view of a didactic process in a nursery school and is a great help for working out long-term planning.