

Capabilities of training adult and children to elements of TRIZ in places of mass rest

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Introduction

The important task for the teacher of TRIZ is a search of own examples for an illustration of the basic statutes of this theory, accessible for his students to understand. In 1988, making patent searching on toys "Bob of toy", I have noticed that in many of them the Altshuller's Inventive Principles are used [1], and then began to create a card file of schemes on toys - inventions. The idea to create an exhibition of toys for training children and adults to TRIZ elements was born in 1993, when the information on Disneyland construction projekt in Minsk has appeared in press. I have thought, that when we collect at one place - at the constantly working exhibition - ALL toys, ever patented in the world, it is possible to create on the basis of these toys a Centre of TRIZ training. Belarus government rejected Disneyland construction projekt, but I continued my work on the idea to combine TRIZ training of children and adults with rest and entertainment [2]. "The Exhibition of toys - inventions" can be created in entertainment parks, for example, in Disneyland or Aquaparks. These organizations are interested in differing from other similar establishments by any "highlight". The training of creativity with rest at the same time can be interesting offer for them.

1.0. Connection of the theory and practice

During teaching activity on TRIZ training of kindergartens tutors, teachers of physics and engineers I created techniques of training to Altshuller's Inventive Principles and laws of technical system evolution with use of toys [3]. So the game technique of training children to Typical Principles of fantasy "TEREMOK" was developed [4, 5]. The own practice convinces me that training to TRIZ elements in the game form is really possible, but it is not sufficient. It is necessary to teach our students to apply TRIZ and to realize ideas in life.

Psychologists think: last years the problem of training of creativity, extension of creative capabilities people is considered as a most effective way of an active development of the personality. And a concept "creativity" is more and more often used in a more comprehensive sense: as the ability of a man to build his life more flexible, as a capacity to find alternate versions of the solutions of problems, as a capacity to achieve success in implementation of the ideas [6]. Professor of psychology and education from Yell University R. Sternberg believes that the successful creativity in life is not reduced only to ability to generate new ideas. He offers to develop at the people three various components of making successful self-realizations [7]:

1. Actually creative: skill to find new interesting ideas to leave for frameworks of the accepted norms, to see latent for other opportunity.
2. Analytical: ability to analyze and to estimate ideas to expect consequences of new ideas, to solve problems and to accept the decisions.
3. Practical: skill to realize ideas. Even the most magnificent idea is useless, while it is not embodied in the real world as the effective solution, while it does not bring the results.

TRIZ offers us ready tools to develop a creative and analytical components of success: Altshuller's Inventive Principles and Standards, 9-Windows, laws of technical system evolution. It is necessary "to add" a practical part and learn to realize ideas!

We propose to organize the special exhibitions - exposition of the toys - inventions for system realization of training to develop creative analytical practical thinking. They can be situated at places of mass rest of adults and children: DisneyLands, Aquaparks. It is necessary to create such an environment, in which every person can not only learn to develop the abilities, but also to realize the creative ideas. We can connect system resources of education, entertainment industry and venture capital for people training at the time of rest and entertainment.

2.0. Project "The Exhibition of toys - inventions"

2.1. We propose the following structure of an exposition of the exhibition. The exposition can consist of the following sections:

2.1.1. Thematic halls: on different kinds of games and toys; on effects lying in the basis of their action; halls of the firms-manufacturers of the patented toys. In these halls Altshuller's Inventive Principles and Standards, 9-Windows, laws of technical system evolution can be trained to. A guide should be an expert on TRIZ. Students of TRIZ schools, students of engineering and pedagogical high schools can work there. A guide should obtain that the students will think up an idea of a new toy, using Altshuller's Inventive Principles.

2.1.2. Hall of "Inventing Computers". Each toy, invented by visitors, can be at the time checked up on patent fund in this hall. While going through several sections of toys, the child with the help of a guide, prompting the further possible development of seen toys, undoubtedly will offer if only one idea of the own invention – a new toy. Special computer programs with help to check up, as far as this idea is new and is original. Other programs can help the child to see new opportunities of development of his idea (for example, "TechOptimiser"). Visiting of exhibition will necessarily give a child appreciable "material" effect ("the anchor") [8]. It can be original "Creative patent"-description of the idea, offered by the child, and its variants, colourfully made out on the firm form.

2.1.3. Library of Games. It is possible to receive on some hours any game there, available at the exhibition, or toy and to play in a hall with the friends.

2.1.4. Hall of Fairy Tales. The Fairy of tales work there. They teach visitors to compose fairy tales and fantastic histories with the help of Typical Principles of fantasy TRIZ A fairy tale, which was previously composed by the child, can be written down here in the computer, printed on a beautiful firm sheet and given to the author. TRIZ trained children can "work" the guides in this hall, as well as children from art schools. They can help the beginning author to illustrate his fairy tale, to learn to draw.

2.1.5. Creative Workshop. The Foremen - inventors work here, there are different machine tools, adaptations, materials at hand. With the help of the Foremen child can at once make a breadboard model of invented toy and to take away it home (and other copy of a toy remains at the exhibition). And it is possible to sign a contract with the Exhibition. It can be, for example, about manufacturing of several copies of new toys with the information on the author, using them for gifts on competitions or for the charitable purposes. Or it can be about realization of marketing researches of different idea direction, drawing up a business - plan, patenting the invention, manufacturing of a toy or sale of the license. Just such projects are mostly promoted by venture capital [9]. Students of engineering and economic high schools, managers of innovation funds can also work there in this hall.

2.1.6. Hall of the beginning inventors. The separate stand with photo of each author of new toy idea and breadboard model of a toy is carried out there. It will be important for the child to see new toys, thought up by him on his stand there. It is possible to carry out In this hall the international competitions on TRIZ for children, for example, "Ikariada".

2.2. Advancing on different halls, in each of them the child and adult not only think out new idea, but also MAKE the further steps on it realization: check on originality and novelty, receive "the creative patent ", "issue" a fairy tale and make a breadboard model of a toy, conclude "the author's contract ". Thus we acquaint the beginning inventor with that way, which he will have to pass on a road to his Worthy Purpose. The child will get acquainted to people, which will be useful for him to realize his ideas – patent-engineers, publishers, foreman, economists. And it is very important, that on each step he should receive psychological "reinforcement" both with material subjects ("patents", "issued" fairy tale, breadboard model of his idea, "his stand"), and with a positive emotional charge [8]. We hope, that visiting of such Exhibition can become a present for a child and his parents by "Meeting with a Miracle" and promote formation of own creative strategy of life [10].

2.3. We created a computer database from 1388 inventions – toys, patented in USSR, and studying the Altshuller's Inventive Principles, physical, chemical and geometrical effects, used in these

inventions. In some inventions a few of Altshuller's Inventive Principles are used at once. We revealed the interesting technical decisions, which cannot be related to one of 40 Altshuller's Inventive Principles. Now we continue the work on sorting toys on those, that can be used in the educational purposes for demonstration of Inventive Principles, effects, laws of technical system evolution, and those, that can not be used in this purpose.

To show a principle of their action we should make transparent breadboard models of these toys. Some kinds of toys can not be used for training to TRIZ elements at all. Practical all inventions in electronic games concern to the circuits of management, and it is impossible evidently and understandably for children show such technical decision.

2.4. We continue the work on definition of thematic halls contents. Each kind of toys is necessary to be situated in a separate hall (kaleidoscopes, "Bob of toy", "Yo-Yo", board games, puzzle, designers and other). The plenty of toys of one kind allows to take off people's psychological barriers. Having shown the child, for example, 30-40 "Bob of toy", 50-60 various kaleidoscopes, it is possible to induce him to ideas: "Everything, that there is - only small part possible"; "that there is, not necessarily best of possible"; "You too CAN think up a new toy". It is necessary to assembled in various thematic halls such toys, in which the identical effects are used. In analysed patents database we found toys, which can enter the "Magnetic effects", "Water effects", "Acoustic effects", "Optical effects", "Electromagnetic effects", "Geometrical effects" sections. It allows to organize special mini-rates of training to application of various effects for new toys creation. For example, having looked at application of optical effects in kaleidoscopes, tops, Yo-Yo it is possible with the help of a guide to try to apply them in other toys. And then it is possible to check up the idea - whether the invention it is - in a hall "of inventing computers" and to make it a breadboard model in Creative Workshop. Such arrangement of toys - on effects - can be applied to conduct school lessons on physics, geometry directly at the Exhibition. For children of more senior age, and also students and parents of children it is possible to carry out lessons on laws of technical system evolution, using an example of different kinds of toys. It is also possible to train students (teachers and engineers) how to carry out creative lessons, to teach TRIZ. For realization of training in the game form two kinds of techniques has been designed. One of them - with usage of fairy tales (for children from 4 years and adult) [5], and another one - with usage of toys (for children from 10 years and adult) [3]. Any visitor - both child and his parents with comprehensive or higher education - can find an accessible level of teaching for themselves at visit of the exhibition.

2.5. We assembled the card file of toys for the first hall. About 100 "Bob of toy" can enter there. Certainly, it is necessary to supplement our database by toys from USA, France, Germany and other countries of the world.

2.6. If we try to make provisional "the formula of the invention" for our project, it can look as "The Exhibition of toys, that distinguishes with filloing:

1. It contains ONLY toys-invention
2. It contains ALL ever patented toys-inventions
3. It is situated in a place of mass rest of children and adults
4. The toys are used for training to elements TRIZ
5. It gives possibility to train to skills of practical realization of the ideas".

3.0. Opportunity

Where it is possible to organize "The Exhibition of the toys - inventions"? In any city, where there is Disney-Land or Aqua-parks, and enough TRIZ-trained people. Certainly, the financial participation of the representatives venture capital is necessary.

The organization of training of TRIZ, creative analytical practical thinking in places of mass rest will allow, it is possible:

- To train effectively to TRIZ, methods of creativity in a game, entertaining form, joining training process with entertainment of adult and children.
- To extend a range of people, who are busy of their personal development, by the way of self-teaching a great deal of visitors of a Disney-Land or a Aqua-parks.

- To train students (teachers, engineers) how to teach people to TRIZ
- To organize creative workshops on manufacturing of toys, invented by the visitors.
- To organize marketing centers, teaching practically how to organize a venture corporations, how to produce and merchandise various toys, invented by visitors.
- To conduct cultural events to extend friendly contacts, inviting children and adult from all world to rest, train and participate in creative competitions.
- To use widely resources of entertaining organizations and venture capital for training people at rest to skills of successful creative self-implementation.

These capabilities can be interesting to organizations and teachers, who engage in learn TRIZ, and also to administration of entertaining organizations. We are ready to consider the organizing of such system of training with those people, who are interested in it.

The conclusion

What problems can arise? The increased creative abilities of the man - not always boon. The receptions of effective creative thinking have potential danger as the tool raising power that, who owns it. Any tool can be used for realization of the dangerous purposes. But, as the poet G.Herbert said, "If a brain is not sowed by cereals, it produces weeds".

Our world today sowed by weeds of evil. One of ways to salvage our planet - to learn children to create kind ideas, to learn children to realize these kind ideas, to learn children to change our world to better.

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