

Dare to think!

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Summary

The gap between school and real life is huge and it should be eliminated. We only need to figure out how. Our team – Association "Education for a New Era" – develops the concept and content of the New Education, which is focused on development of creative thinking together with the ability to see and to solve open problems. The main methodological basis of our works is TRIZ-pedagogy, which we enhance with a number of other world-known methods of finding new ideas and developing creativity. One of our major projects for today is the development and approbation of the course for extracurricular education "Dare to think!", which is a pattern of modern education.

The article describes the activities of the Association "Education for a New Era" and the course "Dare to think!".

Keywords: education; creativity; TRIZ-pedagogy; open problems.

1. THE CHASM BETWEEN SCHOOL AND REAL LIFE

The modern world is changing rapidly. The volume of information sharply increases; new scope of activities, new technologies, new specialties appear on a daily basis. The competences, which were considered as unique just recently, came to be in great demand. So, in order to be successful, a present-day person has to be able to:

- act in a non-typical situation;
- analyze huge volumes of information;
- make decisions and forecast the outcomes;
- quickly and efficiently insert themselves into unfamiliar areas;
- establish effective relationships with colleagues and partners;
- self-educate.

And surely, everybody needs to be taught to do this.

But the education system does not change. Or even if it is changing, it is doing that very slowly, often in the wrong direction. This mismatch between the demands of reality and what the traditional school teaches causes a lot of sharp contradictions. [1]

Thus, for example, the modern school is based on teaching specific data to students. But today data become obsolete very quickly, and its amount tends to infinity. Moreover, the Internet made any information very easy accessible so students lose their motivation to learn.

Another strong contradiction is that the real life problems are not similar to those solved in school. Real life problems don't have clearly defined situation and scope, pre-known "correct" solution, the only possible right answer (Figure 1). School doesn't teach how to solve real life problems.

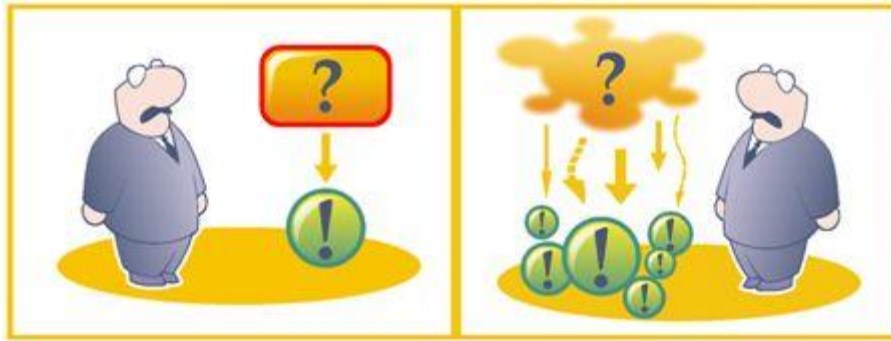


Figure 1. Closed (study) and open (real life) problems

Today many of education professionals consider the gap between school and real life as huge and agree that it should be eliminated. We only need to figure out how.

2. BREAKING THE ICE

We – the International Association "Education for a New Era" – believe that the solution of these problems is possible. But the society must perform a number of coherent steps to get there and the most important of them, in our opinion, are:

- popularization of new approaches to education in the society¹;
- making the children creativity development fashionable;
- teaching the methods of children creativity development to parents;
- training teachers, selection and motivation of the most creative and talented of them to master new technologies and new educational content;
- development, approbation and step-by-step implementation of patterns of extracurricular education.

Our team makes efforts to advance the situation in all these directions. This work will be briefly described at the end of this article. In the first place, we would like to focus on our actions regarding the last of the above-mentioned steps. Namely, on the development of a new extracurricular education course "Dare to think!".

3. DARE TO THINK!

Our course "Dare to think!" was conceived as an example of modern educational course for children. The course is based on our understanding that to be prepared for life in today's dynamic world children need to be trained in certain style of thinking, ability to see real life challenges and not to be afraid of them. The main methodological basis for our work is TRIZ-pedagogy, which we enhance by a number of other world-known methods of finding new ideas and developing creativity.

Surely, in order to teach children to think creatively and solve real life problems well, it is necessary to give them certain skills, concepts and algorithms of thinking. But children are bored to learn sheer theory, they don't understand what they need it for. We solved this contradiction by designing the process of education based on solving open problems [2]. An interesting problem, mystery, riddle – is always a challenge. Children always accept it with enthusiasm. But if the problem is not simple, it cannot be solved by trial and error method. At this time, the teacher provides the students with the tools they need for solving the problem. Thus, the learning proceeds enthusiastically, with passion and pleasure.

Solving of this and other contradictions led us to formulate several basic rules on which we rely during the development of the course "Dare to think!":

- hands on activities for at least 70% of the class time;
- lessons should be rich with interesting facts, they must surprise, inspire, motivate for self-improvement;
- knowledge is given only through solving open problem;
- all problems are taken from real life;
- student has wide freedom of choice, but also bears responsibility for it.

¹As an example of a right step in this direction we can cite the publication of 10 million copies of the book "The Learning Revolution" written by Gordon Dryden and Dr. Jeannette Vos in China.

Following these rules solves the problem of students' motivation, stimulates broadening of students' life experience, cultivates their self-dependence and fosters them to work together.

Having defined the purpose and the rules of the course let us consider its structure.

The course is divided into modules. A module is a number of lessons united by common main goal. For example:

- master the rules of working in group and the basic tools of TRIZ;
- learn to see inventive problems around themselves and to solve them;
- learn to ask questions correctly and precisely etc.

For each lesson we provide the teacher-coach with all required materials² as well as the guidelines. Moreover, as everybody knows, the environment has significant affect on formation of a personality. Therefore, in addition to the mandatory materials used in class, we give teachers motivating posters, which they can use to decorate the classroom or as gifts for students (Figure 2).



Figure 2. Motivating poster «We are creative»

The course lessons are mainly based on the following scheme: initial challenge – main activity of students according to the challenge – presentation of the results – theory – feedback – new challenge (Figure 3).

² didactic handouts, presentations, video materials etc.

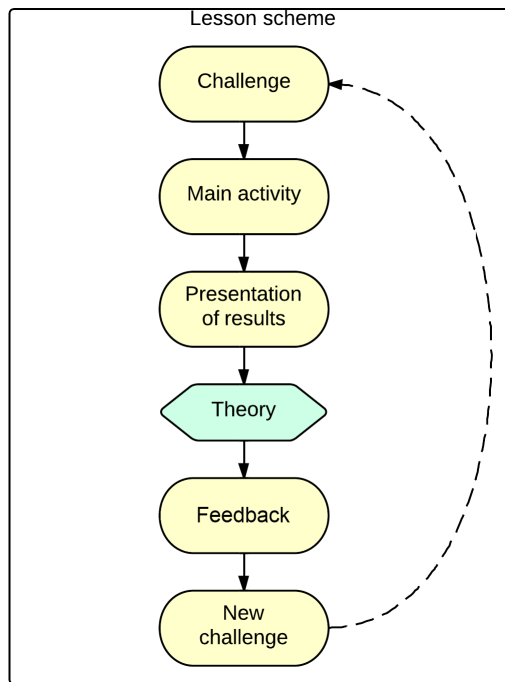


Figure 3. Basic scheme of a “Dare to think!” course lesson

Let’s consider this scheme in more detail:

1. A lesson begins with a challenge. It should intrigue students and dispose them to creative activities. A surprising fact, a mystery, an open problem, a bright experiment or a specially designed game can be used as a challenge.
2. After that students proceed to the main activity. They are being invited to solve an open problem (research or inventive) or a case from the history of science. Different kinds of activities are being provided: working in pairs, working in small groups, student debates etc.
3. Presentation of the activities’ results is also performed in a variety of formats: a business game, a presentation, an interview etc. The goal here is to involve all the students, not only those making a report.
4. If it is relevant in a particular lesson, the teacher introduces students to new theoretical knowledge, concepts and tools of thinking. They accomplish this based on the results of students’ work and learn how to use these tools and knowledge together with them afterwards.
5. By providing feedback students learn to give well founded assessment of their work, to identify its strengths and weaknesses. It also encourages them to suggest improvements and to proceed further. Feedback is carried out with the help of the teacher.
6. Finishing the lesson with a new challenge stimulates children to look forward to the next class period with impatience and gives them food for thought between lessons.

In our course "Dare to think!" we use problems from different subject areas: physics, biology, history, geography, literature, chemistry and just everyday life or industrial situations. It is often impossible to identify a single subject area of the problem or case because it is interdisciplinary. This approach makes students’ perception of the world more complete removing the artificial boundaries between the different fields of knowledge.

Example of such a problem:

The power of a swordfish.

How do fish and dolphins manage to move in the water with the speeds which are rather typical for flying in the air? A swordfish, for example, reaches the speed of 130 km/h according to some sources.

Scientists have made a model of a swordfish and dragged it on a rope behind a speedboat. The experiment has showed an incredible result! To develop such speed in the water, the fish needs to possess the power of a car engine ... But the fish simply doesn’t have such power!

So how the swordfish manages to reach such a high speed?

To solve this problem they need knowledge of physics, chemistry and biology.

Currently the work on the course is in the process. There are several finished modules that already passed approbation. There are modules that are in development now. And there are even more ideas that we want to implement in the coming years. However, some conclusions can already be reached.

Teachers who apply new learning technologies and teach the modules of the "Dare to think!" course become very successful. Many of them become leaders in their professional area. They begin training other teachers and sharing their experience; win teachers' contests, become a heroes of articles and stories in the media etc.

Children who have been taught "Dare to think!" course don't ask questions like "what is this physics needed for?". They perceive their life not as a sequence of events, but as a sequence of tasks/problems. They have respect for humanitarian and technical creativity and succeed in both of them.

4. EDUCATION FOR A NEW ERA

As we have promised in the beginning of this article, we will briefly describe the steps in the other directions which are taken by the International Association "Education for a New Era" for the modernization of the education system.

4.1. Publishing program

During the last 15 years more than 20 books were published by the authors of the Association. They include both collections of open problems for adults and children of different ages, and methodical guides for teachers who practice the development of creativity and innovative thinking. The books were published in the United States, Eastern and Western Europe and Asia, including the Republic of Korea (Figure 4).



Figure 4. Book-series "World 2.0" published in Republic of Korea

Book publishing contributes to promotion of new approaches in education, training teachers, raising interest to the creativity development in the society.

4.2. Seminars

During the past few years the specialists of "Education for a New Era" have conducted a large number of introductory and in-depth seminars for educators worldwide.

Today, while we continue to conduct specific educational workshops, our team is more interested in conducting large-scale programs for the modernization of educational systems in different regions of the world since they are most effective.

4.3. Certification programs for teachers

In order to carry out the selection and promotion of teachers trained by specialists of the Association, we have developed a multi-level system of certification. For example, to obtain a Level 1 certificate, a teacher should attend the training and then either provide the reports on using the learned methods in their work or pass the

exam. By now we have just begun to spread this system, but there are several teachers who have already received the certificates.

Such certification simplifies the selection of teachers for school administrators and parents. In addition, it motivates the teachers to practice the methods they had got during the trainings.

4.4. Distant learning courses for parents

In many respects the consciousness of a child, their world view and way of thinking are influenced by parents rather than an educator. Therefore at the moment we are developing a program of distant courses for parents focused on the development of children creativity.

4.5. Supportive computer applications

We have developed several educational computer applications that are intended to support the system of creative education proposed by us. They are distributed for free and can be used to train children both by teachers at school and by parents at home. We are in the process of translating this material into English.

4.6. «Creativity Bowl»

«Creativity Bowl» is a form of a team competition developed by the Association "Education for a New Era" [3]. During the competition the participants are offered to solve open (inventive or research) problems. These problems may have more than one right (preferred) answer, they require more creative thinking than erudition. The solutions proposed by participants are evaluated in "originality" and "practicality" criteria.

Creativity Bowl is an active and exciting competition. It is emotions and intellect all in one, a great tool to develop motivation for gaining knowledge.

Today the creativity bowls are held in many cities of Russia and several other countries.

5. SUMMING UP

We get grate feedback from the parents and teachers, who use our developments, materials and methods. This feedback strengthens and motivates us. So today we are making our efforts to extend our experience all over the world. We want to hasten the appearance of a true New Era in Education since we really believe that it is necessary.

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