Problem Management and Effective Education based on TRIZ

(Theory of Inventive Problem Solving)

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Jurmala – Rīga (Latvia)
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AIMS:
- a few useful things to bring back home & use in practice
- something useful & practical to use to home and share with my colleagues
- techniques for problem solving
- to see how I can teach some of these things to children + apply myself
- learn something I can share with my students so that they can use it
- learn how to solve problems, also those related to behaviour, being able to recognise problems

TRIZ Course. Feb 2012. Problems Proposed by Participants (not edited)

Problem 1
One of the problems that I am facing at school is the reaction of my colleagues towards specific pupils who have already shown difficulties in learning and cooperating with others. These pupils have inappropriate behaviour, never study at home, hardly participate during the lesson and have no motivation. Their parents are mainly farmers or workers at nearby cheese factories or even unemployed so some of them see themselves at the same position after a few years - some already help their parents with their farm and livestock. They believe that school has nothing to offer them, especially due to the economic problems that the whole country is facing, so they discredit teachers and the teaching process in general. The school is a rather small one situated in northern Greece, up in the mountains of Chalkidiki. There are only 56 pupils and 7 teachers daily at school. Except for me, the rest of the teachers have 10-25 years of experience in the field of education and have already worked for 5-20 years at that area. I am the youngest not only regarding my age but also my experience at a public school (only 3 years so far). When a problem with some of the above pupils comes up, there is a hesitation among colleagues how to deal with it. Most of the times there is a punishment, usually a reprimand or expulsion from school from one to three days. The problem is that this sort of punishment doesn't really seem to work with them, after one or two days they have the same behaviour and our life at school continues to be rather difficult. The problem, as I see it, doesn't only concern pupils. It also has to do with us, teachers, as no one is trying or even thinking of trying anything else. I get the impression that no one really cares enough. Expelling pupils from the lesson for an hour or a day makes life easier for that specific hour or day. But then what? Do we really motivate young people this way? Do we really try to understand the reason for all this behaviour? Do we try to find alternative ways to make things work? The question is who can suggest a different approach. Can I - as a younger teacher - bring up the matter? Can I suggest that we should try alternative, more motivating ways to approach these pupils? My experience in this school during the last two years has shown that only one or two of my colleagues would be willing to listen. The rest seem to believe that nothing can be done with these pupils except for severe forms of punishment and low grades. So where can this lead us?
Problem 2
How can we make the potential of extra ordinary students be active in the classroom? How can we increase their academic success, lead them to concentrate their lessons? For example, there are two students in my school who are very clever, they solve very difficult maths olympic problems but their lessons mark are very low. It is very interesting that they spent more times for one olympic problems when I was preparing them for maths olympic, however, they don’t follow the other lesson and maths lesson. As a result their maths marks are also low. I mean that How can we educate extra students efficiently with normal students in classroom, not in special place.

Problem 3
In Turkey we have approximately 30 students in each class. Our students have not got same type academic success. For example, some of them are very successful, some very lazy, there are very big difference. I mean that some of class are not homogeneous. Under this condition teaching maths lesson are very difficult. How can we overcome this difficulties and get good results.

Problem 4
As I have already told you I am a physical educator in a Multicultural High school. That means that we have students not only from Greece but also from Albania, Bulgaria, Georgia, Romania, Germany etc. The main problem is the creation of a safe multicultural environment because of the gangs that appears and want to prevail, mainly in the form of physical assault. One gang attacks to the other one, more often outside and rarely inside school. We are trying to built positive relationships among them using cooperative learning, or integrating them into school programs on human rights defence, acceptance of diversity, building friendships etc., but it doesn’t always seem to work. Also, we are dealing with the problem of bullying. I think that bullying is similar to any country. It can include verbal harassment, physical assault or coercion and may be directed repeatedly towards particular victims, on grounds of race, religion, sexuality, or ability. Last year we made a sort film on bullying with 15 students and we present them in each class of our school. The film followed a discussion. My sense was that students couldn’t realize the harm that they cause to the victim.

Problem 5
Certain children coming to school late in the morning, some very late.
Problem 6
Very poor attendance by some

Problem 7
Homework not being done by younger pupils (parents not making sure it's done).

Problem 8
Underachievement - parents and extended family of pupils do not work and have never worked. They live off social welfare and because they have large families, they may receive more money 'on the dole' than other smaller families where the parents do go to work. They don't see the need to work. Therefore, they don't see the need to work hard in school and get good grades to go to college to get higher qualifications

Problem 9
Attitude to change - all teachers in our school do not share the same level of enthusiasm to change in practices in education or any change in general. This can cause problems within staff relations. If some staff accept change and embrace it then it causes resentment between them and the other staff who resist all change. It can then become a 'them and us' us situation which is not good. We all want to do our job well but sometimes it can be made more difficult when all colleagues are not driving in the same direction.

Problem 10
Respect for the common good: to keep the school clean and no damage to structures and equipment

Selected problems:

1. Reaction of colleagues / willingness to change
2. Activity of extra-ordinary students
3. Underachievement: happy to be average
Lifelong Learning Programme
Programma di apprendimento permanente
The problem to which I have dedicated: N. 1

1.1

**How to get colleagues more involved in educational changes?**

At school there are two categories of teachers: those who like to get involved in new projects or methodologies, and those who are completely indifferent, “don’t care, never have time to spend on new things”.

What is that keeps the different ones from getting involved in change?

How could this situation change?

What should be done?
2.1 contradiction model (1)

Specific Situation restrictions

Working the old way

Reasons:
habits
lack of time
lack of desire and motivation

Element or its feature

Demand – 1

Because of ...

Demand – 2 (opposite to Demand –1)

Because of ...

Objective Laws of Nature

Working in a new way
(new methodology)

TEACHER
2.2.

E: An educational project

F: Indifferent teachers’ participation

Eager to join, will join

Uneager to join, won’t join

R1-: Extra effort extra time

R2+: Gain a new experience Learn a new teaching method Grow professionally

R1+: No extra effort No extra time

R2-: Miss the opportunity of a new experience Miss the opportunity to learn a new teaching method Don’t grow professionally

Desired Result:

R2+: Gain a new experience, learn a new method of teaching and develop in their profession

R1+: No extra-time, no extra-effort
2.3

**E: Project**

**F: teachers' involvement**

**Fully concentrated on the project**
(100% involvement)

**Total refusal**
(0% involved)

**R1- : conflicts and misunderstandings**

**R2 + :**
The project is done and educational change is initiated and shared;
Time and effort are shared

**R1 + : No misunderstandings**
No conflicts

**R2 - :**
The project is done, but educational change is not shared;
More time and effort for the problem solver

**DESIRED RESULT:**
It is necessary, with minimum changes to the system
(the project is done and educational change is initiated and shared, time and effort are shared) and <no misunderstanding and conflicts>
2.4

E: Project

F: teachers’ involvement

Fully concentrated on the project (100% involvement)

Total refusal (0% involved)

R1- : Negative flow directed on the problem solver

R2 + : Project done Educational change initiated Share time and effort

R1 + : No negative flow directed at the problem solver

R2 - : The project is done BUT educational change is not shared; More time and effort for the problem solver

DESIRED RESULT:
It is necessary, with minimum changes to the system <project done - educ. change initiated - shared time and effort> and <no negative flow at the problem solver>
### 2.5 RESOURCES

#### PHYSICAL RESOURCES

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<td><strong>Time</strong></td>
<td>48 h (2 a week/2 each)</td>
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<tr>
<td><strong>Space</strong></td>
<td>Teachers’ office without student + classroom with pupils → school</td>
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| **Substance**  | • Teachers  
|                | • Students  
|                | • Reference material                                          |
| **Energy**     | Oral and visual communication                                   |

#### OPERATIONAL RESOURCES

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| **Information**| • web page of Agency  
|                | • text book  
|                | • library book  
|                | • encyclopaedias  
|                | • wikipedia                                                  |
| **Function**   | • to prepare a presentation  
|                | • to inform colleagues and students  
|                | • to give/receive ideas  
|                | • to make a discussion  
|                | • to prepare the final report                                 |
Ideal Final Result (IFR): A basic definition of the IFR*: a useful feature should be obtained (or a harmful feature eliminated) without deteriorating other features (or producing harmful features).

Simplified pattern for IFR:
X-element, itself, without harmful side effects, eliminates
<to indicate the harmful action>
and keeps the ability to provide
<to indicate the useful action>.

* TRIZ dictionary

3.1

Ideal Final result: x-element, itself, without harmful side effects
Eliminates <teachers’ refusal>
and keeps ability to provide
<teachers’ eager participations>
Ideal Final result: x-element, itself, without harmful side effects
Eliminates <teachers’ refusal>
and keeps ability to provide
<active involvement>
Within <48 hours> inside <school>

Operation Time: 3 months per year/twice a week/two hours each → 48 hours

Operation zone: Reas School in Greece /teachers’ office (no students) and classroom (with students)
4.1

X-ELEMENT:

- eliminate teachers' refusal to participate in projects
- demand no extra time
- demand no extra effort
- give the chance to teachers for new experiences
- provide new methods of teaching

4.2

X-ELEMENT:

- colleagues can’t say “no”
- no extra time or effort required
- experiences: sharing

Operation time: within <twice a week>

Operation zone: inside <teachers’ office and classroom>
4.3
X-ELEMENT:

- colleagues stop saying “no”
- share time and effort
- no conflicts and misunderstandings
- educational changes implemented

Operation time: within <twice a week>

Operation zone: inside <teachers’ office and classroom>

4.4
X-ELEMENT:

- block colleagues’ refusal
- shared time and effort
- eliminate negative flow
- provide educational resources

Operation time: within <twice a week>

Operation zone: <teachers’ office and classroom>
2.6. Specific Situation restrictions

Objective Laws of Nature

- Fully concentrated on the project
- Teachers’ involvement
- Total refusal

**Reasons:**
- Project done
- Educational change initiated
- Shared time and effort

**Reasons:**
- Educational change not shared
- More time and effort
4.4

X-ELEMENT:

a) block colleagues’ refusal
b) shared time and effort
c) eliminate negative flow
d) provide educational resources

e) Operation time: within <twice a week>

f) Operation zone: <teachers’ office and classroom>

OBJECTIVE LAW TO BYPASS:

g) fear of anything that is new, unknown, and/or unpredictable

h) use resources to show the positive side of getting involved

i) share experiences from past projects