



# University TRIZ Education Program

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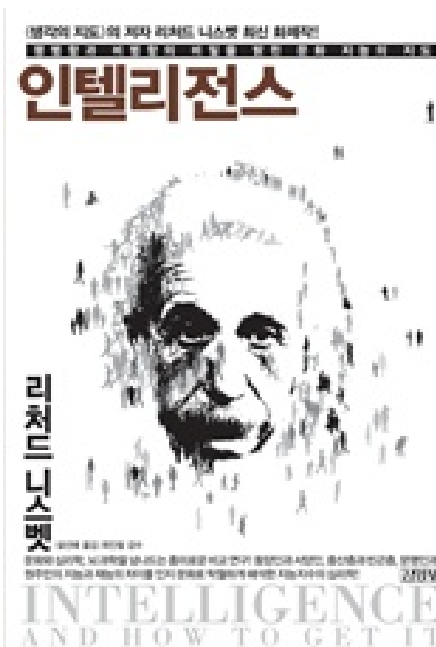
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# Introduction

## Richard E. Nisbett

Served as a professor of psychology at Yale University  
Chair-Professor, Theodore M. Newcomb University



**IQ is not the matter of genealogy, but of social environment and education**

He emphasized the importance of  
1) Integrated education system  
2) Problem solving education

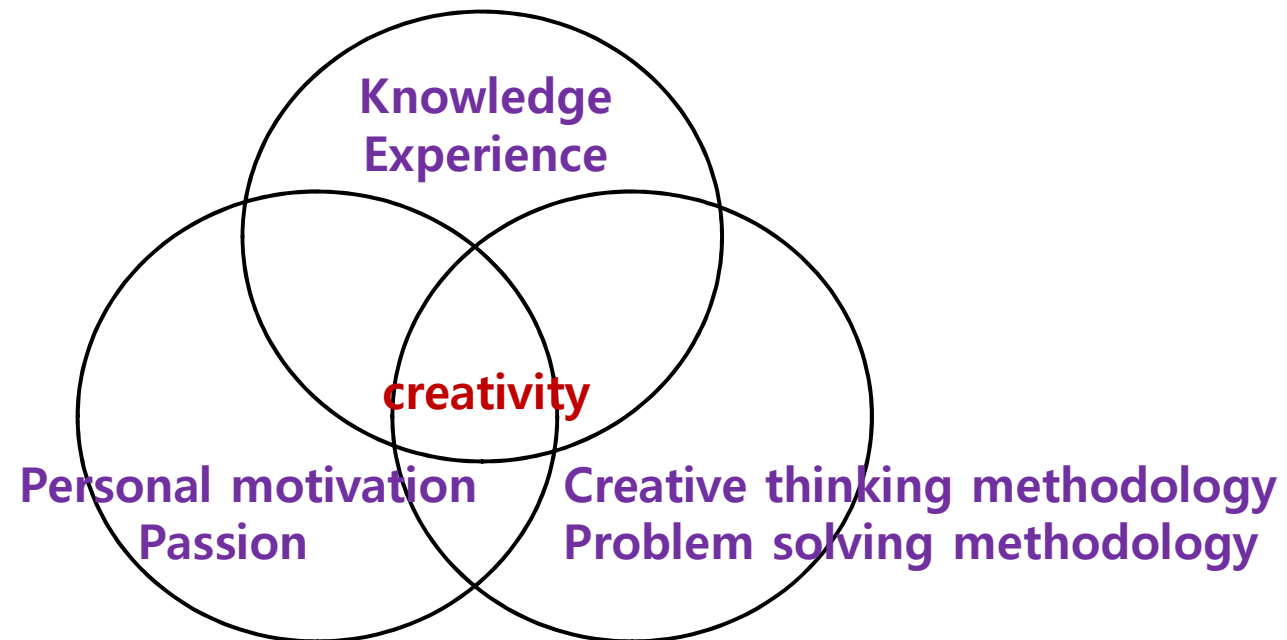
**PBL(Problem-Based Learning)**



**Howard Barrows (1928-2011)**  
Southern Illinois University  
School of Medicine

# Introduction – Creativity?

- What do we need to be creative/to develop problem solving ability ?





# Introduction - TRIZ?

# TRIZ

## Theory of Inventive **Problem** Solving

# TRIZ education program

- ▶ Development of creative thinking (DCT)
  - Creativity & Psychological Inertia
  - Classical (Aristotle) Formal Logic
  - Dialectics
  - Image Thinking (2,3 dimensional Imagination Training)
  - Method of Creative Imagination
  - Brain Storming
  - Focal Object Method
  - Morphological Analysis
  - Model of Small Smart People
  - Ideal Final Result
  - Diversion Analysis

# TRIZ education program

- ▶ Development of creative thinking (DCT)
  - **Classical Formal Logic**
    1. Law of Identity
    2. Principle(Law) of Sufficient Reason
    3. Law of Contradiction
    4. Cause-Effect Chain Analysis
  - **Dialectics**
    1. Good-Good game
    2. Bad-Bad game
    3. Good-Bad game
  - **Diversion Analysis**

# TRIZ education program

- ▶ Development of creative thinking (DCT)
  - To overcome Psychological Inertia/To generate New Idea
    - Methods:
      - Brain Storming
      - Focal Object Method
      - Morphological Analysis
      - Ideal Final Result(IFR)
    - Practice : Making “Innovation Products”

# TRIZ education program

- ▶ Development of creative thinking (DCT)
- Development of Creative Imagination
  1. Enlargement & Reduction
  2. Change of natural laws
  3. Image Thinking
  4. Chronoclasm
  5. Fantasia
  6. Prosopopeia etc.....
- Model of Small Smart People (Smart Dwarfs)
- Ideal Final Result (IFR)
- Practice : Write his/her own "Fantasia"

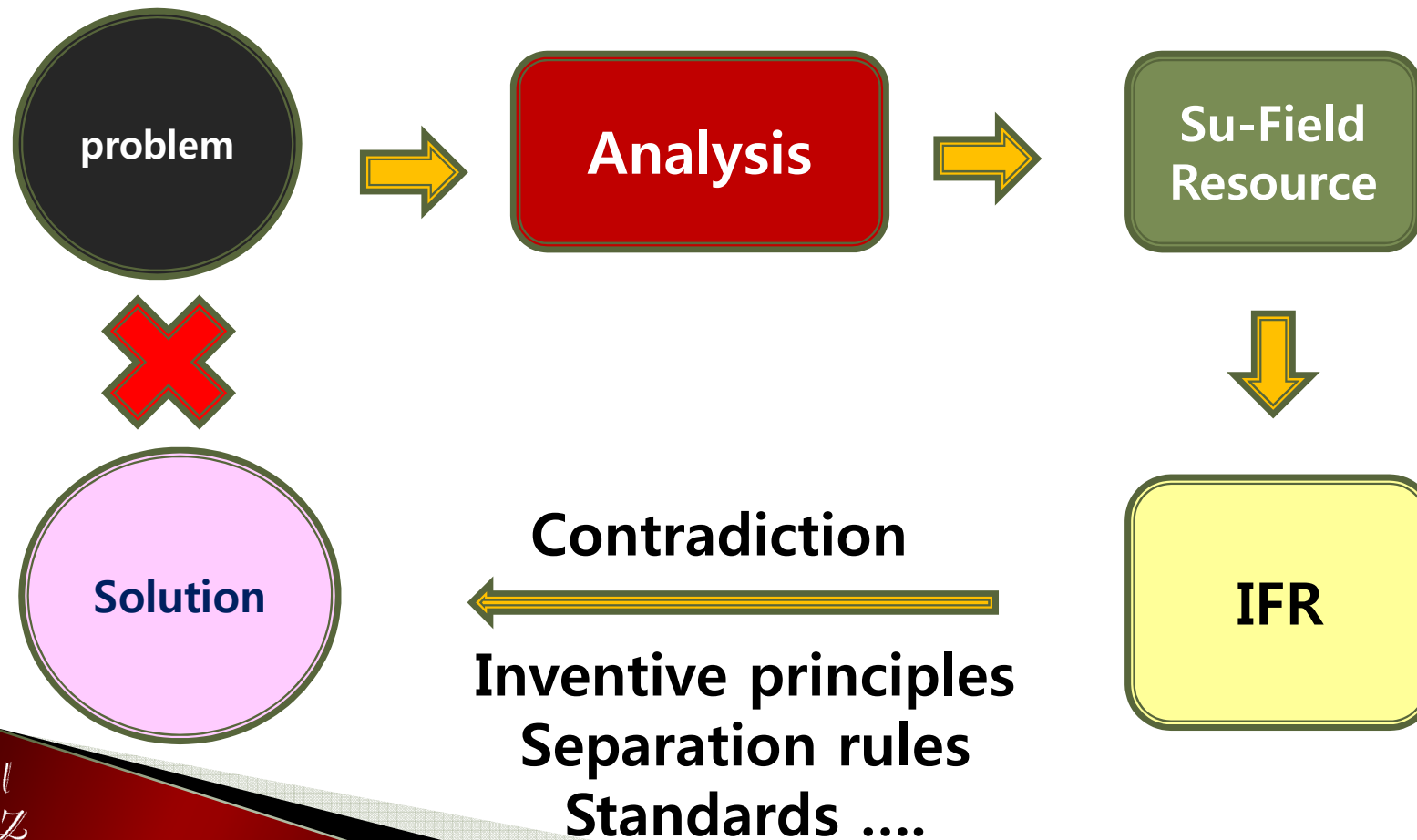
# TRIZ education program

## ▶ Inventive Problem Solving

- **Systematic Analysis Methods (multi screen thinking, substance-field analysis, function analysis, cause-effect analysis...)**
- **Resource**
- **Ideal Final Result (IFR)**
- **Contradiction (administration contradiction, technical contradiction, physical contradiction)**
- **40 inventive principles, separation principles, standards)**
- **The Trend(Law) of Technical System Evolution**
- **Algorithm – ADRIGE, ARIZ, ARIP**

# TRIZ education program

- TRIZ : Algorithmic/Systematic thinking methodology



# Students on-line conference

- **How to promote TRIZ Education?**
  - TRIZ is not popular subject
  - Not much literatures in Korean language and English  
(Much Good Russian literatures)
  - Need practices
- **International Students on-line TRIZ conference**
  - Economical
  - Motivation
  - Practice
  - Communication with Russian/foreign students  
(Korea Polytechnic University, Komsomolsk-na-omure State  
Technical University)



# Students on-line conference

- **Preparation**

Exchange visit (Prof. Song, Prof. Berdonosov)

TRIZ Education Program Exchange

Invitation Lecture(Prof. Berdonosov), Summer School

Making Conference Program

Preparation



# Students on-line conference

## ● International Students on-line TRIZ Conference

- Date : November 24, 2011
- Software : TrueConf (Video, Audio)
- Theme :
  1. The application of TRIZ to practical industrial problems
  2. The TRIZ application in non-technical problems
  3. The use of ARIZ to solve problems
  4. The use of 40 inventive principles to resolve technical contradictions

# Students on-line conference

- **International Students on-line TRIZ Conference**
  - **Professors and TRIZ experts attendees**

## Korea(6)

**Professor Song Yongwon**, Korea Polytechnic University  
**Professor Oh Chaegon**, Korea Polytechnic University  
**Dr. Kans Seunghyun**, Korea Polytechnic University  
**Dr. Han Youshin**, LG Electronics, Chief Research Engineer  
**Mr. Ivanov Igor Gennadievich**, Korea Polytechnic University  
**Mr. Bystritskiy Alexander Anatolievich**, Korea Polytechnic University

## Russia(6)

**Professor Berdonosov Victor Dmitrievich**, KnAGTU  
**Professor Kosmynin Alexander Vitalievich**, KnAGTU  
**Professor Eskova Anna Vladimirovna**, KnAGTU  
**Professor Sluchaninov Nicholay Nikolaevich**, KnAGTU  
**Professor Chizhiumov Sergei Demidovich**, KnAGTU  
**Malashevskaya Elena Anatolievna**, senior lecturer KnAGTU

# Students on-line conference

## ● International Students on-line TRIZ Conference

- **Students attendees(Korean : 6, Russian : 12 ):  
(5-7 minutes presentation, 3-5 minutes discussion)**

**Masko V. I.** Komsomolsk-on-Amur State Technical University

Using TRIZ in upgrading the cooling tower thermal power station

Scientific advisor: Sluchaninov N. N.

**Sycheva T. U.** Komsomolsk-on-Amur State Technical University

Systematization of the existing programming languages and prognosis of the emergence of new languages

Scientific advisor: Berdonosov V. D.

**Belyaev V.A., Kuznetsov D.S.** Komsomolsk-on-Amur State Technical University

Ship Thrusting by the Bending Oscillations of parts of a hull surface

Scientific advisor: Chizhiumov S.D.

**Parshina M. E.** Komsomolsk-on-Amur State Technical University

Methods of conflict resolution in the construction of an electric kettle

Scientific advisor: Malashevskaya E. A.

**Hong sa cheol.** Korean Polytechnic University

The evolution of "Display"

Scientific advisor: professor Song Yongwon

**Kwag tae sin.** Korean Polytechnic University

Application of TRIZ in CIGS Solar Cell technology

Scientific advisor: professor Song Yongwon

**Safonova (Mikhailova) A.O.,** Pochekunina K.I. Komsomolsk-on-Amur State Technical University

Usage of the wave energy on ships

Scientific advisor: Chizhiumov S.D.

**Glushkova O. I.** Komsomolsk-on-Amur State Technical University

The systematised representation of knowledges of a defined domain on an example of methods of one-dimensional optimisation

Scientific advisor: Berdonosov V. D.

**Shiryaev V. N.** Komsomolsk-on-Amur State Technical University

Modernization of system of a dust of preparation of thermal power plant

Scientific advisor: Sluchaninov N. N.

# Students on-line conference

## ● International Students on-line TRIZ Conference

### ▪ Students attendees(Korean : 6, Russian : 12 )

**Kozgevnikova V.I** Komsomolsk-on-Amur State Technical University

Solutions of a problem of impacts about water by the bottom of high speed crafts

Scientific advisor: Chizhiumov S.D.

**Park sang jin, Lee you ri.** Korean Polytechnic University

Problem Solving by ARIZ

Scientific advisor: professor Song Yongwon

**Kim min han.** Korean Polytechnic University

Application of 40 inventive principles in "Umbrella"

Scientific advisor: professor Song Yongwon

**Shavrukova N. N.** Komsomolsk-on-Amur State Technical University

Coping with the calcium sediments on the inner surface of the pipe of the secondary water to Khabarovsk CHP-1 with the help of TRIZ

Scientific advisor: Sluchaninov N. N.

**Sen N. D.** Komsomolsk-on-Amur State Technical University

The "GROWTH-CURVE" (S-CURVE) of system of RAM

Scientific advisor: Berdonosov V. D.

**Yaropolov Y.V.** Komsomolsk-on-Amur State Technical University

How can we prevent the collision of high-speed ships with obstacles

Scientific advisor: Chizhiumov S.D.

**Magola A. A.** Komsomolsk-on-Amur State Technical University

reducing the time to clean the shoes from the mud

Scientific advisor: Berdonosov V. D.

**Ahn hwang gyun.** Korean Polytechnic University

Application of 40 inventive principles in car industry

Scientific advisor: professor Song Yongwon

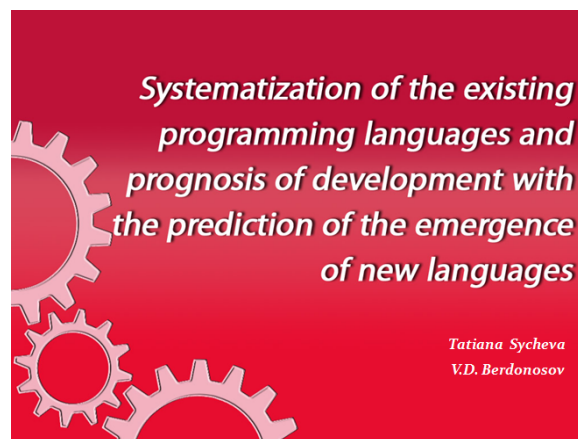
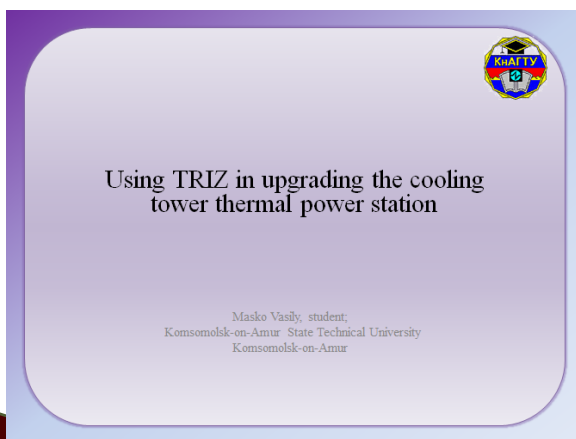
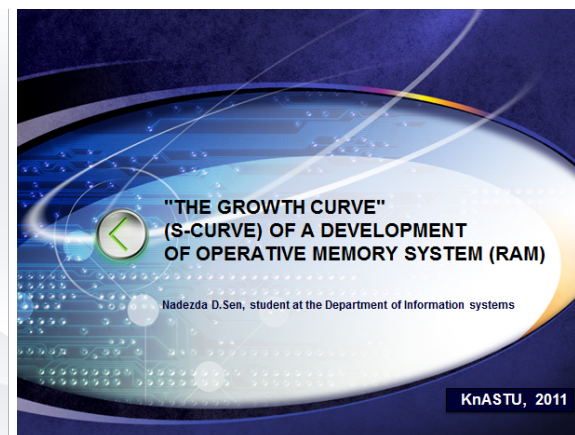
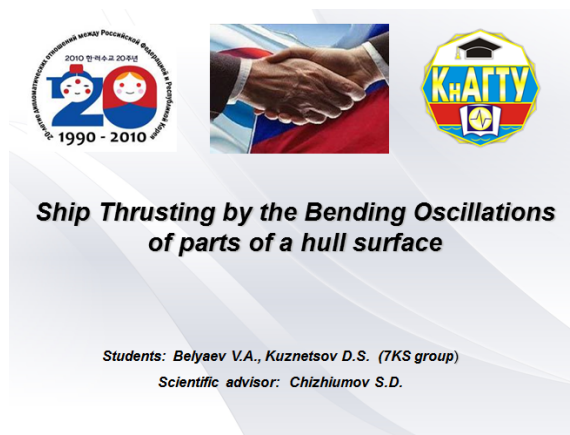
**Park yu ra.** Korean Polytechnic University

Application of 40 inventive principles in "bag"

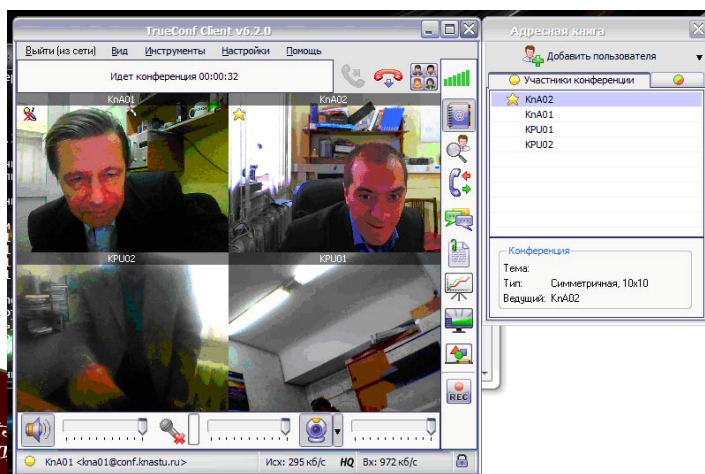
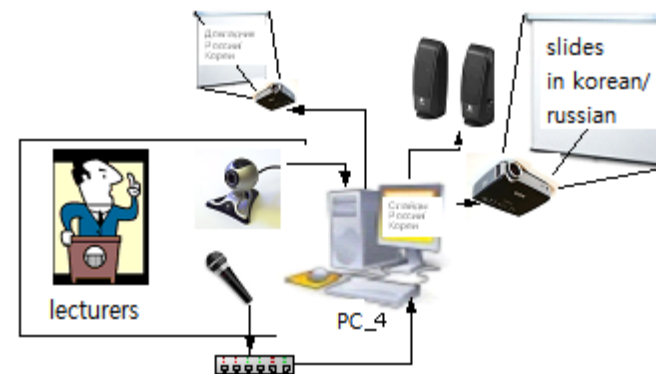
Scientific advisor: professor Song Yongwon



# Students on-line conference



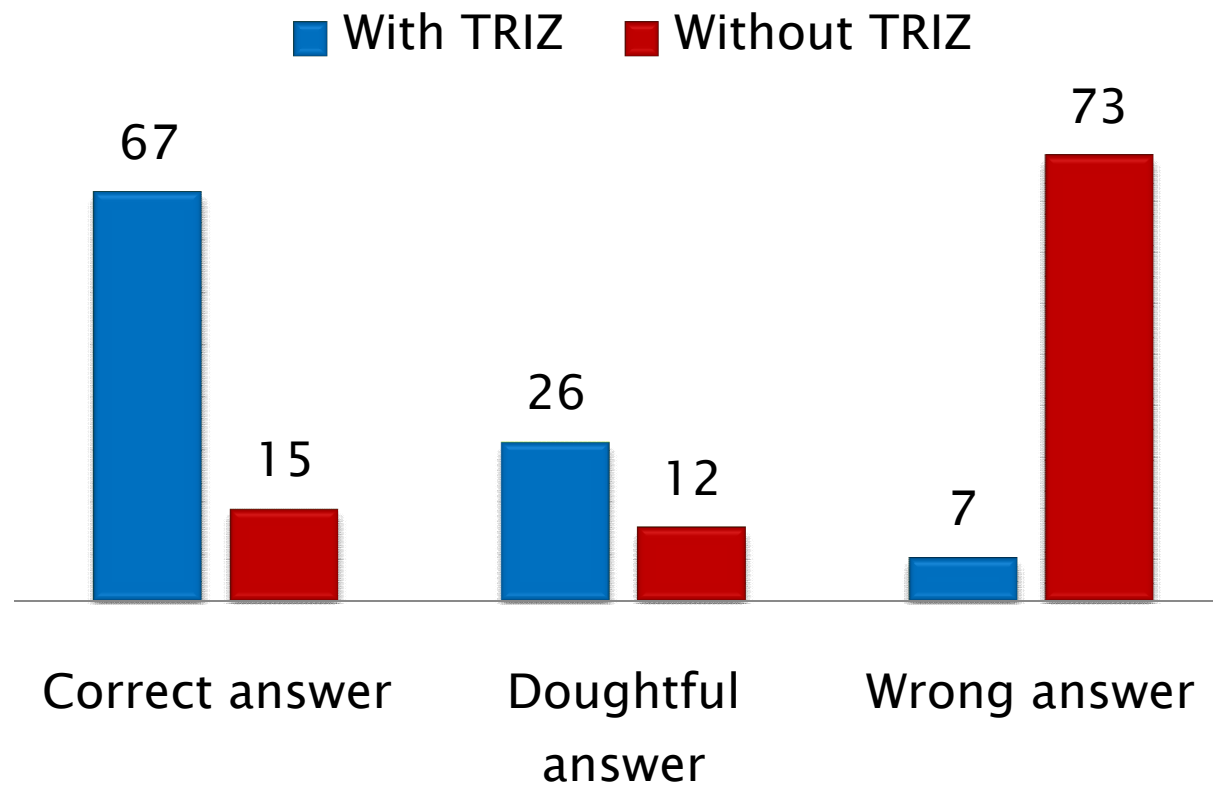
# Students on-line conference



GRIZ  
Conference 2013 in Korea

# Conclusions:

## The Result of Problem Solving





# Conclusions:

1. **Students perceived that their problem solving skills had been enhanced by the TRIZ course. TRIZ contributes very much to systematic and creative thinking and solving problems.**
2. **The International students on-line TRIZ conference strongly motivated students to learn TRIZ and solve problems using TRIZ.**
3. **We plan to expand this conference; Beijing Univ. of Technology, Harbin Univ. of Science and Technology, Northeast Agricultural Univ. (China), Ube National College of Technology (Japan)**