How to teach TRIZ thinking to teachers while saving the sinking Titanic?

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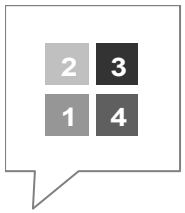
TRIZ thinking & sinking Titanic

- Motivation / key issue « more with less »
- State of the art / the Knowledge spiral
- **Experimental « rescuing all on Titanic »**
  - 1st step – context
  - 2nd step – model(s)
  - 3rd step – resources
  - 4th step – solution(s)
- Results & discussion
- Thanks & references



Motivation / key issue to solve

2012 prototype

- 1 high school
- 6 teachers
- 60 students

Challenge for creativity for innovation

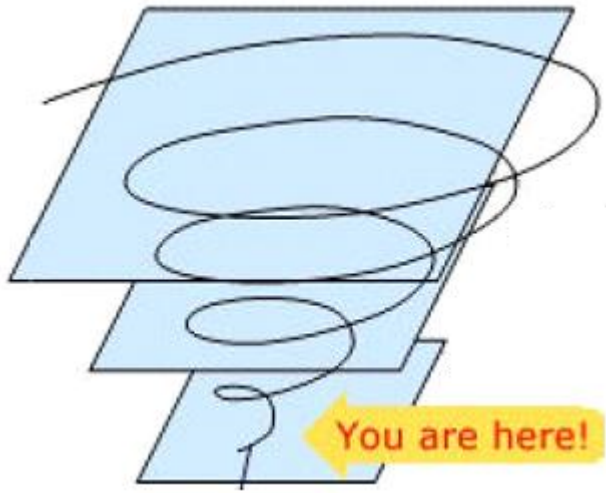
- 15 local groups
- Several good ideas

1st group at ETRIA

- 2013 experiment
  - 17 high schools
  - 24 teachers
  - 1,000+ students
- LESS time
  - Teachers' training
  - Teachers' practice
- No money
  - Students' travel
- ***What should be done?***

State of the art / the K-spiral

- Knowledge spiral
  - First described at ETRIA in 2008
  - Enriched by practice (industy, education) 2006-2013



- Knowledge spiral with 3 levels
  - TRIZ expert
  - Trained teachers
  - Learning students
- Challenge context
  - Groups' stimulation
  - Students' motivation
  - Everybody wins!
- 2D-radar evaluation

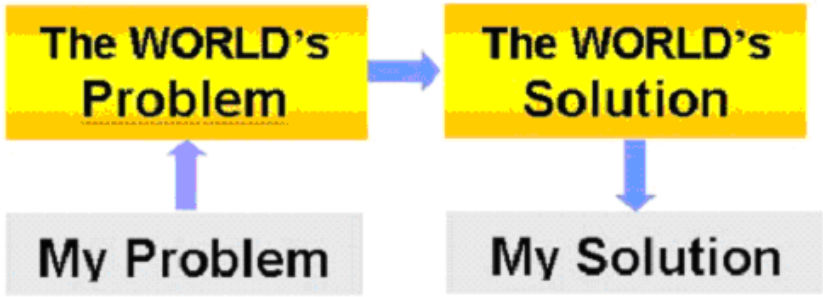
Experimental « context »

- TRIZ thinking, learning & practice
  - Training both teachers and their students
  - Introducing « classical TRIZ » methods and tools, for example:
    - Contradictions
    - Ideal Final Result
    - Available resources
    - Specific conditions
- Sinking Titanic as a creativity exercice
  - Well-known example (famous 1997 film, 1912 anniversary)
  - Easy to understand and to use for a wide variety of technical & cultural backgrounds
  - Efficient launching point with minimal preparation

Experimental « model » (1/2)

- TRIZ-related reading
  - Pedagogy of rupture
    - Fundamental research and technological developments
  - Duo teaching
    - Case study and creativity project
  - Relentless pace of innovation...
    - Evolution of technical systems

- 4-step TRIZ model
  1. Reformulation (problem to solve)
  2. Abstraction (looking for model of problem)
  3. Resources (re-use, value free resources)
  4. Specific conditions



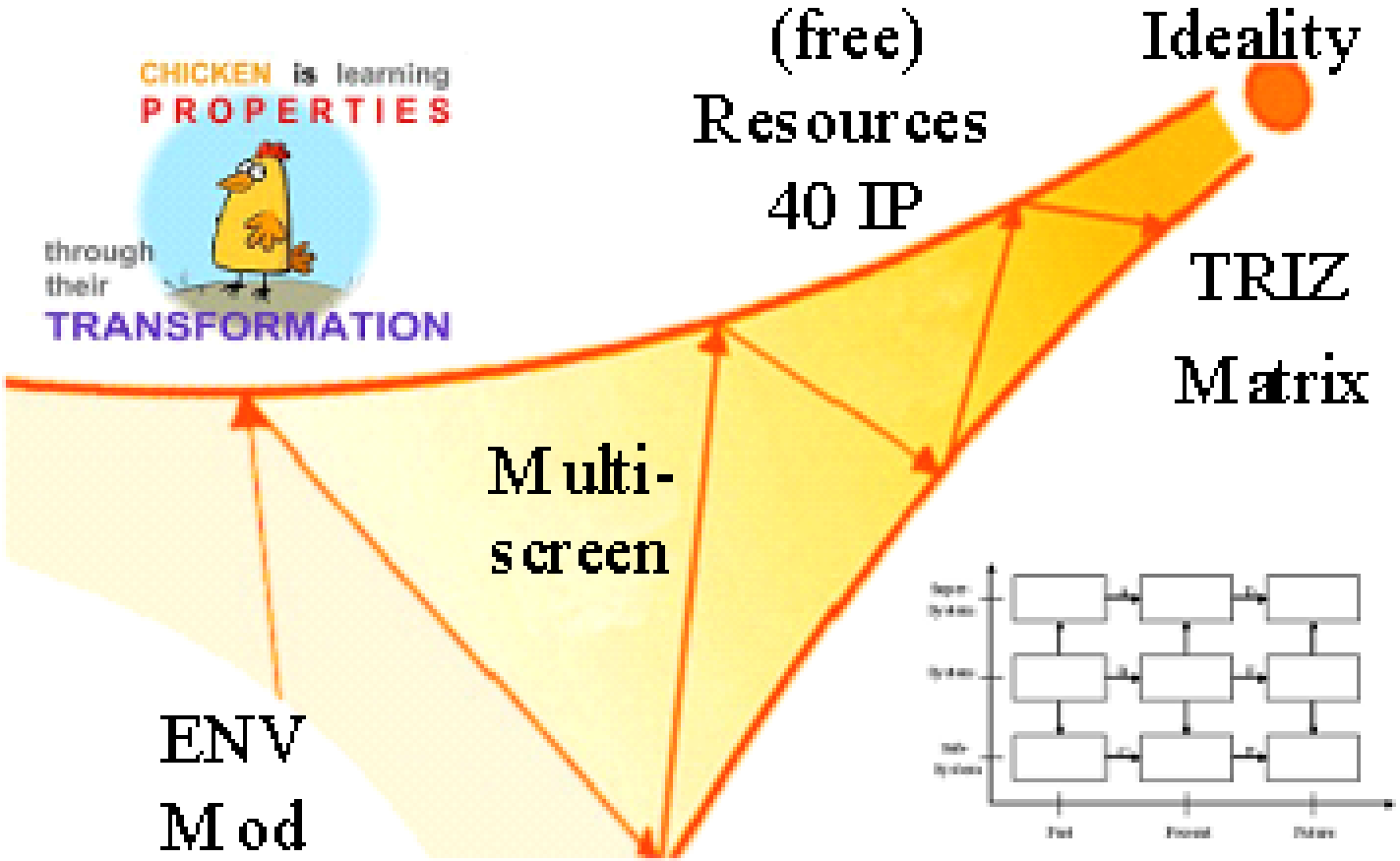
Experimental « model » (2/2)

- 2012 successful model re-used
  - Creativity workshop prepared & run within education time slot
  - Participants choose their problem to solve
  - No solutions listed in advance by the expert
  - 2D-radar evaluation allowing contradictory capabilities within a group of participants
- Titanic story added as a creative game
  - 2-hour workshop (same time as it took for Titanic to sink)
  - Participants feel the urgency of situation
    - It could be their story to rescue a group of people
  - Many problems to solve: organisation, technical issues, etc.

Experimental « resources »

- TRIZ methods and tools
  - 2-hour presentation delivered before the Titanic workshop
    - Ideal Final Result
    - Size-Time-Cost
    - Miniature men
    - Contradictions
    - Available resources
    - Laws of evolution
    - Etc.
- Titanic workshop management
  - Class of 24 teachers divided into sub-groups of 4-5 participants
  - Separated in different rooms + paperboard to draw diagrams
  - Follow the 4-step method proposed by the TRIZ expert
  - Write their conclusions

TRIZ methods and tools



Titanic workgroups (teachers)

Feedback and giveback

Team feedback

Most teachers felt comfortable with the workshop and length

Some even agreed that they enjoyed being the captain and possibly *saving ALL passengers*

at first they thought it was impossible

At least most teachers found TRIZ powerful

- Pre-defined rules
  - Wide scope of the problem to solve
  - Allocated time and team diversity
  - innovative evaluation (2D-radar)
- Best practices
  - Expert or trained teacher as « coach »
  - Methodology support

Early results & discussion

- At this point, a few trends are already clear
  - Approach accepted by 8 teachers, entirely voluntary
    - without reward, they gained new skills in both innovation and innovative educational approach
  - K-spiral extends smoothly, in addition to TRIZ tools
    - through teachers able “to live a risk” with students
    - innovation spirit transmitted by these “live models”
  - *Next step for these newly trained teachers is to play the game with their students, which is another story…*

=> complete results at 2013 TFC in Paris!

Stay tuned for next steps...

- ICSI 2013
  - Pascal Sire described

  "Lessons learnt in the introduction of TRIZ at IBM Corporation"
    - Busy professionals
    - Knowledge spiral
    - TRIZ community

- TFC 2013
  - Haeffele, Dubois, Sire will describe the full experiment & results
    - K-spiral 4th level
    - 8 teachers trained
    - 200 students
    - 1st group at ETRIA

Thanks & references

- Alsace region (FR)
  - Regional educational inspectors
- Lycée Blaise Pascal (Colmar, France)
  - High School Headmaster
  - Technical education manager
- Teachers & students
- Gilles Haeffele & Sebastien Dubois
- Ellen Domb
  - "Titanic TRIZ: A Universal Case Study" Altshuller Institute conference, May 2000
- Titanic film trailer
  - Atmosphere, human and material damage
- Titanic animation
  - Problematic situations without heroes and romance

Inventive Design Network's experts