Problem Posing and Solving for 100 schools

Short overview

- The purpose of the project : ***to innovate teaching of scientific disciplines*** in ***secondary schools (gymnasium),*** enforcing the ***problem solving approach*** in mathematics, physics, etc… and introducing ***Informatics as a curricular discipline***.
- Why this project (critical issues to be considered) :
  - Education is late to prepare students in fundamental Informatics knowledge
  - School's programs are still more focused on a theory-driven approach, while application to real world are still very limited
  - Lack of interaction among the different disciplines of curricula
  - To be prepared as a citizen acting in a computing-intensive world and to be prepared for jobs of the 21.st century, students must have a deeper understanding of computer science (digital literacy not sufficient)
- The main goals of the project :
  - Empower the informatics culture, introducing specific courses in a systematic way.
  - Promote an approach based on PP&S paradigm (i.e. make use of real world examples to develop the teaching of scientific disciplines by the "model, solve, simulate, verify loop")
  - Develop an integrated view linking together mathematics, logic, informatics
  - Enforce the informatics competences of teachers community : they have to play a fundamental role in accompanying the new way of learning
  - Not least, make use of the internet technologies in doing distance course, tutoring, assignments and (self) evaluation.

- The organization of the project : the first phase (2012/2013) covers about 150 teachers of more than 110 different secondary schools and 4500 students of the 3.rd year courses.
- Our approach : to introduce the Problem Solving methodology mainly in math and physics, with the use of robust software packages for :
  - Enhance the cooperation between teachers and students by means of a course management and distance learning platform : Moodle
  - Innovate the teaching methods adopting an advanced computing environment for symbolic and numeric calculus : Maple Suite (Maple, MapleSim)
  - Offer to students a way to test their abilities with on-line assignements and verification tools : Maple-TA
- The "story board" of the first year :
  - June 2012 : kick-off
  - July : first "trial seminar" for a small group of Teachers
  - September: full seminar (3 days) for 110 teachers with labs
  - November second seminar (2 days) for 150 teachers
  - September 2012 – February 2013 : teachers homework to setup courses material (Maple worksheet)
  - February – May 2013 : deployment with students
- Next steps :
  - Development and deployment of a module for "informatics principles"
  - Disseminate the PP&S methodology and tools to a broader basis of schools