About new methods of the youth's creativity competitions

Josef Molnár, Jaroslav Švrček
Palacký University in Olomouc, Czech Republic

Abstract

The young people's interest in Mathematics and Sciences has been on decline. What should be done to make these disciplines attractive and amusing for students? Grant and endowment agencies are announcing calls for submission of projects focused on the support of the interest in Mathematics and Sciences, competitions that look for and bring up mathematical, technical and science talents. We would like to mention two such activities in our paper.

Keywords: Exciting Materials and Methods in Mathematics and Science, mathematical competitions, gifted students, Mathematical Duel, Mathematical and Science Kangaroo, Middle European Mathematical Olympiad, Tournament of Towns, Young Inventor.

Young people's interest in Mathematics and the fields of sciences has been on decline. This is confirmed by a considerably small number of applicants for studies at the faculties offering studies of Mathematics, Physics and Chemistry as well as at technical universities all over the Europe. What are the causes of such a situation? What should be done to make these disciplines attractive and amusing for students? (Perhaps not completely seriously-meant proposal sketches in the overall situation: Math teachers should look sexy.)

Grant and endowment agencies are announcing calls for submission of projects focused on the support of the interest in Mathematics and Sciences, competitions that look for and bring up mathematical, technical and science talents. We would like to mention two such activities in this paper.

The first one is the Socrates-Comenius project *Motivate Me – Motivating and Exciting Methods in Mathematics and Science* which unites a group of people pursuing the fields of didactics of Mathematics and sciences from Austria, the U.K., Slovakia, the Czech Republic and Italy. By this project, the solvers follow up with the preceding one entitled *Promote MSc. – Provide Motivation through Exciting Materials in Mathematics and Sciences,* which has been successfully concluded and within which a number of materials for the direct support of teaching at secondary schools have been made. At present, these materials are being tested to verify the attractiveness and efficacy of the selected teaching method for pupils and students in the project solvers' countries.

The second activity lies in a project of the Palacký University Olomouc that has been approved by the Czech Ministry of Education within the call *National Program of Research*. The title of this project represents the project's main focus – "*Research of new methods of the youth's creativity competitions aimed at the motivation to scientific research activity in the field of natural sciences, especially Mathematics, Physics and Chemistry*". While creating this project, the Palacký University staff searched for attractive forms of working with youth in

the area of competitions and they have focused on the following areas: **Science is fun** – a team competition in the form of natural science groups (clubs) concluded by a presentation of results at a final competitive conference. **Science Kangaroo** – a competition derived from the popular international competition Mathematical Kangaroo containing questions as well as the creative tasks from Mathematics, Physics, Chemistry, technique and foreign languages. **Science in air** – an interactive competition for individuals as well as groups realized through the internet bring amusing and illuminating tasks from Mathematics, Physics and Chemistry. **Having fun with Nature** – popularization of natural sciences in the form of one-shot events as, for example, the "Fair of Physics-Mathematics", the "Summer School of Young Chemists, Physicists and Mathematicians", the "Run with a Kangaroo" etc. The **Tournament of Towns** – a gradual involvement of the Czech Republic in the international competition suitable for class teams which can even be combined from a number of different schools. **Middle European Mathematical Olympiad** – MEMO in the region of middle Europe. Further it is the **Mathematical Duel** – 16 year old math competition for gifted students of three grammar schools (GMK Bílovec - CZE, BRG Kepler Graz – AUT and I LO Chorzów - POL) and **MAKOS (Autumn School of Care of the Math Talented Ones)** – annual meeting of teachers and other people who take care of math gifted students. **Play with Mathematics** – simple mathematics competitions and projects within a classroom or a school (multiple-stage competition of individuals and groups) for elementary schools ("junior" high schools – those having more years of study due to the fact that pupils go there earlier than usual, i.e. from the 6^{th} grade of elementary schools), where the disabled pupils can also participate. The **Young Inventor** – a creative contest requiring a participant to work actively with a set of input data (so-called Fermi's problems) or creating a new reality (Inventor). The **Scholar** (**Scientist**) - a modification of the well-known Student Scientific Work. A Secondary-school student collaborates with a university teacher – a scientist. S**cience from "High Perspective"** – student scientific contest taking place at universities in the form of a scientific conference. **Chemical workshops** – unusual competitive Chemistry workshops – innovative form of teaching and its pedagogical assessment.

Examples from the competitions mentioned can be found on the below mentioned web-sites (and will be shown at the presentation).

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