How the F1 in Schools competition affects the teaching of math and science

Eng. Abdelkhaleq Shboul

The main goal of this presentation will be to show the effect of science competitions on the learning and teaching of math and science, using F1 in Schools as an example. The F1 in Schools challenge is an international competition for school-age children to design and race CO_2-powered scale-model open-wheel racing cars, using computer-aided design and computer-aided manufacturing technology. The competition takes place at the regional, national, and international level. This presentation will concentrate on how the competition will affect the teaching of math and science.

F1 in Schools:
The Formula One Technology Challenge

Supervisor: Eng. Abdelkhaleq Shboul

F1 in Schools and Its Influence on Promoting Mathematics and Science

Formula One in Schools, or F1 in Schools, is a program offered by the Center for Excellence at the Jubilee Institute of the King Hussein Foundation. A competition that challenges students' skills and abilities, F1 in Schools promotes their learning and their interest in mathematics, science, computer science, and engineering.

Vision
Empirical research has confirmed that the involvement of students in scientific and pragmatic challenges and competitions leaves a great impact on the students. Such competitions

- improve the students' grasp of various scientific theories and laws.
- help raise the students' performance in science.
- promote the students' thinking skills, scientific creativity, and problem-solving abilities.
- guide the students in their choice of university majors and future professional specializations.

International F1 in Schools Competition
The Formula One Technology Challenge is an international student competition supervised by Denford Ltd, and aimed at students between the ages of 9 and 17. Andrew Denford started the competition experimentally in the United Kingdom (UK) in 1999, becoming a national competition in 2000. In 2001, it spread into six regional contests in the UK and finally became an international competition. The program started with 11 countries participating in 2003, and by 2009 students from 31 countries were competing.

National F1 in Schools Competition
The Jubilee Center for Excellence/King Hussein Foundation is the organizer of the F1 in Schools national competition in Jordan. The first competition will be held on April 16, 2011. The Center

1. will be meeting all of the participants' needs, from providing essential tools and meeting with and training coaches regularly to offering laboratory facilities during preparation time.
2. The Center will be organizing the competition in accordance with international regulations and will be nominating candidates and helping prepare teams for international participation.

How Will Students Benefit?

The following are among the benefits that students who participate will receive:

1. Training in sharpening their thinking skills and in solving problems.
2. Enhancing their group work skills, teamwork, and social relations.
3. Improving their grasp of scientific matters.
4. Becoming familiar with the practical aspects of science, mathematics, and engineering.
5. Participating in international competitions is an experience that contributes to improving their scientific and technical standards and reinforcing their spirit of creativity and their achievement in science.

Stages of the Competition

Step 1: Thoughts and ideas

The team members brainstorm to determine the specific sciences—physics, mathematics, computer science, etc.—that they will employ to meet the challenge.

Step 2: Analysis

The team members analyze the ideas presented during brainstorming, determine which ones will progress to the design and production stages, and take on responsibilities for realizing the latter ideas.

Step 3: Design

The vehicle to be designed must contain the following elements:

- Airfoils
- Wheels
- Chamber housing CO_2
- Side pods
- Virtual cargo
- Tether line slot

Step 4: Production

In this stage, a suitable design program allows work on the Computer Numerical Control (CNC) which operates with both programs through computer-aided design (CAD) and computer-aided manufacturing (CAM).

Step 5: The contest

The challenge is in more than one domain:

- Research
- Design
- Speed
- Teamwork
- Other areas designated by the organizing committee