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Region 4 and the Southeastern Michigan Section Help Foster STEM With Robofest PACE Project

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IEEE Region 4 and the Southeastern Michigan Section have been supporting the autonomous robot competition called Robofest since 2004, by sponsoring IEEE medals for Robofest participants and providing volunteer judges and mentors.

For the region and section, participation in Robofest is a PACE (Professional Activities Committees for Engineers) activity. While many PACE activities involve seminars on topics such as career enhancement, employment assistance and professional development, precollege education projects like Robofest also receive funding.

Robofest aims to inspire interest in science, technology, engineering and mathematics (STEM) among precollege stu-

Robofest participants, spectators, judges and mentors await the start of the competition.

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dents through robotics. Since 2000, more than 10,000 students have competed in Robofest, including teams from the United States (13 states participate), England, China, France, South Korea, Mexico and Singapore. Of the 496 teams that participated in the 2011 season, 67 advanced to the Robofest 2011 World Championship.

Robofest makes the competition affordable, effective and accessible to a wide range of students, without compromising educational quality. Robots are expected to be programmed to sense and respond intelligently in a dynamic and partially unknown environment. There are no restrictions on the brand of robot kit students may use, and any programming language is allowed. Furthermore, the playing field materials are reusable, affordable and modular, as well as easy to construct, transport and store.

Using data from Robofest 2011, the Robofest office compared math performance between fourth- to twelfth-grade students who participated in Robofest, and those who did not. A pre-competition assessment included 164 students who would participate in Robofest, and 47 students who did not participate (the control group). The post-competition assessment included a subset of the students who took the pre-assessment: 51 Robofest students and 40 control students. The pre- and post-competition assessments were multiple-choice tests of 15 similar math questions. Robofest students' mean scores on the test improved from 7.19 pre-competition to 7.94 post-competition, while the control group's scores decreased slightly. This data suggests that participation in robotics competitions can help improve STEM scores.

A long-term goal of Robofest is to provide a highly qualified future STEM workforce. In April 2011, the Robofest office

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conducted a survey to find out how many of its participants between 2003 and 2011 have pursued, or are planning to pursue, STEM careers. Of 51 students who responded to the survey, 84 percent indicated they are currently in, or are planning to pursue, a STEM career. Data, obtained from 32 parents who responded and had 38 students involved in Robofest, showed that 74 percent of their children who participated in Robofest were majoring in, or were planning to major in, a STEM field—well above the national average. This data suggests that participation in robotics competitions can also provide a pipeline for the STEM workforce.

Tell us your thoughts by clicking on the COMMENTS tab below.

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