

by Tom Gordon

Robots to the Rescue ... of our Children's Future

Educational Robotics Comes of Age

Students face a world in which competition and technological change are accelerating at an unprecedented rate, and many traditional career paths are or will become obsolete. Because of this, the Robotics Educators' Conference at Butler County Community College (Butler, PA, on August 6 through 8) brought together academic and business leaders to share ideas and strategies for bringing education into the 21st century.

"How do we prepare our workforce to compete globally?," asked Robin Shoop, director of Carnegie Mellon University's (CMU) Robotics Academy. "Studies by the U.S. Department of Labor Workforce Investment Boards suggest that the five fastest-growing career paths in 2015 haven't been invented yet."

[Preparing for a career today]... "is like training for the Olympics and not knowing which sport you'll be competing in," writes Thomas Friedman, author of "The World is Flat."

Among learning scientists, a consensus has emerged that the one thing that will not work is the traditional, lecture-based model of education still used in most American classrooms.

Studies by the University of Pittsburgh's Learning Research and Development Center (LRDC) reveal that children need to contextualize math and science to learn effectively and that robots help students to make cross-discipline connections by contextualizing science, technology, engineering and mathematics (STEM) learning and providing the kind of "soft" skills modern industries are looking for. They advocate an



Robin Shoop (right) confers with attendees.

inquiry-based learning model in which teams of students work on realistic projects.

"We aren't trying to create roboticists," says Shoop. "We're trying to use robots to teach students to become team-based problem-solvers. Robots serve as the hook. It's 'hard fun' that kids find engaging."

"You've got to be able to learn how to learn," writes Friedman. "It's not what you know, it's how you learn."

Highlights at the conference included a discussion of the Robot Algebra project. This is one component of a much larger STEM Curriculum Continuum project that is being jointly developed by CMU, the University of Pittsburgh's LRDC and a consortium of

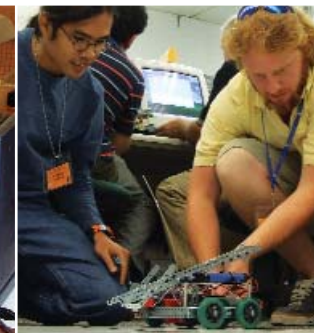


John Bares



industry, government, foundation and education partners. All are committed to improving both the quality and the quantity of students pursuing science, technology, engineering and mathematics (STEM) careers.

Robotics is already being used as an organizer to teach STEM competency in thousands of schools; initial research has shown that although there are many opportunities to teach STEM, many teaching moments are missed. The Robot Algebra (RA) project will develop a



set of classroom teaching tools and seek the best ways to implement them. It will ground mathematics in robotic activities to better prepare students for careers in science, technology and engineering.

KEYNOTE SPEAKERS

The conference's keynote speakers were Red Whittaker, the Director of the Field Robotics Center and Principal Scientist of the Robotics Institute, and John Bares. Earlier this year, Whittaker guided CMU's Red Team to victory in the DARPA Urban Challenge, and Bares is the Director of the National Robotics Engineering Consortium.

The Robotics Educators Conference featured a wide range of speakers from the robotics industry and academia. There was also a series of classes designed to introduce and familiarize educators with software languages and hardware platforms that they can use to introduce robotics to their classrooms. Classes included instruction in the newly developed ROBOTC programming language and the new and old LEGO MINDSTORMS languages.

The classes also examined and participants learned more about the multimedia CDs that are already available to teach robotics. These include the Vex Curriculum, Introduction to Mobile Robotics Volumes I and II, and the ROBOTC Curricula for LEGO MINDSTORMS and Vex. ©

Links

Carnegie Mellon Robotics Academy, www.education.rec.ri.cmu.edu

For more information, please see our source guide on page ____.



Red Whittaker