

Project Information

Please tell us about yourself and give us a brief abstract of your project.

Name of Project Advanced Robotics Intensive

Type of Project (e.g., Professional Development) K-12 Outreach Program (w/Professional Development for teachers/coaches/mentors)

Project Manager:

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PreK-16 Regional STEM Network affiliation (check one): xx Central

Description of Project: Quinsigamond Community College (QCC) has promoted robotics programs in the Worcester Public Schools since 2002. Starting with a summer camp and then a middle school after-school program, QCC has utilized a variety of approaches to robotics. In 2007, QCC was one of only four institutions in the state to receive a one-year grant (\$139,000) from the Microsoft Foundation's U.S. Partners in Learning Initiative to create our Advanced Robotics Intensive (ARI) program. Now, a total of 750+ students participate in the program each year, including 200+ from elementary, 250 from middle and 300 from high school. ARI introduces students to many STEM topics at one time (engineering, electronics, physics, computer programming, technical math such as gear ratios, etc.), providing math and science enrichment and the real life experiences of teamwork and innovation. ARI takes place over the course of two 12-week semesters. Predefined activities take place in a project-based environment at each school. Students participate in "kick-offs", practice sessions and competitions at QCC, which provides them, their parents and WPS instructors the opportunity to tour QCC's technology labs and view robotics in action. All schools work on a unique challenge (i.e. a series of "obstacles" on a game board). Teams pair up to compete, which fosters an awareness of others, collaborative innovation and strategy. Currently, ARI uses the economically priced, reusable and transportable VEX Education Platform (VEX Robotics Competition), which makes after-school robotics accessible for large numbers of students. In addition, select schools utilize the VEX Pro (FIRST Robotics Competition) or the WPI Savage Soccer models. In summer programs, QCC often uses less expensive/less functional robotics platforms such as WAO, Parallax, Lego, or Sumo. It is anticipated that several WPS high schools will participate in a short-term summer underwater robotics program that utilizes existing VEX components.

Each student receives 100+ contact hours of STEM activities per semester, which include: (1) weekly "hands-on" application of STEM concepts (from structural and mechanical engineering, electronics and computer programming to robot design, construction and operations) using a high-tech robotics-focused curriculum; (2) student competition in local, regional and potentially national/international robotics tournaments; (3) students designing, constructing and programming their own robots; (4) visits to local companies, agencies and colleges; (5) guest lectures by industry experts; (6) college prep services and programming; (7) community service activities; (8) students sharing/discussing their work on a safe project web site; (9) professional development for WPS teachers; (10) incorporation of 21st century skills necessary to compete in the global marketplace; (11) open houses and other social events for friends, family and other teams; (12) students conducting "show and tell" at elementary schools; and (13) on-line access to the curriculum.