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# Increasing High School STEM Participation Through Robotics Training and Tournaments (INTERIM REPORT)

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# **Provost's Thinkfinity Grant Interim Status Report**

## **Increasing High School STEM Participation Through Robotics Training and Tournaments**

Cornerstone II: Community Outreach and Empowerment  
through Service Learning and Volunteerism

**Principal Investigator: Richard Kline, Seidenberg School**

**June 1, 2010**

### **A. Review of Project Objectives and Expected Outcomes**

The initial proposal contained a clear set of expectations and goals for the scope of the work to be done. The overall goal was to excite area high school students in science and technology through the design, building, and programming of robots which they use in international competitions, and to bring them to several such events held at and run by Pace University. We planned to accomplish this by becoming an official Affiliate Partner of the FIRST Tech Challenge robotics competition, a fast-growing program which had more than 1,100 teams participating in 2009-2010.

Objectives:

- To increase the student interest in science and engineering (the STEM fields) in high schools throughout the Lower Hudson Valley area and beyond.
- To improve technology and science education in the 9<sup>th</sup>-12<sup>th</sup> grades.
- To have the Pace University community reach out to prospective students interested in technology. The community includes alumni, advisory board members, and corporate partners.
- To provide an opportunity for high school students interested in technology to attend a high-quality program at Pace University
- To provide an opportunity for former FLL (middle school-aged) students to advance to a high school-level robotics competition.

Anticipated outcomes:

- Within the fall semester, the Seidenberg School will have reached out to 10 area high schools promoting FTC.
- At least two “veteran” teams and three new/prospective teams will participate in a season kick-off / information event in the Kessel Student Center in Pleasantville.

- At least six teams will participate in an all-day robotics training workshop at Pace.
- On February 21, approximately 500 individuals will be in the Goldstein Fitness Center watching twenty-four high school-aged teams (approximately 120 – 200 students) compete in a challenge with their robot. Those in attendance include parents and friends, engineering mentors, judges and referees from industry and the Pace community, and Pace student volunteers.

## **B. Progress To Date**

Each of the anticipated outcomes enumerated above were achieved. Specifically:

The Seidenberg School reached out to more than 20 area high schools to encourage the formation of new teams and programs. Of these new contacts, Suffern High School formed two teams which competed at the Pace University tournament this season. Croton-Harmon High School, Woodlands High School of Greenburgh, and the Packer Collegiate Institute of Brooklyn have shown strong interest in forming teams in fall 2010.

A season kick-off / information event was held on the Pleasantville campus on Friday, October 9, 2009. It was attended by approximately 30 students and teachers from the area.

A training workshop was held on the Pleasantville campus on Sunday, December 6, 2009. It was attended by eight area teams. A representative from PTC was on hand to provide free CAD (computer-aided design) training to participants.

The first annual Hudson Valley FTC Championship Tournament was held on the Pleasantville campus on Sunday, February 21, 2010. Twenty teams registered for the event. Teams came from the Hudson Valley and from all over the Northeastern U.S. Participating teams joined us from Delaware, Pennsylvania, New Jersey, Virginia, Connecticut, and Massachusetts. Approximately 160 team members, plus their coaches, mentors, parents, siblings, and friends, all spent the day on the Pace campus. A follow-up survey of tournament participants showed that teams were very satisfied with their experience, and many cited their extremely positive interactions with Pace volunteers as a highlight of the event.

The event also drew the volunteer support of more than 20 working professionals from IBM, Bayer, AT&T, and Gartner Group. They also reported a positive experience at the event. We expect many of them will be willing to participate in planned FTC activities in the 2010-2011 academic year.

Finally, we agreed to allow FIRST to run a beta test of a new prototype robot control system at the Pleasantville tournament. A FIRST engineer and the FTC Partner Services Manager came to run the test, and Dr. Kline trained 10 Seidenberg students to support them in their activities. The test exposed significant problems with the system not seen at smaller-scale tests, so the exercise was very valuable to FIRST, and their employees were very impressed with the tournament and the Pace volunteers. Teams were temporarily inconvenienced but were very supportive of the test.

In recognition of our early successes and in making use of the wonderful collaborative relationships we built with the FTC organizations in New York City and New Jersey, we added

an extra FTC event to our schedule, which was planned and held on the New York City campus on Saturday, May 8, 2010. Seven area teams participated, including six from New York City who had not come to the Pleasantville tournament. We also invited FIRST to bring back their prototype control system for another test, and this brought engineers from FIRST, Cisco Systems, and National Instruments to the campus. All thanked us for our participation and complimented the organization and our student help. This test went much more smoothly.

The events generated a lot of excitement on the Pace campuses and were featured in the Pace Pulse, Pace Magazine, and e-Communique.

### **C. Impact on Students**

The February tournament was supported by the enthusiastic help of more than 60 Pace University students. More than a dozen Seidenberg majors served as technical experts and as some of the referees; students in three different Seidenberg civic engagement courses performed many different roles throughout the day; students from the football and lacrosse teams helped with set-up and tear-down of the event; and other students from around the university also contributed to the successful tournament.

More than 15 students, who were either Seidenberg majors or students in Seidenberg civic engagement courses, volunteered to put on the May 8 event. They also had the opportunity to interact with the expert outside engineers.

### **D. Impact on Faculty**

The efforts of this supported work were in harmony with separately funded efforts by Dr. Pauline Mosley of the Seidenberg School to increase local participation in robotics activities. Dr. Mosley provided equipment loans, financial and/or technical help to teams at Woodlands High School in Greenburgh; Roosevelt High School in Yonkers; and Carmel High School in Carmel.

Drs. Joe Ryan and Kathy Winsted volunteered as announcers at the February event. Seidenberg faculty Matt Ganis, Jimmy Chin, Henry Wong, and Pauline Mosley were among the many volunteer judges for the event. Seidenberg faculty Andrea Taylor and Sung-Hyuk Cha were instrumental in providing support and coordinating student volunteers.

The events also benefitted from the volunteer contributions by many staff and administrators. Bernice Houle is the co-chair of the Hudson Valley FTC Committee and used her considerable experience in FIRST LEGO League to successfully organize the tournament. Other staff who volunteered their time and effort included Dean Constance Knapp, Assistant deans Eileen Murphy, Louise Kleinbaum and Jonathan Hill, Dawn Rigney, Tricia Brogan, Brendan Halligan, Geoff Harter, Andreea Cotoranu, Lynne Larkin, Fran O’Gara, Lovette Esliker, Gerry Forstrom, Matthew Poli, Thomas Reivik, Nicholas Rudzwick, Susan Downey, and Wilfredo Pena.

### **E. Next Steps**

Our efforts to date have been extremely successful. We brought approximately 200 FTC team members who are interested in science and technology to Pace University campuses from all over the Northeast.

During the 2010-2011 year, we will continue our outreach and the rapid growth of this exciting, effective program.

Dr. Houle will be attending the FTC Annual Partner Conference at FIRST in Manchester, New Hampshire in June.

We expect to hold at least two FTC informational and training events on the Pleasantville campus during the Fall 2010 semester. We have already begun planning for the second annual Hudson Valley FTC Championship in January or February, 2011. We expect to hold at least one event on the New York City campus during the academic year.

We will continue our outreach to area high schools to promote the program and offer support activities to those considering a team.

We will continue our efforts with area professionals to further their involvement in FTC and Pace University.

We will seek additional funding for future activities, both internally and externally.

Respectfully submitted,

Richard Kline  
Seidenberg School