ASME Diversity Action Grant Report

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Summary of DAG Project

ASME DAG Funding: $1500 **Total Project Budget: 3000**

Partnering Organizations: Brooklyn High School of Collaborative Studies, NYC FIRST, and City Tech's STEP Program

Attendance: Total 25 Women 15 Minorities 85%

ASME Section/Region Reps Edward Ecock

Project Title Creation of Hands-On Robotics Project

Project Description: There are many areas that the ASME student chapter at the college was involved this year.

First, we continued to help Brooklyn Collaborative Studies High School's (BCS) robotic team to build its FRC robot at the college. College students serve as mentor to provide training to help the BCS high school students to learn mechanical design, electronic design and software design as related to robotic design activities and through which to help high school students to realize the importance of STEM education. College students also help the high schools students on how to use 3D printers, water jet, milling machine and lathe to fabricate components needed from the FRC and FTC robots.

Second, college students offered many Computer Aided Design (CAD) workshops to many FRC and FTC teams in the Mechatronics lab at the college. One student from John Dewey High School was able to use what he learned from the workshop, design and fabricated a working worm gearbox to be used in the high school's FRC robot.

Third, we offered a robotic workshop to a group of middle school students who were enrolled in the college's STEP program. Over 15 students, almost all of them are minority and female students, were exposed to robotic technology and computer aided design practice.

And last, we, on behalf of ASME, used the robots we built in classes, participated the 2015 Google Geek Fair to promote interactive STEM education. ASME booth has attracted huge crowd during the Google Geek Fair. The interactive robots that the college students built in their machine design classes also attracted many media coverage.

Project Goal/Objective and How Achieved: The goal and the objective is to use hands-on engaging robotic design activities to young people especially minority and female students to study engineering or other STEM related fields. Team based hands-on engaging robotic projects have been to proven to be a very effective tool to attract people to study engineering. This project presents the use of hands-on robotic activities to expose to high school students especially minority and female students the different fields of engineering work, from mechanical design, to electronic design, and to software design. To help the high school students to realize the importance of multidisciplinary approach to solve engineering problems. From the increasing number of high school and middle school students who participated, we believe the our goal or objective has been achieved.

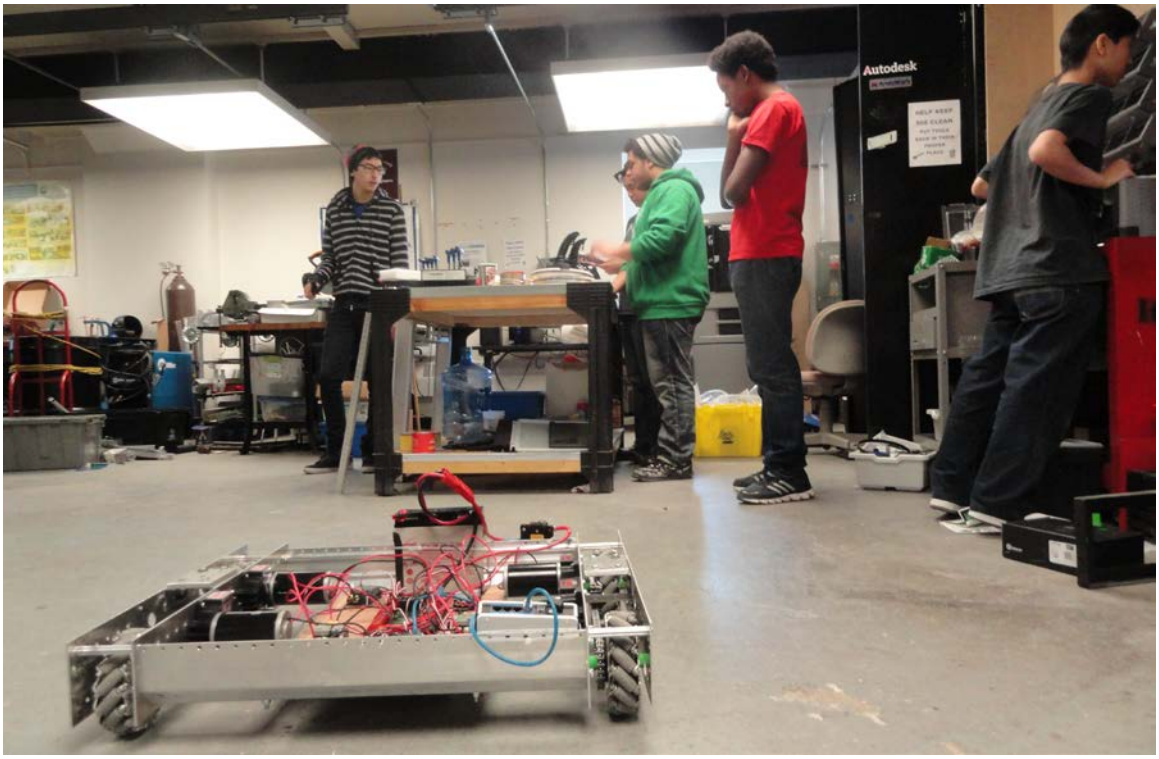
Evaluation of Program's Success:

Many students BCS who participate in hands-on robotic projects have decided to study in mechanical engineering technology at City Tech after finish high school. Hands-on robotic activities gave students a new meaning on what is engineering. A lot of feedback was received from high school students who attended the 6-weeks FRC build season activities. Many high school teachers at the Google Geek Fair asked if we can help their schools to create similar programs. For example, Monique Mckenzie, an educator, was planning to sponsor a summer STEM day camp in upper west Manhattan this summer. She would like to have some of the students to help her in organizing the events.

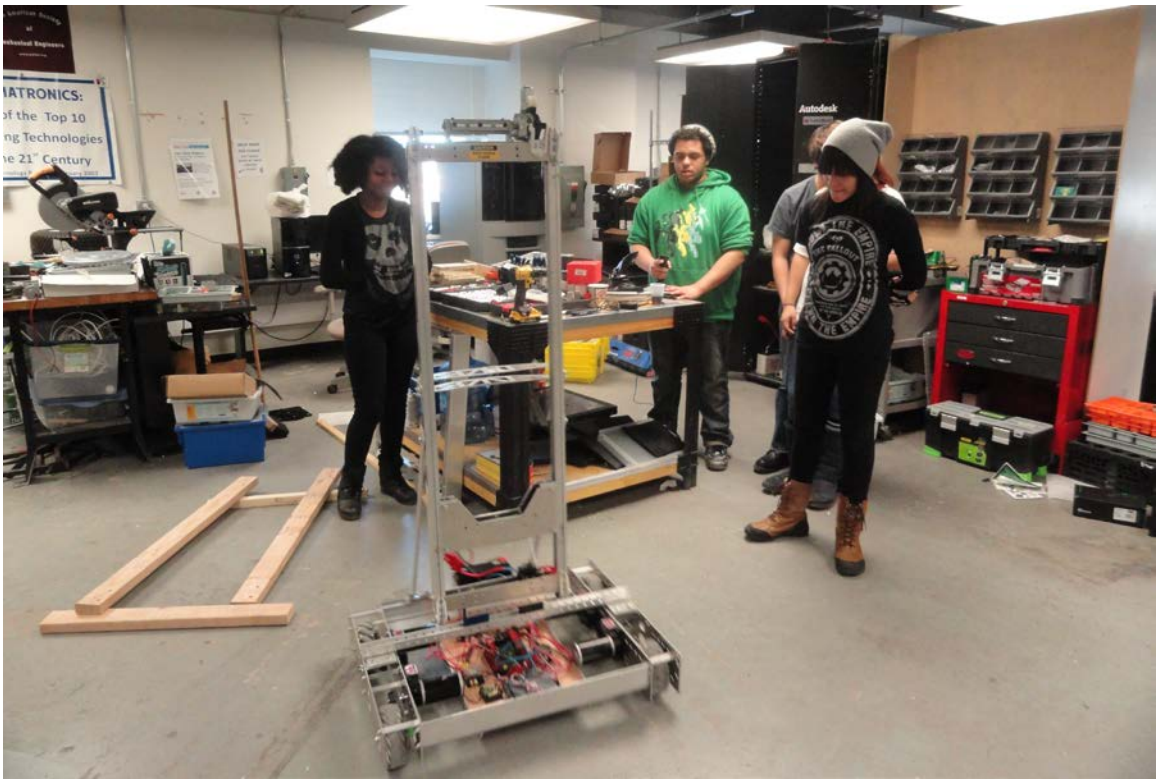
The following photos document most of the activities mentioned above. ASME has the permission to use these photos.

BCS HS Students were taught on how to use drills.

Students learn to use different kinds of tools for constructing their robot



BCS HS Students were working on programming the robot



BCS HS Students were testing their robot.

BCS HS Students were fine tuning their robot during 2015 NYC Regional FRC competition at Javits Convention Center.

After taking a few classes on solid modeling using Autodesk Inventor, a student from John Dewey High School, was able to design and fabricate a worm gearbox for his team to use.

Over 15 middle school students from the college's STEP program visited the mechatronics/robotic lab.

Candy Crane robot attracted a lot of people at 2015 Google Geek Fair

Kids like to drive the "Twisted Sister" Rover robot at the 2015 Google Geek Fair

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Mr. Alexis Ortiz, a student from City Tech, was interviewed by USA Today during 2015 Google Geek Fair

Financial Report

The following table list the cost associated with this year's ASME student chapter's outreach activities.

	Vendor	Comments	Payment Method	Cost
1	Ebay	servo metal horns	credit	$30.60
2	Ebay	JST ZH 1.5 6-pin connector	credit	$13.48
3	Andy Mark	NI RobotRIO, Power distribution board, voltage regulator, MXP entension calbe, wireless bridge for Helping High School's robotic program	credit	$1,056.80
4	Andy Mark	Gears and Speed Controllers for BCS	credit	$429.07
5	Andy Mark	Metal shafts and Pneumatic Control module for BCS HS	credit	$245.08

6	Andy Mark	Mecanum Wheels and Output Shafts for BCS	credit	$445.67
7	Amazon	Books for engineers and Arduino Sensor Kit	credit	$139.95
8	front street pizza	food for Saturday Outreach program	cash	$49.49
9	front street pizza	food for Saturday Outreach program	credit	$41.31
10	Andy Mark	Speed controller, roller chains, and analog breakout for BCS	credit	$429.51
11	Andy Mark	FIRST Choice Components	credit	$20.85
12	Grubhub	food for Saturday Outreach program	credit	$57.92
13	Vex Robot	Flange Bearings	credit	$112.53

Total: $3,072.26

Acknowledgement

ASME student chapter at City Tech appreciates greatly the support provided by ASME DAG that allows its members to continue to make contributions to the local high schools and middle schools' STEM education.