Revitalizing Achievement by using Instrumentation in Science and Engineering

RAISE: A GK-12 Project (URL: raise.poly.edu), Grant# DGE-337668

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IMPACT ON FELLOWS

- Exercised and honed technical and non-technical skills that will undoubtedly play a pivotal role in their careers as scientists and engineers
- Afforded the opportunity to conduct cutting edge research in their disciplines and share results with a non-academic audience
- Sharpened communication and public speaking skills through classroom presentations and demonstrations. Improved ability to describe scientific and engineering concepts in layman’s terms has been the greatest benefit to the Fellows
- Improved management skills as a result of managing a classroom full of teenagers
- Emergence of new leadership skills since most high school students admire the Fellows and consider them role models
- Networking with professionals and other students by presenting conference papers and by organizing and attending professional events
- Exposure to and sensitization toward the community for which they will develop products/services and make technical/business decisions in their professional careers

IMPACT ON HIGH SCHOOL STUDENTS

- Students see the sensor-based labs and the presence of Fellows as the areas expected to yield the greatest educational value
- Students are receptive and appreciative of the new sensor-based activities in their classrooms and have reported that the lab component is their favorite and most helpful aspect of the science course
- Many students have expressed interest in continuing their education in STEM disciplines
- Benefits due to the RAISE Fellows include:
  - helping to explain science concepts
  - providing useful lab exercises
  - presenting positive role models for their students
  - helping to improve lab attendance
  - engaging students’ attention
  - providing information on what is involved in working in science/engineering professions

IMPACT ON HIGH SCHOOL TEACHERS

- Professional development and expansion of technological literacy
- Acquired the ability to integrate sensor-based demonstrations in classroom lessons and modernize labs with hands-on experiments

OBJECTIVES

- Elevate academic achievement of students in STEM disciplines
- Prepare students to succeed on standardized exams (tutoring)
- Inspire an underserved student population for higher education and productive career opportunities in STEM disciplines
- Provide technology literacy to students and teachers
- Reinforce science and math skills of students
- Provide unique professional development opportunities for NYC teachers
- Build lab infrastructure for sensor-based STEM curriculum and instruction
- Advance discovery and learning through technology-enhanced STEM curriculum and instruction
- Improve lab attendance
- Provide information on what is involved in working in science/engineering professions

TRAINING FOR RAISE FELLOWS

- RAISE fellows are provided extensive hands on training in mechatronics using Parallax Inc.’s “STAMPS in Class” educator’s program
- Education/pedagogy workshops for RAISE fellows
  - Lesson planning and effective questioning techniques (pedagogical skills)
  - Student behavior and cognition
  - Learning theory and styles
  - Classroom/group management skills
  - Effective communication/presentation skills

QUOTES FROM HIGH SCHOOL STUDENTS

- “I like having them here because they help me understand the material. The sensor labs make things more interesting and understandable.”
- “Our fellows are great help for our class. They help us out whenever we need it. The sensor labs are fun too. Good technology.”
- “I think the guys from Poly are great. They help us one by one. The sensor labs are better because we experience better skills like working together.”
- “The sensor labs are very knowledgeable. We get to test things and calculate stuff we ordinarily wouldn’t do.”

PUBLICATIONS