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Passaic County Community College Receives \$1.7 Million Federal Grant to Enhance Science, Technology, and Math Education

PCCC Introduces Innovative Program with Local High Schools to Increase Student Success in STEM Areas

PATERSON, NJ – Passaic County Community College (PCCC) has received a \$1.7 million grant from the U.S. Department of Education to expand and enhance education in the fields of science, technology, engineering and math (STEM).

To achieve these goals, PCCC this year launched an ambitious two-year project entitled *Passaic Partners for STEM Innovation and Achievement (PPSIA)* to increase the number of students enrolling into the College's Science, Technology, Engineering, and Mathematics (STEM) programs. The project also aims to improve the rates at which students successfully complete the programs and transfer to four-year institutions.

“We are very excited about what this will mean for the future of STEM studies and careers,” said Kate Joyce, director of the College's STEM grant program. “Our science and math programs are challenging and have tended to have high attrition rates,” she noted. “We think this project will enable us to engage and retain more students.” According to projections, the rates of students who complete STEM programs at PCCC and who successfully continue on to university level are expected to increase by five per cent at the end of the two-year project period.

Thomas van Aken, coordinator of the STEM grant program at PCCC, emphasized the project's unique interactive approach. “We want students to see how the various STEM disciplines impact each other and how they are relevant to everyday life,” he said. Van Aken pointed out that students will also be exposed to career options they may never have thought about before. “Many students think teaching is the only career a person with a science degree can pursue,” he said. “We're going to broaden their view of options.”

Passaic Partners for STEM Innovation and Achievement – Program Components

The PPSIA project has three major components:

K-12 outreach to seven local schools that especially targets high school students, involving them in collaborative STEM learning experiences as preparation for postsecondary education;

an intensified effort to provide strong academic and personal support for students, once they have entered PCCC, to help them meet the challenge of college STEM courses;

an initiative to facilitate transfer to four-year institutions by aligning curriculum in STEM disciplines to guide students from high school to community college to the university level.

The STEM grant also funded:

the College's newly constructed state-of-the art STEM Learning Center,

a training program for teachers in STEM disciplines to enhance their interactive instruction skills, and

a free summer program for incoming PCCC freshmen interested in STEM subjects to ease the transition from high school to college.

STEM and Urban Education Challenge

The STEM administrators noted that the two-year project will enable PCCC, with its main campus in urban Paterson, to address the challenges of attracting students from low-income areas to STEM programs as well as the realities of the future employment market. According to data provided by the STEM program, workforce projections for 2014 by the U.S. Department of Labor show that 15 of the 20 fastest growing occupations require significant science or math training and that between 2006 and 2016, information technology jobs will increase by 24 per cent.

Those facts - combined with studies that show inner-city students in low-income school districts consistently lag behind their peers in more affluent areas in math, science, and technology skills - indicate the need for increased STEM education in urban schools. Looking ahead, van Aken voiced the hope to continue the project beyond the two-year, grant-funded period. "We have a vision that this will go on and grow far beyond that point," he said.

Passaic Partners for STEM Innovation and Achievement Project Component Details

K- 12 Outreach

According to Joyce, PCCC anticipates over 150 STEM students from eight area high schools in dual-enrollment programs where they participate in and get credit for college-level classes. Some classes are taught by high school teachers who hold a master's degree and who follow a course syllabus provided by PCCC. "To qualify, students were tested and recommended by their teachers," Joyce explained.

STEM Summer Bridge Program 2009

To "bridge" the transition from high school to college for incoming freshman, PCCC offers two eight-day sessions in July and August where students will attend classes, free of charge, in PCCC's new STEM Learning Center and experience a stimulating environment that incorporates discovery, hi-tech, and hands-on group learning.

"This is a survey program that will give the students broad exposure to different areas of science and technology," explained van Aken. The goals, he said, are to help students better understand the connections across STEM disciplines through interactive experiences and to develop the important scientific skills of observing, recording data, and measuring results.

The sessions, each three hours long, will be taught by presenters from the science, technology, engineering and math fields. Because math is often a barrier to the practical application of STEM concepts, the administrators said, this summer's program will emphasize the application of math to topics such as forensics, astronomy, environmental science, and computer technology, among others.

Topics have catchy titles, such as "Who Done It," which deals with the use of DNA to identify criminal suspects, and "Does Your Dog Bite?" which explores how animals react under specific circumstances and offers students a chance to apply the principles in practical situations.

Dr. Ida Greidanus, chair of the PCCC science department, will teach "Off-Beat STEM Careers," a session that explores little-known, but viable jobs, such as milking spiders for venom, designing artificial body organs, and becoming a "professional" hacker.

Multi-functional STEM Learning Center and College Enrichment

The spacious new, state-of-the art STEM Learning Center is located on PCCC's Paterson campus in a renovated space that was previously a nurse education laboratory. Constructed in spring 2009, the 1200 square-foot facility is equipped with 24 laptop computers, an interactive smartboard, and two projectors. Moveable furnishing permits flexibility to enhance interactive instruction. Lecture capture technology will be added in the near future.

In addition, tutors will be available regularly in the Center to provide students with the academic support that is one of the essential components of the partnership program

Professional Development for Faculty

PCCC offered its first STEM faculty development program at the end of June. Twenty full and part-time faculty – including teachers from Paterson and Passaic public high schools, attended the four-day, 16-hour program. Classes were taught by professors from various colleges, including PCCC, and by industry professionals with the goal of assisting college and high school faculty in creating learning environments that encourage both beginning and advanced STEM students to excel.

Classes covered topics such as collaborative learning strategies, interdisciplinary learning, academic and career advising strategies, as well as ethics in STEM fields. Activities focused on diverse learning styles and the use of culturally responsive materials and approaches to teaching.

*For more information about STEM at PCCC, go to: www.pccc.edu.
Contact Professor Kate Joyce at 684-4856 or kjoyce@pccc.edu*

Passaic County Community College (PCCC) was founded in 1971 to provide academic, cultural, and technological resources and experiences to the residents of Passaic County. Through education, we seek to help bring about more satisfying and productive personal lives, stronger community leadership, and a strengthened economic base. Today, PCCC maintains four campuses throughout Passaic County and offers more than 50 degree and certificate programs. Visit www.pccc.edu

