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Mentor Program Introduces Students to STEM-Related Fields

By Jamaal Abdul-Alin

At the Arlington Career Center in Arlington, Va., engineering instructor James “J.C.” Parry leads half a dozen youths in a discussion on whether to design an amusement park, a lunar base, or a prison.

At a muddy, stone-laden construction site at Woodrow Wilson High School in the District of Columbia, students in white hardhats tour the gutted insides of the building and get an up-close look at the structure of their soon-to-be renovated high school.

A few miles south, in a cramped third-floor classroom at Booker T. Washington Public Charter School, students hear from Brian Petruzzi, a newly minted “blast engineer”—someone, in other words, who works to ensure that buildings can withstand the force of a terrorist attack. He reveals to them how he didn’t even know what a blast engineer was until just before he graduated from college this past spring.

Those scenes represent snapshots of the ACE Mentor Program of Greater Washington Inc.

Just one of dozens of local chapters affiliated with the national **ACE Mentor Program**, headquartered in Stamford, Conn., the program provides early career exposure, mentoring, and scholarships to high school students in an attempt to encourage them to enter one of the three fields that make up the ACE acronym: architecture, construction, and engineering.

Founded in 1993 by longtime engineering consultant Charles Thornton, the program is increasingly being seen as one potentially effective model for reaching the Obama administration’s goal of getting more youths into science, technology, engineering, and mathematics, or STEM-related careers. Nationally, the ACE Mentor Program serves 5,200 youths, down from 9,400 last year, a dip that program officials attribute to the poor state of the economy. But the organization has started hiring regional staff to help reach its goal to enroll 100,000 students annually by 2018.

“I think ACE does a really powerful job,” Kumar Garg, a policy analyst in the White House Office of Science and Technology, said in an interview.

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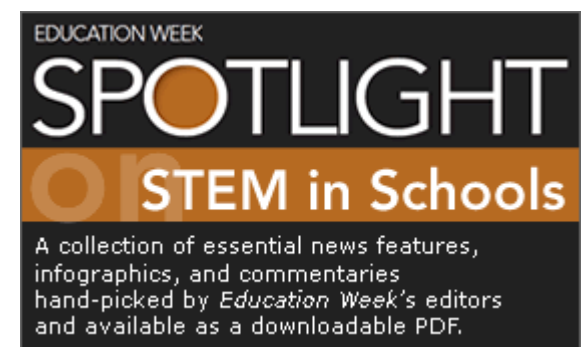


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Mr. Garg said the program's philosophy and approach dovetail with a number of themes that President Barack Obama has been touting about the importance of putting science and technology among America's educational priorities.

And much as the hit TV series "CSI" has whetted more students' interest in exploring careers in crime-scene investigation, Mr. Garg said, ACE is influencing more young people to explore careers in architecture, construction, and engineering.

"Exposing students to different types of careers and how to get there has a powerful impact on their motivation in school and getting good grades, whether their interest is in science and technology and what they do to get there," he said.

Influential Factor

The ACE program operates as an after-school activity. Members at each site meet twice a week for classes led by teachers and industry professionals who volunteer their time. Guest speakers and site tours are regular features of the class. Students typically find out about it from teachers or by word of mouth.

The capstone of the experience comes in spring when students from chapters nationwide present proposals to design or redesign various structures at the American Institute of Architects, or AIA, in Washington. Previous design proposals have included everything from energy-efficient houses to underwater casinos. One project, the restoration of a greenhouse and surrounding grounds at Coolidge High School in the District of Columbia, found its way from paper to reality.



Lisa Anders, senior project manager for the Martin Luther King, Jr. National Memorial, leads a tour of the memorial construction site.

—Christopher Powers/Education Week

Program alumni say its emphasis on practical considerations in related careers has provided invaluable insight for their higher education and career decisions.

"I think it played a big role," said D.C.-area alumna Carlyn Luu, who recently graduated magna cum laude from the Virginia Polytechnic Institute and State University. She is working as a member of the architectural staff at Wiencek & Associates Architects & Planners in Gaithersburg, Md., where she is gaining experience to become a licensed architect.

Unlike most students served by ACE, Ms. Luu actually sought out the program back in 2005 when she was a senior at Chantilly High School in Chantilly, Va., and wanted more architectural and engineering education than the drafting classes her school offered. She started attending ACE sessions in nearby Fairfax, Va. Now, she plans to give back to ACE as a mentor in Chantilly.

A survey of program graduates from 2002 to 2009, conducted and released by ACE in January, indicates that the vast majority of alumni chose a career in the architecture, construction, or engineering fields or began to consider one after participating in the program. The same survey found that ACE students graduated from high school and enrolled in college at substantially higher rates than the national average: 97 percent vs. 73.4 percent and 94 percent vs. 68 percent,

respectively. It also found that minority students were majoring in architecture and engineering at several times the rate of their non-ACE counterparts.

Such students include Krystal Robinson, a senior majoring in electrical engineering at Howard University in the District of Columbia. Through the program, she has interned at Arup, a global consulting firm of engineers and designers, where she helped design lighting and power at the Abu Dhabi International Airport in the United Arab Emirates.

"It was really a good learning experience, because I was already interested in architecture and engineering," Ms. Robinson said, "and it was a plus because I got the chance to see what engineers do in the field instead of just reading about it," which is one of the primary goals of the program.

"It's not just the brick and mortar stuff anymore," said Christine Merdon, the chief operating officer of the Architect of the U.S. Capitol. Ms. Merdon, who serves as board president of the ACE program in Washington, said a key emphasis of the program is "making buildings more efficient and intelligent."

"We're trying to get students to think about all the needs," said Mr. Parry of the Arlington Career Center. He noted construction-project considerations that range from providing access for cargo vehicles dropping off their loads to making sure all facilities are handicapped accessible.

Real-World Perspective

Among the college-going ACE students, a limited number of scholarships are awarded to those who plan to study a related field.

Last academic year, of 79 high school seniors in the D.C. program, 27 applied for scholarships, meaning that roughly a third went on to study ACE-related fields. The program registered 312 youths, 210 of whom completed it at one of 18 schools in the metropolitan area.

"That's a pretty good number," said Trisha Grant, who was recently hired as the executive director of the program in Washington, referring to the seniors who applied for ACE scholarships. "It could have easily been zero before the ACE program came around."

A challenge has been finding scholarship money. Of those students who applied for the \$4,000 scholarships, only 14 got them. It wasn't because the other 13 weren't qualified, but rather, \$56,000 is all the program had to award, Ms. Grant said.

The D.C.-area program relies almost entirely on volunteers and operated on a budget of roughly \$64,000 in fiscal 2008, tax returns show, but program officials say the organization has stepped up its fundraising efforts, holding, for instance, an annual fundraising breakfast with ACE partners in the private and government sectors. Local affiliates across the country are similarly responsible for holding fundraisers to cover their costs and scholarships, although each affiliate also gets support from the national office.

Though historically the program has operated on a shoestring, school administrators involved in ACE say the program is playing a pivotal role.

Alexander Wilson, the director of academic development for Woodrow Wilson High School at the University of the District of Columbia, where the Wilson students meet until their school is renovated, said ACE serves as a "wonderful bridge between academics and kids' curiosity and

passion about construction, design, building, and engineering and puts it in a real-world perspective." Woodrow Wilson has had the program for three years.

"This walk-through is one of the best experiences that we've ever done," Mr. Wilson said shortly after the ACE-sponsored tour at the construction site at Woodrow Wilson High. Students—walking among spools of cable and uninstalled ductwork—got to meet the construction manager, ask questions, and learn architectural descriptions for various physical aspects of their school.

But the strongest component, Mr. Wilson said, is ACE's mentoring.

"I strongly believe that every kid's success requires a caring, consistent relationship with an adult," he said. "The ACE program provides really solid mentoring."

Those mentors, who often meet with students in groups instead of one-on-one, come in the form of professionals such as Mr. Petruzzi, the blast engineer.

On a recent day, students at Booker T. Washington took advantage of Mr. Petruzzi's presence by chatting with him when the after-school session ended.

"He told me you have to be creative and, at the same time, you have to look at [engineering] from a realistic standpoint," sophomore Sean Holston said of his conversation with Mr. Petruzzi. "The architect tells you how he wants a building to look, but the engineer tells you how it has to be built so it can stand."

Mr. Holston said he is leaning toward becoming an electrical engineer and feels the ACE program has given him a competitive edge for college.

"Some people go to college and they want to study architecture and don't know nothing about it," he said. "But through this program, you'll go with a little extra than the rest."

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