

Bridges to Science

INCOMING STUDENTS GET HELP DEALING WITH COLLEGE, ACADEMICALLY AND SOCIALLY, THROUGH SUMMER PROGRAMS THAT OFTEN TURN THEM ON TO SCIENCE AS A BONUS.

ENTERING COLLEGE CAN BE DAUNTING, especially for students not fully prepared for the rigors of academic life. “Some of them have not been challenged in high school,” says HHMI professor Isiah M. Warner, a chemist at Louisiana State University (LSU). “They come to college thinking it is going to be like high school, and they have not developed the skills they need.”

Inadequate preparedness is especially a barrier to success in science, technology, engineering, and mathematics (STEM) courses. Such limitations may be contributing to the country’s precipitous decline in STEM majors documented by the National Academy of Sciences and others.

Academics like Warner, who directs LSU’s LA-STEM, are trying to turn things

around by setting up summer “bridge” programs to ease the transition from high school or community college to college. While some students are initially reluctant to give up their summer, in the end they realize what they have gained: a good head start. Incoming students get acclimated to the campus and are taught how to handle the rigors of college life. Some programs

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Part of the challenge in encouraging freshmen to consider STEM is finding a research project at their skill level yet applicable to the real world of science, says HHMI professor Graham F. Hatfull, a biologist at the University of Pittsburgh. In that spirit, he established the PHIRE program (phage hunters integrating research and education), in which high school juniors and seniors as well as undergraduates explore the basics of biology by conducting experiments at the scientific frontier. A popular option is to have the students go “phage hunting”; they isolate previously undiscovered bacteriophages (viruses that infect bacteria), extract the DNA, and uncover the genomic secrets.

Phage hunting has suited the young students’ technical skills so well that two science papers, one in *Cell* and the other in *PLoS Genetics*, have resulted from the now four-year-old program.

PHIRE precollege students typically study during the summer, but they also have the opportunity to work in the lab during the school year. “Instead of an experiment that’s done tens of hundreds of times by high school students, they get to be a part of something larger because they are adding data to a real science project,” says program assistant coordinator Deborah Jacobs-Sera. “It’s very cool when the students really like it. At first they come in every other week, but before long it’s every other day.”

even use science as the key—for instance, by placing students in a lab.

Brad Corso is one of LA-STEM’s success stories. He graduated in the middle of his high school class, but after going through the summer program—which he credits with teaching him study and time-management skills—Corso ended his freshman year at LSU with a GPA of 4.0.

Now a junior and a joint physics and math major who still has a 4.0 GPA, Corso admits, “If I hadn’t done the summer bridge program it would have been more like hitting a brick wall instead of crossing a bridge.”

Andrew Hryckowian began in PHIRE as a high school junior and was one of the students the program turned on to science. “Up until then I kind of thought science was all just textbooks,” he says. Now a sophomore and microbiology major at Pitt, he continues to work in Hatfull’s lab and plans to get a Ph.D. in life sciences.

Bridge programs give students a boost socially as well as academically. “Before college, I was really terrified of what it was going to be,” says Hufsa Ahmad, a freshman at Harvey Mudd College in Claremont, California. “In new situations, I’m not as outgoing as I could be.” But in the summer after high school graduation, she entered her college’s bridge program, and its team-building experiences and math and biology minicourses infused her with the confidence she needed. Ahmad is now class president and wants “to major in everything.” ■

—JACQUELINE RUTTIMANN