

Up Front

Fast Track to Teaching

States design high-speed routes for scientists to run classrooms.

Two years ago, Huân Ngô's career trajectory seemed preordained. He would finish his postdoc in infectious diseases at Yale University and become an assistant professor. But something was weighing on his mind—perhaps it was the faces of the students he had met when he volunteered in the New Haven public schools or of the children in inner-city Chicago, where Ngô had earlier developed new biology teaching tools through an HHMI fellowship.

"I realized that disadvantaged kids don't have a fighting chance," says Ngô. "They are not getting the training they need to even consider science as a career." So Ngô chose a different path. He's now in his first year as a science laboratory teacher at New Haven's Sheridan Middle School.

In the past, he would have had to go back to school himself to meet the state requirement for teacher certification. But in Connecticut, and increasingly in other states, scientists and other professionals who want to give teaching a chance can take an accelerated route to the classroom through an alternative certification program. In Ngô's case, it was an eight-week summer "boot camp," as he affectionately calls it.

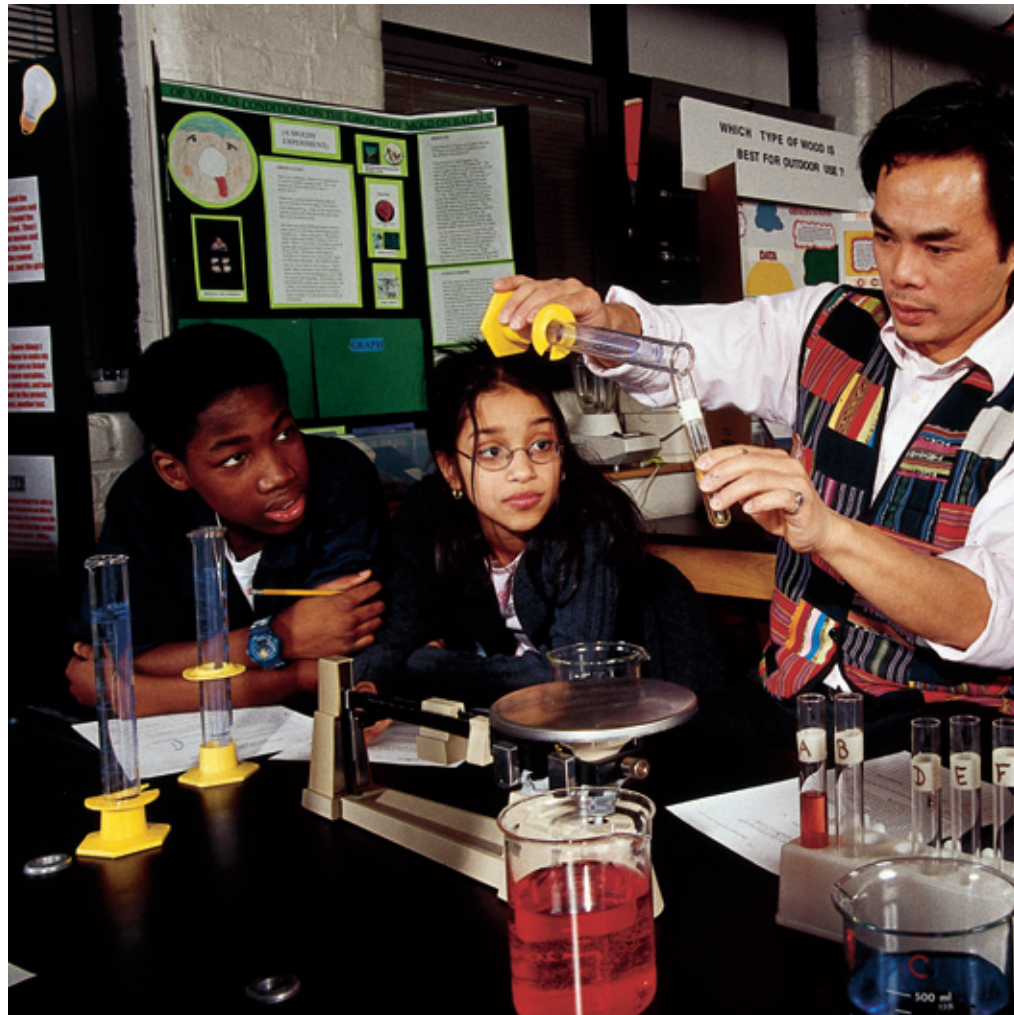
Once regarded as just a stopgap measure, alternative certification programs and other nontraditional routes to teaching are being touted as the best way to remedy the severe shortage of committed teachers who know their subject matter.

One-third of high school students and almost two-thirds of middle school students are being taught mathematics by teachers with essentially no background in the subject, according to a report by the nonprofit Education Trust in Washington, D.C. The National Science Teachers Associ-

ation reports that 48 percent of all middle schools and 61 percent of all high schools have difficulty finding qualified science teachers. And the situation could get much worse. A National Research Council report

predicts that U.S. schools will need to hire 20,000 new teachers a year for at least the next 10 years to fill vacancies created by an aging teacher population and a growing student body.

Figures like these have created a sense of urgency about recruiting and training new science teachers, and now the move to recruit professionals and college science majors to teaching is gathering steam. In 1983 only 8 alternative teacher-certification programs were offered in the United States; today there are 45. In the past five years alone, 17 states have created new programs of this type, and in 2002, two major national initiatives aimed at recruiting and training "nontraditional" teachers were



Huân Ngô left a promising research career to teach students such as Jamell Donegan-Maddox (left), Nolishya Balseiro and Ivy Co

launched: the U.S. Department of Education's \$35 million Transition to Teaching program and part of the National Science Foundation's \$240 million, five-year initiative called the Mathematics and Science Education Partnerships.

Now that the number of such programs has expanded, the challenge is to find candidates who will not only fill them but remain committed to the profession long afterward. So programs are reaching out to people at key decision-making points in their lives and offering some important incentives, says Fred Eiserling, dean of life sciences at the University of California, Los Angeles (UCLA). These incentives include the following:

Combining depth of subject knowledge with basic teacher training.

"The problem in designing a program that incorporates science and education is that we don't understand each other's cultures," says Eiserling. "We [scientists] think we know how to teach as soon as we get our Ph.D.s, but we don't." Eiserling in fact helped design and run an HHMI-supported cooperative program between UCLA's schools of life sciences and education to help bridge the cultural divide. Similarly, since 1997 the University of Texas, Austin (UT), has offered UTeach—a joint program of the colleges of natural sciences and education—in which undergraduates major in math or science and simultaneously receive teacher training. "It has taken several years," says Michael Marder, professor of physics and codirector of UTeach, "but today both colleges view the program as part of their essential role and core mission."

Compensation from the start. Financial support must be available during preservice teaching—before candidates are certified. "We have to show them that they will be able to earn money right away," Eiserling says.

Mentoring for new teachers. "For us, the key has been six master teachers who direct, design and teach the courses," says UT's Marder, and their results so far are impressive. Through 2002, 80 percent of the program's first 65 graduates are still teaching, although Marder emphasizes that the sample is small and long-term data will be needed to determine how many continue as teachers. Mentoring is a vital aspect of UCLA's program as well, which boasts a 70 percent retention rate placing math teachers in urban Los Angeles schools, says Eiserling. He adds, "The fact that department chairs and principals at their schools try to take care of the new teachers, along with the caring attitude of a few key faculty members in the education school and the math department, shows them that they are valued as colleagues."

Teaching early and often. Hector Penaflor, a current UTeach student majoring in mathematics, says he was attracted to the program because it allowed him to get prac-

tical classroom experience right away. "I thought, 'If I'm going to be doing this for the rest of my life, I'd better get in there and decide,'" he says. "When I was able to watch [the students] grasp for themselves the concepts I was trying to get across, that's when I decided this is what I want to do."

Ability to stay connected to research. Would-be teachers in the science community fear being cut off entirely from the mainstream, but a pilot project in Montgomery County, Maryland, is addressing that very issue. Scientists at the National Institutes of Health (NIH) remain on the NIH payroll while taking courses to meet state teacher-certification requirements and learning how to teach with extensive mentoring. They return to work in NIH labs during the summers in paid positions. "We have found that it was important to people that they could keep one foot in the laboratory," says Michael M. Gottesman, deputy director for intramural research at NIH.

With such incentives in place, the potential yield is great. A 2002 report by the National Academy of Sciences, "Attracting Ph.D.s to K-12 Education: A Demonstration Program for Science, Mathematics and Technology," found that although less than 1 percent of Ph.D. scientists are employed in K-12 education, up to 36 percent of those surveyed would consider teaching.

Huân Ngô concurs. "I have had to overcome the stigma within the scientific world that I was on my way to become a prestigious professor and it is a waste of training to become a teacher," says Ngô. "But I have seen many people who enjoy science but are not interested in getting involved in the politics of setting up a research laboratory. Of course, not everyone is equipped to teach kids, but I think there is a pool of people who would consider teaching if it were presented as a [genuine] career option."

For those who choose to trade the life of an academic researcher for a roomful of pre-teens, the hurdles are many but the rewards are great, says Ngô. "My sixth graders are so revved up to get in the lab and get started; they can't wait to get in. This is the enthusiasm that I am trying to tap."

—KARYN HEDE



AMY ETTRA

y Conyers from Sheridan Middle School in New Haven, Connecticut.