Newspaper want ads paint a clear, dim picture—school districts are scrambling to recruit math and science teachers. Openings are everywhere—in both rural and urban settings—and schools sometimes simply take what they can get. Currently, about 30 percent of high school math teachers didn’t major in math in college. Likewise, approximately 60 percent of teachers in the physical sciences didn’t major in these areas and are considered to be teaching “out-of-field.”

There are reasons for the shortages, apart from normal attrition. Relatively few students major in these disciplines—in math, often less than 1 percent of the graduating class—and when they do, their career options far exceed the salary offered by a career in teaching. Furthermore, some academic departments tend to dismiss secondary education as a “fall-back” profession. Another part of the equation: the accelerating retirement of a generation of Baby Boomer teachers.
Grants promote innovation

The lack of qualified math and science teachers comes at a time when states not only require more math classes, but also expect higher scores on standardized tests. What’s more, it’s also happening at a time when comprehending public policy issues with global consequences—the environment, energy, food production—requires grounding in science and math that relatively few people possess.

AASCU-member institutions and other universities recognize these challenges and are working to address them. In 2007-08, four AASCU universities—Northern Arizona University, Western Kentucky University, the University of Texas at Dallas, and the University of North Texas—were among 13 nationwide recipients of major grants that will support an innovative program designed to increase the number and quality of math and science teachers in the U.S.

The five-year, $2.4 million grants were awarded by the non-profit National Math and Science Initiative (NMSI), with funding provided by ExxonMobil and the Michael and Susan Dell Foundation. At Northern Arizona, the Helios Education Foundation contributed an additional $1 million.

UTeach a successful model

Starting this fall, the 13 universities will begin to replicate the University of Texas at Austin’s “UTeach” model. More than 470 math and science teachers have graduated via UTeach since 1997, and more than 85 percent of them entered the profession.

Five and six years after graduation, more than 75 percent of UTeach alumni are still in the classroom. Most of the participants are teaching in Texas, and 45 percent teach in schools where 40 percent or more of the students qualify for free and reduced-cost meals.

UTeach focuses on getting math and science majors interested in becoming teachers early on. The model employs a “master teacher” to lead Step 1 classes, recruit students to the program and provide individual counseling. “Mentor teachers” are those still working in a school setting. They relate directly with UTeach students, who observe (and are observed by) the mentor teacher and submit sample lesson plans that reflect the UTeach model.

Campus collaboration for success

UTeach requires collaboration between education programs and math and science departments. That’s not a problem at Northern Arizona, where Julie Gess-Newsome is co-director of NAUTeach. She is a professor of science education, director of the Center for Science Teaching and Learning, and a former high school science teacher.

“School districts are outrageously enthusiastic about NAUTeach and the prospect of a larger pool of math and science teachers,” says Gess-Newsome. “Northern Arizona serves a tremendous number of first-generation college students, many of whom are Hispanic or Native American. That’s a perfect population for NAUTeach, because these students often have a service orientation. They want to go back home to support their community.”

Northern Arizona graduates more math and science teachers than the state’s other universities combined, but it’s still a small number. Gess-Newsome hopes to see 60 graduates a year by the time the grant ends. “We have 50 students—freshmen and transfers—signed up for Step 1 this fall and another 45 on a waiting list,” she says. “We’ll start a second group of 50 in the spring.”
“Students get it”

UT-Dallas is a different setting for UTeach. It is a largely non-residential university that has no school of education but does certify teachers. Program Co-Director Mary Urquhart is an associate professor of science education with an affiliate appointment in the Department of Physics.

“Our master teacher is the former director of K-12 science in the Richardson Independent School District,” near Dallas, says Urquhart. “He’s the heart of the program. He’s officed right next door to me so we have close collaboration. The program officially starts this year but we had a very successful preview last spring. We planned for 15 students, enrolled 24, and will have at least 33 more this fall.”

Urquhart says parents have been calling her about the UT-Dallas program, along with community college students who want to transfer so they can enter UTeach. “Students get it,” she says. “They recognize this as a stable career choice with an incredibly high demand. School districts tell us they will hire a UTeach graduate on the spot.”

“Global competitiveness issue”

NMSI wants to ensure the campus UTeach programs continue once the initial grant is used. It strongly encourages each recipient to raise a minimum endowment of $1 million for that purpose (those that do will receive an additional $1 million endowment grant from NMSI at the end of the five years). At Western Kentucky, Provost and Vice President for Academic Affairs Barbara Burch thinks that goal is well within reach.

“We had a successful $100 million capital campaign recently and are halfway toward a $200 million target in the current campaign,” she says. “We’ve gone from no endowed professorships 12 years ago to 32 today.” She expects that momentum to carry through for SKyTeach, a program at WKU that cultivates more and better science and math teachers. Matching support from the Commonwealth may be possible, since the governor and legislature are promoting an economic development agenda rooted in research and technology.

“As a nation, we are losing ground in math and science education,” says Burch. “It’s simply a crisis if we don’t do something to turn it around. This is a global competitiveness issue, a state initiative, and an institutional priority. The UTeach model requires a strong sense of community, and encourages students to feel the honor and importance of choosing to teach. We support that.”

Teaching: a legitimate career

“Many of our institutions began as teachers colleges and have an historic commitment to education,” says George Mehaffy, vice president for Academic Leadership and Change at AASCU. About 60 percent of the nation’s new teachers graduate from AASCU universities each year. Even so, concern for the math and science teacher shortage reflects an additional priority.

“It’s our mission to be responsive to the needs of the state,” says Mehaffy, “and this is one of those big needs.” From his perspective, the chronic shortage of qualified high school math and science teachers affects the vitality of cities and rural communities, the curricula of schools and universities, and the nation’s ability to meet the demands of a high-tech future.

“To have students majoring in math,” he says, “you have to start in second grade. We have to think about those issues right now, before they even get to college. UTeach offers students early recognition, early field experiences, early support, and the strong message that being a teacher is a legitimate career.”

There’s an additional benefit, says Mehaffy. “We need more math and science graduates in the U.S., period.” Raising the profile of these disciplines through a UTeach partnership may influence students to consider a major in biology, statistics or engineering. Even if they don’t become teachers, that’s a good outcome for a nation whose economic strength and social fabric depend on well-educated workers, consumers and voters.

Kevin Boatright is director of communications for the Office of Research and Graduate Studies at the University of Kansas, one of the 13 UTeach grant recipients.