



**The role of graduate education in the new Arizona economy cannot be overemphasized**

*By Gary Pivo*

It is not a new observation that Arizona's capacity to achieve its economic development goals depends on the presence of highly educated workers with advanced post-baccalaureate degrees. However, as Harvard professor Martha O'Mara recently concluded in an award-winning study of business location drivers, the link between education and economic development "cannot be emphasized too much!"

In light of this, two recent studies should cause Arizona considerable concern:

First, a 1998 study by the American Association for the Advancement of Science reported that Arizona is below the U.S. average in the number of residents with science and engineering master's and bachelor's degrees.

Second, a 1999 report by Arizona State University's Morrison Institute found that

- Arizona ranked 30th nationally in 1995 on the percentage of scientists and engineers in the workforce;

- Arizona has a below average share of biological scientists, chemical engineers, chemists, space scientists, and mathematical scientists; and

- Arizona ranked 22nd nationally in 1996 in the per capita number of science and engineering graduate students.

The University of Arizona's graduate programs can help address this situation by graduating more students. We are already making an effort to increase our enrollments. Unfortunately, our ability to respond is hampered by our limited capacity to accommodate more students and the stiffening competition we face from universities in other states for the very brightest students.

There are three strategies we should

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*Painting by Gabe Ruane*

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pursue to produce more citizens with graduate degrees for Arizona. First, we should attract more of those we admit to enroll in our graduate programs. Second, we should admit more of those who apply. And third, we should encourage more of those we graduate to stay in Arizona.

Every year, more than 1,500 students who are accepted to UA graduate programs choose not to enroll. Most of these decide to pursue their degrees in other states.

This loss of prospective students is made worse by the fact that those we lose are some of the best we admit. The most promising students are normally admitted to several universities, which then compete with one another to get them to enroll. The coin of the realm in this competition is scholarships, fellowships, and assistantships. Our competitors are moving aggressively to raise the bar in the competition. Stanford and Wisconsin, for example, are both in the middle of capital campaigns seeking to raise \$200 million in endowments for graduate fellowships. That would give them more than 10 times the fellowship money that we have at Arizona. It is already common for our graduate programs to lose their top prospects in the competition over support packages. Unless we increase our merit based scholarships, we will fall even farther behind.

And then what is the chance that any one of these lost ones will move to Arizona after completing graduate work in another state? Small at best. Arizona's greatest chance of getting the nation's top minds to come to Arizona occurs exactly at the moment they're deciding where to go to graduate school. If we can be more competitive at that point, we could significantly increase Arizona's pool of highly educated citizens.

The second way to produce more graduate degrees for Arizona is to admit more graduate students. Every year, UA graduate programs turn down about 4,000 applicants. Could we accept more of them? Not many, unless we hire more faculty and build more facilities.

Most graduate students require one-to-one faculty advising and instruction when working on their theses and dissertations. But faculty members already spend more

than 35 hours per week dedicated to instructional activities and another 22 hours per week on research, service, and administration. So, it is difficult to see where faculty could find the time to take on many more graduate students.

Facilities are another limiting factor. Many graduate students work in research labs during their degree programs. But UA's lab space is already in short supply, according to Arizona Board of Regents guidelines.

So, by adding to our faculty and facilities, we could increase our capacity to accept more students into our graduate programs.

The third way to produce more graduate degrees for Arizona is to encourage more graduates to stay and work in Arizona. Strengthening UA's collaborations with Arizona employers can help this occur. Cooperative programs, such as those that send employees to graduate school or provide graduate students with internships and job opportunities, increase the chances that more graduate students will stay in Arizona after they earn their degrees.

For our future, let us reinforce the alliances that exist between government, philanthropy, business, and the University. And together, let us expand our financial aid, faculty, and facilities so we can attract, accommodate, and retain more of the country's best young minds. If we can accomplish that, we will have done our best to prepare for the new knowledge-driven Arizona economy.

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