

# MORE U.S.-BORN FACULTY: A UNIVERSITY RESPONSIBILITY

Higher stipends, more scholarships, and advising are needed to ease our risky reliance on international graduate students.

The January 2016 *Prism* article “A Matter of Degree” discussed some of the reasons why U.S. citizens are not going on to graduate school: “Tempted by starting salaries of \$60,000 to \$80,000 and often saddled with debt, only an estimated 20 percent of engineering students across the country opt to go directly to graduate school.” According to ASEE figures, international students earned 55 percent of engineering doctorates at U.S. universities in 2016. In a 2017 report on the National Science Foundation’s Engineering Research Centers program, a National Academies panel warned: “The United States faces a critical workforce imperative: Either increase the number of U.S. students in the engineering pipeline, including more American women and minorities, or increase dependency on foreign scientists and engineers.”

Doctoral students go on to become faculty members and researchers in industry and national labs. Because U.S. citizens are not pursuing engineering graduate degrees in sufficient numbers, particularly in doctoral programs, faculty positions are increasingly filled by foreign-born graduates. A 2005 National Academies report stated that foreign-born engineering faculty who earned their doctoral degrees at U.S. universities have increased from 18.6 percent in 1973 to 34.7 percent in 1999. We are fortunate to have these graduates, many of whom have become distinguished faculty members. But the trend of increasing numbers of foreign-born faculty is risky, as noted in a 2007 Duke University study: “The nation cannot continue to depend on India and China to supply such graduates. As their economies improve, it will be increasingly lucrative for students to return home.” Already, the pipeline of international graduate students appears to be

shrinking as the United States adopts a less welcoming attitude. Universities are at the mercy of federal laws and regulations dealing with immigration that flow from the political process. For instance, Sen. Orrin Hatch (R-Utah) has suggested capping the number of H-1Bs a single employer can seek and requiring additional proof that employers had tried to hire an American first.

What can be done to get more U.S. citizens

goes into teaching engineering. I led a Society of Automotive Engineers forgivable loan program in 1984. Now these funds will be given annually as scholarships for \$10,000 each to two Ph.D. students who plan to become faculty members.

Departments and the faculty could do a better job of advising students on the career benefits of a M.S. or a Ph.D. degree. ABET should require a defined effort for “faculty advising” to discuss graduate education in depth. Universities need to take responsibility for the lack of U.S. citizen graduate students. They need to review their graduate program policies, including who gets financial support so that there are goals and plans to graduate more U.S. citizen Ph.D.’s who become faculty.

In addition, the National Academy of Engineering and the National Academies’ Board of Higher Education and Work Force should conduct a new study that discusses trends of tuition and student debt; trends of graduate engineering degrees by U.S. citizens and foreign-born; future demand for Ph.D.’s in industry, universities, and national labs; and H-1B and student visa programs. The end point would be to recommend policy and actions to increase the number of

U.S. citizen graduates qualified to become faculty members. If you agree this issue deserves study, write to the president of the NAE.

For over 30 years we have been heavily dependent on foreign-born students in our engineering graduate programs. This has resulted in a heavy dependence on foreign-born faculty. Now is the time to determine what needs to be done to get more U.S. citizens to study for the Ph.D. degree.

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to go to graduate school, particularly students who want to teach engineering? One of the problems is that graduate research assistant and teaching assistant support levels are not high enough to compete with starting salaries of B.S. degree engineers. Support needs to be in the range of \$60,000 to \$80,000 a year for tuition plus stipend (depending upon tuition and living costs). Scholarships and fellowships directed to U.S. citizens must be expanded. Universities, technical societies, industry, foundations, and individuals need to fund these scholarships. Another approach would be a program to provide loans that are forgiven if the student