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Mary Chind/The Register

Iowa State University computer engineering senior Matt Swanson, left, and graduate research assistant Koray Celik work in the computer vision lab recently. ISU's College of Engineering has been encouraging students to enroll in graduate school.

Working together

Iowa State University and Des Moines Area Community College have recently announced they will work together to boost the number of students earning engineering degrees.

A five-year, \$2 million grant from the National Science Foundation will help ISU and DMACC encourage students to study science, technology, engineering and mathematics through a Student Enrollment and Engagement through Connections program.

The grant provides \$1.5 million to ISU and \$500,000 to DMACC.

At DMACC, the project is expected to boost the enrollment of students in science and technology. That is expected to increase the number of transfers from the community college to ISU's College of Engineering, college officials said.

With the help of the grant, ISU will take several steps to increase enrollment numbers, including redesigning the first-year curriculum for engineering students and making some courses available to community college students via distance education technology.

The program will also establish a recruiting and outreach network across the state with the help of alumni, ISU Extension and DMACC. The network would help students, parents and teachers understand the benefits of an engineering education and career.

Engineering colleges want more local grad students

Advanced-degree numbers not enough 'to sustain our economy,' ISU official says

By LISA ROSSI
REGISTER AMES BUREAU

October 4, 2007

STORYCHAT: 1 Comment

Ames, Ia. - Four years ago Karl Albrecht faced a choice.

The South Sioux City, Neb., native was about to graduate from Iowa State University with a bachelor of science degree in chemical engineering and was torn between following the path of peers who were landing starting salaries of more than \$50,000 or staying in school another four to five years to get his Ph.D.

Albrecht stayed, lured by what he described as the "pure science elements of engineering" taught in graduate school.

ISU is trying to get more of its native-born students to emulate Albrecht. As international students predominate in American graduate engineering schools, fears grow that most of them will leave the United States upon graduation to take jobs in U.S. offshore offices across the world. The United States is expected to be left with a shortage of engineers.

"We, as a country, do not produce enough domestic engineers at the graduate level to sustain our economy," said ISU College of Engineering Dean Mark Kushner.

"We actively recruit, and spend a lot of time to recruit, domestic students. They choose not to come to graduate school."

The push for U.S. students to enroll in the engineering college's master's and Ph.D. programs comes also as the quality of applications from international students went down post-Sept. 11, 2001, when immigration policies made it more difficult for the best international students to come to the United States, forcing them to apply for programs in Canada, Australia and Europe, Kushner said.

Foreign students still substantial

Despite those challenges, international students make up nearly half of the University of Iowa's graduate program in engineering in 2007-08 and 48 percent of ISU's graduate engineering program. Meanwhile, international students made up 7 percent of the U of I's total university population and 8.5 percent of ISU's total university population.

Nationally, foreign students claimed 61.7 percent of engineering doctorates in 2005-06, according

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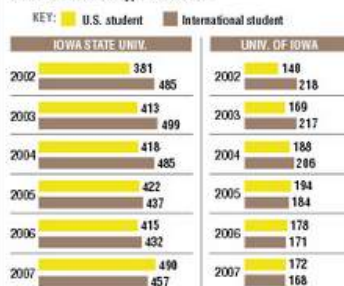


Mary Chind/The Register

From left, chemical engineering graduate students Zheng Li, Sikander Hakim, Karl Albrecht and Sarah Hruby work in the synthesis lab at Iowa State University.

ZOOM Graduate engineering students

Iowa State University College of Engineering Dean Mark Kushner said the school "heavily" recruits domestic students to attend graduate school in engineering. At the University of Iowa, College of Engineering Dean Barry Butler said there's no formal program to recruit one type of student vs. another type of student.



Note: Figures are for school year beginning in the year indicated.
Source: Iowa State University, University of Iowa

to the American Society for Engineering Education.

"It's good for us," said Nancy Knight, director of diversity and graduate student affairs at ISU's engineering college.

"We need the brainpower to help us run a research enterprise. If we can't get it from domestic students, we are going to get the best students either way."

The reasons for the lack of U.S. students in graduate engineering programs vary.

The U.S. job market for bachelor of science degrees in engineering, and other math and science fields, is booming, so engineering graduates are snapped up with high-paying positions, college officials said. Hefty student loans might push some students to quickly get a job to pay them off, rather than go to graduate school.

Focus put on undergraduates

It's also possible undergraduates in engineering don't understand the career opportunities that come with a Ph.D., Kushner said.

"You're simply not going to become a faculty member at a big-time university without a Ph.D.," Kushner said.

"You're not going to be director of research at a large company. Your credibility with venture capitalists, if you want to start a company, is going to be greatly enhanced if you have an advanced degree."

The engineering college at ISU has made several efforts to pique undergraduates' interest in graduate school.

In the last five to 10 years, Kushner said the college has increased its intensity of marketing undergraduate research opportunities, giving students a better idea of what sort of work they would do in graduate school.

He said the college has also worked to make it easier for people with full-time jobs to enroll in graduate engineering programs by working with the employers on advising, and picking topics for a Ph.D. thesis. Also, the engineering colleges at the U of I and ISU allow qualified students to start working on their master's degree as undergraduates.

"It gets them engaged in research while they are an undergraduate," said U of I College of Engineering Dean Barry Butler. "It builds confidence to complete a graduate degree. Even the absolute best students second-guess themselves."

Cases same in math, computer science

Engineering isn't the only field attracting high percentages of international students for graduate work.

In 2007-08, international students were 71 percent of those enrolled in graduate mathematics and computer science programs at ISU. At the U of I, international graduate students were about 42 percent of those enrolled in the same programs.

At the University of Northern Iowa, nine foreign students and one American student were enrolled in the master's program in computer science in

2007. The majority of people enrolled in the graduate mathematics program at UNI are from the United States, and most of them are in the mathematics education program, data show.

Businesses have responded to the lack of advanced degrees by getting undergraduates in the door and pushing them to go for more certifications.

Randy Nyberg, assistant vice president of information technology at Principal Financial Group Inc., said his company is also looking at technology to enable employees to work from areas other than the Des Moines central campus.

"We anticipate that there will not be enough people graduating in technology areas to fill the needs, so we will have to look for more flexibility with where people work," Nyberg said.

More jobs expected to be created

Larry Hanneman, director of engineering career services at ISU, said post-undergraduate education of engineers is going to be increasingly important as baby boomers start to retire, and as infrastructure like the interstate highway system built in the mid-1960s needs repair.

The demand for high-level knowledge is already great, he said.

"We sold out the engineering career fair about, jeez, a good two months in advance," he said, explaining that ISU had to turn away 50 to 100 companies for the fall 2007 fair because of lack of space.

At the event, 151 of the 313 companies offering full-time engineering employment opportunities were seeking a master's degree or Ph.D., Hanneman said.

In Eugene, Ore., Chris Stephenson, executive director of the Computer Science Teachers Association, said troubling attitudes towards science and mathematics among U.S. students start in middle school.

"As a society we don't place as high a value as other societies on the importance of being educated and being smart," she said.

"Society tells them it's really cool to be a sports athlete, but it's not cool to be someone who's really smart."

At ISU, Sikander Hakim, 27, from Udaipur, India, said being smart in India doesn't mean being the most popular, but bringing home stellar grades in mathematics was extremely important to his parents.

"If I bring my grade card home, my dad said, 'What did you get in math? History, I don't care,' " said Hakim, who is seeking a Ph.D. in chemical engineering.

Education emphasis differs, student says

That's the difference between the United States and Asia, Hakim said.

"All over Asia, math is really taken seriously over there," he said. "I don't know why we stress on math so much. It's very rigorous. We go through things in (high) school that are taught here in colleges. On the other hand, I would say here, independent thinking and analytical skills are stressed more."

Hakim also said doctors and engineers are valued more in India, and upon graduation, he might go back home near his family if jobs are available.

Sarah Hruby, 25, of Minnetonka, Minn., also studying for her chemical engineering Ph.D. at ISU, said there is a nerdy stereotype attached to engineers, "kind of like Dilbert stuff."

Albrecht, the ISU student from Nebraska, agreed, adding that the people he meets comment on how hard his area of study must be.

"I don't know how many times I've heard, 'I couldn't do that,' " he said.

He said he wants to tell people: "Yeah, you could. You just gotta buckle down and do it. No matter what you do, you have to enjoy it. Any major is difficult. You have to want it at the end of the day."

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STORYCHAT

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Perhaps a focus on
EDUCATION


Posted by: **whocares**
on Thu Oct 04, 2007
7:48 am

and less on DIVERSITY would help!



They also might try having the TENURED PROFESSORS teach the classes instead of the TA foreign nationals who are nothing but glorified students themselves.

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