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Not adding up: Schools faced with an enrollment drop in computer-science students

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CU STUDENTS IN THE CLASS 'THINGS THAT THINK'

CU students Mike MacFerrin and Ali Crocett in a computer class called "Things That Think" work on their projects at the Discovery Learning Center on Thursday.



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All the panel discussions had a similar vein when Liz Jessup, chairwoman of University of Colorado's computer-science department, attended an annual computing research conference for academics in Snowbird, Utah, last June:

Where have all the students gone, and how can we get them back?

They're questions that have roiled university computer-science and computer-engineering programs across the country in recent years.

In 2006, undergraduate enrollment nationwide in computer studies was half of what it was in 2000. Graduate-level programs also are shrinking as the trend works its way through academia.

The industry's bust five years ago — followed by rounds of layoffs and hundreds of startup companies

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disappearing — tarnished the profession in the eyes of many outsiders. More recent trends of sending some technology jobs overseas only solidified that perception.

Many high schoolers, influenced by their parents and media reports, are seeking out other disciplines to avoid professional downsizing later, experts say.

A slight uptick in freshman declaring an interest in computer majors for the 2007-2008 year has observers encouraged that the slide has stopped.

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But the great irony is that the enrollment declines hit bottom just as technology employers have grown healthy enough to hire, and predict continued growth.

It's not a return of the dot.com booms days — when startup companies lured undergraduates out of school before graduation — but the dearth of computer majors emerging from colleges has heightened demand for the ones entering the job market.

"The people who are coming out of our programs right now are getting these fantastic job offers," Jessup said.

Numbers don't compute

CU offered admission for fall 2007 to 109 high school seniors who expressed interest in studying computer technology, 27 of whom have confirmed their intent to enroll, according to preliminary figures.

That's almost identical to the enrollment statistics a year ago, Jessup said, which is encouraging given the enormous decline in the numbers in recent years.

Before the dot.com bust five years ago, the typical incoming class was two-and-a-half times larger, Jessup said.

The Computing Research Association has tracked enrollment in computer majors at four-year universities since 1974.

It counted 7,798 declared undergraduate majors in the field at the start of 2006, down from 15,958 at the discipline's high point in 2000.

The trend has already pulled down the number of related doctorate degrees in the field by 30 percent, the CRA found. The numbers are expected to keep shrinking, despite having programs of such renown that they draw students from around the world.

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Foreigners studying in the United States accounted for more than half of those pursuing doctorate degrees in computer engineering or computer science for the 2005 academic year, according to the CRA's annual study.

Stuart Zweben, associate dean of the College of Engineering at Ohio State University, helped put together the annual CRA survey.

He said part of the enrollment trend is that the figures are falling from an unprecedented and unsustainable stretch, during which enrollment in computer fields doubled at the height of the Internet boom.

The frenzy was fueled by the belief that the technology industry was the path to riches. Those enlarged classes graduated just as the dot.com economy crashed, making the job market that much more difficult amid all the layoffs.

This seesaw of supply and demand is a common part of the industry, but the thinning ranks of graduates is already too small to meet industry's demand.

"If you're looking at it from an employer's point of view, you're going to have to wait around a few years for the degree production to catch up and the talent to be available," Zweben said.

The looming shortage of home-grown graduate students was the subject of a dire presentation Colorado State University's John Hoxmeier, associate dean of graduate studies, put together last year.

Heading into last school year, CSU had only one freshman who had declared a major in computer information systems.

Lori Zaragoza-Wright, human resources director for Sun Microsystems Inc.'s systems group, has been leading a mission to recruit 100 new college graduates into jobs and find 100 college interns.

The Santa Clara, Calif.-based computer server and software company, which has major campuses in Broomfield and Louisville, has cut 10 percent of its global workforce in recent months.

Even so, hiring veteran technology workers to fill openings has become increasingly competitive as demand for them elsewhere has grown.

After years of looking elsewhere, Sun is returning to college campuses to build the pipeline for its next generation of workers, Zaragoza-Wright said.

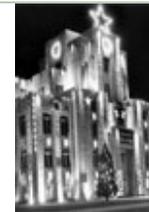
The decline in university enrollment has not yet been a problem for her hiring, but it is trend Zaragoza-Wright said she'd be watching.

"We are finding the talent out there," she said. "We just have to get out there ahead of people and

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be aggressive."

On campuses, the job scene for motivated computer science and computer engineering majors hasn't looked so good in years.

"People don't even pursue some job leads because they've got three or four already they want to look into," said Bruce Sanders, a CU instructor who works with undergraduates interning with area companies.

He wonders whether young people picking their majors believe the field means being professionally desk-bound and anti-social, spending most of their time coding language at a keyboards and fixing broken machines.

The quality of job prospects isn't the issue.

Reprogramming schools

Fixing the enrollment decline is expected to take a mixture of marketing and refocusing what gets taught, professors say.

When the description of a major is simply "computer science," it's little wonder some students don't get enthusiastic.

"The reason we're not having a recovery may be that the product we're offering is not interesting to students," Jessup said.

Georgia Tech, which features a large computing program, changed its coursework into "threads" of study emphasizing emerging niches in computer technology.

CU is doing something similar.

Next fall, it will start rolling tracks for studying things such as digital and social systems, biological infomatics and Internet systems — specialties and descriptions that help students understand the potential uses of what they'll learn.

Thomas Frey, a futurist and founder of the Louisville-based DaVinci Institute, suspects the enrollment trends may be a symptom of something too big for colleges to reverse.

He predicts this is the start of an emerging shift in education to less structured, more organic forms of online learning that will eventually challenge the whole idea of a university.

Some of those who may have signed on for a college-track computer education a decade ago may be just as inclined these days to log in and learn independently, he said.

If one wants an education bad enough, one only needs to go online any more, he said.

The Massachusetts Institute of Technology recently started posting course materials and videos online for free, making classes at one of the world's most prestigious technical institutions available to anyone.

Such developments may ultimately indicate that that colleges will lose their appeal for those students most motivated to learn about technology, Frey said.

"We're speeding up to a whole new gear in society, and we need an education system that's designed to keep up with it," Frey said.

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