



Harvard, Yale Boost Engineering in Race With China (Update1)

By Brian Kladko

May 30 (Bloomberg) -- Harvard and Yale are boosting their engineering programs because of increased demand and competition from China, where more engineering degrees are awarded each year than in the U.S.

Both academic institutions, following the lead of Princeton University and Columbia University, added to the status, staffing and visibility of the engineering schools in the past year. Yale University, in New Haven, Connecticut, is enlarging its faculty by 17 percent, to 70, during the next five years. Harvard University, in Cambridge, Massachusetts, is expanding to 100 professors within a decade, up 43 percent.

``These are two institutions that are almost synonymous with education," said **Rick Rashid**, the senior vice president for research at Redmond, Washington-based **Microsoft Corp.**, the world's largest maker of computer software, in a May 20 telephone interview. ``They're sending a powerful message, and hopefully that's a message that helps to pique the interest of young people."

The growth in engineering reflects increased hiring needs of companies as diverse as biotechnology developer **Genzyme Corp.** and solar-cell maker **SunPower Corp.** The **Labor Department** anticipates an 11 percent rise in engineering employment in the U.S. between 2006 and 2016. While China says it annually turns out seven times as many engineers as the U.S., a Duke University researcher says that number is inflated, though the Asian nation does outpace American schools.

U.S. engineering and technology degrees peaked at 97,122 in 1986, and fell 16 percent to 81,610 in 2006, according to the **Web site** of the Washington-based National Center for Education Statistics.

Duke Debunker

While enrollments swelled in the 1980s because of students' interest in energy, the environment and biotechnology, the U.S. now produces about 30 percent fewer engineers per capita than it did two decades ago, **Joseph Helble**, engineering dean at Dartmouth College in Hanover, New Hampshire, said in a telephone interview yesterday.

The totals for engineering degrees granted in China, Japan, South Korea and the U.K. all rose in the years 1985 to 2005, according to a January **report** from the Arlington, Virginia-based National Science Foundation, a U.S. government agency.

Data provided by the Chinese government showed that 575,000 undergraduate engineering degrees were awarded in 2006, said **Vivek Wadhwa**, an adjunct professor at Duke, in Durham, North Carolina. That figure was inflated because China uses the term engineer to include auto technicians and other jobs not deemed engineers in the U.S., he said.

Princeton, Columbia

The actual number of engineers comparable in quality to those graduating in the U.S. may have been closer to 60,000 in 2006, Wadhwa said in a May 28 telephone interview. That's less than half of the number of U.S. graduates in 2006, he said, citing figures that include computer scientists not in the National Science Foundation survey.

At Harvard, 4.5 percent of students now major in engineering. At Yale, the figure is 2.9 percent. Those totals compare with 17 percent at Princeton in New Jersey and 19 percent at Columbia in New York.

``Places like Harvard have traditionally made heroes out of Einstein much more than Edison," said former Harvard president **Lawrence Summers** in a May 19 interview.

The same emphasis on training thinkers as distinct from technicians was long the practice at Yale, said **Paul**

Fleury, the university's former engineering dean.

"Yale was a gentleman's school, and this wasn't a thing gentlemen got involved with," Fleury said in an interview this month. "Getting your hands dirty was not what Yale people did."

U.S. News Rankings

None of Harvard's or Yale's graduate programs placed in the top 10 schools in mechanical, chemical, electrical or biomedical engineering, according to the latest annual **U.S. News and World Report** survey of engineering department heads.

In biomedical engineering, the magazine's No. 1 school was Johns Hopkins University in Baltimore. The California Institute of Technology in Pasadena, the Massachusetts Institute of Technology in Cambridge and the University of California, Berkeley, tied at the top of the chemical group. MIT came first in electrical and mechanical engineering. MIT also led the magazine's overall ranking of U.S. graduate schools of engineering.

Harvard, in an effort to give its engineering program greater visibility to potential faculty, students and donors, created a separate school last year. Yale followed with a similar move last month.

Sixth Building

Harvard engineering dean **Venkatesh Narayanamurti** now points to a new engineering link on Harvard's main Web site, alongside those to the schools of medicine, law and business.

"There is no ambiguity," Narayanamurti said in an April 28 interview at his Cambridge office. "This is a university priority."

Narayanamurti, who is stepping down as dean in September, said his successor, as yet unnamed, may increase graduate enrollment within a decade to 500 or 600 students, from the current 350.

Yale, under President **Richard Levin**, has promised the engineering school a sixth building, for which construction is scheduled to begin in 2009 or 2010, said Dean **T. Kyle Vanderlick** in a May 5 phone interview.

All of the universities in the elite, eight-member Ivy League now have engineering schools, except Brown University in Providence, Rhode Island. Brown's undergraduate engineering program is called a division and may be elevated to a school, spokesman Michael Chapman said May 2 in an e-mail.

Capital Campaign

Columbia's **Fu Foundation School of Engineering & Applied Science** is conducting a \$125 million capital campaign, with \$100 million needed to recruit faculty and students and \$25 million to expand research programs.

Officials at Harvard and Yale say they want to wield the same influence in the fights against energy and food shortages and global warming as they exert in the worlds of law, politics and medicine.

Shriram Ramanathan, a Harvard materials science professor, is working on improving solid-oxide **fuel cells** that might be an improvement over hydrogen fuel cells for automobiles.

"They're sitting right on some marvelous resources," said **Richard K. Miller**, president of the **Franklin W. Olin College of Engineering**, a six-year-old school in Needham, Massachusetts, and an advisory-committee member at Harvard's engineering school, in an interview this month. "If they just use them, they could be very influential."

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