

INTERNATIONAL ENGINEERING EDUCATION DIGEST

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A periodic electronic newsletter for engineering education leaders,
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CONTENTS

1 - International developments

- *Study recommends thorough revamping of engineering education in India*
- *Enabling Europe to innovate*
- *Indian PM receives report recommending more and better universities*
- *New American-style Iraqi university planned outside of Baghdad*
- *Latest university bombing in Baghdad targeted academics*
- *British university heads warn of large tuition fees*
- *Japanese education trend questioned*
- *Edinburgh poised to change its honorary degree criteria*
- *African ethics boards reveals complex problems for researchers*
- *Japan's universities act on misconduct*

2 - US developments

- *NSF braces for opportunities lost*
- *Reduction in earmarks will impact minority-serving colleges*
- *Increase in federal agency support of US R&D*
- *Another front on accreditation*
- *NAE 2007 top awards*

3 - Technology

- *Congress to take up Net's future*
- *Grand challenges for engineering*
- *Asia scrambles to repair quake damage to data cables*
- *"Nature" editors pull the plug on open peer review experiment*
- *Apollo Group moves into online secondary education*

4 - Students, faculty, education

- *New report emphasizes increased relevance of liberal education*
- *Affirmative action dropped at U of Michigan*
- *Profiling the American freshman*
- *Women made substantial advances in science and engineering*
- *Higher ed and the high schools*
- *21st Century Professors*
- *Study more: live longer*

- *Study recommends single standard for certifying math, science teachers*
- *Affirmative action for men?*
- *Florida agencies approve bachelor's degrees from community colleges*
- *Small research universities move to expand*
- *Reality TV show for engineering education*
- *Sacré bleu!*

5 - Employment, competitiveness

- *Immigrants big in tech startups*
- *Plenty of jobs for class of '07*

6 - Meetings

- *Global Colloquium on Women in Engineering and Technology*
- *ASEE Global Colloquium on Engineering Education*

7 - Journals

- *International Journal of Engineering Education*
- *Issues in Science and Technology*
- *The Bridge*
- *Global Journal of Engineering Education*
- *International Journal of Technology and Globalization*

1 - International developments

Study recommends thorough revamping of engineering education in India – The January 2007 issue of *World Education News and Reviews* features a major study on “Engineering Education in India: A Story in Contrasts.” It gives a short introduction to the structure of higher education in India, describes some of India’s famously strong engineering schools, then goes on to discuss the challenges to engineering education and some of the recommended solutions to systemic problems. The top tiers of engineering institutions are the seven Indian Institutes of Technology followed by the twenty National Institutes of Technology. These are followed by large numbers of public and private engineering schools which are reportedly proliferating at a rate of one per week. The top-tier schools are excruciatingly selective, relying on difficult entrance examination, then imposing heavy workloads on their students and demanding excellent performance. Nonetheless, the perception is that student quality has sharply declined over the past decades. In 2002 a five person committee headed by U. R. Rao was charged by the Ministry of Human Resources Development to review the umbrella agency governing engineering education, the All India Council for Technical Education. Their report cited the unfettered proliferation of engineering schools and programs, the scarcity of qualified faculty, and the lack of enthusiasm and organization for accreditation, as major problems facing the country. Recommendations coming from the report include reduction in the number of engineering graduates in order to increase quality, tighter coordination

between manpower needs and program offerings, plans for turning out more doctorates and then incentives to keep them from abandoning higher education for industry, and more attention to accreditation, including membership in the Washington Accord. (See <http://www.wes.org/ewenr/PF/07jan/pffeature.htm>)

Enabling Europe to innovate – A major article in the January 19th *Science* by Andrew Dearling reviews European efforts to develop a supportive ecosystem for drawing the private and public sectors into the type of complex partnerships needed to produce innovations required to compete in today's global economy. European public policy has in recent years emphasized the importance of R&D in achieving competitive knowledge-based societies, and it is now shifting toward approaches that address the broader qualities required for innovation. The desired ecosystem will incorporate the roles of market demand, public procurement, regulation, science, education, and industrial R&D, as part of determining effective innovation policies. (See <http://www.sciencemag.org>)

Indian PM receives report recommending more and better universities – The National Knowledge Commission reported to Indian Prime Minister Manmohan Singh that the country's current 350 universities should be expanded to 1,500 by 2015 in order to serve a great proportion of 18 – 24 year olds, writes Shailaja Neelakantan on January 16 in *The Chronicle of Higher Education*. The commission also recommended that government support to higher education be increased, that new means of funding universities be explored, and that an independent regulatory authority be established. The report calls for improving the quality of universities by focusing more on understanding rather than rote memory, and making better efforts to recruit and retain good faculty members. Finally, the report calls for research and teaching to be rejoined in universities. (See <http://chronicle.com/daily/2007/01/2007011603n.htm>)

New American-style Iraqi university planned outside of Baghdad – A new, American-style university is under development in Iraq, with a curriculum taught in English, with faculty recruited internationally, and with an emphasis on applied fields such as petroleum engineering, business and computer science. Organizers say that the university would attempt both to stem the brain drain from Iraq and to serve as a prod for the reform of Iraqi education, reports Edward Wong in the January 3 on-line edition of *The New York Times*. While it follows a long-standing tradition of higher learning in Iraq, the new university goes counter to tradition in being situated in Sulaimaniya, rather than Baghdad, and that is causing some dissatisfaction. Sulaimaniya is located about 150 north of Baghdad in the Kurdish region of the country which is much more peaceful than the capital, but is also considered more corrupt and apt eventually to secede from Iraq. (See <http://www.nytimes.com>)

Latest university bombing in Baghdad targeted academics – Two bombs went off outside al-Mustansiriya University in Baghdad on January 16, killing at least 60 people and wounding dozens more, writes Mariam Karouny in a Reuters' report accessed on January 17. The attack is seen as part of a deliberate targeting of academics. "Academics have apparently been singled out for their relatively respected public status, vulnerability and views on controversial issues in a climate of deepening Islamic

extremism,” said the latest UN rights report. The UN also pointed out that Iraqi academics are increasingly leaving the country. (See <http://today.reuters.com>)

British university heads warn of large tuition fees – Tuition fees for undergraduates in England will have to rise to £6,000 a year or more to cover teaching costs, according to a *Guardian* survey of university vice-chancellors and senior staff. As reported in the January 18th issue of *The Guardian* by James Meikle, the survey reveals growing unease about the funding system which came into force last autumn. Some suggest that science courses could cost students up to £10,000 a year when the current structure is reviewed. The current maximum tuition fee allowed is £3,000. Many of those surveyed also expected the Treasury to make student loans more expensive to repay, due to the cost of government subsidizing such loans and the writing-off of unpaid debts. The higher education minister noted that fees are fixed until 2010, and that prior to that time an independent commission reporting to parliament would report on the first three year’s experience with the system and consider future arrangements for the fee cap and student support. (See <http://education.guardian.co.uk>)

Japanese education trend questioned – Japan has slipped down the international rankings for high school literacy, mathematics, and science according to an article in the December 23rd *The Economist*. In the OECD’s last assessment of 15-year-olds in 41 countries, Japan remained a healthy second in science, but had fallen from first to sixth in math and from eighth to fourteenth in reading ability. Parents are worried, and the fledgling new government is casting about for reforms. But the reforms being contemplated by the education minister appear to be aimed at instilling a love of their country in students – through a grasp of the country’s history and culture and perfection of their own language – rather than addressing basic reforms that are needed to keep the country economically successful in the global economy. (See <http://www.economist.com>)

Edinburgh poised to change its honorary degree criteria – Edinburgh University is taking steps to tighten up its tradition of awarding honorary degrees, and may even go so far as to revoke one or more of them, reports Murdo MacLeón in the online edition of *Scotland on Sunday* dated January 14. Documents released under the Freedom of Information legislation have revealed plans under consideration to stop awarding degrees to people who already have many others, to ban current politicians from getting the awards, and to consider whether to deny honorary degrees to people from countries with bad human rights records. There is even an indication that the honorary degree that Edinburgh University awarded in 1984 to Robert Mugabe, President of Zimbabwe, might be revoked, since Mugabe’s subsequent acts of human rights abuses have been a source of embarrassment to the institution. (See <http://news.scotsman.com>)

African ethics boards reveal complex problems for researchers – Professor Nancy Kass has conducted a study of research ethics boards in Africa and discovered both progress and problems, reports Susan Brown in the January 23 issue of *The Chronicle of Higher Education*. Kass, from Johns Hopkins University, surveyed 12 ethics boards in nine countries, the oldest (South Africa) in place since 1967, and the eight youngest organized within the past five years. Ethics boards have proliferated under pressure from mostly

Western funding agencies which require review from both the home and the host institution. Training reviewers is a difficult process, but even more difficult are the complex ethical questions they must tackle. In many countries, subjects are illiterate, posing problems of how to obtain informed consent. In addition, subjects unfamiliar with medical research may have faulty expectations about the personal health care which researchers can be expected. (See <http://chronicle.com/daily/2007/01/2007012305n.htm>)

Japan's universities act on misconduct – A series of outstanding scientific misconduct cases in Japan have ended suddenly and decisively in Japan, according to an article in the January 5th *Science* by Dennis Normile. Two leading Japanese universities have fired scientists because of questionable publications, and a researcher is reported to have resigned from a third university over alleged mishandling of research funds. Over the past year all three of the universities involved introduced codes of conduct for researchers and established offices or committees to promote good ethics and investigate allegations of fraud. But the wider scientific community may not yet recognize the need for enforcement. In a recent survey, only 13.3% of responding institutions had adopted a code of ethics, and only 12.5% had established procedures for handling allegations of misconduct. (See <http://www.sciencemag.org>)

2 - US developments

NSF braces for opportunities lost – The freezing of the federal budget at last year's levels by Congress has put many agencies, including the National Science Foundation, in a tight financial box. According to an article in the January 5th *Science* by Jeffrey Mervis, NSF had hoped for an 8% boost this year in its \$5.6-billion budget – and it had been targeted by the Bush administration for such a significant increase as part of the American Competitiveness Initiative. The President's budget request to Congress last February contained the first installment of what was intended to be a 10-year doubling of federal basic research spending in the physical sciences. NSF's proposed 2007 budget contained a \$25-million pot of money to fund frontier research at the intersection of engineering and a host of other disciplines, as well as significant increases in other programs. Such initiatives will now apparently be placed on hold. (See <http://www.sciencemag.org>)

Reduction in earmarks will impact minority-serving colleges – The crackdown on congressional “earmarks” proposed by US House and Senate Democrats would be a blow to the large research universities which lobby heavily for such funds, but it would also affect smaller African American-serving institutions and tribal colleges. Already in doubt are numerous proposals caught between the last session of Congress, dominated by the Republicans, and the forthcoming session, dominated by the Democrats, writes Charles Dervarics in *Diverse Online* on January 10. Examples include \$100,000 destined for Lincoln University in Pennsylvania for technology upgrades, \$300,000 for Virginia State University for an international economics program, and \$400,000 to Southwestern Indian Polytechnic Institute for equipment and training programs. (See <http://www.diverseeducation.com>)

Increase in federal agency support of US R&D – The latest statistics from the US National Science Foundation Survey of Federal Funds for Research and Development reveal that federal agencies provided \$109.7-billion for research and development activities in 2004, part of a decade-long average increase of 4.7% each year. The survey also shows that research accounted for 48.6% of total federal R&D money in 2004, with 42.5% of those research dollars going to universities and colleges. (See Press Release 06-178 at <http://www.nsf.gov>)

Another front on accreditation – After months of uncertainty, the US Department of Education has decided to begin a process in which it will explore possible changes to the federal rules that govern the higher education accreditation process, according to an article in the January 17th *Inside Higher Ed* by Doug Lederman. The decision offers yet another sign that the department plans to move aggressively, on many fronts, to carry out the recommendations of the Secretary of Education's Commission on the Future of Higher Education. The rules on accreditation were last revised in 1999, and department officials have made a variety of interpretations of those rules that have confused and at times confounded accreditors. According to the education department, the upcoming review is at least partly intended to provide greater clarity and consistency in the rules governing accreditation. Accreditors will be involved in the negotiated rule making process. (See <http://insidehighered.com>)

NAE 2007 top awards – The engineering profession's highest honors for 2007, to be presented by the National Academy of Engineering during E-week in February, recognize three achievements that have revolutionized how people use information, opened new frontiers of medical research, and guided promising engineers into leadership roles. Timothy J. Berners-Lee will receive the prestigious Charles Stark Draper Prize – a \$500,000 annual award that honors engineers whose accomplishments have significantly benefited humanity – “for developing the World Wide Web”. The Fritz J. and Dolores H. Russ Prize – a \$500,000 biennial award recognizing engineering achievement that significantly improves the human condition – will go to Yuan-Cheng “Bert” Fung “for the characterization and modeling of human tissue mechanics and function leading to prevention and mitigation of trauma”. The Bernard M. Gordon Prize – a \$500,000 award issued annually that recognizes innovation in engineering and technology education – will be awarded to Harold S. Goldberg, Jerome E. Levy and Arthur W. Winston of Tufts University “for the development of a multidisciplinary graduate program for engineering professionals who have the potential and desire to be engineering leaders”. (See <http://www.nationalacademies.org>)

3 - Technology

Congress to take up Net's future – Senior lawmakers, emboldened by the recent restrictions on AT&T and the change in control of Congress, have begun drafting legislation that would prevent high-speed Internet companies from charging content providers for priority access. According to an article in the January 10th *New York Times*

by Stephen Labaton, proposals for “net neutrality” face significant political impediments, and no one expects that they will be adopted quickly. Giants like Google, Yahoo, e-bay and Amazon support such legislation, while it is opposed by telecommunications giants like Verizon, AT&T, and large cable companies like Comcast. Supporters of such legislation contend that without it some content providers would be discouraged from offering services while others would be forced to increase prices to consumers. But the telephone and cable companies say that efforts to limit their ability to charge for faster service would discourage them from making billions of dollars in investments to upgrade their networks. (See <http://www.nytimes.com>)

Grand challenges for engineering – The US National Academy of Engineering has convened a committee of leading technical thinkers to create a list of the grand challenges and opportunities for engineering facing those born at the dawn of this new century. According to an NAE press release, this blue-ribbon committee will then look at research and innovation – either already being explored or which should be considered – that might help address aspects of each challenge. Input is being sought from a wide range of sources, ranging from experts in science and engineering to the broader general public. Details on this NSF funded project can be found at its web site. (See <http://www.engineeringchallenges.org>)

Asia scrambles to repair quake damage to data cables – Undersea data cables linking countries in North and Southeast Asia were broken in a late December quake and its aftershocks. According to an article in the December 29th *New York Times* by Donald Greenlees and Wayne Arnold, the quake of magnitude 6.7 struck the Luzon Strait off southern Taiwan. Six of seven undersea cable systems, accounting for 90% of telecommunications capacity in the region, were broken. Most telecommunications companies were able to restore international calls by rerouting traffic to satellites and to cables unaffected by the earthquake, while repairs were being made to the damaged cables. (See <http://www.nytimes.com>)

“Nature” editors pull the plug on open peer review experiment – The editors of *Nature* have ended their attempt to solicit open peer review, reports Susan Brown in *The Chronicle of Higher Education*. Last year the editors told authors of articles undergoing traditional confidential peer evaluation that they had the option of posting the papers online for comment by signed spontaneous reviewers. Once a paper was either accepted or rejected, the entire posting was removed. About 5% of authors accepted, higher than expected, since such public posting are risky in terms of competition. The results were disappointing. Nearly half of the posted papers received no comments, and most of the comments that were made were cursory. Linda J. Miller, *Nature*’s executive editor, speculates that when the MySpace and Facebook generation of scientists begin publishing, they may be more attuned to such processes. (See <http://chronicle.com/daily/2007/01/2007011102.htm>)

Apollo Group moves into online secondary education – The Apollo Group, owner of the University of Phoenix, has purchased Insight Schools, a company that runs an on-line high school in Washington State. This secondary school began offering courses last fall

and now enrolls 600 students who pay no tuition if they are from in-state. This is the first time Apollo has entered into the secondary market. The on-line high school is seen as a potential feeder into Apollo's Axia College, a two year on-line institution, reports Audrey Williams June in *The Chronicle of Higher Education*. (See <http://chronicle.com/daily/2007/01/2007011105n.htm>)

4 - Students, faculty, education

New report emphasizes increased relevance of liberal education – The Association of American Colleges and Universities issued a report based on a survey of what business leaders want from college graduates. “College Learning for the New Global Century” first listed skills that employers want colleges to emphasize more: 82% of employers, for example, are called for more emphasis on “concepts and developments in science and technology.” Other results: 73% for more “more effective oral and written communication”; 72% more “understanding global issues and their impact”; 70%, more “ability to locate, organize and evaluate information from multiple sources”; 60% more “understanding the role of the United States and the world”. Then the report goes on to recommend that colleges adopt seven “principles of excellence,” such as engaging “the big questions,” and connecting “knowledge with choices and action.” Clifford Adelman, formerly a researcher with the US Department of Education, commented that the implications of this report for engineering students, for example, might be to choose a five year program, reports Scott Jaschik in *Inside Higher Ed*. (See <http://insidehighed.com/news/2007/01/11/aacu>)

Affirmative action dropped at U of Michigan – A state constitutional amendment passed by Michigan voters last November has caused the University of Michigan to drop its efforts at affirmative action and immediately stop considering race and gender in admissions. According to an article in the January 11th *Washington Post* by David Goodman, the move came in the middle of the admissions process for next fall's freshman class. The university had asked the courts to give it until next summer to comply with the ban, but a federal appeals court said no. The university will continue its legal challenge to the measure while complying. It said it would use other criteria to achieve diversity, including the level of education completed by students' parents and whether students attended a disadvantaged school. (See <http://www.washingtonpost.com>)

Profiling the American freshman – Researchers at UCLA have reported on their annual survey of 270,000 entering freshmen at roughly 400 colleges across the country. According to a summary of the report written by Elia Powers in the January 19th *Inside Higher Ed*, this year's data show that the first-year students are increasingly politically minded and moving away from the center of the political spectrum. They are far apart on many social issues, and appear mixed on affirmative action. They are concerned about financing their educations and are fully confident in their academic abilities. Making more money and getting a better job were two of the top reasons students cited for choosing to go to college. And Lake Wobegon lives: 72% of men and 66% of women

surveyed said they were either “above average” or in the “highest 10 percent” of academic ability. (See <http://insidehighered.com>)

Women made substantial advances in science and engineering – The Commission on Professionals in Science and Technology released a report showing that women have made substantial progress in earning degrees in science and engineering over the past four decades, reports Paul D. Thacker in *Inside Higher Ed*. In 1966 women earned 24.8% of bachelor’s degrees in these fields, 13.3% of master’s degrees and 8% of doctorates, while in 2004 they earned 50.4% of bachelor’s degrees, 43.6% of master’s, and 37.4% of doctorates. Women now constitute 25% of the labor force in science, engineering and technology fields, but the disaggregated figures show continued problems with women turning away from careers where math is important. Underrepresented minorities have not made the same progress that women have. African Americans, for example, are 13% of the population but earned 8.4% of bachelor’s degrees, 6.3% of master’s and 2.8% of doctorates. (See <http://insidehighered.com/news/2007/01/09/science>)

Higher ed and the high schools – Speakers at a recent “Advancing College Readiness” summit outlined the role higher education should play in ensuring that high school graduates learn the right skills and graduate ready for college and the workforce. According to an article by Elizabeth Redden in the January 23rd *Inside Higher Ed*, longstanding challenges in effecting needed change within a seemingly intractable system include: low respect and pay for teachers, and the poor job higher education has often done in preparing them; the failure of higher education leaders to agree on standards among themselves, let alone dictate them to high schools; and minimal incentives and opportunities for dialogue between the K-12 and higher education sectors. One speaker estimated that 40 to 45% of recent high school graduates report experiencing significant gaps in the skills they need for success in college and the workplace, and outlined a four-part agenda for college leaders: involve professors in identifying the knowledge and skills needed to succeed in college; work with state policy makers to ensure that their graduation requirements are consistent with the demands of college-level work; collaborate with the K-12 sector to ensure that the assessment measures they use adequately measure college readiness; and initiate a feedback loop to send information about first-year students’ performance back to high schools. (See <http://insidehighered.com>)

21st Century Professors – The cover story in the January *ASEE Prism*, written by Thomas Grose, explores what it is like to be starting an academic career today – expected to raise lots of money to fund research projects and be a superstar in the classroom. The article points out that money for basic and applied research is tight today, and that many young academics – whose workweeks can range from 50 to 80 hours – can easily spend nearly half their time writing grant proposals, often with minimal results. In addition, one dean is quoted as saying: “There was a time when, if you were a strong researcher and a mediocre teacher, you could survive. Today, that’s impossible. You have to be great at everything you do.” (See <http://www.ase.com/prism>)

Study more: live longer – A health economist at the RAND Corporation, James Smith, was recently quoted by Gina Kolata in the January 3 online edition of *The New York Times* as saying that “health insurance . . . ‘is vastly overrated in the policy debate.’” What really matters in terms of increasing longevity is education. In study after study conducted around the world, education is linked to longevity, playing a much more important role than race, income and availability of health insurance. Why this is true is not clear. Dr. Lleras-Muney, a researcher at Princeton who did some of the most powerful analyses of the link between education and longevity, suspects, along with Smith, that more education is tied to the important ability to defer gratification in order to prepare a better future. (See <http://www.nytimes.com>)

Study recommends single standard for certifying math, science teachers – The Commission on 21st Century Education in Science, Technology, Engineering, and Mathematics, reporting to the National Science Board, (the policy making group for the National Science Foundation) has approved a draft of a report for review by the Board in February. The fifteen commission members, five of which are academics, have proposed a national standard for certification of math and science teachers and increased incentives to draw science and math majors into education as a career. They understand that the problems of fragmentation of the teaching of math and science cannot be solved without the cooperation of higher education, but have not tackled the problem of science faculty members’ resistance to having their students become teachers rather than scientists, writes Jeffrey Brainard in *The Chronicle of Higher Education*. (See <http://chronicle.com/daily/2007/01/2007012403n.htm>)

Affirmative action for men? – *The Chronicle of Higher Education* featured a major article on “The New Gender Divide,” written by Robin Wilson. It is a study of the implications of the fact that women now constitute 58% of undergraduates in the US. Individual institutions describe steps they are taking to re-establish a better balance when their enrollments of women are even higher than the national average and to level the playing field. Elon College, for example, has opened an engineering program and has moved its football team to Division I, in hopes of attracting more men. And some scholars have created the Boys Project, to do for men what the women’s movement did for girls. Not everyone agrees that there is a gender crisis, however. To many, it is just clear that women students are better prepared, and work harder. It is not that men are doing worse: it’s just that women have improved their performance faster. One thing is clear: today’s students have never known a time when women did not dominate on campus. (See <http://chronicle.com/weekly/v53/i21/21a03601.htm>)

Florida agencies approve bachelor’s degrees from community colleges – The Florida Board of Governors of the state university system and the Florida State Board of Education have agreed to permit the state’s community colleges to offer baccalaureate degrees in fields where there are shortages of graduates. The community colleges already offer bachelor’s degrees: this agreement defines and restricts them to nursing, teaching and technical fields, writes Karin Fischer in *The Chronicle of Higher Education*. (See <http://chronicle.com/daily/2007/01/2007011905n.htm>)

Small research universities move to expand – The University of Rochester features prominently in a report by Scott Jaschik for the January 16 edition of *Inside Higher Ed* about the renewed interest on the part of some relatively small research institutions in expanding in size. The motivation for expansion is the need for scale in order to conduct interdisciplinary research such as nanotechnology. So Rochester is planning to increase the size of its faculty and undergraduate enrollment by 25%. Similarly, Rice University will grow its undergraduate program by about 30%. Rochester’s growth would be strategically planned, not random, possibly aimed at creating productive links with its famous Eastman School of Music to include work in signal processing, or creating area studies which would engage the world beyond US borders. (See <http://insidehighed.com/news/2007/01/16/rochester>)

Reality TV show for engineering education – A new half-hour weekly television program, “Design Squad”, will use the formula of reality television to introduce children and families to engineering design processes. As described in an article by Jason Laday in the January IEEE *The Institute*, the show is being produced by WGBH Boston in partnership with the sponsors of US National Engineers Week. The show will feature two competing teams of high school students plucked from real life and follow their progress as they design, build and test fun yet practical machines such as an automatic pancake maker and a motorized wagon. Chosen through audition the eight contestants have minimal engineering experience, though for many working with technology is an after-school hobby. The show premieres on Public Broadcasting Service stations during E-week, 18-24 February 2007. (See <http://www.theinstitute.iee.org>)

Sacré bleu! – A British-born Australian academic, Stephan Charters, has recently been appointed “professor of champagne” at the Reims (France) Management School, reported Alexandra Smith in the *Education Guardian* online edition on January 9. (See <http://education.guardian.co.uk>)

5 - Employment, competitiveness

Immigrants big in tech startups – Foreign-born entrepreneurs were behind one in four US technology startups over the past decade, according to a recently released study from Duke University. As reported by Rachel Konrad in the January 4th *Seattle Times*, 25% of technology and engineering companies started from 1995 to 2005 had at least one senior executive – founder, chief executive, president or chief technology officer – born outside the US. Immigrant entrepreneurs’ companies employed 450,000 workers and generated \$52-billion in sales in 2005, according to the study. One of the study’s greatest surprises was the extent to which Indians led the entrepreneurial pack. Of an estimated 7300 US tech startups founded by immigrants, 26% have Indian founders, CEOs, presidents or head researchers. (See <http://seattletimes.nwsourc.com>)

Plenty of jobs for class of ‘07 - Employers are diving back into the fountain of youth, according to an article in the January 23rd *Wall Street Journal* by Erin White. This year is shaping up as the strongest for college recruiting since the downturn earlier this decade,

colleges report. Employers plan to hire 17% more graduates from the class of 2007 than from the class of 2006, according to the National Association of Colleges and Employers. More than half of the surveyed employers said they planned to increase hiring, with only 5% planning a decrease. Salaries were forecast to rise 4.6%, according to another survey by the same group. Traditionally heavy recruiters such as management consulting firms, investment banks, and accounting firms are intensifying college recruiting efforts. And they are facing increased competition from other employers in such fields as technology, consumer products, government, and even nonprofits. (See <http://www.wsj.com>)

6 – Meetings

Global Colloquium on Women in Engineering and Technology – Abstracts are sought for a conference to be held in Tunis from 6-8 June 2007. Topics include women in the engineering and technology workforce, women in engineering education, women as entrepreneurs of small and medium enterprises, and women enabling technology in communities. (See <http://www.wfeo.org/women/call.html>)

ASEE Global Colloquium on Engineering Education – The sixth in a series of global colloquia organized by the American Society for Engineering Education will be held in Istanbul, Turkey from 1-4 October 2007. Papers are being sought on three themes: advancing global engineering education research, enhancing global engineering innovation and entrepreneurship, and assuring engineering quality and enabling global mobility. (See <http://www.asee.org/gcee2007/>)

7 – Journals

International Journal of Engineering Education – The final 2006 volume of IJEE contains a special issue on Trends in Agricultural, Biosystems and Biological Engineering Education, edited by Joel Cuello of the University of Arizona and Linus Opara of Sultan Qaboos University. That portion of the journal includes eight papers on curriculum reform, assessment and accreditation and six papers on simulation, resource management and field demonstration tools. A second portion of the journal contains ten assorted papers on engineering education more generally. (See <http://www.ijee.dit.ie>)

Issues in Science and Technology – The feature articles in the Winter 2007 issue include one on understanding the psychological and emotional processes of aging, two on domestic security – one on transportation security and one on public safety communications – and a final article on deep international competitiveness challenges. (See <http://www.issues.org>)

The Bridge – The winter 2006 issue of the journal of the US National Academy of Engineering contains six papers from the 12th Frontiers of Engineering Symposium. Topics include video gaming, synthesizing materials at the molecular level, the

capabilities of biological systems, world travel demands, urban transportation, and managing disruptions in supply chains. (See <http://www.nae.edu/TheBridge>)

Global Journal of Engineering Education – Volume 19 Number 2 of the GJEE contains papers that won Best Paper Awards at international conferences organized by the UNESCO International Center for Engineering Education in 2006. Topics include shaping future engineering leadership, engineering curricula for globalization, liberal arts in engineering education, philosophical ethics, simulation programs for teaching, final year project work, continuous program improvement, remote laboratories, quality systems, and internationalization of higher education. (See <http://www.eng.monash.edu.au/UICEE>)

International Journal of Technology and Globalization – The final issue of IJTG for 2006 is a special issue edited by Calestous Juma on Science and Innovation in Africa: New Strategies for Economic Growth. Thirteen papers cover topics including strategic options for Africa in the global knowledge economy, achieving productivity-led growth, higher education in economic transformation, innovation for development and poverty reduction, governing technology and economic growth, institutional innovation, and industrial migration. (See <http://www.inderscience.com>)

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