

Engineering education world

Contributions are invited for this feature. News items on policies that concern the engineering education world, new courses and curricula either of a unique nature or of international interest, new innovative laboratories and concepts, funding news for engineering research projects involving international participation, special international continuing education courses and news, industry-university interaction, engineering faculty news, and developments in engineering education of international interest. Please send news items and conference information to the Editor-in-Chief. Public relations offices of universities and human resources divisions in industry are requested to contact the Editor with news items concerning engineering education and training.

World

UNESCO sees need for university fees

As reported in this section, as well as in the editorial of Volume 10(3), the World Bank report on *Higher Education: The Lesson of Experience* advocates a restructuring of funding for higher education. In particular it strongly urges institutions to find alternative sources to public funding. Now in a UNESCO policy paper these recommendations are taken up and partly endorsed. It was clear that hard resistance to such restructuring is going to come from many sources. The World Bank policies were called 'fundamentalist', 'out of context' and 'suicidal'. UNESCO concedes the possible need for tuition fees, but at the same time stresses the maintenance of public funding and student support. A further report, by a commission headed by **Jacques Delors** is expected to appear

on education for the next century. The UNESCO report *Policy Paper for Change and Development in Higher Education* is available from UNESCO, 7 Place de Fontenoy, 75352, Paris, France.

Internet growing by leaps and bounds

Internet has developed into the most popular computer network, and continues to do so. As of now 3.2 million computers are connected to the system, distributed into 46,000 domains. During the first six months of 1994, there were 1 million new connections to the net, an increase of 45%. The increase is coming increasingly from areas outside the USA. USA increases amounted to 38% during this period. Other services are trying to keep up the pace of expansion, especially CompuServe and AT&T Mail. A list of the main service providers is given in Table 1.

Table 1. Main Internet service providers

| Service provider | Max. bitrate (kbit/s) | Subscription (\$/month) | Cost (\$/h) |
|------------------|-----------------------|-------------------------|-----------------|
| Delphi | 9.6 | 14 | 9 |
| PSI Link | 9.6 | 19 | variable |
| CompuServe | 14.4 | 9 | variable |
| SprintMail | 9.6 | 20 | 14 |
| AT&T Mail | 9.6 | 3 | variable |
| American online | 9.6 | \$10 for 4 h | \$3.5 after 5 h |
| MCIMail | 9.6 | none | variable |

UK

How British universities control foreign security risk students

British universities employ selective admission to studies such as metallurgy, electrical and mechanical engineering, radiography, aerodynamics, ballistics and nuclear physics. The so-called 'voluntary scheme' of restrictive studies applies to students from countries which are not signatories to the nuclear Non-Proliferation Treaty. Blacklisted countries are Egypt, Cuba, Iran, Iraq, Israel, North Korea and Pakistan—all nations with available or suspected nuclear weapons potential. The Under-secretary for Education **Buswell** announced the scheme in the House of Commons in July 1994. Students applying for these subjects from the listed countries are expected to fill out an additional application form, which is to be transferred to the government for advice on whether the student applying is a risk.

Engineering higher education restructuring . . . again

From time to time the Engineering Council tackles accreditation questions with a view of bringing qualifications in line with demand—or with other education systems. The journal reported in Volume 1(6), 1985, in a paper by **Michael Bement**, *How the Engineering Council is Changing British Engineering Education*, on the introductory phase of the three levels of British engineers, namely Engineering Technician, Technician Engineer and Chartered Engineer. Parts of the terminology have changed and the first level, corresponding to Higher National Certificate or Incorporated Engineer, seems to be less in demand. This may be a result of the expansion of higher education and the trend to obtain higher qualifications. **Keith Foster** from the Engineering Council says that categories of engineering qualifications are now less distinguishable from each other, and there is no clear delineation between the levels. Many universities are offering courses at the Incorporated Engineer level and the Council aims at accreditation of such courses. Professor Foster wants occupational standards to be introduced which will make for mutual and international recognition, which is necessary to facilitate greater mobility of engineers. Clear demarcation lines between the levels need to be introduced, as well as a new entry qualification structure. The Engineering Council has interests in accreditation which supplement or even compete with independent university accreditation. The inclusion of practice as a criterion for engineering competency and chartered incorporation has always been a feature of engineering life in the Anglo-Saxon countries. This has successfully helped to offset the relatively lower esteem with which the engineering profession has had to cope. Having two bodies, i.e. the universities and the Engineering Council, involved

in qualifications and accreditation has created increasing problems due to a number of factors. These include the expansion of the British University system and the opening of education systems in Europe and overseas.

Germany

Industry has higher demand for engineering graduates

The fall in demand for engineers seems to have bottomed out: 1994 saw 29,617 openings on the job market. It was notable that mechanical and electrical engineers, who have had a tough time finding jobs, are being recruited again. Nevertheless, the largest number of vacancies is still provided by the construction industry, which has over 40% of all vacancies. It needs to be remembered that after many years of depression, this industry has been revived following the unification of Germany. This branch, although still strong, is now showing signs of weakening, with a decline of 14% in job openings. Increased demand has also been registered for industrial and management engineers with 1,940 offers in 1994, an increase of 46%. Most engineers were sought in marketing and sales with 6,400 openings, an increase of 22% over the previous year.

Controversial programme to help jobless engineering graduates

In spite of a silver lining in the prospects of engineering companies forecast for 1995, the job situation for fresh graduates is unsatisfactory, and may remain so for some time to come. With total wage costs exploding in recent years, in particular with hidden social costs, German companies need to become leaner than their competitors abroad in order to maintain competitiveness. With many engineering graduates looking for jobs, measures to ensure that these graduates will still be available and suitable when the job situation improves have been initiated. In Hamburg a joint initiative between the Ministry of Trade and Industry, the governmental Labour Exchange, the Technical University and the Fachhochschule has come into operation. Graduates are being inducted into a one-year programme, aimed at providing them with complementary studies in marketing, English and presentation techniques in the first three months. At the same time they are looking for projects they can do at enterprises which can be completed within the support year. The graduates receive DM 1,500 per month for the duration of the project. The scheme has been criticized on the grounds that graduates receive only a fraction of the minimum wages expected for employed engineers and that this may undermine the salary structure of fully employed engineers. Moreover, it is not easy to find candidates even with this incentive for companies, in spite of the non-

committal nature of the scheme. Students are also critical because if they partake in the scheme they are not able to look for a real job at the same time. Nevertheless, such schemes have positive aspects in that they enable frustrated graduates to widen their horizons and get involved in areas where the market projects future demand. This is particularly so in marketing and sales which traditionally were less attractive for graduates but where future demands will be high.

Spain

Unemployment rate of graduates highest in Europe

A report published by the Industrial Research and Development Committee (IRDAC) commissioned by the European Union for assessing and recommending developments in human resources has compared the educational performance of member states. The report claims that Spain spends less on students than any other country. Spending of \$4,000 per student has recently risen to \$5,000 per year. The report says that Spanish students choose traditional subjects such as law in preference to engineering and computer science. Sixty per cent do not complete engineering degrees, and those who do graduate take twice as long as their counterparts elsewhere in Europe. According to Spanish government sources, the professional engineering organizations are a restricting influence, as they limit the number of graduates in employment.

USA

USA still top destination for foreign students

Universities in the USA admitted 450,000 foreign students in 1993/4 according to figures published by the Institute of International Education in New York. While a smaller rise has been shown from Asian countries, an increase is shown by students coming from Europe. Asians still form the highest group, with 58% of all incoming students. The Middle Eastern student intake remains largely unchanged. The most popular subjects are engineering and business. The top states are New

York and California. The publication *Open Doors* is available at \$4 from IIE Books, 809 United Nations Plaza, New York, NY 10017-3580, USA.

Table 2 shows countries of origin and student numbers for USA foreign students for 1992/3 and 1993/4.

Australia

Educational exports on the rise

In order to increase its educational export activities an office of the Australian International Education Foundation has recently been opened in Bangkok. Australian educational exports amount to US\$1.2 billion per year and are rising. Markets for education and students have shifted in recent years. Hong Kong student numbers in Australia are down; the Chinese contingent, which used to provide half the Australian foreign student body, has shrunk. Japan, Korea and Taiwan are USA oriented. Australian education is now expanding in south-east Asia, especially in Thailand, Malaysia, Vietnam and Indonesia. The association with Thailand is strong with 2,000 students now studying in Australia. Australia will train university administrators and Australia will upgrade academic staff from Thailand.

India

Education minister resigns

Indian education minister **Arjun Singh** has resigned. During his three years in office he has spared no efforts in attempts to dislodge the prime minister from office. He has also been active over the development of financial crises in government-supported educational institutions. In particular he promoted the privatization of higher education, resulting in high fees for students, in particular foreign students. Fees at high-level institutions such as the Indian Institutes of Technology were considerably raised and the pressure to generate income has been on the increase. A proposal to set up special colleges charging high fees for foreign students is currently being examined by a committee of vice-chancellors.

China

Salaries lower while a shift in demand for technology graduates remains

The number of graduates from Chinese universities is increasing fast with 900,000 graduates finishing in 1994. Graduates have been subjected to a system of job assignments by the government, with a large demand from enterprises which has exceeded supply. With university expansion some areas are now experiencing a declining demand—these include the sciences, literature and secretarial

Table 2. Origin and numbers of foreign students in the USA

| Country | 1992/3 numbers | 1993/4 numbers | % change |
|-----------|----------------|----------------|----------|
| China | 45,130 | 44,390 | -1.7 |
| Japan | 42,840 | 43,770 | 2.2 |
| Taiwan | 37,430 | 37,580 | 0.4 |
| India | 35,950 | 34,800 | -3.2 |
| Korea | 28,520 | 31,080 | 9.0 |
| Canada | 20,970 | 22,660 | 8.1 |
| Hong Kong | 14,020 | 13,750 | -1.9 |
| Malaysia | 12,660 | 13,720 | 8.4 |
| Indonesia | 10,920 | 11,740 | 7.5 |
| Thailand | 8,630 | 9,540 | 10.5 |
| Pakistan | 8,020 | 8,510 | 8.0 |

management. Areas of strong demand are technology areas such as mechanical and electronic engineers, as well as business, foreign languages and architecture. When China first reinvested in higher education after the Cultural Revolution, exorbitant salaries were expected by qualified graduates. As the situation normalizes the expected graduation in demands for professionals is expected to settle in China as it has in the rest of the world.

Conferences

CAL 95: Computer Aided Learning in Education 10-13 April 1995

Queens' College, Cambridge, UK
Contact: CAL 95 Secretariat
University of Cambridge Computing Service
Pembroke Street, Cambridge CB2 3QG, UK
Tel: +44 223 334600 Fax: +44 223 334679
e-mail: CAL95@ucs.cam.ac.uk

Sixth World Conference on Continuing Engineering Education

8-12 May 1995
São Paulo/Rio de Janeiro, Brazil
Contact: Professor Edith Ranzini
Escola Politecnica-EPUSP
Caixa Postal 8174
01065-970 São Paulo-SP, Brazil
Fax: +55 118137415 e-mail: wcce95@lsd.usp.br

EAEIE: The Technology Transfer in Electrical and Information Engineering

31 May-2 June 1995
Bologna, Italy
Contact: Professor V. A. Monaco
Facolta de Ingeneria, University of Bologna
Viale Risogimento 2, 40136 Bologna, Italy
Fax: +39 51 6443073
e-mail: vamonaco@deis.unibo.it.

5th International Forum on Technology and Management

5-8 June 1995
Espoo, Finland
Contact: Anne Heaton, Director ETMI,
93 Hampton Hill, Middlesex TW1 2HQ, UK
Tel: +44819779033 Fax: +44819433763

American Society for Engineering Education Annual Conference

25-28 June 1995
Anaheim, CA
Contact: ASEE
1818 N. St. NW, Washington DC 20036, USA
Tel: +1 202 331 3500 Fax: +1 202 265 8504

International Congress of Engineering Deans and Industry Leaders

3-6 July 1995
Monash University, Melbourne, Australia
Contact: Professor Z. J. Pudlowski
Faculty of Engineering, Monash University,
Calayon, Victoria 3168, Australia
Tel: +61 3 905 4977 Fax: +61 3 905 6069
e-mail: zjp@eng.monash.edu.au

AI-ED 95: 7th World Conference on Artificial Intelligence in Education

16-19 August 1995
Washington DC, USA
Contact: AI-ED/AACE
PO Box 2966, Charlottesville, VA 22902, USA
Tel: +1 804 973 3987 Fax: +1 804 978 7449
e-mail: aace@virginia.edu

International Conference on Engineering Design: ICED Praha 1995

22-24 August 1995
Prague, Czech Republic
Contact: ETH—Swiss Federal Institute of
Technology
ICED-UNO, CH 8028 Zürich, Switzerland
Tel: +41 1 632 2431 Fax: +41 1 262 0211

First Lebanese Association for the Advancement of Science Conference on Computer Simulation

1-4 September 1995
Beirut, Lebanon
Contact: Professor Ibrahim Hajj, Coordinated
Science Laboratory, University of Illinois, 1308
Main St., Urbana, IL 61801-2307, USA
Tel: +1 217 3333282 Fax: +1 217 244 1946
e-mail: i-hajj@uivlsih.csl.uiuc.edu

CAEE 95: 3rd International Conference on Computer Aided Engineering Education

6-8 September 1995
Bratislava, Slovakia
Contact: Conference Secretariat
Slovak Technical University, Microelectronics
Department
SK-81219 Bratislava, Slovakia
Tel: +42 7 723486 Fax: +42 7 723480
e-mail: caee95@elf.stuba.sk

Fourth World Conference on Engineering Education

15-20 October 1995
Minneapolis-Saint Paul, Minnesota, USA
Contact: Dr E.R. Krueger
William C. Norris Institute, 245 East Sixth St.
St Paul, MN 55101, USA
Tel: +1 612-225 1433 Fax: +1 612 225 1241
e-mail: wcnrex@epx.cis.umn.edu

**Active and Productive Learning in Higher
Engineering Education**

1-4 November 1995
University of Twente, The Netherlands
Contact: Huib J. van Oort
Department of Mechanical Engineering,
University of Twente
7500 AE Enschede, The Netherlands
Tel: +31 53 892474 Fax: +31 53 356490

**Preparation of World Class Manufacturing
Professionals**

13-15 March 1996
San Diego
Contact: Mark Stratton
One SME Drive, Dearborn, MI 48121, USA
Tel: +1 313 2711500 Fax: +1 313 240 8255

**ICCE 95: International Conference on
Computers in Education**

5-8 December 1995
Raffles City Convention Centre, Singapore
Contact: Professor D. H. Jonassen
Instructional Systems Program, Pennsylvania
State University, University Park, PA 16802-
3206, USA
Tel: +1 814 865 0624
e-mail: dhj2@psu.edu