

Switching over to technology teaching

from Richard Pearson

The teaching of science and technological subjects in schools must be made more attractive and employers must do what they can to help.

THE graduate labour market is booming again. The *Employment* column last year reported that a record number of graduates went into jobs in 1984, demand grew again in 1985, and vacancies are expected to be a further 5–10 per cent higher in 1986. Graduate unemployment has fallen for the fourth year running, and is now at 11.2 per cent for scientists (and 6.4 per cent for engineers) from the universities, although it was still at a worryingly high 17.3 per cent for scientists graduating from the polytechnics (Table 1). All the signs are that demand for graduates will continue to increase, yet higher education is well into a phase of retrenchment.

In terms of the numbers graduating, the full effects of the government-imposed cuts in university expenditure in 1981 are only now beginning to filter through. At the time, the universities relied heavily on "natural wastage" and voluntary redun-

Table 1 Unemployment six months after graduation

	Universities	Polytechnics
Scientists	11.2%	17.3%
Engineers	6.4%	7.5%
All students	9.6%	13.6%

dancies. As a result, losses of academic staff were disproportionately higher than of support staff, particularly in subjects such as engineering and management where alternative employment was most readily available. This, together with the high equipment costs and uncertain student demand, hit the engineering courses particularly hard. Course numbers were cut and in 1985 the output of home students in the supposedly important technological subjects fell; in the case of electrical/electronic engineering output was down by 8.4 per cent, to be followed by a further 5.4 per cent fall this year. In computer science, numbers also fell in 1985 by 9 per cent. Admissions started picking up again in 1984 as selective funding was applied so the output in these, and in virtually every other subject, except physics and geology, will start to rise again in 1987, overall university numbers going up by about 7 per cent (see Fig. 1). There has been continuing growth in the polytechnics and other public sector institutions which has compensated in part for these falls, but as the polytechnics still account for only about 30 per cent of the total numbers graduating, the net effect is more one of static overall output¹. In the case of information technology (IT), how-

ever, the initiative embracing one-year postgraduate "conversion" courses for graduates in non-IT subjects has been a major boost.

The consultation period on the government's green paper in higher education is now over. If there is no major change in the government's stance, the next decade is likely to see a long-term decline in the output of higher education because of a continuing squeeze on finance. Engineering and technology are to be protected, however, the "switch" in this direction in 1985 resulting in a £43 million cash injection to increase the output in these subjects by about 1,500 a year from 1989.

While the government has been heavily criticized for the low level of its projections of student demand between now and 1995, it could be over-optimistic about the supply of suitable students to fill the planned 30 per cent increase in engineering and technology places unless some radical changes are quickly implemented.

There are two major concerns. The first is a possible shortage of students with mathematics and physics A levels. There will need to be a major growth in student interest in the information technology-related courses, especially from girls, who at present account for only about one in ten of the applicants, if the increased number of places are to be filled with high quality students. Between 1979 and 1984, the number of students passing A-level physics grew by 15 per cent and those passing A-level maths went up by 24 per cent. Yet the polytechnics are struggling to fill their science and technology places, with a number of empty places remaining in 1985, and the number of applications for university physics places fell in 1983 and again in 1984, possibly due to students switching to electronics and computer science courses. Between 1984 and the end of the decade, the number of students with two or more A-levels is expected to fall by about eight per cent due to demographic changes. It seems unlikely therefore that there will be the major increase needed in passes in mathematics and physics to fill the extra places. In addition, a repeat of the well-publicized problems of the electronics industry in 1985 will hardly encourage students to apply for electronics-related courses.

One of the causes of the already low standards of mathematics and physics achievements in schools is the shortage of suitable teachers. This will get worse over the next decade if science graduates con-

tinue to turn away from teaching. Applications for teacher-training courses in these subjects have fallen by over 20 per cent in the past year, and continuing low pay and teacher unrest are no incentive for the numbers to rise. Shortages of experienced lecturers in higher education are also likely to be a continuing problem as long as salaries and conditions remain uncompetitive.

Action is needed now to make teaching of these subjects more attractive. Dif-

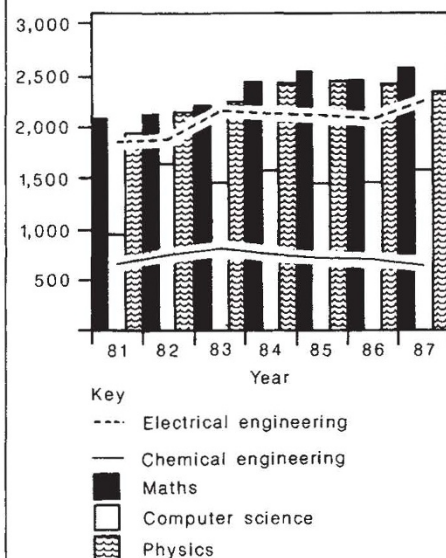


Fig. 1 Output of UK university graduates 1979–87, for home students only. Data for 1985–87 are projected. (Source: *Graduate Supply and Availability to 1987 and Beyond*, by R. Pearson (Institute of Manpower Studies, Brighton, 1986).

ferential salary increases for staff are likely to be far more effective than supplementary grants for students on teacher-training courses. If employers are to meet their future needs for manpower, they will have to become much more closely involved in collaborative arrangements such as sponsorship in order to attract a share of an inadequate supply. More importantly, employers will have to help encourage more able students to study science in schools and to enter vocationally relevant courses, and to support the teaching profession if shortages are not to become a permanent feature of the labour market over the next decade. □

Richard Pearson is at the Institute of Manpower Studies, Mantell Building, University of Sussex, Brighton BN1 9RF, UK