

# Entry standards to UK science courses fall

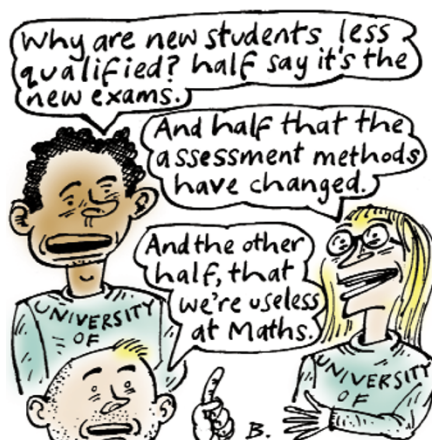
[LONDON] Students entering physical science and engineering courses — but not life science courses — in British universities are less qualified than a decade ago, according to a survey by researchers at Brunel University. But a greater proportion of students now leave university with first-class degrees.

There are several reasons for this anomaly. The drop in university entry qualifications is almost certainly due to a fall in the standard required for mathematics, whereas the rise in first-class degrees appears to result partly from changes to assessment methods.

The survey of British science education was carried out by Alan Smithers and Pamela Robinson, director and deputy director of the Centre for Education and Employment Research at Brunel University, west London. It was funded by the Leverhulme Trust, and will be published soon.

It coincides with a controversy about university assessment techniques. Brian Dodd, a mathematics lecturer at Heriot-Watt University in Edinburgh, has angered his university by alleging in newspaper interviews that assessment methods there have been changed to reduce the student drop-out rate.

The university has denied his allegations that pass rates were reduced and the emphasis on final examinations toned down to lower the failure rate in mathematics.



The Brunel survey was based on databases kept by the Universities Statistical Record that contain details of about 600,000 students who entered and left higher education in England and Wales between 1975 and 1993. Data include subjects studied at school and grades obtained at A-level — a two-year course taken before university entrance — as well as the degree subject and class, and the first destination upon graduation.

Between 1975 and 1989, there was a doubling to 40 per cent of the proportion of physical science graduates embarking on postgraduate work, including research.

The survey reveals that average A-level

scores for students starting degree courses in mathematics dropped from 23.9 to 22.5 between 1985 and 1993. (The 'points' are the equivalent sum of grades awarded, with A=10, B=8 and so on).

In the physical sciences, scores dropped from 22.2 to 21.6, while for medicine and dentistry they increased slightly from 26 to 26.4. Only the biological sciences registered a clear increase, from 20.8 to 21.3.

But students' performance at university has improved, with more obtaining top degrees, and fewer getting low qualifications.

In 1975, 11.3 per cent of physical science graduates left universities in England and Wales with a first-class degree. By 1989 this had increased to 16.4 per cent. Similarly, in 1975, 21.3 per cent of physical science graduates obtained a third-class degree, the lowest honours degree classification. By 1989 the number had fallen to just 14.7 per cent.

Many university teachers say that the mathematics knowledge base of students embarking on degree courses in mathematics and the physical sciences has fallen consistently over the past decade. Some blame the introduction of a new examination at 16, the General Certificate for Secondary Education (GCSE), which they believe requires a lower standard of mathematics than its predecessor, the O-level examination.

Jim Matthew, professor of physics at the University of York, says the standard of mathematics and physics of students embarking on physics degree courses is worsening. Since 1979, every York physics undergraduate has sat a 'prior-knowledge' test at entry comprising 50 multiple-choice questions. The questions have remained unchanged, but Matthew says that average scores dropped "significantly" after the GCSE examination was introduced in 1990.

The reasons for the rise in the numbers of first-class degrees appear more complex. Possible factors include an increase in the numbers of women students — who are perceived to work harder than men — more individual choice in the range of subjects studied and changes to assessment methods.

Lecturers have also observed that today's students work harder than their counterparts of 10 or 15 years ago, possibly because of the much more competitive job market.

The Brunel research shows that, whereas there was a 12 per cent rise in the numbers of men studying degrees in the physical sciences between 1985 and 1993, the numbers of women increased by 52.2 per cent. The numbers of women in the biological sciences increased by 60 per cent, compared with a 20.7 per cent rise in the numbers of men.

Universities also increasingly assess students throughout the year, relying less on the traditional final examination. **Ehsan Masood**

## Japanese research 'must be more flexible'

[TOKYO] Japan's research infrastructure must change to meet scientists' demands for a more open, flexible and competitive environment, according to a report by the Science and Technology Agency (STA).

A 'white paper' produced by the agency last week indicates that it is keen to improve research by adopting management styles from overseas institutions, such as Germany's Max Planck Institute and the US National Institutes of Health.

The report says that up to 70 per cent of researchers at universities and institutes are unhappy with their research environment. They complain about inflexibility in the funding system and the limited control they have over the planning of projects.

The report points out that, although the government is promoting collaboration between industry and universities, most companies prefer to do research in Europe and the United States. Most of these said the main reason was the presence of superior research organizations in these countries.

The white paper emphasizes a need to improve research management by increasing flexibility and competitiveness. It cites the Institute of Physical and Chemical Research (RIKEN) as the prime example of a

Japanese research organization that operates at an international standard.

Other science-related ministries and agencies, such as the Ministry of Education, Science, Sports and Culture (Monbusho) and the Ministry of International Trade and Industry (MITI), are trying to find a model for an 'ideal' research institute.

Their efforts are taking place amid preparations for the reorganization of nationally run research centres, part of a series of reforms aimed at streamlining Japan's government ministries and agencies.

The plan calls for the 'rationalization' of national research institutes by merging laboratories with overlapping research and turning some into independent 'agencies'. In principle, it will promote collaboration between ministries and agencies. But scientists from the organizations concerned have expressed mixed feelings about it.

For example, the merger of STA and Monbusho, scheduled for 2001, implies a possible integration of their space agencies. But researchers from the Monbusho agency are concerned that merging with the STA's applications-orientated National Space Development Agency will jeopardize their focus on basic research. **Asako Saegusa**