

OPINION

Science in Schools

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A point of concern within the science community is the fall in student numbers taking science at schools and universities. During the last decade, the A level entry has risen by one third, whilst there has been a fall in physics and chemistry students of approximately 20 per cent. There are a variety of factors that contribute to this, and this has been the subject of valuable reports from select committees in both Houses, as well as studies by professional bodies.

Government has responded in part; it has made progress in dealing with recruitment and the training of teachers in science, but there are still problems, particularly the retention of staff, with about 50 per cent leaving after five years. A point raised in the reports was the content of the courses, and the form of the examinations. As a result, syllabi and examinations have undergone significant changes for both GCSE and A level courses and new types of course have been introduced.

In 1990, with the introduction of the National Curriculum, it became compulsory to study science up to 16 years of age. This led to the introduction of the double award in science. This provides a very good basic course for an overall coverage of science. For the maintained sector, the number of entries for chemistry and physics at GCSE is around 23-30,000 whilst for the independent sector it is 13-14,000. For the double science course, the maintained sector number is of the order of 500,000 whilst the independent sector figures are about 26,000.

Although there is some question about the reliability of the interpretation, it has been estimated that the chances of attaining an A or B level in chemistry is increased by 76 per cent for pupils who take the separate science courses. If this is correct, then it is clear that taking the separate science courses is a better pathway to attain an A level

qualification of the appropriate standard for entry to read chemistry at university. It is significant to note that the Government has recently agreed that from 2008 any pupil with at least level 6 at key stage 3 will be allowed to study triple science at GCSE.

The reduction in numbers of students taking A levels in chemistry and physics has also been reflected in the decrease in the numbers of graduates in these subjects. In chemistry the fall in graduate numbers between 1994 and 2005 is 41 per cent, whilst the corresponding figure for physics is 11 per cent. This has serious implications for the country's scientific work force.

The Government has modified the pre-university courses in a variety of ways, leading to new structures for A level courses. Thus starting in 2008 there have been major changes in the conventional A level courses, with the introduction of an A* grade, an optional project which will be equivalent to half an A level, and a change in the content of the modules. However, a point of concern is the removal of the practical examinations for assessment of practical courses in school.

A new qualification, the Diploma, has also been introduced. The Diploma encourages collaboration between schools, FE colleges and industry, and introduces a 'vocational' flavour to the courses. There are five subject areas included in the 2008 entry of which Engineering and Information Technology are the most directly applicable to sciences courses. Recently the Government has announced three new Diplomas, termed 'academic' – in science, languages, and humanities.

The course in Engineering is academically demanding and does encourage a partnership between employers, schools and colleges. The Diploma will be offered at three different levels: levels one and two will



be comparable to GCSE and level three equivalent to three and a half A levels.

With the potential entry to the Diploma programme at GCSE level, this could involve students committing themselves to a specific area of study at 14, and limiting the general breadth of their educational experience. This situation may not have general public appeal, and appear as a step back in secondary education. A further problem could be the travel involved between the centres that will be particularly difficult for rural schools.

Finally, another new course is the 'Cambridge Pre-U', which also commences in 2008. The aim of this examination is to revert to the more traditional A level course, with no modular component, but a single set of examinations at the end of the two-year course. The course will involve the study of three principal subjects, and two further projects, each with half the weighting of a principal subject. As the name implies, this course has been designed with university entry in mind, and involves a top grade above A*; this has proved to be very popular with the independent school sector.

It is of concern that all these modifications will apply to the 2008 entries, and the monitoring of these courses will be important. It will be interesting to see how they affect the intake to chemistry and physics courses and reduce the criticisms of the examinations and the alleged fall in standards.