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## CHALLENGES IN ENGINEERING EDUCATION IN THE UK

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### ABSTRACT

This short presentation will outline the background to engineering education in the UK, particularly in the higher education sector, and discuss some of the challenges currently being faced.

**Keywords:** Engineering Education, United Kingdom, Higher Education

### BACKGROUND

The higher education sector in the UK has gone through considerable change in the last 25 years. In 1992, the distinction between Polytechnics, which concentrated technical education, and Universities was removed, and there are now over 150 degree-awarding institutions in the country, mostly Universities offering a wide range of subjects. Devolution of government occurred in 1998, and education is a devolved matter in Scotland, Wales, and Northern Ireland, and this has led to differences in policies between these three nations and England, where the UK government retains control.

Prior to 1999, students made no direct contribution towards their tuition fees, but these were introduced as a response to the Dearing Report on Higher Education Funding. The initial level was £1000 per year, but it has risen substantially since, and now stands at £9000 in England, though no fees are payable by Scottish students studying at a Scottish university and different arrangements also apply in Wales and Northern Ireland. Alongside the fees, there is a student loan scheme, so that the fees do not need to be paid at the time, but payments are deducted in subsequent years, once a graduate's salary exceeds a certain level. There was some concern initially that students would be discouraged from seeking a degree by these fee levels, but the evidence seem to suggest that this has not been borne out in practice.

Further changes are now likely to take place, and the UK government has published proposals to replace the Higher Education Funding Council, the 'arms length' regulator of universities in England, with more direct government control, although universities would still remain independent educational charities, rather than being directly in the public sector. Also envisaged are changes in funding arrangements, so that the funds a university receives will depend to some extent on 'student satisfaction', although how this can be effectively measured is a matter of lively debate. The net effect of these changes may well be to further encourage the idea that students are simpler 'consumers' of education, rather than more actively engaged as learners in the process. This has already led to changes which attempt to make the courses offered and the university environment generally more attractive to students. A particular example of this is the new engineering faculty teaching centre, constructed by the University of Sheffield (Fig.1.)

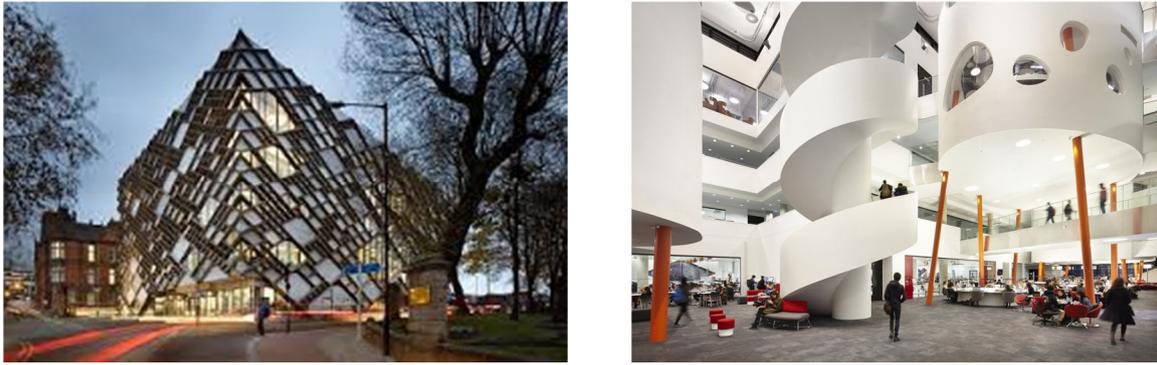


Fig. 1 - Exterior and interior of the Diamond teaching building at the University of Sheffield

## **ENGINEERING EDUCATION**

The majority of UK universities offer some form of engineering degree, either in general engineering, or in one or more of the individual disciplines: mechanical, electrical, civil etc. The Finniston Report in 1979 recommended the establishment of four-year integrated masters courses, which lead to the M.Eng. qualification, in parallel with the existing three-year degrees, leading to a bachelors (B.Eng.) degree. The majority of UK universities follow this pattern, sometimes including a ‘sandwich year’ in industry. However, the four year master’s is not generally compatible with the Bologna Process framework, which typically requires five years of study for a master’s degree. A number of organisations are concerned with engineering education in the UK, these include:

- (i) The individual engineering institutions, such as the I.Mech.E., I.C.E, and the I.E.T., which accredit degree courses as providing exemption from the academic requirements for chartered engineer (C.Eng.) status.
- (ii) The Engineering Council, which acts as an umbrella body for the institutions.
- (iii) The Royal Academy of Engineering, which exists to promote engineering in a similar manner to the promotion of science by the Royal Society.
- (iv) The Engineering Professors’ Council.

## **CHALLENGES**

The background described above presents a number of challenges for the future. These include:

- (i) Adapting to changing funding regimes and to increased government control.
- (ii) Reconciling often conflicting demands on the curriculum, including pressures from the institutions to include additional material and from funding mechanisms which may prioritise student satisfaction.
- (iii) Attracting sufficient suitably qualified students to register for the courses. In particular, one of the effects of ‘Brexit’ may be to reverse the existing trend for greater numbers of European students.
- (iv) Adapting teaching patterns to changing ways of learning in a digitally-connected society. Actively under discussion is the future of the traditional lecture.