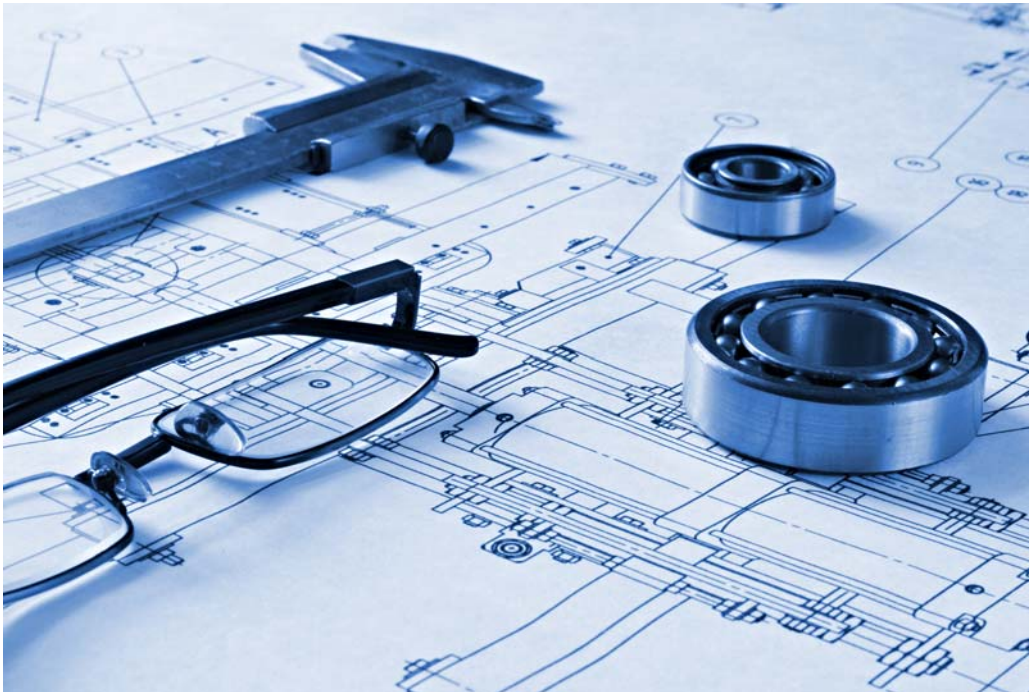




# The Costs of Teaching Engineering Degrees

## Summary Report



The ETB is an independent organisation that promotes the vital role of engineers, engineering and technology in our society. The ETB partners business and industry, Government and the wider STEM community: producing evidence on the state of engineering; sharing knowledge within engineering; and inspiring young people to choose a career in engineering, matching employers' demand for skills.

The Engineering Professors' Council represents all the professors and Heads of Department of Engineering in UK universities and has a membership of over 1600 individuals. Its mission is to promote excellence in engineering education, teaching and research.

**November 2007**

# The Costs of Teaching Engineering Degrees

## Key findings and issues

- A study was commissioned from JM Consulting by the Engineering and Technology Board (ETB) and the Engineering Professors' Council (EPC) into the possible mismatch between the costs and resource requirements of, and funding for, the teaching of engineering degrees in UK Higher Education Institutions. The study was overseen by a steering group made up of representatives from the EPC and the ETB and chaired jointly by Prof Helen Atkinson of the EPC and Dr John Morton, the Chief Executive of the ETB.
- Detailed case studies were undertaken in four Higher Education (HE) establishments in England, covering a range of engineering disciplines and institution types. Information from institutions' management accounts was used in the analysis along with the outputs from the national higher education costing system TRAC<sup>1</sup>. These outputs include data from annual TRAC and TRAC (T)<sup>2</sup>, and costs per student (Subject-FACTS<sup>3</sup>) which are to be formally reported to the Higher Education Funding Councils from 2008.
- TRAC (T) data provided clear evidence, in the departments studied, of systemic deficits in HEFCE-fundable teaching. Overseas student fee income was reported to play an important part in offsetting these funding deficits.
- In addition, all of the figures reported are historic figures; they have in part been dictated by the resources allocated to the departments. They do not reflect the expenditure which needs to be incurred for long term sustainable teaching. This is very difficult to quantify, but it is likely to increase the resource requirements not reduce them. This would arise from addressing some of the areas of greatest concern which are affecting the quality of the student experience (restricted innovation; increasing the size of project groups; reducing research activity that would inform teaching; the challenges for new lecturers as they try to develop their teaching and research capabilities whilst holding down an increasing student teaching workload; and equipment which is gradually being run down). It would also arise from reducing the dependence for home/EU provision on the cross-subsidy from overseas students.

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<sup>1</sup> Transparent Approach to Costing

<sup>2</sup> Transparent Approach to Costing for Teaching

<sup>3</sup> Teaching costs by academic cost centre

- The sector mean Subject-FACTS cost for 2005/6 for a HEFCE<sup>4</sup>-fundable student in Engineering was £6,967<sup>5</sup> pa – compared to a HEFCE standard unit of resource for engineering of £6,134. To raise the current standard unit just to meet the mean would require a 14% increase in the HEFCE funding allowance.
- The study shows that provision is increasingly targeted to meet market demand and resource allocation is consequently undergoing adjustment and institutions are restructuring and reorganising accordingly.
- There are a number of observed trends:
  - A less hands-on, more virtual, bench-top learning experience, increasingly avoiding real industrial equipment;
  - A reduction in space allocation, reflecting the need for greater efficiency;
  - Growth in the recruitment of higher fee-paying overseas students (with issues of balance in the undergraduate population and potential vulnerability if there is a downturn in this recruitment);
  - Higher student-to-staff ratios;
  - Increasing teaching hours with less time for staff development;
  - More intensive use of facilities and resources;
  - Extension of equipment lifespan with less frequent updating; and
  - Insufficient time to develop new programmes.
- Further rationalisation or more intensive use of existing resources to cope with continuing inflationary and other cost rises may impinge on the quality of the student experience.
- The contributions of different sources of income and types of expenditure – such as teaching or research strands – are not generally visible in management accounts.
- Internal income and cost allocation methodologies vary widely but generally exhibit the following features at the academic department level:
  - Not all costs are allocated;
  - Real costs of central services and estates are not truly reflected; and
  - Teaching and research costs are not shown separately.
- It appears that the new level of variable fee income on UK/EU domiciled students will not be able to offset cost inflation. The temptation may be to focus still more

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<sup>4</sup> Higher Education Funding Council for England

<sup>5</sup> Based on sector pilot year data provided by institutions

on non-EU overseas students, which may create a significant imbalance within institutions.

- Whilst the historical analysis tells us much, it is essential to reflect on future resource needs, not least to take account of changing technology, which is likely to increase demand for investment in facilities in order to sustain high quality courses that are relevant to employer needs. Funding the innovation necessary to respond to these challenges has not been considered in this study and would require higher levels of funding.
- In summary the study suggests that that there are very real reasons to be concerned about the future of engineering teaching in HE:
  - Current levels of spend are lower than those required for long-term sustainability;
  - Changing technology will have implications for capital and revenue expenditure requirements which are not being met by current funding levels;
  - Pressure on resources is high and is likely to increase;
  - The quality of student experience is increasingly under threat;
  - Scope for further efficiency savings is becoming limited;
  - The long-term sustainability of departments may come into question; and
  - A better balance between expenditure and funding must be sought.

## **Conclusions**

The findings demonstrate that under-funding has created an imbalance between the resources for, and the needs of, engineering subject teaching in HE. The capacity for further efficiency savings is limited and the EPC and the ETB therefore believe that, for the long-term sustainability of engineering disciplines, which are strategic to the UK, funding must better reflect the true costs of teaching. Just to match the sector mean in UK Departments, an increase of 14% would be required. However, the evidence suggests that to maintain current teaching standards, a significantly higher increase is necessary.

As technology continues to evolve, new challenges and opportunities will emerge in the provision of world-class engineering graduates. In order to ensure that the UK's HE institutions deliver the engineers needed to respond to the challenges that new technology and new social and environmental needs present on a global basis, more realistic, higher levels of funding are needed – over and above simply making up the current funding deficit.