

## Annex A Consultation questions

Responses should be made online by **Monday 12 July 2010** using the electronic response form, which can be accessed on the HEFCE web-site alongside this document at [www.hefce.ac.uk](http://www.hefce.ac.uk) under Publications.

### Consultation question 1

Do you broadly agree with our statement of the purpose of HEFCE's funding for teaching?

**Yes**/No/Don't know

Add any further comments below

The Royal Academy of Engineering welcomes the opportunity to contribute to the consultation on Higher Education teaching funding method. The engineering community has a long-standing relationship with higher education and is keen to ensure that the HE system meets the needs of not only the engineering profession but also the future needs of the economy, employers and individuals.

We agree broadly with the statement of the purpose of HEFCE's funding for teaching in particular on the following points:

#### *Addressing policy objectives (para 28 of HEFCE Consultation)*

There is a clear need for public funding of HE teaching to ensure a supply of graduates in subjects of strategic importance to the UK.

Engineering is one of these subjects; it is a main driver of the UK economy, the world's seventh largest manufacturing economy<sup>1</sup>. Engineering is central to over 50% of the UK's exports. In 2008 there were over four hundred and seventy thousand engineering enterprises in the UK employing more than 4.5 million people<sup>2</sup>.

The current economic climate has focused policy objectives towards a more balanced economy with manufacturing, engineering and technology at its heart as a key driver to encourage growth and stimulate employment. The right level of funding to ensure supply of graduates to achieve this objective is essential.

#### *Ensuring an appropriate level of investment (para 25)*

Engineering is a practical subject with a high cost of delivery and, as recognised by the consultation document, requires public funding for appropriate investment in capital infrastructure, facilities, technician support and equipment. While there is good evidence that the overall general student experience has been improved following the recommendations of the Dearing Report and subsequently the 2004 Higher Education Act, there is less evidence that

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<sup>1</sup> Financial Times 21<sup>st</sup> June 2010

<sup>2</sup> Engineering UK 2009/10 Report. [www.engineeringuk.com](http://www.engineeringuk.com) (accessed April 2010)

such investments have reached individual subject areas such as engineering. Prioritising the student experience in engineering would be a cost effective way of improving retention rates on engineering courses and improving the level of graduate engineering skills.

*Employer Contributions (para 27)*

While it is correct that employers cannot be certain of recouping their investment (in individual students), in general engineering has a very close relationship with employers who recognise investment in HE produces a graduate workforce equipped with the skills necessary to work in 21<sup>st</sup> Century industry.

The Engineering Graduates for Industry report demonstrates that employers make significant and wide contributions to the engineering student experience through Visiting Professor and Visiting Teaching Fellow appointments, membership of Industrial Advisory Groups, accreditation by Professional Engineering Institutions, student bursaries, internships, sandwich year placements and so on.

The relationship between the universities and employers must be encouraged and built upon through HEFCE funding method.

*Supporting the wider public benefits of HE (para 24)*

The engineering sector supports the wider benefits of HE to society. Indeed, engineers contribute substantially to the voluntary sector in the form of STEM ambassadors for schools and outreach activities. There are some twenty one thousand ambassadors in all, of which a very high proportion is engineers. The Professional Engineering institutions and industrial employers have ambassador schemes that contribute to the STEMNET Science and Engineering Ambassador scheme.

## Consultation question 2

Do you broadly agree that our funding method should give institutions the freedom to manage provision in a way that best responds to the needs of students, employers and society?

**Yes**/No/Don't know

Add any further comments below.

(para 33)

It is right that HEIs retain their financial autonomy and set their own priorities.

However, we welcome the recognition that the future funding method will include subject-based costs. We are concerned that the relatively low perceived status of engineering as a taught subject adversely impacts on the number of applicants to engineering programmes and critically on the diversity of the candidates. There is a limit to which the student tuition fee can be raised in this situation before recruitment suffers. While it is vital to fund the improvement of the student experience in engineering, this must not be achieved through a rise in the student tuition fee alone.

In February 2010, The Royal Academy of Engineering published the Engineering Graduates for Industry<sup>3</sup> report. This advocated the use of active learning programmes to produce graduate engineers with the skills that industry has identified as being necessary to run successful businesses in the twenty first century – skills such as critical thinking, problem solving, system thinking, working in teams and the like.

The Academy's report presents six case studies of HE institutions currently delivering varying amounts of active learning in engineering programmes. Whilst this approach produces graduates with a wider skill set, there is a cost associated with it. For the six departments examined, independent analysis showed the programmes were underfunded *on average* by 15%.

A separate EPC / ETB study focusing on TRAC data<sup>4</sup> suggests a more systemic problem with all engineering departments, across all mission groups, operating at a deficit of around 15% on the current unit of resource. This would suggest the need for a greater than 15% increase in the current level of funding before more widespread adoption of innovative active learning approaches can be realised.

However the range in the cost of delivering engineering courses noted earlier suggests that averages such as these can only offer an indication of overall funding deficiencies in the current system. Each delivery model should be considered in its own right.

Our concerns of underfunding in engineering programmes are as follows:

- It is difficult to provide a student experience that is immediately relevant to employment and therefore graduates are entering employment without the right mix of skills.
- Practical work on "real machinery" is being replaced by the use of less realistic teaching models or simulations of one kind or another.

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<sup>3</sup> Engineering Graduates for Industry. The Royal Academy of Engineering, February 2010

<sup>4</sup> The costs of engineering degrees. A report for the Engineering Professors Council and Engineering Technology Board. JM Consulting. November 2007.

- A reduction in space allocation
- Reductions in technical support staff
- Bigger classes, fewer tutorials, less group work, move to paper-based projects (rather than design build & test)
- Higher student-to-staff ratios
- Increasing teaching hours with less time for staff development. This is particularly serious for staff in their early careers
- Extension of equipment lifespan with less frequent updating or modifying, resulting in the use of outdated and less realistic kit

It is clear that an increase in the unit of resource is needed in order to meet the demands of productive industry and of the economy.

### Consultation question 3

Do you broadly agree that our funding method should enable us to incentivise change which is in the public interest?

**Yes**/No/Don't know

Add any further comments below

*(para 37)*

There is a clear need for funding to incentivise change.

Given the current and likely future constraints on HE funding and the strategic importance of engineering to the UK economy, the engineering profession believes that funding for engineering courses must be prioritised in any future funding mechanism.

We recognise the additional support from HEFCE in the past for Engineering and Technology as one of the Strategically Important and Vulnerable Subjects (SIVS) identified in the HEFCE advisory group 2005 report. Other SIVS include Physics, Chemistry and Modern Foreign Languages. Between 1999-2000 and 2007-8 there has been an overall increase in FTE students across all subjects of 18%. For SIVS over the same period, there has been an increase of 2%. However the number of FTE undergraduate students taking engineering programmes over the period has actually fallen by 4%<sup>5</sup>.

In 2008/09 Engineering and Technology accounted for 6.18% of Higher Education FTE students<sup>6</sup>. There is variation of recruitment within the engineering subject area. Some disciplines have suffered greater decline than others - most notably in electronic, electrical and computer engineering where the number of FTE undergraduates has fallen by 13% in the three years from 2005/6 to 2007/8. In contrast, Civil Engineering has seen growth of 9% and Chemical Engineering has grown by 30% although from a smaller base.

<sup>5</sup> Strategically Important and Vulnerable Subjects. The HEFCE advisory group's 2009 report. [www.hefce.ac.uk](http://www.hefce.ac.uk) (accessed April 2010)

<sup>6</sup> Higher Education Statistics Agency [www.hesa.ac.uk](http://www.hesa.ac.uk) (accessed April 2010)

Continued funding to reverse the trend in disciplines with declining number and to strengthen growth is required.

The engineering community also supports incentives to widen participation in HE. Attracting people who would not normally study engineering at HE is essential to meet future demand for engineers.

Only 12% of engineering undergraduates are women. This under-representation is restricting the supply of engineering graduates, for which attitudes to technology within schools are at least partly to blame. But we also believe that wider interest in engineering education will only materialise when additional funding for the subject enables an improvement in the student experience.

In addition, there is particular concern that the number of undergraduates studying engineering and technology subjects at post-1992 HEIs declined by 13% between 1999-2000 and 2007-8, while over the same period there was a growth in student numbers at pre-1992 HEIs. The consequences of continuing with this trend could be the closure of engineering departments at post-1992 universities, undermining the policy of widening participation in which these institutions play a key role.

#### **Consultation question 4**

Do you broadly agree that we should achieve this through a 'strategic margin'?

**Yes**/No/Don't know

Add any further comments below

*(para 36)*

Funding to incentivise change through the strategic margin is most appropriate.

#### **Consultation question 5**

Do you broadly agree that our funding method should be compatible with various modes of study, including flexible provision?

**Yes**/No/Don't know

Add any further comments below

*(para 43)*

We fully support this position.

There has been a substantial decline in the take-up of part-time mode of study in engineering and technology subjects. Over the period 1999-2000 to 2007/8 the number of undergraduates opting for part-time study has fallen by 8% against a decline in full time study of 4%

Ensuring that the funding method be compatible with different modes of study will help reverse the decline in part time engineering students on whom the up-skilling of the current industrial workforce relies. It would also encourage the progression into higher education for those completing engineering apprenticeships.

### Consultation question 6

Do you broadly agree that our funding method should be as simple and easy to understand as possible?

**Yes**/No/Don't know

Add any further comments below

*(para 47)*

*As per Engineering Council comment: We have assumed yes but would welcome comments from those in HE who deal with the funding method.*

### Consultation question 7

Do you broadly agree that our funding method should be responsive and dynamic?

**Yes**/No/Don't know

Give reasons for your answer.

*(Para 51)*

A funding model which is responsive to changes in demand *should* lead to an improvement in the overall quality of teaching.

However, there is a concern that a funding model which is purely demand-led will favour or encourage growth in subject areas on the basis of their popularity rather than disciplines which meet national strategic priorities.

### Consultation question 8

Do you broadly agree that, to achieve value for money, our funding method should continue to reflect the impact of income from tuition fees and contributions from employers?

Yes/No/Don't know

Add any further comments below

There may be further opportunities for employers to make more or different contributions. However, the business case for extended employer engagement must be made first. This business case must rest on the demonstration that improving the quality of the student

experience indeed leads to an increased supply of high quality graduates able to make a greater contribution to productive industry.

### **Consultation question 9**

Do you consider that any other principles or features should be fundamental to our teaching funding method?

The engineering profession would argue that greater employer engagement in HE would improve the student experience and the quality of graduates. We would therefore suggest that greater effort should be made to encourage employers to work in partnership with Universities.

Providing matched-funding to employer bursary schemes would be a feature that would incentivise schemes such as the IET 'Power Academy' which provides vital support to strategically important yet vulnerable subjects such as power engineering as well as those aimed at widening participation in engineering higher education (such as the Smiths / Royal Academy of Engineering bursaries).

### **Consultation question 10**

What are the advantages/disadvantages associated with each of the options in paragraph 60? Are there other effective alternatives?

*(para 60)*

a) We support the allocation of student numbers to Institutions which support policy priorities. Providing greater flexibility on student numbers would reward those engineering courses that provide the excellent student experience required of productive industry in the UK.

b) Additional funding for each student already studying engineering would improve quality of provision. We believe this would stimulate attracting more applicants to entrants to the subject area improved provision would deliver enhanced employment opportunity for graduates.

We would agree with rewarding quality provision. As noted previously, the report by The Royal Academy of Engineering examined six case studies of HE institutions that used different mechanisms to deliver high quality provision. We would wish for HEFCE to support improved teaching, but this funding would need to be sustained to ensure continued best practice. Withdrawal of additional funding would ultimately damage provision.

c) The Engineering Graduates for Industry report shows that it is possible that other universities could adopt or adapt to best practice provision if incentivised, or if disincentives are removed.

d) Reducing funding for behaviour that does not address specific priorities is counter to the principle that the funding method should give institutions the freedom to manage provision in a way that best responds to the needs of students, employers and society.

Withdrawal of funding from engineering departments would have significant impact on infrastructure and capital equipment. This would have long term implications for delivery of programmes.