



Clarity among the diversity of purposes of universities

Response to the inquiry by the Education & Skills Committee of the House of Commons into the future of higher education.

1. Campaign for Science & Engineering is pleased to submit this response to the Committee's inquiry into the future of higher education. CaSE is a voluntary organisation campaigning for the health of science and technology throughout UK society, and is supported by over 1,500 individual members, and some 70 institutional members, including universities, learned societies, venture capitalists, financiers, industrial companies and publishers. The views of the membership are represented by an elected Executive Committee.
2. It has not proved possible in the time allowed to provide detailed evidence and fully-reasoned answers to every one of the large number of important questions set out in the call for evidence.

THE ROLE OF THE UNIVERSITIES

What do students want from university? What should the experience involve?

3. Different students want different things, and to treat the entire student body as a single entity is probably one of the largest mistakes policy makers can make. In a mass system of higher education, the variety of institutions and individuals will be enormous.
4. Prior to entering university, the majority of students probably want a pathway to a rewarding and lucrative career. Many individuals want to study something they find interesting. For example, a recent survey of what would induce 15-18 year olds to study the sciences found that interest (50%), good job prospects (24%) and high salaries (17%) were the top reasons given¹.
5. Many students probably want to study something with which they are familiar, and which extends their earlier educational experience. Some, probably an increasing number, want something not too demanding.
6. But many probably *do not really know what they expect or want*. An increasing proportion go to university because it is the thing to do, following their peers, although they have no real career pathways in mind and no real interest in acquiring new knowledge for its own sake.
7. In view of this, the deeper question is to what extent the preferences of 16 and 18 year olds, choosing A-levels and university preferences, should be allowed to determine the structure of higher education.
8. Although they may not realise it, what students really want is honesty about their higher education experience. For too long, many in the system have colluded in the

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fiction that all degrees are of equal value. Studying at different institutions and (importantly) studying different subjects bring different rewards, some very much greater than others (both intellectually and financially).

9. The student experience should involve acquiring new skills and knowledge, both general and subject-specific. Students should be intellectually challenged to the limit of their abilities throughout their courses. They should also be encouraged to take the opportunity afforded by the student lifestyle to develop as citizens across the widest range of activities possible.

10. Nevertheless, it is evident that current financial arrangements are such that many students need to take paid work both during and out of term, and it is unrealistic to expect that a large proportion of students will have the time to enjoy the ideal level of extra-curricular activities.

11. It is also crucial to remember that the higher education experience should be considered not on its own, but as part of the whole education lifespan of an individual. What a student's experience at university should involve will depend in large part on what he or she has experienced at school or college.

What do employers want from graduates?

12. As with students, employers are varied and want different things. The university system should be sufficiently diverse and flexible to deliver many of the things they want.

13. In so far as it is possible to generalise, employers want people who are perfectly trained for whatever roles happen to be available in their companies today, but that is not a realistic ambition. Moreover, the economy changes so constantly that it is verging on impossible to predict what specific skills will be needed by the time someone in their first term at university comes to enter the labour market.

14. In preparing people for the world of graduate work, therefore, the aim of the system should be to help students to be flexible, adaptable and independent. Most graduates go into employment that has no obvious connection with what they studied at university; even those that go into broadly the same field probably use in their jobs relatively little of the specific information they have been taught at university.

15. However, it is possible to say that the economy will continue to require adequate numbers of people with skills falling within the broad range of experimentation and reasoning inherent in the hard sciences, especially significant mathematical ability.

16. Employers are certainly entitled to assume that graduates will have good levels of literacy and numeracy, and it is worrying that a number of recent surveys and opinions have tended to suggest that many graduates of UK universities appear not to have acquired some of the basic skills that one might expect².

What should the government, and society more broadly, want from Higher Education?

17. The university system delivers, or could deliver, a whole range of benefits to society. Perhaps one of the more interesting purposes is to speak truth to power, to be a repository of unconventional thinking from which comes genuinely novel research ideas and questions that serve to sharpen the government's thinking and improve its policies. Recent policy changes have tended to play down this role, but if universities cannot perform it, who can?

18. But the universities also have the more prosaic purpose of producing graduates suitably skilled to work in the modern economy and of conducting internationally competitive research.

19. Other activities, such as widening participation, engaging with schools and working with local industry may be valuable, but they cannot happen unless the core business of teaching and research is strong. Of course the benefits of higher education should be equitably distributed, but it is absurd to propose that 'widening participation' should have the same strategic status as sustaining the quality of teaching. There would be no point in widening participation in a low quality system.

20. Moreover, although it is perfectly sensible for universities to engage with local schools, and to offer methods of entry into higher education that are suitable for as wide a range of people as possible, this cannot be a substitute for sorting out the failures of the schools system. If not enough young people from relatively deprived areas of the country achieve the required grades to get into university, and if not enough of them aspire to higher education, then there is only so much the universities can do. For example, as long as a quarter to schools teaching 11-16 year old have no physics teacher³, and as long as A-level results in physics differ so strongly between private and state schools⁴, no amount of subtly or unsubtly blaming the higher education institutions will do anything genuinely to widen participation in university-level physics or to give the state-educated children of the inner cities the chances that every right-thinking person believes they deserve.

21. While universities should do everything to widen participation, we must recognise the abilities and limits of different students, and create a range of qualifications to match. Any temptation to lower standards in order to push students past their academic limit should be avoided. There cannot be a general dumbing down to meet fatuous targets on widening participation at the expense of international competitiveness or intellectual rigour.

22. Overall, it must surely be taken as a given that the UK deserves and expects an internationally-competitive higher education sector, and that the Government's role in this is to ensure a stable platform from which the universities can continue to develop their research and teaching activities.

23. In future, this may have to involve a greater degree of honesty about the level of variation within the system, and it will certainly require us to stop pretending that all universities are equal or that all degrees are equivalent, when they are not.

UNIVERSITY FUNDING

Is the current funding system fit for purpose? Is the purpose clear?

24. The current system is manifestly not fit for purpose. It is based on the idea that the Government can set both the demand and the supply for higher education teaching and research, but that it does each independently of the other. The level of student fees is based on the political compromise the Government could pass through the House of Commons rather than any serious assessment of what is needed to do the job properly. The system is basically still operating in a way that it did when conditions were very different and there was far less diversity across institutions.

25. The purpose of much funding is not clear. Although some streams of funding have increased dramatically in recent years, these changes have been accompanied by new and enhanced demands outside of the universities' core business of teaching and research. These include engaging with local industry, attracting participation from under-represented groups and commercialising the results of research. The increases in

funding have not kept pace with these demands, but perhaps more importantly, the funding mechanism has not adapted to these purposes. In research, for example, the bulk of the new money is channelled through the Research Councils, which are designed to be good at picking basic research projects from among competing applications. They are not set up to fulfil other roles, such as knowledge transfer or outreach to the wider community, but have nevertheless been expected to undertake these activities.

What are the principles on which university funding should be based?

26. The basic principle is that the nation should decide what it wants, what it is prepared to pay for out of the public purse, who it thinks should pay for the rest, and what it is prepared to forego in the absence of adequate funding.

27. In more detail, one of the principles for funding anything should be honesty. At present, the system is based on a series of half-truths, dodgy assumptions and unfunded mandates. For example, the ratio of teaching funds between science disciplines and others was reduced two years ago on the basis of an analysis that the Higher Education Funding Council for England admitted at the time was inappropriate⁵. When asked to justify it, the Chief Executive of HEFCE stated as facts reasons that are either not supported by the evidence or for which there simply is no evidence⁶.

28. For example, he claimed that “there is little differential between classroom-based and laboratory-based subjects” in terms of the proportion of the total cost of teaching that is attributable to the salaries of staff. When CaSE asked for the evidence for this, HEFCE directed us to the 2001/02 Edition of *Resources of Higher Education Institutions*, published by the Higher Education Statistics Agency⁷. Quite why this edition was quoted was unclear, but in any case, the data it contains show quite clearly that proportion of identifiable teaching costs attributable to staff varies from 72% to 79% for science and engineering subjects and from 85% to 86% for arts and humanities, a consistent and important difference. Sir Howard also claimed as a fact in his evidence that the difference costs of IT equipment had narrowed between science and non science subjects over the past ten years, but when CaSE asked for the evidence base we were told that “these are not areas on which HEFCE holds...specific quantitative evidence”.

29. A second principle on which funding should be based is some gross assessment of national needs. Precise calculation of the numbers of graduates required in different fields would be absurd and impossible, but at present, huge quantities of public money are put into teaching particular subjects because 17 and 18 year olds happen to think they want to study them, at the expense of subjects that happen currently to be unpopular with this age group. This false market does not serve the country especially well, nor is there any reason to believe that it will serve the students involved, who are being misled about the opportunities that will be available to them following different choices.

30. A third principle is that of autonomy, both within institutions and within the wider teaching and research communities. For example, in research funding, there has been a creeping tendency for more and more of the money to come with strings and conditions attached. The Science Budget, which used simply to be divided among the Research Councils has in recent years come with ring-fenced pots for research on subjects like the ‘rural economy’ (where policy-driven research ought properly to be in the remit of the Department of the Environment, Food and Rural Affairs). On one occasion, there was even a list of specific questions that that researchers should work to ‘solve in the next few years’. It included ‘What does it mean to be a citizen of the expanding European Community [sic]?’ and ‘What is gravitation?’⁸

31. The first of these may be an important policy question, but if so, it is the job of the Foreign Office to commission research, not the job of the Science Budget to hypothecate money to it irrespective of the quality of relevant applications. The second is a genuinely fascinating and important question but the idea that it will be 'solved in the next few years' by central diktat is laughable.

Should the £3,000 cap on student fees be lifted and what might be the consequences?

32. It is difficult to see how the fee can remain at £3,000 into the medium term future. The facts are that universities are underfunded for the range of activities that society expects them to perform and that there is no realistic prospect of any other source of income making up the difference within the next decade. There are many calls on public money, even within the education system let alone more widely, and no political party appears to have the will to promise the levels of funding needed to sustain a world-class university system.

33. Of the other sources of funds, industry already funds a higher proportion of university activities in the UK than in other countries⁹, borrowing on the necessary scale would be both financially imprudent and probably impossible, and endowments cannot be built overnight. There is no easy solution, and it would be preferable to accept and admittedly-imperfect one than to allow universities to be chronically underfunded until the ideal method is devised. To hold fees at £3,000 may endanger standards and quality of higher education.

34. However, the cap cannot simply be abolished without an informed debate about the wide range of issues that this throws up. For example, if *differential* fees become a reality, science disciplines will cost more to study than arts subjects, because the costs of laboratories will always make them inherently more expensive. Proper thought will need to be given to how the country maintains its strategic needs in different disciplines, and it will not be enough to act as if a market based on the whims of 17 year olds is capable to delivering the optimum result, or even an acceptable one.

35. The debate about uncapping fees must recognise that a properly diverse higher education system will have a shifting assortment of ambitions to meet a range of student needs, not all of which necessarily demand the same level of resourcing. If this debate is worked through properly, it has the potential to lead to a sector that is not subjected in a mechanistic, uniform manner to the Funding Councils' levers for implementing Government policy.

Should research funding be based on selection of 'quality'? How should quality be defined and assessed? How might this drive behaviour across the sector?

36. How quality is defined and assessed depends on what the assessment is for. The aim is not to reward departments and individuals for being 'good' but to ensure that huge sums of public money are distributed in ways that promotes the research the nation wants done. This means, for example, that how far strictly applied research should be included depends not only on how we judge its quality against that of pure research in some abstract sense, but in part on whether it is being adequately supported from other sources.

37. The key element of any assessment must be that it measures *outputs* and *outcomes* not inputs.

How can leading research universities reach internationally competitive levels of funding? Should limited central Government funding be directed elsewhere?

38. Leading, internationally-competitive universities around the world obtain their funding from a wide variety of sources, but the mainstays will always be public sector grants, industrial sponsorship and contracts, fees, commercialisation of research, philanthropic donations and endowments. To sustain levels of funding similar to the best in the world, universities need to maximise their income streams from all of these.

39. At present, the only one in which UK universities excel is in industrial funding – a higher proportion of British university research is funded by the private sector than in most other industrialised countries, including the USA.

40. Of the other income streams, any enhancement in fees is likely to be swallowed up by the desperate need to remain competitive in teaching, with relatively little effect on research. Income from commercialising research will never be a massive element of the overall mix – the best in the world produce a few per cent of their research income in this way.

41. That leaves two major potential sources - public funds and endowments, including philanthropic donations.

42. The building up of endowments is an essential part of the future of funding world class universities in the UK, for a variety of reasons, not least that substantial endowment funding gives a degree of freedom and independence from Government. But reserves of the magnitude needed to compete with the best in the world are not going to be generated overnight, and any policy that relies on UK alumni suddenly behaving like their American counterparts is doomed to failure. There should be very significant tax and other incentives for individuals and organisations to donate towards university endowments, with a view to securing major financial benefits to the institutions on a timescale of decades.

43. However, the *only* credible way of ensuring in the short to medium term that our major universities have the resources needed to compete on the world stage is for them to be adequately funded from public funds. Preferably those funds would be channelled through a variety of different routes, allowing ideas that do not suit one funder to have a chance of succeeding elsewhere. This needs to be carefully balanced with the need not to create a confusing array of small and ineffective pots of money.

44. At present, despite the very welcome increases in research funding that have been delivered in recent years, UK universities do not receive the same level of public investment as those in the other major economies. If we are serious about using our higher education institutions as important drivers of economic, social, cultural and environmental development, we have to acknowledge that their share of public spending is not yet sufficient to the task.

How well do universities manage their finances, and what improvements, if any, need to be made?

45. Different universities manage their finances with differing degrees of competence, but all suffer the same difficulty not shared by the private sector institutions with which they might be compared. In higher education, the supply and demand of all sorts of activities (teaching undergraduates, performing research etc.) are both controlled by the Government, which sets targets, dictates prices and micro-manages. But the supply and demand are not set in conjunction with one another. Inevitably, the supply of cash is rarely adequate to the full cost of meeting the demand for activity.

46. Unlike private companies, universities do not have complete freedom to axe the loss-making parts of their businesses. If they did, then they would almost certainly close down the vast majority of their science departments. In chemistry and physics for example, detailed examination of the finances of a range of faculties has demonstrated that they are all losing money, and that their financial losses can be attributed to both teaching and research activities¹⁰.

47. Thus, there is little point in concentrating on criticising the universities for poor financial management unless there are to be changes that would give them the power to improve their performance.

Are some parts of the sector too reliant on income from overseas students?

48. Yes, and it is reasonable to ask if UK taxpayers are getting value for money when too high a proportion of the facilities they paid for and being devoted to educating and training students from competitor countries. The UK should be competing for business in the higher education sector, and should be proud of its record in attracting foreign students. But it cannot afford to rely on them.

THE STRUCTURE OF HE

Is the current structure of the HE sector appropriate and sustainable for the future?

49. No, the structure is essentially that which evolved when only a relatively small proportion of 19 year olds went to university. It is not appropriate now is supposed to include half the population.

How well do structures and funding arrangements fit with 'diversity of mission'?

50. Not well at all. The *only* mechanism through which universities can obtain significant sums of additional public money for being good at anything is the Research Assessment Exercise, which measures one specific kind of activity.

51. There is no similar route to recognition and investment for universities that are superb at internationally-competitive teaching, or which are brilliant at creating educational access for youngsters whose schools have let them down, or which expertly solve the problems of local businesses.

52. There is an underlying assumption that all universities are supposed to be achieving all the different goals of the sector.

Can, and should, the Government be attempting to shape the structure of the sector? Is the Government's role one of planning, steering, or allowing the market to operate? Should there be areas of Government planning within HE – e.g. for strategic subjects?

53. At the beginning of the twenty-first century, nobody would plan a higher education sector *ab initio* and create the one we have now. But we must start from where we are, and adapt the system we have for the future.

54. The diversity of mission that is arguably needed by the country and which is espoused by the sector may only be sustainable in the short to medium term if there is more explicit stratification. Much of this already exists in fact, even if it is not explicit, but it may well be advisable for it to be codified in revised institutional mission statements and funding mechanisms.

55. Given the number of universities and other institutions delivering higher education in a country as geographically small as the UK, resources are being spread very thinly, and there is no case for further expansion without appropriate consolidation and resourcing.

56. The Government spends billions of pounds of taxpayers' money on higher education each year, and the idea that it can simply absolve responsibility to 'the market' is ridiculous when there is no way a proper market, with everyone free to do as they choose, could ever really operate. The market is, and will always be, rigged by the Government.

57. Recent debates about strategic subjects have been falsely polarised into the idea that any degree of central planning is tantamount to micromanagement of the universities. There is all the difference in the world between, on the one hand, a minister instructing an institution that it must keep open a struggling department and, on the other, a sensible assessment of national needs leading to appropriate incentives. The science community has been asking for the latter, but the Higher Education Funding Council has been pretending that the debate was about the former.

58. The Government should have a planning role in relation to important subjects and must steer changes to the sector. But in doing so, it must embrace the needs of the nation in general and of employers in particular. It must also recognise that students paying significant fees are customers and will act as such. They can only be drawn into studying particular subjects as a result of good school teaching, credible and timely advice, guidance and information and attractive employment opportunities. These would in themselves provide the one of the most secure methods of supporting strategic subjects. Coupled with a much fairer funding mechanism than currently exists, these things would obviate the need for Government interference.

What levers are available to the Government and how effective are they?

59. The chief lever available to the Government is money – he who pays the piper calls the tune. The problem is that this can be a very clumsy lever. For example, the current funding arrangements have led to the closure of many science, engineering and related departments, but it is far from clear that this was the Government's intention. The problems are not simply a matter of demand from students.

Is there a clear goal for the future shape of the sector? Should there be one?

60. The only body that could have a 'goal' for the whole sector is the Government on behalf of the electorate, so the question should be 'Does the Government have a clear goal?' It may well do, and if so, it would be better to acknowledge this openly.

Is there a clear intention behind the balance of post-graduate and undergraduate international students being sought? Is this an area where the market should be managed? Can it be managed?

At present, there does not appear to be a clear intention behind the balance because all the pressure is for universities to attract as many international students as possible for financial reasons. It is probably impracticable (and possibly not even desirable) to manage the market across the entire sector, but it would be wise at least to monitor the situation and possibly act where there were problems, for example where there was a shortage of places and home students were at an unreasonable disadvantage. We believe that the University of Toronto Medical School, for example, offers only 7 places a year (out of over 200) to students who are neither citizens nor permanent residents of Canada.

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Notes and References

¹ *What teenagers think of science*, London Metropolitan University, 2006.

² For some examples, see *The Observer*, 21 February 2006, p.31.

³ *Physics in schools and colleges*, The Gatsby Charitable Foundation, 2005.

⁴ *Minutes of Evidence before the House of Lords Science & Technology Committee*, 28 June 2006, Science Teaching in Schools, 10th Report of Session 2005-06, HL Paper 257, p.13.

⁵ *Funding method for teaching from 2004-05: The Outcome of the Consultation*, HEFCE, 2004 (HEFCE 2004/24).

⁶ *Minutes of Evidence before the House of Commons Science & Technology Committee*, 7 February 2005, *Strategic Science Provision in English Universities*, HC 220-II, Question 197.

⁷ In a letter dated 30 March 2006, which arrived on 10 May 2006.

⁸ *A Vision for Research*, RCUK, 2003.

⁹ *OECD Science & Technology Statistics*.

¹⁰ *Study of the Finances of Physics Departments in English Universities*, Institute of Physics, 2006; *Study of the Costs of Chemistry Departments in UK Universities*, Royal Society of Chemistry, 2005.