
Higher Education: Students at the Heart of the System

A joint response from the Institute of
Physics, the Royal Society of Chemistry,
and the Society of Biology to the
Department for Business, Innovation &
Skills' consultation on the Higher
Education White Paper

20 September 2011

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Summary

The Institute of Physics, the Royal Society of Chemistry, and the Society of Biology have worked together to form this response to the Department for Business, Innovation and Skills' consultation on the strategy described in the Higher Education White Paper.

Our main priority is that we continue to produce adequate numbers of well-trained scientists and ensure we have a scientifically literate population. The outputs from higher education (HE) include new knowledge and highly educated, skilled people; both are essential for a vibrant economy.

Whilst we welcome the fact that high-cost subjects, such as the sciences, have been recognised as needing to receive teaching funding from HEFCE, we are very concerned that the funding proposed for 2012/13 is inadequate and that the amount of HEFCE support for 2013/14 and beyond is, at present, uncertain.

The proposals to liberate student numbers could initiate an unwelcome approach to provision by incentivising the development of a low-cost, low-quality element to the HE sector, with a consequent prioritisation of recruitment of high-performing students to non-science subjects. We are also concerned that this will lead to a decrease in the numbers of students taking science and mathematics subjects at A-level.

Access to the study of science courses should be irrespective of the ability to pay. We welcome the stated aim to encourage wider participation, but we note that many of the actions proposed in the White Paper are likely to limit opportunities to study the sciences, particularly for students from lower socio-economic groups and those constrained in their choice of where to study.

The White Paper reveals a lack of joined-up thinking on the intricate relationship between teaching and research. A more coherent approach to teaching and research in the sciences by the Government is essential.

Many students may feel unable to afford to take four year undergraduate degrees or to continue into postgraduate study which would lead to negative repercussions for the research base in the future and the long-term health of the economy. We are pleased to see that postgraduate funding and support will be addressed in a forthcoming HEFCE consultation exercise, and hope the Government will monitor the impact of the new fees regime on the transition from undergraduate to postgraduate study.

We welcome the proposals to provide students with further information to enable them to make informed decisions about their education. However, these data need to be widely disseminated to students and support must be provided to help interpret these data. We have several concerns over the reliability of the data included in the Key Information Set, and ask that the content be reviewed.

The Government must encourage more interactions between employers and higher education institutions (HEIs) to ensure the employability of graduates and the suitability of degree courses.

Main response

The Institute of Physics, the Royal Society of Chemistry, and the Society of Biology welcome the opportunity to comment on the Higher Education White Paper.

Our main priority is that we continue to produce adequate numbers of well-trained scientists and ensure we have a scientifically literate population. The outputs from HE include new knowledge and highly educated, skilled people; both are essential for a successful economy. Science in its totality contributes enormously to our economic and social prosperity and the provision of resources to maintain the numbers of appropriate science courses is vital.

The science subjects represented here should continue to be recognised as strategically important and vulnerable, and it is essential that HEFCE continues to provide additional funding (over and above the Band B/C differential) for such subjects; the maximum student fee plus the Band differential is insufficient to cover the costs of providing an appropriate student learning experience in the sciences.

Reform of grant funding methods

We welcome the fact that high-cost subjects, such as the sciences, will continue to receive teaching funding from HEFCE in the next academic year. However, we have concerns that the amount of HEFCE support is, at present, uncertain. The proposals made in the White Paper will result in significant uncertainty for HEIs over future funding and the sector faces a substantial period of turmoil and unpredictability. HEIs now have to plan in the absence of vital information, such as the value of the teaching grant per student in each subject area, the impact of the greatly increased tuition fees, and the proposals to liberate student number controls. The fact that the teaching allocation for 2012/13 is only an interim measure, and the possibility of more fundamental changes to the funding of high-cost subjects in 2013/14 and beyond, is of great concern.

The teaching of science subjects is expensive compared with arts and humanities subjects, because of the need to impart practical laboratory and fieldwork based skills that require adequate floor space, consumables and often expensive modern equipment. It is important that HEFCE provides adequate funding for the sciences that in addition to tuition fees, covers the whole cost of teaching. Sufficient capital funding must also be available from HEFCE to invest in teaching facilities and laboratories to ensure that they provide an experience that prepares students to enter the modern research and industry environment. This is essential to deliver employer demands for more practical, hands-on experience in the graduates they recruit to avoid the need for 'remedial' training, a practice that is uncompetitive with international comparators.

Most HEIs in England that offer provision in science subjects will charge the maximum fees of £9,000 from the 2012/13 academic year. The additional income from HEFCE for Band B subjects, such as the sciences, has been estimated to be around £1,500. Transparent Approach to Costing (TRAC) data demonstrate that the cost differential between science and non-science subjects is currently of the order of £3,000-£3,500. As a result, even with the additional HEFCE funding, an HEI accepting a new science student in 2012/13 will suffer a financial penalty of around £2,000, compared to one accepting a new humanities or social science student. This is a serious funding shortfall and will remain an acute problem for 2013/14 and beyond. HEFCE acknowledges this in its recent consultation on teaching funding

when it states that: "...funding supplements' for high cost subjects...will contribute towards, rather than necessarily meet the additional costs of high cost subjects"¹. It is unacceptable that this funding shortfall should continue, particularly in light of the cuts in funding that the science community has already faced, and we would like to recommend that this policy is seriously reconsidered. Furthermore, this additional income of £1,500 may be forced down if HEFCE funds have to be re-allocated to cover the costs of higher than expected tuition fees, pushing science departments into the red and making them vulnerable to potential closure. In addition, biosciences subjects within Band C that include large amounts of fieldwork must also be recognised as a high priority for the additional HEFCE funding. The biosciences have not been considered as vulnerable but are strategically important.

If the Government takes the decision to increase neither the fee level nor the additional income from HEFCE's teaching budget, inflation will erode departmental income, and when coupled with student bursary contributions, etc., this may result in less science being taught in English universities.

Such a development will not be in the national interest. Perhaps the greatest contribution that university science departments make to the economy is the annual production of trained physicists, chemical scientists, and bioscientists. These graduates are highly skilled people employed in many nationally important areas, including, for example, information technology, financial analysis, pharmaceuticals, biotechnology, environmental science, engineering, energy technology, teaching and the civil service.

Indeed, a recently published report by the Science Council has revealed that 20% of the UK's workforce – 5.8 million people – is dependent upon scientific skills in order to do their jobs, and that this is projected to rise to 7.1 million people by 2030². This report's findings clearly demonstrate why the Government needs to ensure that HEIs are not disincentivised from offering provision in science courses, due to cost pressures. Moreover, to meet this demand, the capacity for science teaching at the HE level must also increase. This will require capital investment in laboratories, consumables and equipment to release the fixed limit imposed on science departments.

Future of the four-year integrated Masters

The four-year integrated Masters degree – the MPhys/MChem/MBiol/MSci – is now the norm for those considering a career in university or industrial R&D, as it is the preferred route to professional recognition and PhD entry. Financial constraints are certainly a factor in some able students choosing to study a three-year degree, and not taking-up the extra year which means another year of debt accumulation. HEFCE teaching funding provision should ensure that science departments can continue to offer four-year courses.

Liberating student number controls

The Government has stated that 65,000 places are to be made available for students achieving AAB grades or above at A-level or equivalent (here termed AAB+

¹ Teaching funding and student number controls: Consultation on changes to be implemented in 2012-13; HEFCE (2011); http://www.hefce.ac.uk/pubs/hefce/2011/11_20/

² The current and future UK science workforce; The Science Council; <http://www.sciencecouncil.org/content/science-workforce>

equivalent), and that initially, 20,000 places will be allocated to HEIs whose average charge is at or below £7,500 (following waivers).

The core quotas for HEIs will be lowered according to the existing numbers of students achieving AAB+ equivalent, following which an HEI can freely recruit as many students at this level as it is able to attract and accommodate. With all HEIs competing freely for the students with the highest exam results of above AAB+ equivalent, there is a risk that some may prioritise the recruitment of high-performing students to non-science subjects where the cost of teaching them more closely matches the income available from tuition fees. We would like more information on how higher cost and strategically important and vulnerable subjects will be treated with regard to AAB+ equivalent students.

We also have some questions over the practicalities of unlimited recruitment of the AAB+ equivalent students. Will foundation years be treated as A-level equivalents, and how will this work? Will all A-level subjects be considered equal (including general studies)? Will subject combinations be taken into account? Will there be a differentiation between subjects that are more difficult relative to others?³ If not, this could then lead to a decrease in the numbers of students taking science and mathematics subjects at A-level, for which the grading is more severe, if students, instead, choose to study other A-level subjects which may increase their chances of achieving AAB+ equivalent grades. This will result in an even more disproportionate student population only eligible to study non-science degrees, unless a decision is taken to ensure that all A-levels are of equal grade severity, or at least to restrict the policy to certain A-levels that have approximately the same degree of difficulty in obtaining an A or a B grade.

In addition, as it is understood, the 20,000 places allocated to HEIs whose average charge is at or below £7,500 will be made available by reducing the core quota (i.e. the non-AAB+ equivalent quota). This will benefit HEIs 'lower down' in the sector that do not have the capacity to teach laboratory-based sciences, nor will have the ambition to do so, as fees of £7,500 will not be sufficient to teach science subjects. The implication of this policy is that the national provision of science courses could reduce as certain HEIs take on more students in lower cost subjects. HEFCE will need to implement levers to ensure that the provision of science courses is maintained at both the 'top-end' and in the middle-ranked HEIs; the latter, which, of course, have a critical role to play in achieving the widening participation agenda. Furthermore, with students now facing an increasing burden of debt, the Government must also take steps to ensure that there is a comprehensive regional provision of science courses given the potential of the funding changes to result in a decreasingly mobile student population.

The effect of these changes on the HE landscape and, in particular, on student numbers in the various science disciplines must be carefully monitored. We propose that HEFCE be charged with this role to ensure that the nation's ability to provide graduates in strategically important subjects is maintained.

Widening participation

Access to the study of science courses should be irrespective of the ability to pay. We welcome the stated aim to encourage wider participation, but we note that many

³ Relative difficulty of examinations in different subjects (2008); SCORE; <http://www.cemcentre.org/attachments/SCORE2008report.pdf>

of the actions proposed are likely to limit opportunities to study the sciences, particularly for students from lower socio-economic groups and those constrained in their choice of where to study.

Diversifying the sector

The White Paper addresses issues such as moves to form a 'diverse sector' with provision by further education (FE) colleges, alternative providers, new providers, diverse business models, teaching-only institutions, etc., under the guise of offering 'more student choice'. We are concerned at the prospect of new commercially-oriented providers not offering high quality courses in science subjects. This change will not widen student choice of science subjects.

The proposed changes to the regulatory environment do not seem likely to provide sufficiently robust maintenance of quality. New providers are not currently subject to the Quality Assurance Agency and (in the name of de-regulation) will not be required to be. This could undermine the reputation of English HEIs.

Teaching and Research

The White Paper acknowledges that: "...this reform focuses on higher education teaching but our universities have a much wider role". By publishing the White Paper now and holding back its strategy for research and innovation to be published as a separate document later this year, the Government reveals its lack of joined-up thinking on this issue.

In science subjects, one cannot divorce teaching from research. There is an intricate relationship between the two, in terms of space and facilities, financial sustainability, student contact with researchers, academic staff time and workload, and the supply chain of new researchers. Access to research facilities in undergraduate science programmes is needed even in teaching intensive departments.

A more coherent approach to teaching and research in the sciences by the Government is essential.

Postgraduate study and student finance

There is little in the White Paper to address postgraduate study and support. The White Paper has recognised that postgraduate education is becoming more important. However, with the increased costs of undergraduate study, many students may feel unable to afford to continue into postgraduate study. Such disincentives are likely to impact most on students who come from lower socio-economic groups.

There is no route of funding for students who wish to take a taught Masters after an undergraduate degree, and fees for these courses are likely to escalate because they are funded from the teaching component of the HEFCE grant. These courses will die out or be run exclusively for overseas students.

In addition, PhD courses now generally take four years and, while these may not cause students to accrue further debt, they do not allow loans to be paid off either. As certain industrial and academic sectors require specific skills and the experience that only PhD study can provide, this may lead to negative repercussions for the

research base in the future and on the long-term health of the economy. We are pleased to see that postgraduate funding and support will be addressed in a forthcoming HEFCE consultation exercise, and hope the Government will monitor the impact of the new fees regime on the transition from undergraduate to postgraduate study.

Key Information Set (KIS)

We welcome the proposals to provide students with further information to enable them to make informed decisions about their education. We suggest that BIS draws on the professional bodies such as the Institute of Physics, the Royal Society of Chemistry, and the Society of Biology for any information and assistance that we will be able to provide.

We believe that the real value in these data will only be realised if they are disseminated widely and effectively to all students, parents, teachers and schools at various education stages. We wish to see BIS's proposals on how it will ensure that all interested parties are able to access and make use of this information. There has been much that has been misunderstood over the HE reforms, and we trust that support will be made available for students enabling them to interpret these data in order to make informed choices.

The KIS data also need to be reliable and routinely updated and compiled by one independent body. Employment measured sixth months after graduation will not give much useful information on the value of a degree and we recommend that data should also be collected at least five years after graduation, as many science graduates, particularly the highest achieving ones, go on to postgraduate study and may not enter the workforce until three/four years after the completion of their first degree.

There is also uncertainty over the reliability of the student satisfaction data which will be based on evaluative feedback from students with limited experience of other HEIs. The current proposal risks institutional damage based on either an individual lecturer's performance or a student's unhappiness. BIS should consider safeguards for an HEI on these points.

While there is likely to be some correlation between student satisfaction and actual learning gains in subject-specific skills and transferable skills, one does not necessarily imply the other. If school students are to make well-informed choices, they should be able to base their choice not only on satisfaction measures. The KIS should include a strong focus on student learning, not only student satisfaction. As a minimal, but insufficient, improvement, the National Survey of Student Engagement⁴ items on student learning (e.g. "courses are intellectually stimulating", "as a result of this course, I feel confident in tackling unfamiliar problems") should be added to the KIS. We would also suggest eliciting retrospective student opinion, after a period of employment, to gain a more objective view.

⁴ National Survey of Student Engagement; <http://nsse.iub.edu/>

Employer engagement in higher education

A number of reports have claimed that graduates do not always have the necessary skills for employment after graduation⁵. If students are to pay significantly higher fees, their interest in employability skills will inevitably increase.

The Government must encourage more interactions between employers and HEIs, in terms of both sandwich placement provision, employer sponsorship of student places or courses, innovation and enterprise, and gaining evidence-based feedback from employers on the employability of students.

⁵ Ready to grow: business priorities for education and skills; CBI; <http://www.cbi.org.uk/pdf/2010-cbi-edi-ready-to-grow-business-priorities-for%20education-and-skills.pdf> (2010)

IOP Institute of Physics

The Institute of Physics is a leading scientific society promoting physics and bringing physicists together for the benefit of all. It has a worldwide membership of around 40,000 comprising physicists from all sectors, as well as those with an interest in physics. It works to advance physics research, application and education; and engages with policy makers and the public to develop awareness and understanding of physics. Its publishing company, IOP Publishing, is a world leader in professional scientific communications.



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The Society of Biology is a single unified voice for Biology: advising Government and influencing policy; advancing education and professional development; supporting our members, and engaging and encouraging public interest in the life sciences. The Society represents a diverse membership of over 80,000 - including practising scientists, students and interested non-professionals - as individuals, or through the learned societies and other organisations.