

UK Deans of Science

Response to the Higher Education Commission Postgraduate Education Inquiry

Background

UK Deans of Science (UKDS, www.deansofscience.ac.uk) is a national body that seeks to represent the individuals, usually formally designated as Deans, who are responsible for science in HEIs across the UK and who generally hold the budgets for science including any research budgets. Its primary aim is to ensure the health of the science base through the promotion of science and scientists and of scientific research and science teaching in the UK.

This response has been agreed by the UKDS Executive Committee. Any queries should be addressed in the first instance to Prof Ian Haines, Executive Secretary, UK Deans of Science (i.haines@bopenworld.com). The response is mainly limited to issues relating to aspects of science and mathematics where our members' experience and knowledge is most relevant. We would be happy to engage further with the inquiry if this should be considered to be helpful.

We very much welcome this inquiry, which is being held at a time when the impact on undergraduate education of the Government's HE reforms has the potential to impact very severely on the demand, at least by UK students, for postgraduate study, whether for taught or research programmes.

The four year integrated Masters courses (MBiol, MChem, MMath, MPhys, etc) are of significant importance as 'academic' preparation both for roles in industry and as a foundation for commencing a doctorate. It is important that consideration of these qualifications is included within the scope of this inquiry.

Inquiry Questions

Q1: How well does the current postgraduate system meet the needs of businesses? How can the system become more responsive?

Demand for, and utilisation of, postgraduate skills

This is a complex issue. In the UK a substantial proportion of the 22 to 35 population now have a Bachelors degree. Even in times of full employment in the 2000s a significant amount of demand on the supply side for Masters qualifications was from individuals seeking to distinguish themselves in the job market by adding to their Bachelors degree. Since this led to a more highly educated workforce, and studies show that the most successful economies have the most qualified workforce, we would argue that for UK plc this was generally a very positive feature. However, much of this part of the Masters degree market could not be said to be supplying any obvious demand from employers, whether stated or implied. However, we are confident that those educated to Masters level in science and mathematics disciplines were able to make a greater contribution in whatever area of employment they worked.

The second important area of Masters qualifications is where a candidate specialises in a particular aspect of a subject or studies a multi- or inter-disciplinary programme. This may represent a major specialised advance on her/his undergraduate degree or a conversion programme to open up job opportunities that would be more difficult to obtain by relying on the undergraduate qualification. Here again it is not easy to argue that many of these programmes are directly employer-led.

At the level of the research degrees, employer demand for holders of doctorates in science and mathematics is well established. Most of those who possess doctorates in science and mathematics find that their knowledge and high level research and problem solving skills are well utilised by their employers. We believe that there is a significant need for such skills in many SMEs which is still unrecognised and therefore unmet.

- *Postgraduates' role in R&D*

The research output of a UK doctorate is substantial. Masters programmes, including the four year integrated Masters in science and mathematics usually have a significant research content and this can act as a way of attracting Masters candidates to continue research towards a doctorate either full-time or part-time. The combined research activity from PGT and PGR programmes makes a substantial contribution to the output of university science and mathematics departments, to the UK research environment and to the international reputation of UK universities.

- *The response of Higher Education Institutions to emerging industries*

In research terms, and therefore within their PGR agenda, universities have consistently adapted to emerging technologies. Indeed UK university research has often been the catalyst for the creation of new methodologies and processes and the development of new industries. University research strategies and policies have led increasingly to support for research centres, often jointly with several university partners, that deliberately set out to follow completely novel lines of inquiry including the often fuzzy challenges that can only be solved by inter- or multidisciplinary teams.

Because science and mathematics graduates usually seek Masters programmes that have an obvious potential for enhancing their employability, the vast majority of science and mathematics PGT programmes have a clear link with the needs of manufacturing or high technology service industries, health, etc. However, there is a need to ensure that structures and funding exist for creation of such programmes with commercial or other partners to help cover the risks associated with their development and start up costs. We would point out here that there have been (confidential) reports from our members who have invested heavily to prepare new bespoke Masters and short course programmes for a single employer, only to be told just prior to the start that it is no longer needed due to a change in company strategy or investment plans. Alternatively, they find that the course is no longer required after one cohort has completed it. Notwithstanding these difficulties science faculties will continue to work to deliver new and innovative postgraduate programmes, including short, general and bespoke, CPD courses.

We hope that this inquiry will take appropriate account of the opportunities that exist for development of appropriate Professional Doctorates, especially within industries such as agriculture where research activity embedded the workplace is less well established.

- *Frameworks for dialogue between businesses and HE on postgraduate issues*

University science departments have many mechanisms for dialogue with business, including the not-for-profit sector. These range from the relationships made through individual research projects to departmental and university-wide advisory panels. However, there continues to be a lack of sufficient national, regional and sectoral arrangements that bring together groupings of employers (especially SMEs) and universities to discuss and agree needs and how they may be appropriately satisfied both through a range of provision from short updating courses though to full Masters programmes. Such an arrangement might finally develop an integrated approach to a lifelong learning agenda at postgraduate level. This could be initiated through the Sector Skills Councils, which to date do not appear to have seen this as a significant part of their remit.

- *The role of government*

Please see responses to other questions

- *Professional qualifications*

No comment

International competitiveness

Q2a: What is required for the UK to maintain its ability to attract and retain high-quality international students and international researchers?

UKDS continue to be convinced that the Government must make a commitment to alter significantly the balance of the UK economy towards high technology science research and high value manufacturing and to back its words with strategies and policies that will lead rapidly to such a change. In this context we are deeply concerned that the Government has no target for the percentage of UK GDP that is spent on R&D. We strongly believe that, in the face of increasing global competition from both the developed world and the BRICS countries (Brazil, Russia, India, Indonesia, China, South Africa), the Government needs to agree to - and deliver relevant industrial, tax and investment policies that will achieve - a target of at least 5% of GDP being spent on R&D by 2020. This is recognised to be a major challenge, but it would be the clearest

statement of intent and would act as a magnet to individual postgraduate candidates, professional scientists, innovators and investors to commit to work and invest in the UK. (Please see also the comment on immigration policy under question 2b below).

Q2b: What are the long-term implications of the postgraduate sector's dependence on international students?

If the UK can continue to maintain its relative position as a leader in research, the future can be even better than the past. However, the increasing investment of so many of our competitors during a period of economic difficulty threatens this in the long term.

We trust that the Commission will consider carefully the even more serious *short-term* implications of the Government's immigration controls that are affecting both the perception of the UK's willingness to attract international students and the number of applications to UK universities.

Q2c: How might UK-domiciled students be encouraged to engage in doctoral study?

Since the recent HE reforms we have very few answers to this. As hinted elsewhere, if the job market remains very difficult in 2015 and 2016, it is probable that there will be a reasonable demand from UK students for PGT and possibly PGR programmes. However, the long-term prospects are likely to be poor unless most of the following occur:

- there is a major reduction in the cost (eg by reduced fees and/or subsidised living expenses) of undergraduate study, thus cutting graduate debt
- the bursary/grant/salary for doctoral study is close to the general salaries for graduates
- the Government commits to the strategies and policies outlined in Q2a above
- funding arrangements are put in place that pay off part of the outstanding student loan for those who take up doctoral study
- financial support for doctoral candidates includes contributions to all forms of social security benefits including accumulation of state and occupational pension rights
- there is evidence that the promised position - that banks and other lenders will not count the student loan against the borrowing rights when considering graduates for mortgages, loans to start up a business, etc - is fully adhered to.

Q2d: In what areas can UK postgraduate provision be considered outstanding internationally?

Given the international standing of UK universities and the ranking of their research output, postgraduate research provision is undoubtedly internationally outstanding across the sciences and mathematics. The position of postgraduate taught provision is more difficult to establish. As measured by demand from international students, the attraction of postgraduate courses is very high, but this is affected by a variety of factors, including family ties with the UK and the ease of studying in English. We are unaware of any research that has established any international comparison of the UK's international reputation in postgraduate taught provision.

Progression

Q3: How well does current practice support smooth transitions from postgraduate education into industry and academia?

No comment.

Ensuring fair access to postgraduate education

Q4: How can postgraduate provision in the UK be made more accessible for students from less advantaged backgrounds?

It is essential that Government policies support universities with a range of missions so that all those who might eventually become world class researchers/leaders of industry, from whatever background and including late developers, can find an HEI at which they can begin their intellectual journey.

Impact of the planned HE reforms

Q5: What impact will the changes to undergraduate provision outlined in the recent Higher Education White Paper have on the postgraduate sector?

Please see responses to other questions.

Cross-cutting issues

(i) Funding

Q6: How should postgraduate education be funded?

- *Models of funding for research courses, taught courses and professional education*

UKDS is on record as stating that the reforms of funding of undergraduate education could have a very serious effect on take up of PGT and PGR programmes due to the very high level of debt that are likely to be carried by science and mathematics students. Even if an undergraduate wishes to partly pay her/his way by part-time work the timetabled and other study time commitment for science and mathematics is high and there is an additional increase in debt of one third for candidates who complete an integrated four year Masters course. If the graduate job market continues to remain extremely challenging, the earliest graduates from the new funding regime (in 2015 and 2016) may follow previous cohorts and be willing to complete postgraduate qualifications but such decision are likely to reduce dramatically once employment becomes easier. At the very least incentives must be created for part-time study of PGT and PGR qualifications.

- *The desirability of varying funding provision by subject, level or another factor*

While this will appear to be a form of special pleading it is essential that the pipeline of well qualified holders of PGT and PGR qualifications in science and mathematics is expanded. Clearly the Government needs to find ways of funding that supports such areas and any other disciplines where there is a national demand or that are vulnerable due to lack of take up (for example in modern languages). Such funding may take a variety of forms, including direct funding, tax or other incentives for companies, charities, individual benefactors, etc, to support postgraduate candidates. With the right financial package there might be no need for Government to support the candidates differentially, but the costs of different disciplines would need to be taken into account when calculating and paying for capital and revenue costs.

- *The financial sustainability of the postgraduate sector*

In science and mathematics, the PGT sector has developed and expanded through increasing intakes of international and European mainland EU candidates. Many courses are critically dependent on these groups and any significant reduction in such recruitment would close many courses. There are already difficulties in many PGT programmes where the high proportion of international students is such that some feel that they are not receiving the 'UK experience' they had expected. We expect many courses that rely on full-time UK students to become much less viable in 2015/2016.

- *Research concentration*

UKDS believes that the current level of concentration of research is about right. It is essential that excellent research is supported wherever it takes place.

- *The size of the postgraduate sector*

There is no simple answer to this question but the size of the sector needs to be such that it produces at least the same number of graduates in proportion to the UK population as its most successful competitor countries.

(ii) Institutional structures

Q7: Are you aware of any distinctive models of delivering postgraduate education which have been deployed with success in other countries?

We are not convinced that a successful model in other countries and cultures would necessarily work in the UK, particularly because the HE reforms make comparison with any other countries very difficult.

(iii) Quality assurance and student satisfaction

Q8: How effective are quality assurance and student feedback mechanisms for postgraduate provision?

No comment

Ian Haines

Executive Secretary, UK Deans of Science

March 2012