One Step Beyond: Making the most of postgraduate education

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Contents

Foreword

Dear First Secretary of State

We are pleased to present you with this report, *One Step Beyond: Making the most of postgraduate education*.

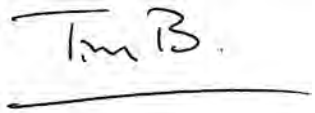
The report responds to the four main areas of investigation that you asked us to consider:

- the benefits of postgraduate education for the economy, employers, the higher education sector and individuals;
- access to postgraduate study and the potential barriers affecting the diversity of participation;
- the importance of postgraduate education in providing employers with the higher level skills they need;
- and the international competitiveness of postgraduate education in the UK.

Our findings confirm that we have much to celebrate about the UK's postgraduate sector, but that there is more we need to do to respond to national and international challenges. After considerable debate, we have produced a set of recommendations that we have all agreed will enhance and strengthen postgraduate education in the UK.

We would like to thank the organisations and individuals who have provided us with evidence and shared their experiences, and hope that you find this report both informative and helpful.

Professor Adrian Smith



Dr Tim Bradshaw

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Executive summary

Introduction

1. Over the last twelve years, the number of people undertaking postgraduate education in the UK has grown 36% – faster than the growth in the undergraduate sector over the same period. Now, almost a quarter of students in UK Higher Education Institutions (HEIs) are studying at postgraduate level and half of international students studying in the UK are taking a postgraduate qualification.

2. Compared to the undergraduate sector, postgraduate provision has had relatively little attention paid to it by policy makers, despite the fact that postgraduate education is of enormous value to the UK and will play a crucial role in driving innovation and growth – particularly in the areas the UK Government has identified in *New Industry, New Jobs*. Recognising this, Lord Mandelson asked for a review into whether the postgraduate system in the UK works as well as it could, and whether there is value in government adopting a more strategic role in shaping the direction of this sector.

3. The review has found that postgraduate education in the UK is a great asset – it is world leading in many areas. But there is scope to build on this success. Making postgraduate provision more responsive to employer needs and encouraging more people to train to postgraduate level will ensure that the UK has the higher level skills needed to succeed in a global knowledge economy. This will be critical to securing the location of high-value business in the UK and to the creation of new employment opportunities in growth sectors.

4. As other countries invest heavily in their own postgraduate provision, the UK will need to work hard to maintain its competitive advantage. This will mean doing more to strengthen and promote UK postgraduate education on an international stage and to attract the very best students from around the world. It will be even more important to ensure that we get the best possible value from the money that taxpayers, employers and individuals invest in postgraduate education.

The value of postgraduate education

5. The UK benefits from a diverse postgraduate system, in which a wide range of postgraduate qualifications and modes of study have evolved to meet the needs of different stakeholders.

6. Cutting-edge research conducted by postgraduates in our world-leading research centres contributes significantly to the health of the UK research base. The UK delivers 8% of world research output, is second only to the US in a number of research disciplines and first amongst the G8 for research productivity. The talent developed in our postgraduate education system is critical to maintaining this success.

7. The advanced knowledge and capability of postgraduates are highly prized by business and the public sector. The skills of postgraduates, especially researchers, are critical for tackling major business challenges and driving innovation and growth. The UK's ability to provide people skilled to this level is an important factor in attracting global businesses to locate high-value operations here.

8. Many employers benefit from postgraduate skills, and not just those in knowledge-intensive industries. Taught postgraduate courses provide people with the skills they need to work in a range of careers and play an important role in translating postgraduate research into practice. Increasingly, postgraduate level continuing professional development is being developed with and for employers and delivered in flexible ways. This model of responsive and tailored postgraduate provision will play an important role in upskilling and re-training the UK workforce.

9. Financially, the growth in postgraduate numbers has benefited universities enormously. Taught postgraduate provision alone brought in income of over £1.5bn for universities in 2008-09. Attracting and retaining high-calibre, taught postgraduate students is a valuable way for universities to recruit postgraduate researchers, who are an integral part of HEIs' research capability.

10. Although less easy to quantify, there are social and cultural benefits attached to a strong postgraduate sector. By encouraging people to question established knowledge, postgraduate education promotes a culture of open and intelligent debate which stimulates innovation and new approaches to tackling difficult challenges. The international diversity of postgraduate education in the UK generates a vibrant and stimulating environment that brings together a variety of cultural knowledge, experience and insights.

11. In general, the value that postgraduate education brings to the UK is under-researched and under-appreciated. This report should go some way to highlighting the benefits, but **Universities UK and the Research Councils UK should do more to identify and promote the economic and social value of postgraduate study.**

The benefits to postgraduate students

12. Postgraduates are highly employable and, on average, earn more than individuals whose highest qualification is an undergraduate degree. They are also more likely to enter professional and managerial occupations and to earn more over their lifetime – although this varies considerably by subject and mode of study. Wider promotion of the different reasons for, and value of, undertaking postgraduate study would help to encourage a wider range of people to consider how it could benefit them. **The UK Government should consider how to promote postgraduate study to individuals, by building on existing campaigns to promote the potential benefits of higher education and skills.**

13. The postgraduate experience surveys run by the Higher Education Academy (HEA) show that satisfaction rates are generally high for both postgraduate taught and research students. Although these surveys are helpful, they are optional for HEIs and the results for individual institutions are not made public. At the undergraduate level, The National Student Survey (NSS) collects data from all students and publishes this online to inform students' choices about where and what to study. Prospective postgraduates should have access to the same level of information. To address this, **the Teaching Quality Information steering group should consider extending the National Student Survey to include taught postgraduate students**. For research

degrees, **the Higher Education Academy should work with Universities UK and Guild HE to extend its Postgraduate Research Experience Survey to more institutions and to improve the student response rate**.

14. Postgraduate students need the right support, information and advice, knowledge and skills, to get the most from their postgraduate experience and to be successful afterwards. HEIs must recognise that the needs of postgraduates are different from undergraduate students, and that some – including part-time and international students – may require additional information and support mechanisms to meet their specific needs.

15. Primary responsibility for the academic standards and quality of postgraduate education in the UK rests with individual institutions, but is overseen by the Quality Assurance Agency (QAA). The UK's quality standards and assurance processes are not widely replicated internationally and therefore have the potential to make an important contribution to the promotion of the UK postgraduate offer overseas.

16. The length of postgraduate courses varies by qualification and between institutions; but in most cases, masters courses last for one year, and PhD courses from three to four. Feedback from several stakeholders suggests that in some disciplines it may be advantageous to extend the length of courses to ensure postgraduates have sufficient time to develop the advanced skills and knowledge that they need to be successful in their career – whether in academia or elsewhere. **HEIs should use the flexibility afforded in funding from the higher education funding bodies and the Research Councils, to offer longer periods of postgraduate research funding and training where appropriate,** recognising that this may result in a reduction in volume.

17. Gareth Roberts' report, *Set for Success,* encouraged the expansion of the Graduate School model of postgraduate researcher training, because of the benefits to the student experience. 76% of HEIs now have at least one Graduate School and this is a welcome development. The expansion of Doctoral Training Centres (DTCs), funded by the Research Councils, has also been a positive step, as have the development of other models of doctoral training that prepare postgraduate researchers for a broad range of careers.

18. Employers expect postgraduates to have a range of skills that go beyond the discipline which they have studied. These include business awareness, languages, numeracy and quantitative methods skills. *Higher Ambitions* asks HEIs to demonstrate what they are doing to boost the employability of their students and this should include postgraduates. **HEIs need to be more pro-active in providing postgraduates with the opportunity to develop the core competencies they need to succeed in a competitive job market.**

19. In response to *Set for Success* – which said that more needed to be done to prepare postgraduate researchers for careers in academia and business – the Research Councils provided HEIs with dedicated funding for wider skills training for postgraduate researchers. Evaluation has shown this to be extremely effective and **HEIs should ensure that transferable skills training is embedded as standard in the funding and design of all postgraduate research programmes.** In addition, **HEIs should work closely with Vitae, employers and other stakeholders to provide better information, advice and guidance on career choices for postgraduate research students.**

Access to postgraduate study

20. Until recently, the issue of whether there is fair access to postgraduate study had been relatively neglected. The report by The Panel on Fair Access to the Professions brought this sharply into focus – recognising the connection between access to postgraduate study and entry into professional careers. As postgraduate level skills are increasingly required in a knowledge-driven economy, it is important that the opportunity to benefit from postgraduate study is open to everyone.

21. The availability of part-time study, distance learning, blended and modular postgraduate courses is already growing – over half of postgraduates study part time, compared to about one third at undergraduate level. The continued expansion of these alternative modes of study will help to ensure postgraduate qualifications are accessible – particularly for people who want to combine this with employment.

22. Accurate, transparent and easily accessible information, advice and guidance play a significant role in informing people about the benefits of postgraduate study, the different types of qualifications, and the funding that is available. Although individual institutions provide this information, and there are a number of student and careers websites designed to help, there is currently no single reference point for someone considering postgraduate study.

23. The Higher Education Funding Council for England (HEFCE) is currently leading work – via the Teaching Quality Information steering group – to review the provision of information to prospective students. **HEFCE should consider extending the Teaching Quality Information initiative to postgraduates, and work with Universities UK and other key stakeholders to promote the development of a single, comprehensive source of up to date information about postgraduate study.** Expanding this resource to include information for international postgraduates would also help to inform those considering studying in the UK.

24. Around 30% of postgraduate researchers, and 60% of taught postgraduates, do not receive any support towards tuition fees or living costs. Although a small number of postgraduates access Professional Career Development Loans (PCDLs) there is no system of subsidised student support such as that available to undergraduates. There is little in the way of robust evidence on whether the cost of postgraduate study and the lack of student support prevent those who would otherwise have pursued postgraduate study from doing so. However, anecdotal feedback from both students and HEIs is that this is an issue – particularly at masters level.

25. Lord Browne's Independent Review of Higher Education Funding and Student Finance in England will consider the higher education system in its entirety, of which postgraduate provision forms an important part. We will provide Lord Browne with the evidence that we have received on postgraduate funding and finance. **If respondents to Lord Browne's call for proposals have evidence on whether cost and access to finance are barriers to postgraduate education, they should include it in their response to the Review.**

26. Unlike at undergraduate level – where there is a wealth of data and opinion – we know very little about the background of postgraduates, nor whether those from less privileged backgrounds are less likely to participate. The few studies that have looked at postgraduate participation by social background have drawn different conclusions.

27. **The UK Government should establish a working group with the Higher Education Statistics Agency, higher education funding bodies, Universities UK and other stakeholders; to advise on what additional information should be collected about postgraduates to inform future policy decisions on widening access to postgraduate study.**

Supply of postgraduate skills

28. Lord Leitch's review of world class skills highlighted the importance of postgraduates in driving innovation, entrepreneurship, management, leadership and research and development. It made it clear that postgraduate skills are critical to a high performing economy and are increasingly in demand from global employers. This is particularly important in the growth sectors identified in *New Industry, New Jobs* and where having sufficient UK capability is critical to maintaining business investment.

29. To maximise economic performance, to generate real opportunities for individuals and for business success, we need to ensure that we supply the 'right' skills, which effectively meet the changing needs and requirements of the labour market. This is a key message from the UK Commission for Employment and Skills (UKCES) National Strategic Skills Audit for England, published in March 2010. The UKCES report – the first of its kind – presents market intelligence gathered by the Sector Skills Councils (SSCs) about the higher level skills that employers need, or may need in the future. However it does not specifically provide an assessment of demand for postgraduate skills.

30. There is a need to build a more coordinated understanding of the demand for postgraduate skills and whether this is being met. As major funders of postgraduates, the UK higher education funding bodies and Research Councils already have an important role to play in understanding the strategic need for postgraduate knowledge and skills and it makes sense to build on this existing intelligence. **HEFCE and Research Councils UK should work together and engage with the UKCES, SSCs and relevant bodies in the Devolved Administrations, to establish employer needs for postgraduate skills**.

31. Despite the lack of a co-ordinated approach to understanding the demand for postgraduate skills, there are in practice many interventions already in place to respond where gaps in supply have been identified.

32. *Skills for Growth* asked the Regional Development Agencies (RDAs) to work with local authorities and other regional bodies to produce regional skills strategies that address local skills needs. There are examples of RDAs that have engaged with this at a postgraduate level and, in some cases, co-funded partnerships with HEIs and SSCs to develop locally responsive postgraduate provision.

33. The intelligence that the Research Councils gather, through discipline and sector specific skills reviews, informs how their funding is distributed. It has also led to a number of specific initiatives developed in partnership with industry to respond to identified skills gaps.

34. *Higher Ambitions* invited HEFCE to devise ways of distributing more funds to provision that responds to higher level skills needs. HEFCE and the other higher education funding bodies are already targeting some funding at stimulating supply and demand in strategically important areas but only a small proportion of this has been at postgraduate

level. There is scope for more funding for postgraduate provision to be allocated in this way – particularly in areas where a small number of postgraduates may have a disproportionate effect on securing economically valuable business activity in UK. **HEFCE should work with Research Councils UK, UKCES and SSCs, and relevant bodies in the Devolved Administrations, to identify how and where to fund provision that responds to employer needs for postgraduate skills.**

35. At the institutional level, much is being done to directly respond to employer needs – for both taught and research postgraduates. There are many examples of partnerships between HEIs and businesses that enable employers to source the knowledge and skills they need. This can involve co-design and co-delivery of postgraduate courses, co-funding, and joint supervision and mentoring of students.

36. Employers are increasingly looking to HEIs to develop tailored postgraduate training for existing staff as part of continuing professional development. There is significant potential for this to expand, particularly where it is delivered flexibly and allows employees to build credits over time, but some HEIs have expressed concern about how to quality assure provision of this kind. **HEIs should work with the QAA to overcome any perceived barriers to quality assuring flexible postgraduate provision delivered partly in the workplace or by more than one HEI**.

37. The growth of professionally orientated doctorates and masters is helping to meet employer needs in both the private and public sectors. In some universities a large proportion of professional postgraduate courses are accredited by employers, and Sector Skills Councils are working with groups of universities to facilitate this. **Universities UK and the SSCs should highlight and encourage best practice in the development and delivery of courses designed to involve and meet the needs of employers.**

38. Schemes such as Collaborative Awards in Science and Engineering (CASE), Knowledge Transfer Partnerships (KTPs) and Innovation Vouchers for SMEs, have helped employers to reap the benefits of postgraduate level skills, whilst providing students with excellent business experience and encouraging knowledge sharing between HEIs and business. The Research Councils should continue to work with the Technology Strategy Board and HEIs to promote the CASE scheme to a wider range of employers and raise awareness of the scheme beyond science and engineering.

39. The UKCES National Strategic Skills Audit highlights that increasing the demand for higher-level skills, as well as stimulating supply, will be important in the future. To support this, **the Council for Industry and Higher Education (CIHE) should promote the value for employers of investing in postgraduate skills, by building on existing evidence about the link between postgraduates and productivity.**

The international competitiveness of postgraduate education

40. Earlier this year, the Prime Minister emphasised the importance of the higher education industry. In *New Industry New Jobs: One Year On,* the UK Government outlined proposals for better supporting HEIs in growing their international activities. As around half of international students coming to the UK take postgraduate qualifications, the strength of the UK postgraduate sector will be central to developing the UK's position in the international market.

41. Whilst the UK is currently very successful in attracting international postgraduates, maintaining this position will become increasingly challenging as competitor countries invest heavily in developing and marketing their own postgraduate systems. As the Government develops its strategy for boosting higher education exports, it must consider what specifically needs to be done at the postgraduate level.

42. Feedback from stakeholders is that efforts to promote UK postgraduate education internationally need to be more coordinated and go further in developing a strong UK postgraduate brand. **Members of the International Education and Research Advisory Forum – UK Trade and Investment, Research Councils UK, the British Council and Universities UK – should work together to identify ways to better promote UK postgraduate provision to governments, employers and students overseas.**

43. This should involve communicating the diverse range of postgraduate qualifications available in the UK, and supporting UK HEIs to expand their postgraduate provision overseas. **The QAA should continue to work with HEIs to ensure that UK postgraduate education delivered overseas maintains its international reputation for rigour and quality** and participate in discussions at the International Education and Research Advisory Forum.

44. The new points-based visa system should make it easier for legitimate postgraduates to study in the UK – but HEIs have reported long processing delays which have, in some cases, prevented legitimate, high-calibre postgraduates from taking up places. There is a risk that this will damage the reputation of the UK. **The UK Border Agency should monitor operational issues with the postgraduate student visa system to ensure there are no unintentional obstacles to entry**. The British Council and HEIs also play a valuable role in communicating to prospective students how the points-based visa system operates to dispel the perception the system itself is an obstacle to studying in the UK.

45. Scholarships and affordable fees rank highly amongst internationally mobile research students as factors which attract them to postgraduate provision. Around one third of international postgraduate researchers in the UK are estimated to receive some form of funding from a UK source. One of the largest sources of support is in the form of fee waivers or discounts from UK HEIs. The UK Government supports over 1,500 postgraduate researchers through a variety of scholarship programmes, and Research Councils award around 5-8% of their studentships to researchers from outside the EU.

46. However, in the face of growing investment from competitor countries, the UK needs to do more to attract the very best postgraduates from around the world. We very much welcome the announcement of a new Newton Scholarship Scheme, which will support around one hundred of the world's best research students to study in the UK. In addition to this, **Research Councils UK should examine ways of opening up more postgraduate research studentships to international students.** This should be done on a strategic, discipline-specific basis where it can add to the strength of research capability in the UK, while taking into account the need to maintain a strong supply of highly skilled UK postgraduates.

47. The Bologna Process of ensuring greater compatibility of higher education frameworks across Europe has highlighted diversity in the length and models of postgraduate provision within Europe and in the rest of the world. UK masters and PhDs tend to be

shorter in duration than equivalent courses elsewhere. This is in many ways attractive to international students, but **HEIs should continue to ensure that their masters level courses are compatible with the Bologna Process through the use of credits and learning outcomes.**

Funding the postgraduate system

48. In comparison to the undergraduate sector, postgraduate education relies on relatively little public funding. Although both taught and research courses are partly subsidised by government, HEIs recover most of the costs of provision via tuition fees. The fact the postgraduate sector has grown 36% since 1997 suggests that this model of funding has operated successfully for HEIs.

49. However, at a time when public funding will come under increased pressure, it is important to ask whether the way the postgraduate system is currently funded offers the best possible value for money and is flexible enough to enable the postgraduate system to respond to growing demand for postgraduate skills.

50. HEFCE and the higher education funding bodies of the Devolved Administrations contributed almost £250m towards taught postgraduate provision in 2009-10 – calculated on the basis of student numbers and subject costs. HEIs recoup the additional cost of providing taught courses through tuition fees which are uncapped and vary widely – masters courses can cost anything from £2,000 to over £30,000, depending on the subject and institution.

51. The taught postgraduate market has in many ways been a success story – expanding substantially to meet demand and generating significant fee income for HEIs. However, there are some areas where the mechanisms of the market do not work effectively, and where supply does not meet demand.

52. A more coherent approach to understanding and communicating employer skills needs, and providing prospective students with more comprehensive information on courses and employment outcomes could reduce the incidence of such market failures.

53. Over 40% of taught masters students currently come from outside the EU and pay fees that tend to be significantly higher than those charged to UK/EU students. In some subjects, where non-UK students make up over two-thirds of the cohort, the income this generates is vital. As the international market for postgraduate study becomes more competitive, HEIs should ensure that their financial sustainability is not overly-reliant on tuition fees from overseas taught postgraduates.

54. *Higher Ambitions* sets out the UK Government's intention to support a world-class research base in our universities by focussing quality-related research funding in excellent research centres, and to encourage collaboration between high-performing smaller research groups where this can add value by building critical mass.

55. To get the best value from limited resources, public funding that supports postgraduate research students should also be targeted in areas of excellence. This will help to sustain our most successful research centres and ensure that research students are located in stimulating environments where world-leading research is taking place. This is particularly true for those disciplines that require critical mass to provide a truly excellent student experience.

56. Excellent research groups may be formed from the collaboration of several smaller research units, often involving multiple disciplines. Bringing research students together in interdisciplinary centres not only enriches the student experience but also encourages the knowledge-sharing and interconnectivity required to tackle some of the world's most challenging issues.

57. Funding to support the supervision of postgraduate researchers is paid to HEIs by the higher education funding bodies of the Devolved Administrations. In 2009-10, HEFCE distributed £203m through this funding stream, calculated on the basis of student numbers. To ensure that public funding for research students is focussed in excellent research centres, **HEFCE should consider how to link future allocations of the research degree supervision grant more explicitly to research quality, rather than volume as at present.**

58. In 2008-09, the Research Councils funded just over 19,000 postgraduate researchers, at a cost of £376m. The Research Councils are increasingly targeting this funding in the form of block grants to Doctoral Training Centres (DTCs).This approach gives HEIs greater flexibility to fund provision that responds to emerging needs. DTCs often bring together several research groups and facilitate working across disciplinary boundaries. This creates an innovative training environment for postgraduate researchers. **HEIs should work together with the Research Councils to develop more multi-disciplinary Doctoral Training Centres**.

59. In the last decade, the number of people participating in postgraduate study has grown substantially but if the UK is to compete in the global knowledge economy and capitalise on new, emerging industries, it is likely that there will be increasing demand for the UK workforce to be trained to postgraduate level. The UKCES National Strategic Skills Audit identifies a number of areas where higher level skills will be required to drive growth and the UK must ensure it is well positioned to respond to the opportunities this will present. Whilst competitor countries may be able to invest heavily in stimulating the supply of high-level skills, the UK Government will need to assess how to get the best possible value from existing public investment.

60. In Autumn 2010, the Independent Review of Higher Education Funding and Student Finance will advise the UK Government on the appropriate balance of public and private investment in higher education in England. **In considering its response to the Independent Review's recommendations, and within the framework of the comprehensive spending review, the UK Government should take the opportunity to consider the appropriate level of public funding that should be invested in postgraduate provision.**

61. In doing so, it should take into account global trends in postgraduate education – including what other countries are doing to promote participation. It will also be necessary to gather more evidence on the return on investment in postgraduate skills, any evidence of existing market failure, the case for targeting funding towards this area of provision relative to others, and the appropriate overall balance between public and private funding contributions.

Introduction

1. Over the last twelve years, the number of people entering postgraduate education in the UK has grown 36% – faster than the growth in the undergraduate sector over the same period. Now, almost a quarter of students in UK HEIs are studying at postgraduate level and half of international students studying in the UK are taking a postgraduate qualification.

2. Compared to the undergraduate sector, postgraduate provision has had relatively little attention paid to it by policy makers, despite the fact that postgraduate education is of enormous value to the UK and will play a crucial role in driving innovation and economic growth – particularly in the areas the UK Government has identified in *New Industry, New Jobs,*[1] and that the Devolved Administrations have indicated in their skills and growth strategies.

3. Recognising this, Lord Mandelson asked for a review into whether the postgraduate system in the UK works as well as it could, and whether there is value in government adopting a more strategic role in shaping the direction of this sector.

4. The review has found that postgraduate education in the UK is a great asset – it is world leading in many areas. But there is scope to build on this success. Making postgraduate provision more responsive to employer needs and encouraging more people to train to postgraduate level will ensure that the UK has the higher level skills needed to succeed in a global knowledge economy. This will be critical to securing the location of high-value business in the UK and to the creation of new employment opportunities in growth sectors.

5. As other countries invest heavily in their own postgraduate provision, the UK will need to work hard to maintain its competitive advantage. This will mean doing more to strengthen and promote UK postgraduate education on an international stage and to attract the very best students from around the world. It will be even more important to ensure that we get the best possible value from the money that taxpayers, employers and individuals invest in postgraduate education.

Structure of the report

6. In **Section A** of this report, we provide a brief overview of the main characteristics of the postgraduate landscape and highlight some recent trends in participation. This is followed in **Section B** by an assessment of postgraduate education in the UK, responding to the main areas of investigation Lord Mandelson asked this review to consider (full terms of reference are at Annex 2). This includes a series of recommendations aimed at further strengthening postgraduate education in the UK.

1 HM Government, *New Industry, New Jobs* (2009)

Scope of the review

7. The review has taken a UK-wide view of postgraduate education. However, postgraduate education is partly devolved. Research Council funding for postgraduate education is deployed across the UK but there are separate higher education funding bodies in each of the four countries of the UK. There are differences in the policies of the Devolved Administrations and therefore in the way the respective funding bodies support postgraduate provision.

8. We have built on the direction set by the UK Government in *Higher Ambitions,*[2] but have also recognised that each of the Devolved Administrations have published their own higher education policy documents in the last two years. In Wales, *For our Future – The 21st Century Higher Education Strategy and Plan for Wales*; in Scotland, *New Horizons*; and in Northern Ireland, the *Review of Postgraduate Policy and Funding*.[3]

9. Some of the recommendations in this report are relevant UK-wide and are therefore addressed to stakeholders across the UK. Where appropriate, others are directed to the UK Government or the Higher Education Funding Council for England; but may be of interest to other Administrations.

2 BIS, *Higher Ambitions: The future of universities in a knowledge economy* (2009)

3 Welsh Assembly Government, *For our future: The 21st century higher education strategy and plan for Wales* (2009)

DELNI, *Review of Postgraduate Funding and Policy* (2009)

Scottish Government, *New Horizons: Responding to the challenges of the 21st century* (2008)

Overview of the postgraduate landscape

Introduction

1. Postgraduate education in the UK has, until recently, been comparatively under-researched. To inform this review, it has therefore been important to spend time drawing together the available evidence on postgraduates and postgraduate study. We have been fortunate that the Higher Education Policy Institute (HEPI), working with the British Library, has updated its previous analysis of the postgraduate sector.[4] The latest report, *Postgraduate Education in the United Kingdom,*[5] published in January 2010, uses some of the most recent data available from the Higher Education Statistics Agency (HESA).

2. What follows is a brief summary of the main characteristics of the postgraduate sector in the UK. It illustrates some of the key statistics that have informed our findings and recommendations. It is by no means a comprehensive analysis – not least because in some areas, there is currently only limited information available.

Types of postgraduate qualifications in the UK

3. Postgraduate education in the UK encompasses a broad range of very different qualifications. This review has taken an interest in all types of postgraduate provision that are offered by HEIs and which therefore benefit from some public funding.

4. Postgraduate qualifications can be classified into two broad types: those that are largely taught; and those with a significant research component. Undertaking a research degree involves a far greater amount of independent study, and encourages the development of skills in advanced research and analysis that a taught postgraduate student would not be expected to acquire. Increasingly however, taught courses may include a research component and research degrees may feature a more structured training element.

5. What distinguishes all postgraduate qualifications is that they are 'more advanced' than those at undergraduate level. The Quality Assurance Agency (QAA) Framework for Higher Education Qualifications (FHEQ) in England, Wales and Northern Ireland defines eight qualification levels, the top two of which are postgraduate[6] (see Annex 5). The FHEQ levels are determined by the achievement of outcomes and the wider abilities that a typical student could be expected to have developed, and bear no relation to years of study or chronology. Scotland has a parallel higher education qualifications

4 Sastry, T., *Postgraduate Education in the United Kingdom*, HEPI (2004)

5 House, G., *Postgraduate Education in the United Kingdom*, HEPI (2010)

6 www.qaa.ac.uk/academicinfrastructure/FHEQ

framework which reflects the differences in its education system whilst aligning it with the framework for England, Wales and Northern Ireland.[7]

6. The FHEQ Framework promotes a shared and common understanding of the expectations associated with typical qualifications by facilitating a consistent use of qualifications titles across the higher education sector. It also provides a framework for comparing UK qualifications to other European higher education qualifications.

Doctoral degrees

7. Doctoral degrees are internationally recognised and widely considered to be the highest level of academic qualification. The FHEQ states that the degree should be awarded to researchers who have demonstrated:

   - the creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication;
   - a systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of an academic discipline or area of professional practice;
   - the general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of the discipline, and to adjust the project design in the light of unforeseen problems; and
   - a detailed understanding of applicable techniques for research and advanced academic enquiry.

Doctor of Philosophy (PhD)

8. The most common doctoral degree is the traditional Doctor of Philosophy (PhD or DPhil), usually awarded following an oral examination of the candidate's research thesis, and normally taking three to four years of full-time study to complete. In recent years, new models of PhD have emerged, offering a larger taught element or combining advanced research with wider skills training to prepare students for a broad range of careers. These models have developed in recognition of the fact that a PhD is not solely a route into academia, and that a large proportion of PhD graduates progress into senior positions outside the higher education sector.

Professional doctorates

9. Over the past twenty years there has been a substantial growth in professional doctorates. These doctorates are offered in a variety of professional fields including engineering (EngD), nursing (DNursSci), veterinary medicine (VetMD), education (EdD), business administration (DBA) and clinical psychology (DClinPsy).[8] As for the traditional PhD, candidates are required to produce original knowledge; but with the additional proviso that this should make a significant contribution to professional practice. Professional doctorates may also be combined with a taught element and, instead of requiring a thesis, may offer the option of producing a collection of extended assignments.

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7 www.qaa.ac.uk/academicinfrastructure/FHEQ/SCQF/2001

8 A helpful guide to the range of professional doctorates now available can be found at www.professionaldoctorates.com

10. In many cases, professional doctorates are designed and delivered in collaboration with employers and professional bodies, and are strongly linked to the needs of a particular sector. In the case of the EngD, for example, doctoral students conduct PhD-equivalent research whilst also undertaking taught business courses and working alongside an industrial partner. This kind of 'experience-led' learning has proved extremely popular with employers.

Higher doctorates and honorary doctorates

11. Higher or honorary doctorates are awarded in recognition of outstanding academic achievement in a particular field and are usually reserved for established postgraduates or academic staff. The higher doctorate is awarded on the basis of a collection of published research that has been formally submitted. Examples include the Doctor of Sciences (DSc/ScD) and Doctor of Letters (DLitt/LittD) degrees.

Masters degrees

12. Masters degrees, which normally take twelve months of (full-time) study are usually described as either 'taught' or 'research' based, with taught courses being the most common. This definition is not exclusive: most taught courses will include a research project which can make up a substantial proportion of credits contributing to the final award; and many research masters will include a taught element.

13. The nature and purpose of masters courses vary widely, but most can be considered to fall into three broad categories:

    - Extension – courses that are designed to extend an individual's knowledge in a particular area, beyond that which could be gained in an undergraduate degree and which often lead towards postgraduate research and academia.
    - Conversion – courses that offer the opportunity to convert to a new discipline and develop advanced knowledge and skills during an intensive period of study.
    - Vocational – courses which prepare the individual for employment in a particular profession.

14. All masters degrees are expected to meet the QAA national qualification descriptor, which states the expected nature and level of the outcomes of study.

> **QAA summary qualification descriptor for masters**
>
> Much of the study undertaken at masters level will have been at, or informed by, the forefront of an academic or professional discipline. Students will have shown originality in the application of knowledge, and they will understand how the boundaries of knowledge are advanced through research. They will be able to deal with complex issues both systematically and creatively, and they will show originality in tackling and solving problems. They will have the qualities needed for employment in circumstances requiring sound judgement, personal responsibility and initiative, in complex and unpredictable professional environments.

15. The QAA also publishes benchmark statements for masters degrees in nine (mostly science-based) subjects. These are developed with the academic community and

describe the expected attributes and capabilities that those undertaking these qualifications should have demonstrated.[9]

Research masters

16. Masters by research include a substantial research project and usually include training in research methodology alongside other taught modules. They are normally given the title of MRes but there is some variation among institutions. Research masters are often undertaken by those seeking a career in a research-led profession where a PhD level qualification is not needed. They are frequently undertaken before embarking on a PhD programme (and may be a requirement for funding), or awarded to individuals who start out on a PhD route but choose not to complete the full award (in which case they are often referred to as an MPhil).

Integrated masters

17. Integrated masters are delivered as part of a single programme of study which includes an undergraduate degree and usually last a total of four years (full-time study). They are common in engineering, mathematics and other science subjects and are often professionally accredited. After two to three years of study, threshold criteria are usually set for students wishing to continue to masters level. Exit routes (offering for example a Bachelor of Science degree) are available for students who do not meet the criteria or who wish to exit early from the programme.

Masters of Business Administration (MBA)

18. The MBA is a management qualification that can be studied in one year full-time – although courses are increasingly of longer duration. In common with other masters degrees, MBAs usually consist of a number of taught modules plus a dissertation or project. Many MBA programmes have links to specific industries or sectors of the economy such as banking, finance, marketing, IT and health care.

Postgraduate diplomas and certificates

19. A postgraduate diploma is a taught course usually taking nine months of full-time study to complete. Postgraduate certificates tend to be around six months in length (if taken full-time) and may precede a diploma or masters course. Both types of qualification are commonly delivered on a flexible, modular basis.

20. Postgraduate diplomas and certificates are often vocationally oriented. They are sometimes required to permit entry into a particular field – for example, the Legal Practical Course and Bar Vocational Course which enable progression to legal training. In other fields (such as journalism), obtaining a professional postgraduate qualification is not mandatory but increasingly expected and often forms part of continuing professional development. It is therefore common for postgraduate diplomas and certificates with a vocational focus to be undertaken on a part-time basis and combined with employment in the relevant field. Employers often contribute to the cost of fees – in some cases covering them entirely – and may supervise some of the assessed learning.

9 http://www.qaa.ac.uk/students/guides/UnderstandQuals.asp

PGCE/PGDE

21. The Postgraduate Certificate in Education is a one year full-time masters level course which trains graduates as teachers. In Scotland, the equivalent qualification is known as the Professional Graduate Diploma in Education (PGDE).

22. The Professional Graduate Certificate in Education is a one year course in England and Wales which provides training for teachers in higher education, further education colleges, prisons, adult education and work-based learning settings. It does not carry credits towards a masters degree, and sits on the 'honours' level of the FHEQ – a level lower than the Postgraduate Certificate in Education.

Funding for postgraduate study

23. In 2009-10, the UK Government and governments of the Devolved Administrations collectively invested over £850m[10] in direct funding for postgraduates and postgraduate provision. The sector also benefits from investment by other stakeholders with an interest in the skills and knowledge that postgraduates generate – including employers, charities, other government departments and international bodies. HEIs tend to invest more in postgraduate provision than they receive dedicated funding for; for example, by delivering high-cost specialist research training, and offering fee waivers and fee support to attract the best postgraduate students from around the world.

24. The level and means of funding for postgraduate provision vary between taught and research-based training, as do the tuition fees charged and financial support available to students. There is also some variation within the UK. However, the basic principles of public funding for postgraduate study are outlined below.

Funding body support for postgraduate teaching

25. Each of the UK higher education funding bodies – the Higher Education Funding Council for England (HEFCE), the Scottish Funding Council (SFC), Higher Education Funding Council for Wales (HEFCW) and Department for Employment and Learning in Northern Ireland (DELNI) – contributes towards the cost of teaching postgraduates. In 2009-10, this amounted to almost £250m.

26. In all of the Administrations, the bulk of this funding is calculated on the basis of student numbers, with different levels of funding for groups of subjects, and is paid to HEIs as part of the overall block grant for teaching. Flexibility in this grant means that HEIs can choose how much of it to use to subsidise postgraduate (as opposed to undergraduate) teaching. More details on how each higher education funding body allocates this funding are at Annex 5.

Tuition fees for taught postgraduates

27. Unlike at undergraduate level, most postgraduate fees are unregulated, which means that HEIs can recover a higher proportion of the costs of teaching through tuition fees. In some cases, HEIs may pass on the full cost of a course to taught postgraduate students – enabling the institution to recruit a higher number of students than its teaching grant provides funding for.

10 £850m consists of the total funding from each of the higher education funding bodies for both postgraduate teaching and research degree programme supervision costs; plus the funding the Research Councils provide for postgraduate researchers

28. The fees charged for taught postgraduate courses vary widely by institution and by subject. Overseas students from the EU are often charged the same fees as UK domiciles. Those from outside the EU tend to be charged significantly more as HEIs receive no subsidy from the higher education funding bodies for the teaching of these students.

29. No data is routinely collected on taught postgraduate tuition fees, although details are usually available on individual institutions' websites and there have been some efforts to collate information on fees charged.[11] A survey of fees charged by English HEIs in 2007-08 found that on average, fees had risen 48% (in nominal terms) since 2001-02, but that this varied by mode and subject of study.[12]

Table 1: Change in tuition fees for UK/EU students on taught postgraduate courses in English HEIs, 2001-02 to 2007-8

	2001-02	2007-08	% Change
Average full-time	£3,664	£4,955	35%
Average part-time (full-time equivalent fee)	£4,797	£7,655	60%
Subjects Allied to Medicine	£3,008	£5,145	71%
Business	£6,242	£9,855	58%
Combined	£3,074	£7,530	145%
Creative arts	£3,236	£4,520	40%
Education	£2,526	£3,985	58%
Humanities	£3,686	£5,060	37%
IT	£3,777	£5,655	50%
Laboratory Based Science	£4,302	£6,650	55%
Languages	£2,694	£3,835	42%
Law	£4,602	£7,085	54%
Medicine	£4,528	£6,075	34%
All	**£4,271**	**£6,300**	**48%**

Source: HEFCE

30. Unlike at undergraduate level, there is no universal system of student support available for postgraduates. The cost of tuition fees for taught postgraduate courses is most often met from private sources – such as the student themselves, their family or employer. In 2007-08, around 60% of UK and EU domiciled postgraduates in English HEIs were funded by private sources.[13]

11 www.publicgoods.co.uk

12 HEFCE, *Survey of fees for postgraduate taught and part-time undergraduate students* (2009)

13 House, G., *Postgraduate Education in the United Kingdom*, HEPI (2010)

31. Public funding for taught postgraduate study is invariably targeted at specific disciplines. In 2007-08, around 30% of UK and EU domiciled postgraduates in English HEIs received public funding – including government support for teaching, social work and some health professions.[14] The Devolved Administrations also offer discretionary awards to a limited number of taught postgraduates studying strategically or economically important subjects.[15]

32. A small number of masters level awards are granted by the Research Councils. Research Council funding (which is awarded to less than 5% of taught masters students in the UK) tends to be targeted at masters courses that prepare people for further research or for employment in specific advanced industries, and is typically focused in areas where it has been deemed necessary to boost the supply of highly skilled people.

33. In 2007-08, HEFCE found that just under 4% of taught postgraduates at English HEIs had their fees waived by their institution.[16] Although still relatively uncommon, the number of taught postgraduate students receiving fee waivers has increased since 2001. Several HEIs have reported offering fee waivers and discounts to attract students onto taught postgraduate courses in 2009-10, as more people considered further study in the face of a subdued employment market.

Professional and Career Development Loans

Professional and Career Development Loans (PCDLs) are commercial loans subsidised by the UK Government, and available to UK residents undertaking career development – including postgraduate study. PCDLs are offered by high-street banks at a commercial rate of interest but with the interest paid for by the Government during the period of learning and for one month after.

PCDLs can be used to cover tuition fees, other course costs, travel, childcare and living expenses, and can be used on top of other sources of funding. In 2008-09, only around 1,750 PCDLs were taken up by UK students undertaking postgraduate courses, but this number is expected to be higher in 2009-10.

14 ibid

15 For example: in 2009-10 the Scottish Government funded a pilot programme offering student support to part-time postgraduates in courses that have been selected as relevant to Scotland's economic priority sectors (www.student-support-saas.gov.uk/student_support/special_circumstances/postgrad.htm); and in Wales, European Structural Funds are being used to fund taught masters places in areas where skills gaps have been identified

16 House, G. *Postgraduate Education in the United Kingdom*, HEPI (2010)

Funding body support for research degree programmes

34. All of the higher education funding bodies in the UK provide HEIs with a contribution towards the cost of supervising postgraduate researchers. Although there is some variation in exactly how this block grant is calculated, each of the funding bodies bases its allocations on the number of eligible research students (those from the UK and other EU students that satisfy residency criteria), and a set of cost bandings for different subject groups. In 2009-10, total UK funding for the supervision of research degree programmes amounted to £249m. Annex 5 provides a breakdown of this sum and details of funding methods used.

Tuition fees for postgraduate researchers

35. HEIs also charge fees to postgraduate research students. Although these are uncapped, they are in practice influenced by the maximum fee level that the Research Councils agree they will pay to HEIs for the postgraduate research students that they fund. In 2009-10 this was set at £3,390 per annum. HEIs have traditionally taken their cue from this fee, which is set by the Research Councils one year in advance. Fees for non-EU students are usually structured on the basis of the Research Council maximum fee, plus the equivalent amount received from the higher education funding body for the supervision costs of an UK/EU student.

36. A far greater proportion of postgraduate research students receive some form of public funding. The largest funder of postgraduate researchers are the Research Councils, which provide studentships for 25% of all full-time postgraduate researchers in the UK. In 2008-09, the Research Councils provided funding for 19,200 doctoral studentships, at a cost of £376m. The vast majority of these were funded through Doctoral Training Grants (DTGs) – allocated as block grants to HEIs who are given the flexibility to decide how many studentships to fund, of what length and in which disciplines. Students may receive a fee-only award, or a full package of support that includes a 'stipend' for living costs. The Research Councils set a minimum level for this stipend which in 2009-10 was set at £13,290 (£15,510 within London). The Research Council stipend acts as a benchmark for other funders of postgraduate research students, who tend to set their funding at the same level.

37. Institutions themselves are major funders of postgraduate research students, with English HEIs offering fee waivers to almost a fifth of UK and EU students in 2007-08. Other funders include charities, industry and overseas governments and organisations. The Devolved Administrations also offer discretionary awards to a limited number of postgraduate researchers studying strategically or economically important subjects.[17]

Demographics of the postgraduate population and recent trends

38. Headline figures show that postgraduate education has grown substantially in the last decade. It is helpful to consider in more detail, where this growth has been and what implications this has had for the make up of the postgraduate population. Doing so also highlights a number of areas where we need more information to better understand patterns of participation.

17 For example: Through its 'SPIRIT' programme, the Scottish Funding Council is funding 31 studentships in partnership with the Scottish chemical sciences industry, at an annual cost of £310,000 over three years; and the Department for Employment and Learning in Northern Ireland is funding 300 additional PhD awards per year in areas of 'economic relevance'

Number of postgraduates

39. Since 1997-98, the total number of enrolments in postgraduate study has grown by 36%, so that by 2008-09, there were over 470,000 postgraduates in UK HEIs. This is higher than the growth in undergraduates over the same period but much of the growth in postgraduates can be accounted for by the rise in students coming to the UK from overseas.

Table 2: Enrolments by level, domicile and mode – UK HEIs, 1997-98 to 2008-09

	Undergraduate			Postgraduate		
	1997-98	2008-09	% change	1997-98	2008-09	% change
Total	1,412,545	1,795,650	27%	347,005	472,415	36%
UK	1,281,240	1,606,525	25%	277,350	315,335	14%
EU	69,010	80,015	16%	23,840	40,255	69%
Non-EU	62,300	109,110	75%	45,815	116,825	155%
Full-time	1,022,605	1,266,500	24%	143,520	236,800	65%
Part-time	389,940	529,150	36%	203,485	235,615	16%

Source: Higher Education Statistics Agency (HESA)
Figures are based on a snapshot basis as at 1st December and have been rounded to the nearest five.

40. Looking at more recent trends and at different types of postgraduate qualification, we can see that the most significant growth has been in the number of people registering for taught masters – up by over 50,000 between 2002-03 and 2007-08. At the same time, entrants to research based qualifications rose 14%; PGCE enrolments fell 13%, despite rising to a peak in 2005-6; and postgraduate diplomas, certificates and professional qualifications all fell substantially. This may be partly due to changes in the way students register for their course – particularly if they are undertaking a modular qualification. Modular courses tend to be classed as 'other postgraduate', and starters in this category have more than doubled since 2002-03.

Table 3: Entrants to postgraduate and undergraduate study in UK HEIs, 2002-03 to 2008-09

Postgraduates				
Level of study	**2002-03**	**2008-09**	**Absolute increase**	**Percentage increase**
Doctorate or research masters	26,900	30,735	3,835	14%
Taught masters	122,270	178,020	55,750	46%
PGCE	29,850	25,350	-4,500	-15%
Postgraduate diplomas and certificates	43,875	31,325	-12,550	-29%
Professional qualifications	10,090	6,125	-3,965	-39%
Other postgraduate	15,910	34,985	19,075	120%
Total	**248,895**	**306,540**	**57,645**	**23%**

Source: Higher Education Statistics Agency (HESA)
Figures are based on a HESA standard registration population and have been rounded to the nearest five.

Subjects studied

41. At masters level, the three most popular subject areas are: Business and Administrative Studies; Social Sciences; and Engineering. Since 2002-03, there has been particularly strong growth in the number of people qualifying with masters in Medicine and Dentistry; Subjects Allied to Medicine; Mathematical Sciences; Engineering; Architecture; Building and Planning; Business and Administrative Studies; and Creative Arts and Design. All of these have grown by at least 50%.

42. The proportion of masters qualifiers who come from outside the UK varies widely by subject. Overall, around half of masters qualifiers are international students, but in some subjects this is significantly higher – amounting to over two-thirds of qualifiers in Computer Science, Engineering, Technologies, and Business and Administrative Studies.

43. The largest number of PhD qualifiers in 2007-08 were in the Biological Sciences, Physical Sciences and Engineering. The strongest growth has been in very similar disciplines to that of the growth in masters; although overall, a much larger proportion of PhD qualifiers are in science, technology and engineering subjects. As with masters degrees, participation by non-UK students varies widely, but in a handful of subjects the proportion of international qualifiers is higher than 60% (Engineering; Architecture; Building and Planning; and Law).

Mode of study

44. The proportion of postgraduates undertaking part-time study varies widely by qualification type and domicile. Those studying for postgraduate diplomas and certificates, professional qualifications and 'other postgraduate qualifications', are much more likely to be doing so on a part-time basis – suggesting that these qualifications are often combined with employment.

Table 4: Mode of study amongst UK domiciled first year postgraduate students in English HEIs, 2007-08

	% full-time	% part-time
Doctorate or research masters	69	31
Taught masters	44	56
PGCE	88	12
PG diplomas and certificates	18	82
Professional qualifications	27	76
Other postgraduate	5	95
Total	**42**	**58**

Source: HESA (re-analysis of data commissioned by HEPI from HESA)[18]

45. Growth in the number of students starting part-time taught masters courses has been faster than for full-time courses, amongst both UK and overseas students. Just over half of all taught masters courses are now taken on a part-time basis. Research degrees on the other hand, remain a predominantly full-time undertaking and growth in this area has been almost exclusively in full-time students.

Gender of postgraduates

46. Among UK domiciled postgraduates, women make up 60% of the cohort and outnumber men in all but doctoral and research masters degrees. The balance of men and women has remained fairly static since 2002-03, with the exception of a small growth in the proportion of women undertaking postgraduate research (up from 45% in 2002-03 to 48% in 2007-08).

Table 5: Percentages of males and females amongst UK domiciled postgraduates 2007-08

Level of study	Female	Male
Doctorate or research masters	48	52
Taught doctorates	75	25
Taught masters	55	45
PGCE	70	30
PG diplomas and certificates	64	36
Professional qualifications	65	35
Other postgraduate	71	29
Total postgraduate	**60**	**40**

Source: HESA (re-analysis of data commissioned by HEPI from HESA)[19]

18 House, G. *Postgraduate Education in the United Kingdom*, HEPI (2010)

19 ibid

Age of postgraduates

47. Although it is still fairly common for postgraduate students to have progressed directly from undergraduate study (roughly 20% of postgraduates enter through this route), the age of postgraduates is widely distributed. Full-time postgraduates are much more likely to be in their early twenties, whereas a far greater proportion of part-time participants are aged over 30.

Table 6: Median age of full and part-time postgraduates, 2007-08

Level of study	FT	PT
Doctorate or research masters	26	37
Taught masters	24	33
PGCE	24	35
PG diplomas and certificates	24	35
Professional qualifications	23	33
Other postgraduate	26	34

Source: HESA (re-analysis of data commissioned by HEPI from HESA)[20]

48. Across all qualifications, there has been little change in the median age of postgraduates over the last few years – with the exception of part-time postgraduate research students from the UK and other EU countries, whose median age rose slightly between 2002-03 and 2007-08.[21]

Ethnicity of postgraduates

49. There are substantial differences in levels of participation in postgraduate study between minority ethnic groups and this varies by type of qualification. By comparing the percentage of postgraduates from minority ethnic groups to the ethnic mix of the general population aged 18-34, we find for example that Black African groups are well represented at taught postgraduate level, but less so on postgraduate research degrees; and Asian groups are relatively under-represented across all types of postgraduate study. Levels of participation also vary significantly by subject of study and institutional location.

50. Data suggests that the proportion of UK-domiciled postgraduates reported as being from ethnic minorities increased by around 3% between 2002-03 and 2007-08, in both taught and research-based study (rising to 20% and 15% respectively). However, during this time, the proportion of students reported as of 'unknown ethnicity' has fallen, which may well account for some of this change.[22] Annex 5 provides a more detailed analysis of participation by ethnicity.

Social background of postgraduates

51. Data on the social background of postgraduates are extremely limited. At undergraduate level this information is collected by UCAS at the point of application, but there is no

20 ibid

21 ibid

22 ibid

central application system for postgraduates. Although some HEIs may attempt to collect data on social background, determining the social background of postgraduates is methodologically challenging. For undergraduates aged under 21, this is determined by parental occupation and address. But these measures are not so obviously appropriate or even available for postgraduates who are older and may no longer have links with their parental home.

52. Research by the London School of Economics for the Sutton Trust has found that of UK undergraduates studying six months after graduating (and therefore assumed to be taking a postgraduate qualification), 29% came from higher managerial and professional backgrounds; compared to 27% at undergraduate level. Although the research also shows that subject, class and institution of first degree have the greatest impact on progression to postgraduate study, it also suggests that undergraduates from an independent school background are marginally more likely to proceed directly to postgraduate study than their state school counterparts.[23]

53. This is clearly an area where more information is required, particularly if we wish to establish whether social background affects the likelihood of an individual undertaking postgraduate study. We explore these methodological issues in more detail in Section B of the report.

Domicile of postgraduates

54. The steady growth in the UK postgraduate sector over the last few years has been driven disproportionately by increasing numbers of students coming from outside the EU. By 2007-08, overseas students represented 36% of all entrants to postgraduate study.

Table 7: Trends in number of first year postgraduates at UK HEIs, 2002-3 to 2007-8

	UK	Other EU	Non EU	Total	% UK	% overseas
2002-3	173,722	20,758	54,637	249,117	70	30
2007-8	179,321	23,018	75,933	278,272	64	36
% increase 2002-3 to 2007-8	3	11	39	12		

Source: HESA (re-analysis of data commissioned by HEPI from HESA)[24]

55. By far the biggest increase has been in the number of non-EU domiciles registering for taught masters courses – which rose by almost half between 2002-03 and 2007-08. During this time, UK starters rose 16% and those from the EU went up by 15%, so that by 2007-08 overseas students made up half of all entrants to taught masters courses.

56. Although UK domiciles still make up the majority of entrants to postgraduate research, between 2002-03 and 2007-08, the number of first year postgraduate researchers from overseas grew at a much faster rate than those from the UK.

23 Machin, S. and Murphy, R., *The social composition and future earnings of postgraduates*, Sutton Trust (2010)

24 House, G., *Postgraduate Education in the United Kingdom*, HEPI (2010)

Table 8: Change in first year postgraduate research student numbers by domicile, 2002-03 to 2007-08

	2002/03	2007/08	Actual increase	% increase
UK	16,106	16,430	324	2
EU	3,010	3,797	787	26
Non-EU	7,840	9,275	1,435	18
Total	**26,956**	**29,502**	**2,546**	**9**

Source: HESA (re-analysis of data commissioned by HEPI from HESA)[25]

57. Ten years ago, the main country of origin for postgraduate students in the UK was Greece. But between 2000-01 and 2007-08, the number of postgraduate students coming from Greece fell significantly, whilst the number of students coming from China almost quadrupled. By 2007-08, the largest number of international postgraduate students came from China, followed by India and the United States, and these countries provided over half of postgraduates coming to the UK. The number of postgraduate students coming from Nigeria and Pakistan has also increased rapidly in recent years, as has that from some of the new EU member states.

Table 9: Top ten non-UK domiciles with the highest numbers of postgraduate enrolments in UK HEIs, 2000-01 and 2007-08

2000-01		2007-08	
Greece	12,605	China	22,790
China	6,135	India	20,085
United States	4,635	United States	8,105
Germany	4,150	Greece	7,295
Irish Republic	3,615	Nigeria	7,235
France	3,400	Pakistan	6,030
India	3,060	Ireland	5,965
Taiwan	2,850	Germany	5,500
Hong Kong	2,820	Taiwan	4,625
Malaysia	2,720	France	4,115

Source: HESA

Outcomes for postgraduates

58. The growth of postgraduate study suggests that there are benefits attached to a UK postgraduate qualification which have attracted more people to postgraduate study. In parallel with participation trends, it is therefore helpful to look at the outcomes for postgraduates and whether or not there is evidence of a postgraduate 'premium'.

25 ibid

Career destinations and earnings of postgraduates

59. The Destination of Leavers from Higher Education (DLHE) survey, which captures information on the careers and earnings of both taught and research postgraduates six months and three and a half years after graduating, shows that postgraduates benefit from both higher earnings and better employment prospects when compared to those with an undergraduate degree alone.

60. Of those graduating in 2007-08, postgraduates earned on average £23,500 six months after graduating, compared to £19,000 for first-degree holders – suggesting a postgraduate premium of around 24%. There is however, significant variation by institution, class of degree and subject. Business and Administrative Studies postgraduates earned on average 36% more than first-degree holders, and Mathematical Science postgraduates earned 23% more, whereas the earnings of Languages and Engineering postgraduates were only 11% higher than those with first-degrees in the same subject. Full details on earnings by subject are in Annex 5.

61. The higher earnings of postgraduates may be partly accounted for by age and because postgraduates tend to have more work experience than people with only an undergraduate degree. This is particularly be the case for those with MBAs. However, the limited evidence available which attempts to control for these factors suggests that there is still a substantial premium attached to postgraduate study.

62. Compared to first-degree holders, postgraduates are also more likely to be in employment soon after graduating. In 2007-08, the unemployment rate of those graduating with a first-degree rose by 2.5% on the previous year, as the economic downturn made it harder to find employment. Masters graduates fared better, with only a 0.4% rise in unemployment, and the proportion of PhD graduates not in employment actually fell very slightly.

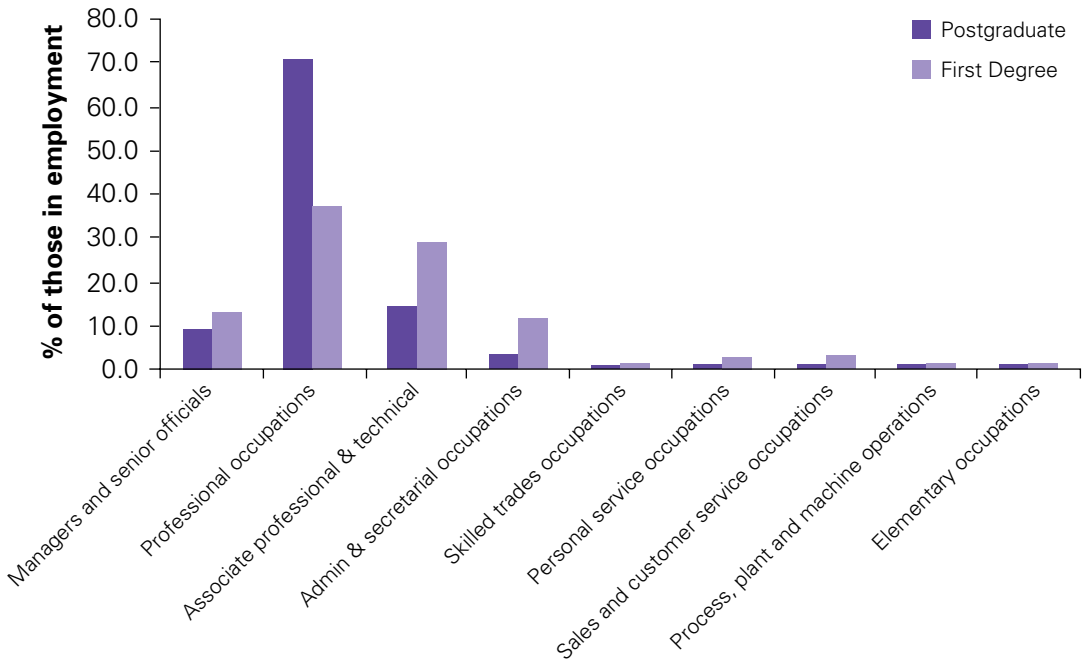
Table 10: Proportion of graduates assumed unemployed six months after graduating, by level of study

	PhD	Masters	First Degree
2002-03	3.2%	3.8%	6.7%
2003-04	3.9%	4.9%	6.2%
2004-05	3.6%	4.3%	6.3%
2005-06	3.3%	3.6%	6.2%
2006-07	3.2%	3.9%	5.6%
2007-08	3.1%	4.3%	8.1%

Source: Destination of Leavers from Higher Education Survey

63. Postgraduates have also been shown to do well in the longer-term. The most recent longitudinal DLHE, which surveyed 2004-05 graduates three and a half years after graduating, found that those with a postgraduate qualification were more likely than first-degree graduates to be in the highest three occupational categories.

Fig. 2: Standard occupational class of postgraduate and first degree qualifiers who were in full-time employment 3.5 years after graduation in 2004-05



Source: HESA Destination of Leavers from Higher Education Longitudinal Survey (2004-05 cohort)

64. The longitudinal DLHE also found that the average earnings of postgraduates after three and a half years remained higher than those of undergraduates. For both postgraduates and undergraduates, those who had studied part-time enjoyed much higher average earnings (£38,000 for part-time postgraduates compared to £27,000 for full-time; and £28,500 for part-time first degree holders compared to £24,000 for full-time). This is likely to be an effect of part-time students being generally older than full-time students, and therefore able to command a higher salary. Students who have combined work experience with part-time study, may also have an advantage in the labour market when seeking full-time employment.

65. Using data from the national Labour Force Survey to project lifetime earnings, London School of Economics researchers have estimated that, over a lifetime, those with a masters or PhD earn on average 15% and 23% more respectively, than those with a first degree. However, the data does not allow for comparison between different subjects and classes of degree. Those with other postgraduate qualifications (including PGCE and professional qualifications) were found to earn over 5% less – suggesting that although some postgraduate qualifications may enable access to a range of professions, they do not necessarily lead to higher lifetime earnings.

Table 11: Lifetime earnings of first-degree graduates and postgraduates

	First-degree	PhD	Masters	Other postgraduate
Lifetime earnings	£1,533,853	£1,882,860	£1,762,125	£1,449,504
Difference over lifetime		£349,007	£228,272	-£84,348
% difference		22.8%	14.9%	-5.5%

Source: Machin, S. and Murphy, R., *The social composition and future earnings of postgraduates*, Sutton Trust (2010)

The value of postgraduate education

1. In 2009-10, the UK Government and governments of the Devolved Administrations invested more than £850m in directly funding postgraduate education. This investment contributes to supporting a system that generates enormous benefit to the UK – both economically and socially.

2. These benefits are wide ranging; not least because of the diverse nature of postgraduate education in the UK. Over the last twenty years, the postgraduate sector has evolved to meet the changing needs of individuals, the economy and employers. New types of qualification, new ways of delivering postgraduate courses and a broader range of subjects are now on offer. The resulting diversity of postgraduate education – underpinned by the autonomy of our universities – is a great asset to the UK.

Research, innovation and economic growth

3. The UK has a world-class research base. It delivers 8% of world research output, is second only to the US in a number of research disciplines and first amongst the G8 for productivity. Cutting-edge research conducted by postgraduates in our world-leading research centres contributes significantly to this capability. UK Trade and Investment (UKTI) estimates that it was able to attract more than 200 research and development investments to the UK in 2008-09[26] and many businesses cite the strength of the research base as a key factor in locating in the UK.

4. In the 2008 Research Assessment Exercise, over half of all university research submitted was rated as 'world leading' or 'internationally excellent'.[27] HEIs use this capability to generate significant value. In 2007-08 HEIs formed 167 new spin-off companies and the combined turnover of all HEI spin-offs was £1.1bn. The talent developed by our postgraduate education system is critical to sustaining this level of success.

5. The advanced knowledge and skills of postgraduates, and postgraduate researchers in particular, are major drivers of innovation and growth. In 2008-09, the UK ranked 4th in the INSEAD Global Innovation Index[28] – a measure of how effectively a country responds to the challenge of innovation. Postgraduates that can develop knowledge, find new applications for technology, create new companies, and improve the performance of existing businesses are vital for enhancing the UK's position as a leader in the global knowledge economy.

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26 UKTI, *UKTI Inward Investment Annual Report* (2009)

27 www.rae.ac.uk/news/2008/results.asp

28 www.insead.edu/discover_insead/newsroom/2009_global_innovation.cfm

Case study: Economic impact of postgraduate research training in the pharmaceutical sector

David Lathbury, Head of Process Chemistry at AstraZeneca, has investigated the role of PhD students in developing blockbuster drugs worth millions to the UK economy.

Over the last forty years, the UK has punched above its weight in the pharmaceutical industry – producing numerous medicines and treatments that have enhanced the health and wellbeing of the population.

Of the eleven 'blockbuster' drugs discovered in the UK during this time, over 80% were invented by people with PhDs. The skills and experience acquired through postgraduate research training set the groundwork for these individuals to conduct excellent research in industry. Almost all of these PhD-trained inventors were funded by Research Councils. The return on this initial investment has been significant: at their peak, annual sales of these blockbuster drugs were in excess of $20bn.

The value of postgraduates to employers

6. The diversity of postgraduate education means that many different types of employers benefit from employing people qualified to postgraduate level.

7. The knowledge and intellectual capability generated by postgraduate research training are highly prized by businesses. In research-intensive technology, science and engineering industries, being able to recruit high quality postgraduate researchers is critical to business success; and this is an important factor in attracting global businesses to locate high-value operations in the UK.

Case study: Rolls-Royce and the importance of postgraduate researchers

Rolls-Royce is a global business providing integrated power systems for use on land, at sea and in the air. In 2009, Rolls-Royce invested £864m in Research and Development to develop new products which add value for its customers, improve efficiency and reduce environmental impact.

Postgraduate research students are fundamental to the delivery of this future technology. Research underway now will provide much of the underpinning science behind products entering service in the next 10 to 20 years. It can be shown that the materials understanding, aerodynamic design and other technological advances deployed in engines powering the Airbus A380 and Boeing 787 owe much to postgraduate research performed for and with the Company over the past 10-15 years.

There are over 350 doctoral students currently working within the global Rolls-Royce University Technology Centre (UTC) network, with two-thirds of these in the UK. The Company recruits a number of these students as they graduate each year, either as direct-entry employees or onto the graduate recruitment scheme.

Postgraduate education and research in the UK underpins Rolls-Royce's successful collaborative research model. It delivers the technology and highly-skilled workforce needed to maintain and enhance the Company's international competitiveness.

8. Public sector employers also benefit from postgraduate research skills – including government, which relies on research to inform the development of more effective public policy. Postgraduate researchers undertaking professional doctorates in fields such as healthcare and education make a significant contribution to the advancement of knowledge and practice in their specific professions.

9. Taught postgraduate courses – including masters, postgraduate diplomas and certificates – provide people with the skills they need to work in a range of careers, and play an important role in translating postgraduate research into practice. The advanced knowledge acquired through masters level training is highly valued by employers, and in some careers (such as law and teaching), vocational and professional taught postgraduate courses are required for entry. Increasingly, postgraduate level continuing professional development is being developed with and for employers, and delivered in flexible ways which allow postgraduate study to be combined with work. This model of responsive and tailored postgraduate provision plays a major role in upskilling and re-training the UK workforce.

The value of postgraduates to universities

10. Postgraduates form a vibrant and important part of the higher education ecology and contribute to the excellence of the teaching and learning environment. In the last few years, the total number of postgraduates has grown faster than the number of undergraduates, so that now around one quarter of all students studying in UK HEIs are doing so at postgraduate level. For most universities, postgraduate provision is a major part of their busines. A very small number of HEIs offer only postgraduate courses.

11. Financially, the growth in postgraduate numbers has benefited universities enormously. Tuition fees for taught postgraduate provision alone brought in income of over £1.5bn for universities in 2008-09. A major contribution to this has come from the large rise in the number of taught masters students coming from outside the EU – up 39% since 2002-03 – as the fees charged to non-EU students tend to be higher than those for UK and EU domiciles.

12. Attracting and retaining high-calibre, taught postgraduate students is also a valuable way for universities to recruit postgraduate researchers, who are a key element of HEIs' research capability and often work on projects that attract income for the university. Many postgraduate researchers support academics with the teaching of undergraduates, and some will go on to be the academics of the future.

The social and cultural value of postgraduate education

13. Although less easy to quantify, there are social and cultural benefits attached to a strong postgraduate sector. By encouraging people to question established knowledge, postgraduate education promotes a culture of open and intelligent debate which stimulates innovation and new approaches to tackling difficult challenges.

14. The international diversity of postgraduate education in the UK generates a vibrant and stimulating environment that brings together a variety of cultural knowledge, experience and insights. Many international postgraduates go on to live and work in the UK, and of those who return home, their connection with the UK can bring long term social and diplomatic benefits.

15. In general, the value that postgraduate education brings to the UK is under-researched and under-appreciated. This report should go some way to highlighting the benefits, but **Universities UK and the Research Councils UK should do more to identify and promote the economic and social value of postgraduate study**.

The benefits for postgraduate students

Introduction

1. Postgraduates are highly employable and on average, earn more than individuals whose highest qualification is an undergraduate degree. Feedback from postgraduates shows generally high rates of satisfaction with their experience and with the knowledge and skills acquired through postgraduate study.

2. However, feedback from students and from employers also suggests that there are areas in which more could be done to ensure postgraduates get maximum benefit from their investment in a postgraduate education and are well equipped to succeed in their chosen career.

Employment prospects and earnings of postgraduates

3. On average, both taught and research postgraduates earn more than undergraduates six months and three and a half years after graduating – although individual returns vary by subject and institution attended. Postgraduates are also more likely to be in employment six months after graduation and to be employed in higher managerial and professional occupations three and a half years on. The financial returns to postgraduates are examined in more detail in Section A.

4. Postgraduate study can be a route to advancing in an existing career as well as opening up new employment opportunities. Around 60% of postgraduates study part-time, many of them remaining in employment throughout their studies. A postgraduate course can be part of continuing professional development or a means of re-training in a new area. Destinations data show that part-time postgraduates in particular, enjoy a high rate of return after graduating.

5. The Research Councils have undertaken a number of studies to track the careers of postgraduates receiving Research Council support[29] and the researcher careers organisation Vitae has produced *What do Researchers do?* – which highlights 40 career profiles and around 1,000 first destination job titles of doctoral graduates. These studies show that postgraduate research students go on to succeed in a range of careers and that many identify postgraduate study as key to their career progression.[30]

6. It is widely acknowledged that by investing in an undergraduate degree, students are likely to enjoy better employment opportunities and will on average, earn more over

29 Dr Arwen Raddon and Dr Johnny Sung, Centre for Labour Market Studies (CLMS), *The Career Choices and Impact of PhD Graduates in the UK: A Synthesis Review* (2009)

30 Institute of Employment Studies, *Doctoral Career Pathways, Skills and Training: Analysis of Research Postgraduate Destinations*, analysis for RCUK, expected publication date April 2010, www.rcuk.ac.uk

their lifetime. But the benefits of postgraduate study are less well publicised and less well known. Better promotion of the different reasons for undertaking postgraduate study and of the value of doing so, would help to encourage a wider range of people to consider how it could benefit them. **The UK Government should consider how to promote postgraduate study to individuals, by building on existing campaigns to promote the potential benefits of higher education and skills.**

Motivations for undertaking postgraduate study

7. Given the diversity of the postgraduate population and the variety of postgraduate qualifications available, it is not surprising that the motivations people have for undertaking postgraduate study are many and varied. The prospect of improved employment opportunities and entry to specific careers is important to a large proportion of postgraduates, but the personal fulfilment gained from acquiring new skills and knowledge is also a major factor.

8. The Higher Education Academy's (HEA) surveys of postgraduate taught and research students are the main source of information about students' motivations and they show that there are specific differences between those undertaking taught courses and those undertaking research.

9. The 2009 Postgraduate Taught Experience Survey (PTES) surveyed 14,421 students engaged in taught postgraduate programmes. The survey found that the top two motivations were 'to progress in chosen career path' (58%) and 'to improve employment prospects' (53%) – suggesting that employability features highly in the reasons for undertaking taught postgraduate study. The next most common motivations were 'personal interest' (45%) and 'to enable progress to a higher qualification' (32%).

10. In comparison, the 2009 Postgraduate Research Experience Survey (PRES) found that postgraduate research students were mainly driven by 'interest in the subject' (34%) and 'preparation for an academic or research career' (32%) – 14% fed back that postgraduate research felt like a 'natural step'. Almost half of respondents were planning an academic career, and just over one quarter wanted to pursue a research career either in higher education or another sector.

Case studies: Career paths of postgraduates

Karen Cross: Leakage Manager, Yorkshire Water

I graduated in 2002 with a BSc in Geography and Geology. After working in accountancy for several years I decided that I wanted to re-train and use the skills I learned in my undergraduate degree. I chose the MSc in Catchment Dynamics and Management at the University of Leeds because of the mix of taught modules and research opportunities, transferable skills training and work experience. Previous graduates from the course had progressed to a wide range of careers with environmental bodies, agencies and consultancies, engineering companies and the water industry. The course is accredited by the Chartered Institution of Water and Environmental Management (CIWEM).

At the conclusion of the programme I gained a place on Yorkshire Water's Graduate Trainee Scheme. I was attracted to Yorkshire Water because of their industry leadership, dedication to research and commitment to innovation. I completed the programme in 2009 and now manage a large team of engineers working in leakage.

Louise Sullivan: Research Manager, Social Research Institute of Ipsos MORI[31]

I wanted to change careers after working in the food industry for ten years and so studied part-time for a master's degree in social research. I thoroughly enjoyed the course and applied for Economic and Social Research Council funding for a doctorate, which I studied for in the Department of Sociology at Surrey University. My thesis drew on the meritocracy debate and identified a new way of measuring and describing social mobility, using second generation structural equation modelling. I thoroughly enjoyed my time as a student and the freedom the doctorate gave me to explore in detail a subject I was fascinated in.

After finishing my doctorate, I took a job in market research, working in a statistics department. I then moved to Ipsos MORI where I have been for the last eighteen months. My job covers all aspects of the research process from proposal writing to job costing, project management, report writing and presenting. I have been able to draw on my writing skills and literature review skills developed during my doctorate.

Satisfaction with postgraduate study

11. The HEA's PRES and PTES also show that postgraduates in the UK have a high degree of satisfaction with their learning experience.

12. The most recent surveys found that taught students generally had very positive views about their experience, with well over three quarters agreeing that the overall experience met or exceeded their expectations. Satisfaction with career prospects corresponds with the main motivations given for undertaking postgraduate study – 89% agreed that the skills and personal development aspect of their course had met or exceeded expectations, and 78% felt their employment prospects has improved. However, students rated some areas of their experience less positively. These included the timeliness and quality of feedback, and the availability and suitability of student support services.

31 Summarised from: Vitae, what do researchers do? Career profiles of doctoral graduates (2009) www.vitae.ac.uk/careerstories

13. Postgraduate research students were also very positive about their overall experience, with 81% feeling that they were now better able to work independently and 78% agreeing that the experience had improved their analytical skills. Respondents were most satisfied with their supervision, skills development and the institution's infrastructure; but were less positive about the provision of guidance on institutional standards and expectations, and opportunities and support for undertaking teaching.

14. Although the surveys undertaken by the HEA are useful indicators of overall satisfaction amongst postgraduates in the UK, they do not offer a complete and transparent assessment across the whole sector. HEIs participate voluntarily in the PTES and PRES and not all choose to do so (in 2009, 30 HEIs took part in the first PTES, and 82 HEIs undertook the PRES). The response rates are low – of students contacted, only 18% of taught postgraduates and only 29% of postgraduate researchers responded – and although the overall results from the surveys are publicly available, the results for individual HEIs are kept confidential.

15. At the undergraduate level, the National Student Survey (NSS) – now in its sixth year – attempts to collect data from all students in their final year of an undergraduate course. Student feedback from the NSS is used to compile year on year comparative data which is published online. The results can be used by prospective students and their advisors to help make informed choices about where and what to study, as well as being used by individual institutions and student unions to encourage and facilitate best practice and enhance the student learning experience.

16. Prospective postgraduates should also be able to access information about satisfaction rates when considering where to study. The Teaching Quality Information steering group – which oversees the National Student Survey – is currently reviewing how the survey is used. As part of this review, **the Teaching Quality Information steering group should consider extending the National Student Survey to include taught postgraduate students**.

17. The experience of postgraduate research students is much more diverse than taught postgraduates and is less directly linked to teaching quality – making it harder to measure. However, it is important to gather relevant information to inform HEI practice in training postgraduate researchers. **The Higher Education Academy should work with Universities UK and Guild HE to extend its Postgraduate Research Experience Survey to more institutions and to improve the student response rate**.

Support, information and advice

18. Postgraduate students need appropriate support, information and advice to get the most from their experience. The National Student Forum's second annual report[32] argues that, while progress has been made, the consistency and sometimes the level of support postgraduates receive still lags behind that given to undergraduates. The National Student Forum agrees that the general postgraduate experience is positive, but highlights some areas of continuing concern, including: patchy information, advice and guidance; variable support from supervisors; and issues of social isolation.

19. We welcome the National Student Forum's recommendations to HEIs, which include: improving postgraduate student handbooks; identifying the development needs and requirements of postgraduates; and using teams of supervisors for postgraduate

32 National Student Forum, Annual Report (2009)

research students. HEIs must recognise that the needs of postgraduates are different from undergraduate students and that some – including part-time and international students – may require additional information and support mechanisms to meet their specific needs.

Quality of postgraduate training

20. Primary responsibility for the academic standards and quality of postgraduate education in the UK rests with individual institutions. However, maintaining quality across all HEIs is critical to sustaining the UK higher education system's international reputation for academic excellence.

21. The Quality Assurance Agency (QAA) for higher education has developed a series of reference points and guidelines for securing and maintaining academic standards and quality, known collectively as the 'Academic Infrastructure', and this includes postgraduate provision. The QAA Code of Practice contains advice on the standards expected from teaching (including postgraduate level teaching), as well as a specific section on the agreed expectations for postgraduate research programmes.[33] Following a review in 2005-06, assessment of the quality assurance of postgraduate research programmes has been embedded in the QAA's institutional audit process. Satisfying this aspect of the audit process is a condition of grants awarded by the higher education funding councils.

22. The overall Academic Infrastructure is currently under review and as part of this the QAA will consider whether its Code of Practice could be strengthened in any way. The UK's quality standards and assurance processes are not widely replicated internationally and therefore have the potential to make an important contribution to the promotion of the UK postgraduate offer overseas.

Length of postgraduate courses

23. The length of postgraduate courses in the UK varies by qualification and mode of study. In comparison with some other European countries and with postgraduate courses in the United States and elsewhere, the UK masters and PhD are relatively compressed. Masters courses in other countries are often up to two years and a PhD may take more than five years to complete.

24. The European Framework for Higher Education Qualifications – developed as part of the Bologna Process to improve the compatibility of higher education across the EU – provides a credit framework that enables UK HEIs to demonstrate that the learning outcomes of a one year full-time masters course are aligned with those offered elsewhere. It is important that HEIs engage with this and show that the UK masters is both rigorous and challenging, and that it prepares students to be successful in a competitive employment market.

25. The length of a UK PhD course is less uniform than that of masters but on average lasts three to four years and this is reflected in the way PhDs are funded. The higher education funding bodies fund PhDs for between three, and three and a half years, and funding from the Research Councils supports research programmes of up to four years. Flexibility over length is important, and increasingly Research Council funding

33 www.qaa.ac.uk/academicinfrastructure/CodeofPractice/default.asp

is allocated to HEIs in the form of a block grant, which gives HEIs the freedom to determine the length of a PhD programme.

26. In some disciplines, there is a strong case for PhD courses to last a full four years. The Council for Science and Technology highlighted in its recent report on the future of UK research, that a four year PhD provides time for students to acquire wider skills in communication, problem-solving, entrepreneurship and management.[34] In the science, engineering and technology disciplines in particular, an extended PhD allows students to develop the advanced skills and knowledge required to succeed in their career – whether it be in academia or elsewhere.[35] In feedback to this review, employers of postgraduate researchers in these disciplines have expressed a general preference for PhD students who have undergone a longer period of training.

Case study: The Wellcome Trust four year PhD

The Wellcome Trust – a prominent funder of postgraduates in biomedical research – has developed a flagship four-year PhD programme that it considers to be best practice in terms of delivering a high quality postgraduate student experience.

In the first year, students combine research with taught courses and a series of laboratory rotations, which helps to broaden students' knowledge of the subject area. This exposes students to different research environments and helps them to decide on a research project to specialise in for their PhD.

The high completion rates and high number of these students that stay working in research suggests that this more structured four year programme has been very successful.

27. To ensure that postgraduate researchers have the skills and depth of knowledge that employers need, HEIs should consider what length of training is necessary. **HEIs should use the flexibility afforded in funding from the higher education funding bodies and the Research Councils, to offer longer periods of postgraduate research funding and training where appropriate.** Without extra funding, this will inevitably result in a reduction in the number of postgraduate research students being trained. However, it will ensure that those students are trained to a rigorous and high standard and are competitive in the international employment market.

Models of postgraduate research training

28. Models for delivering postgraduate training have diversified over the last decade, particularly for postgraduate researchers. Since Gareth Roberts' report, *Set for Success*[36] – which encouraged the expansion of the Graduate School model of postgraduate researcher training – the proportion of HEIs with at least one Graduate School has risen to 70%. This more coordinated and cohesive way of organising postgraduate provision, which is common in the United States, offers a greater network of support for postgraduate researchers (and in a small number of cases, taught postgraduates) and is a welcome development.

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34 Council for Science and Technology, *A vision for UK research* (2010)

35 Dyson, J., *Ingenious Britain* (2010)

36 Roberts, G., *Set for Success* (2002)

29. The expansion of Doctoral Training Centres (DTCs), funded by the Research Councils, has also been a positive step. DTCs provide a cohort-based approach to postgraduate researcher training by funding a critical mass of postgraduates in excellent research environments. DTCs offer a structured programme of development with embedded transferable skills training, and in many cases also offer greater opportunities for inter-disciplinary working

30. The New Route PhD and professional doctorate are examples of models of doctoral training that are designed to prepare postgraduate researchers for a broad base of careers. Although they still represent a small percentage of all PhDs, there was a 70% growth in these programmes between 2000 and 2006.These relatively new forms of doctorate allow academia to engage in partnerships with industry and the public sector and offer postgraduate research training that is directly related to the needs of employers.

Case study: The Cranfield Engineering Doctorate

The Enhanced Engineering Doctorate Programme at Cranfield University combines doctoral level research in engineering with training in the management skills needed to develop, assess and market technological products or processes. The course consists of taught modules, group work and an individual research thesis.

In the first year, students undertake core and specialist engineering courses, and attend part one of the School of Management's part-time MBA programme. Students also conduct a project which includes literature surveys, design studies and some preliminary research.

A research thesis is undertaken mainly in years two to four, the topic of which is relevant to the individual students' industrial sponsor. Each student's support panel includes engineering and management academic supervisors and an industrial supervisor from the sponsoring organisation.

By the end of the programme, students have a detailed understanding of the technical area involved in the project and a broad grasp of the management, economic and marketing considerations.

Organisations currently supporting the programme include: Anglian Water, Airbus, England and Wales Cricket Board, BP, GlaxoSmithKline, Jaguar/Land Rover, QinetiQ, Peter Brotherhood, Rolls-Royce plc, BAE Systems, Toyota, and Thames Water.

Preparing postgraduates for employment

Employability skills and work experience

31. *Higher Ambitions* and the higher education strategies of the Devolved Administrations, ask all HEIs to do more to contribute to the employability of their students. This requirement should include postgraduates.

32. Our consultation with employers showed very clearly that postgraduates are expected to have a range of skills that go beyond the discipline which they have studied.

Communication skills and team working are particularly important[37] and those postgraduates who have good commercial awareness or work experience are highly valued.[38] Employers stress the importance of postgraduates being able to adapt quickly and apply their skills in a work environment.

33. The CBI skills survey in 2009 found that with UK firms competing in an increasingly globalised business environment, language skills are highly prized by employers, with more than a third of companies recruiting employees specifically for their language skills.[39] The British Academy has noted however, that increasingly few UK postgraduates are equipped with language skills, whilst the number of multi-lingual postgraduates grows in competitor countries. This is likely to make UK postgraduates less competitive in the global employment market.[40]

34. The British Academy, the Economic and Social Research Council and a number of other stakeholders have also expressed concern about the lack of postgraduates with numeracy skills and quantitative methods training. For many employers, these skills are a core requirement of postgraduate recruits but are often under-developed.

35. **HEIs need to be more pro-active in providing postgraduates with the opportunity to develop the core competencies they need to succeed in a competitive job market.** This should include opportunities for postgraduates to undertake relevant work experience placements and internships in business, public services and the third sector.

Transferable skills training for postgraduate researchers

36. In response to Gareth Roberts' recommendations in *Set for Success* – which said more should be done to prepare PhD students for careers in academia or business – Research Councils UK has provided additional funding to HEIs to develop transferable skills training programmes for postgraduate researchers. This encourages students to undertake courses in areas such as project management, communication skills, personal effectiveness and the commercialisation of research. There are examples of inter-departmental, inter-institutional and regional collaboration on providing this training, and courses are often open to non-Research Council funded research students.

37. The injection of the 'Roberts' funding has made a significant impact on the availability and take-up of transferable skills training. Evaluation has shown it to be extremely effective, that it has improved the student experience and the quality of research, and has helped to prepare postgraduate researchers for success in a wide range of careers.[41]

38. Research Councils UK has committed to providing this dedicated funding stream until 2010-11 and is currently reviewing future provision. The review will address the progress made and will make recommendations for both the medium and longer-term

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37 CIHE, *Influence through collaboration* (2008); McCarthy and Simm, *Survey of employers attitudes to postgraduate researchers*, University of Sheffield (2006)

38 CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

39 CBI, *Emerging stronger: the value of education and skills in turbulent times* (2009)

40 British Academy, *Language Matters* (2009)

41 www.vitae.ac.uk/rugbyteam.
1994 Group, *Survey on the Impact of the Roberts' fund at 1994 Group institutions* (2009)

future of researcher development. It is expected that the Research Councils UK review will report in the summer of 2010.

39. Funding this activity in a distinct and high profile way has helped to raise awareness of the importance of training for postgraduate researchers. Going forward, **HEIs should ensure that transferable skills training is embedded as standard in the funding and design of all postgraduate research programmes**.

Careers guidance for postgraduate researchers

40. We know that well over half of postgraduate research students begin their studies planning a career within academia.[42] But analysis of doctoral graduates from 2003-07 showed that only 23% of all respondents were employed as research staff within academia and 14% as lecturers, in the January following their year of graduation.[43]

41. In recognition of this, Vitae has developed a range of resources for HEIs to use in supporting postgraduate researchers, including development opportunities and information on the wide range of careers that postgraduate researchers go on to pursue.

42. However, employers, Research Councils and other stakeholders still report that many postgraduate researchers are not aware of the full range of opportunities open to them and many have difficulty in articulating how their skills can be applied to non-academic careers. We welcome the excellent work that Vitae has already done in this area and that some HEI careers services have undertaken to better understand how postgraduate researchers are perceived by employers.[44] All **HEIs should work closely with Vitae, employers and other stakeholders to provide better information, advice and guidance on career choices for postgraduate research students**.

42 PRES, 2009

43 Vitae, *What do researchers do? First destinations of doctoral graduates by subject*, The Careers Research and Advisory Centre (2009)

44 McCarthy and Simm, *Survey of Employer Attitudes to Postgraduate Researchers*, University of Sheffield (2006)

Access to postgraduate study

Introduction

1. Until recently, the issue of whether there is fair access to postgraduate study had been relatively neglected – certainly in comparison to the policy measures taken to combat inequality of opportunity at undergraduate level. Last year's report by the Panel on Fair Access to the Professions made it clear that access to postgraduate study deserves the same level of attention.

2. The Panel's report, *Unleashing Aspiration,*[45] specifically examined issues of access to traditional professions such as the law, medicine, engineering and accountancy; but also recognised that postgraduate qualifications are now the route to careers in many other sectors and emerging industries. It concluded that as postgraduate level skills are increasingly required in a knowledge driven economy, it is important that the opportunity to benefit from postgraduate study is open to everyone.

3. There is very limited data available on which to base an assessment of the issues around access to postgraduate study. We know that in the last decade, participation by UK domiciles in postgraduate education has grown at a slower rate than at the undergraduate level, and that since 2002-03, growth in international postgraduates studying has far outstripped that of UK domiciles. However, there is no conclusive evidence to show whether UK-based growth has been held back because of financial or social barriers to postgraduate study.

The importance of flexible modes of study

4. The availability of part-time study, distance learning, blended and modular postgraduate courses is already growing – over half of postgraduates study part time, compared to about one third at undergraduate level. The increasing numbers of students registered as studying for 'other postgraduate qualifications' (88% increase between 2002-03 and 2007-08) suggests that many more postgraduate students are undertaking flexible modular courses, which can later be converted to a diploma, certificate or masters degree.

5. The continued expansion of these alternative modes of study will help to make postgraduate qualifications more accessible – particularly for people who want to combine postgraduate study with employment.

45 *Unleashing Aspiration: The Final Report of the Panel on Fair Access to the Professions* (2009)

The importance of information, advice and guidance

6. Accurate, transparent and easily accessible information, advice and guidance play a significant role in informing people about the benefits of postgraduate study; the types of qualifications and what to expect from different courses; and the funding that is available. Although individual institutions often provide this information, and there are a number of student and careers websites designed to help, there is currently no single, independent reference point for someone considering postgraduate study. There is limited information on the different types of postgraduate degree, on which institutions have particular areas of specialism, and how to compare the availability of academic support, learning resources, facilities and social support structures that are specifically relevant to postgraduate students.

7. Widely available information about the completion rates, employment outcomes and earnings of postgraduates would be a valuable resource for people considering whether to undertake postgraduate study, and for comparing the merits of different courses. This type of information already exists at undergraduate level and is available via the Unistats website.[46] Prospective postgraduates should also be able to access information on the range of options for funding postgraduate study. This should include details of the proportion of students that are self-funded, Research Council-funded, and institution-funded and in which subjects, and provide case studies of postgraduates who have financed their study in different ways.

8. HEFCE is currently leading work to review the provision of information to prospective undergraduate students via the Teaching Quality Information group. **HEFCE should consider extending the Teaching Quality Information initiative to postgraduates, and work with Universities UK and other key stakeholders to promote the development of a single, comprehensive source of up to date information about postgraduate study.**

9. Developing this resource to include information for prospective international postgraduates would provide a useful tool for promoting postgraduate study in the UK. In Australia for example, a single postgraduate scholarship database known as 'JASON' (Joint Academic Scholarship Online Network), allows international students to search the opportunities available for studying in Australia.[47] Information on course choices and funding options could be complemented by information about the benefits of a UK postgraduate qualification. Although at present little is known about what postgraduates from outside the EU go on to do after their period of study, the Department for Business, Innovation and Skills is currently undertaking a project to review the feasibility of including non-EU students in the Destination of Leavers from Higher Education (DLHE) surveys conducted by the Higher Education Statistics Agency (HESA). The initial output from this project is expected Summer 2010.

What HEIs can do to encourage fair access to postgraduate study

10. HEIs already undertake a range of activities to encourage fair access at undergraduate level. For the first time last year, HEIs in England were required by HEFCE to produce Widening Participation Strategic Assessments. These include what each HEI will do and

46 www.unistats.com

47 www.jason.edu.au

the resources they will commit to widening participation, as well as how they will judge their success.

11. *Higher Ambitions* asked Sir Martin Harris to advise the UK Government on further action that could be taken to widen access to highly selective universities for those from under-privileged backgrounds. His report is expected in Spring 2010 and will inform the Independent Review of Higher Education Funding and Student Finance.

12. In future, measures that have been applied to ensure fair access for undergraduates could be extended to the postgraduate level. There is evidence that some HEIs are already considering how this might work, and that others are taking positive steps to ensure fair access for postgraduates.

Case study: Postgraduate Bursary Scheme at the University of Bradford

The University of Bradford launched a postgraduate bursary scheme for taught postgraduate courses in 2007-08.

The first applicants were asked for evidence of LEA fee support, using this eligibility criterion as a proxy for social class. Students were given bursary support whichever institution they studied their first degree in, although it was stipulated that applicants needed to have graduated within the last 4 years. The scheme has now been extended to graduates who were in receipt of a bursary under the new fees regime, and in 2008-09 the scheme was extended to students undertaking a PhD.

By the end of academic year 2009-10, it is expected there will have been 150 beneficiaries of the scheme, each receiving £500 per year of their course.

Financial support for postgraduate study

13. Around 30% of postgraduate researchers, and twice as many taught postgraduates, do not receive any support from public or private funders towards tuition fees and living costs. With the exception of stipends paid by the Research Councils, and government funding for training in teaching, social work and some health professions, the only publicly-funded financial support available to postgraduates is via Professional and Career Development Loans (PCDLs).

14. Only a small proportion of those undertaking postgraduate study access PCDLs. In the academic year 2008-09, it is estimated that 1,750 postgraduate students funded their studies using PCDLs, although this number is expected to rise in 2009-10. There is no information about the number of postgraduates who were turned down for these loans, and little evaluation evidence regarding the reasons why more postgraduates do not access this provision. Feedback to this review suggests that possible reasons for low take-up include ineligibility and concerns about the rate of interest and payment terms.

15. PCDLs are a potentially valuable product for individuals seeking to fund postgraduate study. It would therefore be helpful to investigate why a greater proportion of postgraduates do not access the scheme, and whether there are adjustments that could be made to the product or application process that would make it more accessible while not affecting affordability.

Finance as a barrier to postgraduate study

16. The Panel on Fair Access to the Professions suggested that the lack of financial support for postgraduates may be a major barrier to accessing postgraduate study.[48] However, there is little in the way of robust evidence on whether the cost of postgraduate study and the lack of student support prevent those who would otherwise have pursued postgraduate education from doing so, and research on this issue has drawn different conclusions.

Is money an issue?

A 2006-07 study funded by the Higher Education Academy questioned 1,073 students in their final year of undergraduate study at two different HEIs.[45] The two main reasons given by those not intending to progress to postgraduate study were to 'enter employment' and needing 'a break from study'. While respondents who were worried about incurring further debt indicated that they were less likely to undertake postgraduate study, the actual level of debt incurred did not indicate any significant effect on students' intentions to study at postgraduate level.

A 2006 report by the National Postgraduate Committee and Prospects surveyed prospective and current postgraduate students via the Prospects website on their motivations for, and perceived barriers to, postgraduate study. Most respondents who stated that they did not intend to pursue postgraduate study indicated that financial concerns were major factors. The factor that most respondents gave as having the strongest influence on their decision not to conduct postgraduate study was tuition fees. Almost three quarters stated that this had been a strong or very strong influence on their decision (74.3%). Other factors cited as a strong or very strong influence were: debt from previous study (62.9%); lack of funding opportunities (67.5%); or that postgraduate courses were too expensive (58.1%).

17. In 2009-10, the first cohort of students eligible to pay variable fees at undergraduate level entered the postgraduate system. But due to the rise in applications to postgraduate study during the economic downturn, it is unlikely that we will be able to learn anything for some time about whether higher levels of debt deter students from progressing on to postgraduate courses. However, a substantial amount of anecdotal feedback to this review – from both students and HEIs – argued that the cost of postgraduate study and lack of postgraduate student support does restrict access, and that this is the case at masters level in particular.

18. Lord Browne's Independent Review of Higher Education Funding and Student Finance in England launched its call for proposals in March 2010. In doing so, Lord Browne made it clear that the Independent Review needs to consider the higher education system in its entirety, of which postgraduate provision forms an important part. We will provide Lord Browne with the evidence that we have received on postgraduate funding and finance. **If respondents to Lord Browne's call for proposals have evidence on whether cost and access to finance are barriers to postgraduate education, they should include it in their response to the Review.**

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48 *Unleashing Aspiration: The Final Report of the Panel on Fair Access to the Professions* (2009)

49 Stuart *et al.*, *Widening Participation to Postgraduate Study: Decisions, Deterrents and Creating Success* (2008)

Social background and participation in postgraduate study

19. The Higher Education Statistics Agency's (HESA) student record provides some demographic information about the domicile, subject discipline and institutional location of postgraduates. We also have a good understanding of the gender balance of postgraduates, the number of students with disabilities, and some information about the ethnicity of the cohort.

20. Unlike at undergraduate level – where there is a wealth of data and opinion – we know very little about the background of postgraduates or whether those from less privileged backgrounds are less likely to participate. We also note that the few studies that have looked at postgraduate participation by social background have drawn different conclusions.

21. Using the limited data available – which primarily relates to students who progress directly from undergraduate to postgraduate study (around 20% of entrants) – some studies have found parental occupation, social class and the neighbourhood of the family home to have little apparent influence on progression to postgraduate study, once prior attainment has been taken into account.[50] However, this conclusion is based on treating the university attended at undergraduate level as a proxy for attainment. An exception was progression to PGCE, where students from less affluent backgrounds were more likely to make the transition.

22. In comparison, a recent study led by researchers at the London School of Economics (LSE), in partnership with the Sutton Trust,[51] showed that social background has some impact on the likelihood of progressing directly from undergraduate to postgraduate study. The LSE researchers found that the proportion of independent school educated students assumed to be undertaking postgraduate study six months after finishing their degree, was slightly higher than the proportion of these students at undergraduate level. When controlling for factors such as subject studied, age and institution attended for first degree, there was little difference. Crucially, the study found that the gap, although small, had widened slightly since 2002. It is notable, however, that the LSE study found that by far the most significant indicator of likelihood of progressing to postgraduate level was institution attended at undergraduate level.

23. In another recent study, Paul Wakeling, whose research[52] focused on postgraduate students (including those who had taken a break from study)[53] suggests that these students are considerably more likely to be from a professional or managerial social class background than undergraduates.

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50 Stuart, M., Lido, C., Morgan, M., Solomon, L. and Akroyd, K. (2008) *Widening Participation to Postgraduate Study: Decisions, Deterrents and Creating Success*, (HEA 2008) HEfCE, *Young Participation in Higher Education* (2005)

51 Machin, S. and Murphy, R., *The social composition and future earnings of postgraduates*, Sutton Trust (2010)

52 Wakeling, P. B. J., *Social Class and Access to Postgraduate Education in the UK: a Sociological Analysis*, University of Manchester 2008.

53 Most of the data on research students relates specifically to those pursuing doctoral study. Next to nothing is known about the cohort of students pursuing as MPhil, MRes or MSc degrees by research as they are not typically separately reported in HESA statistics.

24. More robust data is required to establish an informed understanding of the social background of postgraduates. However, measuring this presents several methodological challenges. Whereas the social background of undergraduates (aged under 21) is based on parental occupation at the point of entry, this measure is not suitable for postgraduates who are older and less connected to their family home. There are a number of possible alternative ways to measure social background, and it is likely that a combination of these measures is required.

Improving the data on social background of postgraduates

Parental occupation

Of those students moving immediately from undergraduate to postgraduate study, it is in many cases possible to track progress through the higher education system. Data about parental occupation – captured on the UCAS form upon application to an undergraduate degree – is therefore available to assess the background of these postgraduates. It should be noted however, that the number of 'unknowns' in this data is increasing as more undergraduate applicants refuse to answer this non-compulsory question.

Students who return to postgraduate study after a break from education are not required to provide data on parental occupation when they start their postgraduate course. HEFCE has some ability to link such individuals' undergraduate student records with their postgraduate records, if they studied for their undergraduate qualification at a publicly-funded UK HEI. There is however, a question as to how long this remains appropriate and at what age an individual should be considered to be no longer tied to their parental background. For undergraduates, this is assumed to be 21.

Previous study

HESA currently collects data about postgraduates' highest qualification on entry to postgraduate study. Further details could be collected by HESA on the subject discipline of this qualification, the institution, and the classification (if relevant). It is likely that most institutions already capture this data as part of their postgraduate application process.

This information would enable us to draw clearer conclusions on the impact that previous institution and subject of study has on the likelihood of progressing to postgraduate study. It will not however identify postgraduates' social background.

Application data

Unlike entry to full-time undergraduate study, where comprehensive data is available via UCAS, there is no national application system for postgraduate degrees. UCAS does however run an online service – UKPASS – for a limited number of HEIs. Wider use of this system would provide information on the number of applications and a basic profile of the age, gender, nationality and previous educational background of those applying to study at postgraduate level.

Unique Learner Numbers

A system of Unique Learner Numbers (ULN) that will allow student data to be tracked from the beginning of post-compulsory education is being developed and will be included in the HESA Student Record. The successful implementation of this system would provide the required data for tracking participation patterns. However, it will be several years before students with ULNs reach the postgraduate stage and the question remains as to the relevance of parental background for mature students.

25. **The UK Government should establish a working group with HESA, the higher education funding bodies, Universities UK and other stakeholders, to advise on what additional information should be collected about postgraduates, in order to inform future policy decisions on widening access to postgraduate study.**

Supply of postgraduate skills

Introduction

1. We know that business and other employers value highly the advanced knowledge and skills that postgraduates can offer, and that having sufficient higher level capability is necessary for maintaining or attracting business investment in the UK.

2. In his review of world class skills in 2006, Lord Leitch highlighted the importance of postgraduate training for driving productivity and pointed to the growing demand from global employers for higher level skills.

Prosperity for all in the global economy – world class skills

One of the most powerful levers for improving productivity will be higher level skills. Postgraduate, or Level 5 skills, such as MBAs and PhDs, can provide significant returns to organisations, individuals and to the economy as a whole. These higher level skills are key drivers of innovation, entrepreneurship, management, leadership and research and development. All of these are critical to a high skills, high performance economy and increasingly in demand from high performance global employers.

3. Since Lord Leitch's review, it has become even more apparent that having a good supply of postgraduate skills is critical to a strong economy. Highly skilled people will be required to drive innovation and growth – particularly in the emerging sectors identified by the UK Government in *New Industry, New Jobs,* and by the Devolved Administrations in their higher education and skills strategies.

4. To maximise economic performance, to generate real opportunities for individuals and for business success, we need to ensure that we supply the 'right' skills, which effectively meet the changing needs and requirements of the labour market. This is a key message from the UK Commission for Employment and Skills (UKCES) National Strategic Skills Audit for England, published in March 2010.[54]

5. The UKCES report – the first of its kind – provides market intelligence about the skills employers need, or may need in the future. It identifies the areas in which higher level skills and occupations will be required, but it does not specifically provide an assessment of demand for postgraduate skills. For the UK to get the best value from postgraduate education, it is necessary to understand more about the postgraduate skills and knowledge that employers need. This will require close working between the UKCES and other stakeholders, and is particularly important where the evidence points to a need to boost supply in areas where there is currently very limited capacity.

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54 UKCES, *Skills for Jobs: Today and Tomorrow. The National Strategic Skills Audit for England* (2010)

Employer demand for postgraduate skills

6. It has not been within the scope of this review to conduct a full and thorough assessment of postgraduate skills needs in the UK. This is a significant and challenging task; not least because there is a wide range of postgraduate qualifications and the skills needs of employers are also very diverse. Different types of employers may adopt different approaches to recruiting and utilising postgraduate skills.

7. Some employers – particularly those in research-intensive, high-tech industries – have a very definite need for postgraduate level skills and seek to recruit masters and doctoral level postgraduates with discipline-specific, specialist knowledge.[55] For these employers, being able to access this knowledge is central to the development and innovative capability of the organisation. In the creative industries for example, where high value is placed on the ability to innovate, over 30% of the workforce are educated to postgraduate level.[56]

8. A much broader range of employers – in both the private and public sector – recruit large numbers of people with specific vocational or professional postgraduate qualifications, designed to prepare individuals for a career in a particular field. In some professions, a postgraduate qualification may even be a pre-requisite and postgraduate level professional development is often required to progress in certain careers.

9. The skills and experience of postgraduates are also valued by employers who benefit from their research and analytical capability. The ability to work independently, tackle difficult problems and seek creative solutions, were cited by many employers we spoke to as qualities they value.[57] Employers will often recruit postgraduates for these wider skills and attributes, and not necessarily for their subject-specific knowledge.

Reported problems when recruiting postgraduates

10. A number of recent reports highlight areas where employers are finding it difficult to recruit people with the specific higher level skills, knowledge and experience they need.[58] The CBI reported in its 2009 skills survey that one third of businesses who responded expressed difficulty recruiting science, technology, engineering and mathematics (STEM) graduates and postgraduates; and this figure rose to two-thirds in the science, hi-tech and information technology sectors.[59] In a selection of interviews conducted with employers on behalf of this review, several commented on problems

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55 CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

56 E-Skills, Skillset, Creative and Cultural Skills, *Strategic Skills Assessment for the Digital Economy*, Report published for the National Strategic Skills Audit (2010)

57 CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

58 ABPI, *Skills needs for biomedical research: creating the pools of talent to win the innovation race* (2008)
Cogent, Semta and Skills for Health, *Life Sciences and Pharmaceuticals: A Future Skills Review with Recommendations to Sustain Growth in Emerging Technologies*. Report published for the National Strategic Skills Audit (2010)
Engineering UK, *Engineering UK 2009/10* (2009)
EEF, *Under the microscope: is UK PLC ready for low carbon?* (2009)
E-Skills, Skillset, Creative and Cultural Skills,*Strategic Skills Assessment for the Digital Economy*. Report published for the National Strategic Skills Audit (2010)

59 CBI, *Emerging stronger: the value of education and skills in turbulent times* (2009)

in recruiting postgraduates with the specific skills they need.[60] There is a risk that employers who are unable to find these skills in the UK, will instead choose to source them from overseas, representing a significant loss of value to the UK.

11. To some extent, the difficulties that employers report in recruiting postgraduates relate to there being a lack of applicants with the specific knowledge and qualifications required. However, it is also the case that employers are finding it difficult to recruit people who have sufficient wider knowledge and practical experience.[61] Research suggests that employers value postgraduates who combine their advanced knowledge with wider employability skills such as good communication and team-working.[62] This was confirmed in our interviews with employers which showed that employers clearly value postgraduates who can adapt quickly, apply their skills in a new environment, and demonstrate the potential to be future leaders. Amongst the employers we spoke to, the most common issues experienced when seeking to recruit postgraduates were the limited work experience and commercial awareness of some masters and doctoral level candidates.[63]

The wider skills valued by employers

'Technical qualifications are a given. Hiring is much more to do with a cultural fit: can you give a pitch, can you work in teams?'

Senior business leader: Technology

'Timekeeping, delivering on tasks, a basic professional outlook we look for as well as the right level of knowledge and right attitude.'

Small optics firm

Source: CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

Building a better understanding of the demand for postgraduate skills

12. Individual studies provide some insight into the skills and knowledge that employers need at postgraduate level, and where these needs are not being met. But we do not currently have a co-ordinated understanding that can be used to inform policy and funding decisions. This is primarily because there is no single body with responsibility for taking an overview of the supply of and demand for postgraduate skills.

13. Although some Sector Skills Councils (SSCs) are actively engaged at the postgraduate level – mostly those representing sectors where there has been a tradition of recruiting doctoral skills – this is not consistent across all sectors. As a result, the National Strategic Skills Audit produced by the UKCES, provides limited evidence on the specific demand for postgraduates.

14. As major funders of postgraduates, the UK higher education funding bodies and Research Councils already have an important role to play in understanding the strategic need for postgraduate knowledge and skills. It makes sense to build on this existing

60 CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

61 DIUS, *The Demand for Science, Technology, Engineering and Mathematics (STEM) Skills*, (2009)

62 CIHE, *Influence through collaboration* (2008); McCarthy and Simm, Survey of employers' attitudes to postgraduate researchers, University of Sheffield (2006)

63 CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

intelligence. **HEFCE and Research Councils UK should work together and engage with the UKCES, Sector Skills Councils and relevant bodies in the Devolved Administrations, to establish employer needs for postgraduate skills.** In doing so they should engage with the CBI, CIHE and relevant professional bodies. This should build on the work that the UKCES and HEFCE have already done to better understand the supply and demand of undergraduates, and will enable the UKCES to address postgraduate skills more specifically in subsequent skills audits.

15. This will not only mean understanding the current demand for postgraduate skills, but also identifying where the UK needs to build future capability; particularly in areas where this has the potential to drive growth and attract new business investment – such as low carbon technology. This will require the funding bodies and Research Councils to use the intelligence and expertise of the SSCs, Technology Strategy Board (TSB), Innovation Growth Teams and other stakeholders to build a clearer picture of the future demand for postgraduate skills.

Responding to employer demand for postgraduate skills

16. Despite the current lack of a co-ordinated approach to understanding the demand for postgraduate skills, there are in practice many interventions already in place to respond where gaps in supply have been identified. Where these have worked well, we should build on their success. By developing a more coherent view of postgraduate skills needs we can ensure that these interventions are more strategically targeted in future.

Regional Development Agencies

17. *Skills for Growth*[64] asked the Regional Development Agencies (RDAs) in England to work with local authorities and other regional bodies to produce regional skills strategies that address local skills needs. There are examples of RDAs that have engaged with this at postgraduate level, and in some cases, co-funded partnerships with HEIs and SSCs to develop locally responsive postgraduate provision.

64 BIS, *Skills for Growth* (2009)

Case study: North West Higher Level Skills Partnership

The North West Higher Level Skills Partnership (NW HLSP) is led by the North West Universities Association, which represents the 14 HEIs in the region. It brings together the North West Regional Development Agency (NWDA), Sector Skills Councils (SSCs), Business Link North West, the Regional Skills and Employment Board and other skills providers. The project is backed by the NWDA, which contributes £4.3m. It aims to provide employer-led provision in higher level skills across a range of strategic sectors, including: Energy and Environmental Technologies; Biomedical, Creative and Digital Industries and Advanced Engineering.

The project has helped the HEIs to engage with employers in a coordinated way, and to be more responsive to demand for higher level skills and workplace-based continuing professional development. 60 development projects have been funded, including 32 at postgraduate level. The project involves over 380 employers who have to date given more than 30,000 hours and in-kind contributions worth over £850,000, and the provision developed is anticipated to be taken up by more than 3,500 learners by the end of March 2013.

By working with SSCs, the NW HLSP ensures that the provision is demand led, involves employers and is (if appropriate) professionally recognised. Through the NW HLSP, Lancaster University is working with Cogent (the SSC for science-based industries) to develop modules in advanced bioscience which integrate business development and employability skills, and provide the opportunity to work towards professional recognition with the Society of Biology.

Research Councils

18. The Research Councils invest over £350m annually in funding postgraduate researchers. Through an annual Health of Disciplines report, Research Councils UK demonstrates how this funding will be directed to maintain the long-term health of particular subjects and to build capacity in areas of concern.[65] Discipline and sector specific reviews also inform individual Research Councils in the distribution of their funding. For example, the Natural Environment Research Council (NERC) is currently leading on a major exercise to determine the skills priorities for postgraduate research training in environmental subjects over the next ten years. The review is expected to report in May 2010.

19. By working together where they have overlapping interests, the Research Councils are better able to coordinate investment in postgraduate research and training. In the pharmaceutical sector, the Biotechnology and Biological Sciences Research Council (BBSRC), Engineering and Physical Sciences Research Council (EPSRC) and Medical Research Council (MRC) have mapped their various activities in supporting postgraduate research, with a view to improving the way the sector's skills needs can be addressed. The Science and Technology Facilities Council (STFC) and EPSRC have recently completed a review of skills that will be needed to drive economic growth in nuclear physics and engineering.

20. Where the Research Councils, working with employers, have identified gaps in the supply of postgraduate researcher skills, they have directed investment into these

65 RCUK, Health of Disciplines Reports: www.rcuk.ac.uk/aboutrcuk/publications/policy/hod.htm

areas and attracted co-funding from employers. For example, in October 2009, BBSRC announced that it intends to fund new Advanced Training Partnerships to meet high-level skills needs in the agri-food sectors. These partnerships will bring together employers and employer associations with universities, agricultural colleges and research institutes, to provide flexible employer-focused postgraduate training. Both the MRC and Wellcome Trust have targeted additional funding at studentships in clinical pharmacology, in response to industry concerns that this is critical to the development of translational medicine in the UK.

Higher education funding bodies

21. *Higher Ambitions* invited HEFCE to work with the UKCES to devise new ways of targeting funding at provision that responds to higher level skills needs. The governments of the Devolved Administrations have also made it clear, in their strategies on higher education, that funding must become more responsive to employer needs – particularly in areas of economic importance.

22. HEFCE and the other higher education funding bodies are already targeting some funding at stimulating the supply of higher education courses in strategically important areas. HEFCE's Strategically Important and Vulnerable Subjects (SIVS) programme has invested £350m between 2005-06 and 2010-11 in supporting supply and promoting demand in areas deemed strategic by the UK Government, and vulnerable by HEFCE. Through its employer engagement programme – designed to incentivise employers to co-fund higher education provision that meets their specific needs – HEFCE secured more than 14,000 employer co-funded places in 2009-10. Until now, most interventions of this kind have been focused on undergraduates but this approach could be further extended to postgraduate provision.

23. Building on the lessons learned through strategic interventions at the undergraduate level, a greater proportion of public funding for postgraduate study should be focused on supporting provision that responds to postgraduate skills needs. This is particularly important in those areas where the supply of a small number of postgraduates may have a disproportionate effect on securing economically valuable business activity in the UK.

24. **HEFCE should work with Research Councils UK, UKCES and Sector Skills Councils, and relevant bodies in the Devolved Administrations, to identify how and where to fund provision that responds to employer needs for postgraduate skills.** In doing so, they should engage with the CBI, CIHE and professional bodies.

Case study: Northern Ireland – Boosting the number of PhDs in economically relevant areas

The Department for Employment and Learning conducted a review of Postgraduate Education Policy and Funding in Northern Ireland which reported in February 2009. The report recognised the link between productivity and the supply and retention of postgraduates, and concluded that Northern Ireland will need to invest in more postgraduates to remain competitive in the 'war for talent'. The recommendations included:

- The Northern Ireland Assembly should continue to invest in boosting the number of PhD graduates
- These additional places should be focused in economically relevant areas. These areas were identified through a foresight project looking at future technology opportunities for Northern Ireland and confirmed after consultation with a Skills Expert Group.
- These areas of economic relevance should be reviewed as more information becomes available to ensure that PhDs continue to be funded in the most competitive areas.

Collaboration between HEIs and employers

25. We know that most HEIs now have productive partnerships with employers and that these partnerships include joint research, the co-design of postgraduate courses and the provision of postgraduate-level continued professional development. In some cases, these have brought together multiple businesses or universities to form a wider collaborative offer. There are benefits for both HEIs and employers in developing these links further.

Higher Ambitions

The relationship between universities and employers is critical for both parties and the future prosperity of our country. The capacity of the higher education system to equip people for the modern world of work depends on this relationship being productive and based on mutual understanding. We expect universities and businesses to work together to anticipate, shape, and respond to demand for skills in the economy.

26. In both taught and postgraduate research provision, we found examples of employers that have invested financially in the development and provision of postgraduate courses. This can involve providing funding to aid the development of a tailored course, directly subsidising student places or providing scholarships. In some of the strongest partnerships, employer involvement is not limited to providing funding, but extends to other collaborative activities. These may include: joint course development; guest lecturing; staff secondments; external supervision; work placements and visits; co-sponsored research projects and mentoring. Research by the Council for Industry and Higher Education (CIHE)[66] found that these were the strongest type of partnerships –

66 CIHE, *Influence through collaboration* (2008)

where engagement between staff in the university and the employer was frequent and had been built on over time. The CIHE report also highlights the need for employers to be very specific about their requirements and for universities to be realistic and clear about what they are able to offer.

27. Some employers have long-standing relationships with HEIs that have been developed over several years, but there are also many newer partnerships that have been initiated to respond to emerging skills needs. These have sometimes formed as a result of HEIs proactively seeking to identify gaps in the market and approaching employers with training or research offer. Employers have also approached universities that they have identified as offering – or having the potential to offer – training in areas that they require. This has, for many employers, proved an extremely effective way of improving the supply of staff with the right postgraduate level skills, knowledge and experience. Our interviews with employers found that those in the very high-tech industries needing to recruit PhDs in specialist fields, tended to do this by partnering with departments that they have identified as generating excellent research and researchers.[67]

67 CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

Case studies: Collaboration between HEIs and employers

Long-standing relationship between Loughborough University and Ford Motor Company

Since 1986, Loughborough University has worked closely with the Ford Motor Company to design, develop and deliver part-time MSc programmes in automotive engineering. To date, over 300 engineers have graduated from the part-time programme – a significant number of whom are now in senior positions in the industry.

The programme gives students knowledge and technical expertise in a range of automotive disciplines. It provides them with a comprehensive understanding of automotive design and manufacture, transferable skills and knowledge that is applicable to the workplace.

Although the programme is no longer exclusively for Ford employees, the company continues to be strongly involved in its ongoing development. Staff advise on module content, give specialist lectures and are members of the Industrial Advisory Committee, which advises the University on emerging issues in the automotive sector and regularly reviews the relevance of topics covered in course modules.

University of Sussex links with small IT companies

The University of Sussex Informatics Department has a long history of its postgraduate alumni setting up small businesses in the Brighton area. Keeping in touch with these former students has led to mutually beneficial links on graduate recruitment, project opportunities for students and the development of new teaching areas.

Much of the contact is social and informal, between faculty staff and postgraduates. The links between the university and small firms is helped by a local web-based network – Wired Sussex – which works with digital media companies and helps them to advertise recruitment vacancies and projects, get in touch with students and keep up to date with industry developments.

One company, Sigmer Technologies, has regularly recruited from the university department where its founder studied. It is based on the Sussex campus, a short walk from the department. The company now employs over 25 people and has recruited more than 30 Sussex postgraduates over time.

Lancaster University Management School and Accenture

At Lancaster University Management School, Accenture managers are responsible for delivering the Systemic Interventions and Consulting module of the MSc course in Information Technology, Management and Organisational Change (ITMOC).

Accenture's involvement has led to changes in the way selected parts of the course content are presented, including areas such as financial management, project and program management. Through hands-on involvement in the course, Accenture managers have been able to impart some of the cultural aspects of working with a 'Big 4' organisation. Accenture personnel have commented on how ITMOC course members have developed as a result and how much more attractive they have become as potential recruits to industry.

Postgraduate level Continuing Professional Development

28. Employers are increasingly looking to universities to develop tailored taught postgraduate level training for existing staff, as part of their Continuing Professional Development (CPD).[68] In 2007-08, HEIs in England earned £537m income from the provision of CPD to employers[69] but there is significant potential for this to grow, particularly where it is delivered flexibly, allowing employees to build credits over time. Opportunities to undertake modular postgraduate level training will play an important role in the upskilling and re-training of the UK workforce.

29. Flexible CPD provision may include offering modules at different institutions, as well as crediting work undertaken in the workplace. The higher education academic credit system within England provides HEIs with a standard credit structure and guidance on how to recognise credits from other institutions, and to recognise prior learning that may have taken place outside of a higher education setting.

Case study: Postgraduate level Continuing Professional Development

Cornwall County Council and Coventry University

In May 2004, Cornwall County Council approached Coventry University to develop a Postgraduate Certificate in Management which would be delivered through work-based learning. Coventry devised a specific programme for council employees in the Directorate of Children, Young People and Families (CYPF) and the Department of Adult Social Care (DASC).

Staff from the local area run the programme, along with contributors from Coventry University. Having demonstrated the effectiveness of the certificate within the council, participation was extended to include colleagues from the wider social care sector, including the independent and voluntary sectors.

In 2008 a bespoke Postgraduate Diploma programme was launched and a Masters programme is now also offered. To date, around 90 social workers from Cornwall County Council have been through the Postgraduate Certificate programme.

30. Delivering this level of flexibility can however present providers with some challenges, and both employers and universities have expressed concerns about how to quality assure provision that is split across sites.

31. The Quality Assurance Agency for Higher Education (QAA) in England and Wales has explored the extent and perceptions of employer-responsive provision amongst HEIs and found that some additional advice and guidance is necessary to ensure quality assurance arrangements are appropriate and effective. In response to this, the QAA has published a reflective report which highlights the different approaches institutions have taken to setting up and quality assuring provision run in partnership with employers.[70] HEFCE has also commissioned the Higher Education Academy to run eight pilot projects aimed at disseminating practical examples of how HEIs tackle quality

68 ibid

69 HEFCE, *Business and Community Interaction Survey 2007-08* (2009)

70 QAA, *Employer-responsive provision survey: a reflective report* (2010)

assurance challenges of employer-responsive provision. These pilots are expected to report Summer 2010.

32. Where they remain concerned about these quality assurance issues, **HEIs should work with the QAA to overcome any perceived barriers to quality assuring flexible postgraduate provision delivered partly in the workplace or by more than one HEI.**

Professionally accredited postgraduate courses

33. A growing number of professionally orientated doctorates, masters and other accredited postgraduate qualifications are designed to directly meet employer needs in both the private and public sectors. By embedding career-relevant knowledge and skills into course content, professional and accredited courses prepare postgraduates to apply their learning in a work environment.

34. Professional doctorates, which require the individual to undertake research that directly contributes to the development of practice in a particular field are, in many cases, designed and delivered in collaboration with employers. The industrially-focused Engineering Doctorate (EngD) for example, combines original research with business training and an industrial placement. The industry know-how and wider skills acquired by EngD students makes them highly regarded by employers,[71] who often cite a preference for EngD graduates over the traditional PhD.[72]

35. In some HEIs a large proportion of professional postgraduate courses are accredited by employers, academic bodies and Professional, Statutory and Regulatory Bodies – including masters, postgraduate certificates and diplomas. It is encouraging that SSCs are involved in working with groups of employers and universities to facilitate greater opportunities for employer involvement in the development, delivery and accreditation of programmes. **Universities UK and the SSCs should highlight and encourage best practice in the development and delivery of courses designed to involve and meet the needs of employers.**

Collaborative postgraduate schemes

36. Collaborative schemes designed to encourage HEIs and employers to work together on postgraduate training, promote the sharing of knowledge – which both HEIs and employers can exploit – and can create new opportunities for joint-working.

37. Knowledge Transfer Partnerships (KTPs) – run by the TSB – enable universities and businesses to work together to develop a new product or service. KTPs, which can last anything from ten weeks to three years, place an 'associate' with an employer, to work with them on developing solutions. Associates may be graduates, postgraduates or academics.

71 Royal Academy of Engineering, *Engineering Graduates for Industry* (2010)

72 CIHE, *Talent Fishing: What Businesses want from Postgraduates* (2010)

38. In 2008-09, the TSB supported 977 KTPs, which were all part-funded by the host employer, and involved 449 university departments from across 104 HEIs.[73] KTPs offer extremely good value for employers, particularly SMEs who are able to access KTPs at a reduced cost. They also offer postgraduate students the opportunity to develop valuable experience by using their knowledge and skills to tackle real business challenges.

39. Collaborative doctoral studentships which bring together HEIs (and other research organisations) and public or private sector employers, are funded by the Research Councils with a contribution from the participating employer. They offer postgraduate researchers the opportunity to enhance their skills training and wider learning by spending between three and eighteen months working with the host employer. During this time, students are supported by a supervisor from the host organisation as well as an academic supervisor. Often referred to as 'CASE' awards (because the original scheme involved collaborative awards in science and engineering), the collaborative model has now been adopted in a range of disciplines and opportunities for CASE studentships are offered by several of the Research Councils.

40. Feedback from employers is that CASE studentships are very productive and the postgraduates taking part are extremely employable as a result. We encourage the Research Councils to continue to work with TSB and HEIs to promote the CASE model to a wider range of employers and raise awareness of the scheme beyond science and engineering.

Stimulating demand for postgraduate skills

41. The UKCES National Strategic Skills Audit highlights that increasing the demand for higher level skills, as well as stimulating supply, will be important in the future.[74] Evidence suggests that in the UK, there may currently be a deficiency in demand for higher level skills. There are some examples of over-qualification and under-employment, which may be indicative of inadequate job-matching, but also that employers are not fully optimising employee skills. The UKCES found a range of indicators which question the level of employer ambition in the UK and whether, relative to international competition, we have too few businesses adopting high performance working practices, treating higher level skills as a long term investment and seeking to operate in high-value markets.

42. Feedback from employers suggests that those who do not invest in higher level or postgraduate skills choose not to because there is no perceived value in doing so.[75] This may be particularly true in sectors where postgraduate skills have not traditionally been sought and there has been little direct experience of what postgraduates can offer. It is also the case for SMEs, for whom investing in postgraduate skills can seem prohibitively expensive. Innovation Vouchers – which enable SMEs to purchase expertise from 'knowledge providers' (including postgraduate researcher resource) – have been valuable for helping more SMEs to benefit from postgraduate-level skills.

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73 Technology Strategy Board, *Knowledge Transfer Partnerships Annual Report 2008/9* (2009)

74 UKCES, *Skills for Jobs: Today and Tomorrow. The National Strategic Skills Audit for England* (2010)

75 Kelvin, J., Casey, P., Smith, R., *Known unknowns: The demand for higher level skills from business*, CfE (2008)

43. To stimulate employer demand, SSCs have a role to promote the value of high-level skills within their sectors. On a regional level, RDAs in England will need to work with local employers on how best to access postgraduate skills and use them to drive growth; and through Knowledge Transfer Networks and the KTP scheme, the Technology Strategy Board can raise awareness of opportunities to invest in higher level skills.

44. To support this, **the Council for Industry and Higher Education should promote the value for employers of investing in postgraduate skills, by building on existing evidence about the link between postgraduates and productivity**.

The international competitiveness of postgraduate education

Introduction

1. In *Higher Ambitions*, the UK Government sets out the importance of UK HEIs maintaining their international standing. It asks universities to do this by developing stronger partnerships with providers in other countries, expanding overseas provision, and ensuring that international students in the UK are well-integrated and enjoy an excellent student experience. The UK Government's *New Industry, New Jobs: One Year On*[76] update, published in March 2010, outlines further proposals for better supporting HEIs in growing their international activities.

2. Earlier this year, the Prime Minister emphasised the importance of the higher education industry and the potential for its international value to grow[77] – estimating that international student fees and spending, visitor spending and other international sources of income currently total £5.3bn annually.[78] As more than half of international students coming to the UK study at postgraduate level, the strength of the UK postgraduate sector will be central to developing the UK's position in the international market.

3. Whilst the UK is currently very successful in attracting internationally mobile postgraduates, maintaining this position will become increasingly challenging as developing countries invest heavily in their own higher education systems, and competitors offer attractive packages of support and other incentives to draw in students from overseas. Recent growth in the number of overseas postgraduates studying in the UK has been concentrated in a handful of countries (particularly China and India), and in certain subject areas (business, engineering, technology, law, mathematics and computer science). Shifts in the patterns of international student choices therefore have the potential to impact heavily on UK universities.

4. This does not mean that the UK cannot continue to build on its past successes. But to do so will require universities and public funders to recognise, develop and promote the UK's strengths. As the UK Government develops its strategy for growing international participation in UK higher education as a whole, it must consider what specifically needs to be done at the postgraduate level.

International taught postgraduate students

5. The number of international students undertaking taught postgraduate courses has grown significantly in recent years, so that half of all taught masters students now

76 BIS, *New Industry, New Jobs – one year on* (2010)

77 Prime Minister's speech at the Learning and Technology World Forum, 11 January 2010

78 UUK, *The impact of Universities on the UK economy, fourth report* (2009)

come from outside the UK. The fastest rise has been in international students from outside the EU, where numbers grew by almost 50% between 2002-03 and 2007-08.

6. The financial value that this generates for both universities and the wider economy is considerable. The total fee income from non-EU overseas students at all levels of Higher Education was £2.2bn in 2008-09. As around half of these students studied at postgraduate level, and the vast majority for a taught masters course, we can estimate that the fee income from these courses alone was close to £1bn.

7. The benefits of hosting international taught postgraduate students go beyond the returns from student fees and living expenses. Some students will go on to live and work in the UK (contributing higher level skills to the labour market), or to undertake postgraduate research at a UK university. Nearly one third of students applying for postgraduate research programmes are already studying in the UK prior to commencing research.[79] Of those who return to their home country, many will act as 'ambassadors' for the UK and maintain connections that can lead to business, trade, cultural and diplomatic benefits.[80]

International postgraduate research students

8. Growth in the numbers of postgraduate researchers in the UK has largely been driven by rising demand from international students. Between 2002-03 and 2007-08, UK domiciled first year postgraduate researchers rose 2%, while the numbers from elsewhere in the EU and from non-EU countries grew 26% and 18% respectively; so that in 2007-08 international students comprised 44% of full-time postgraduate researchers. This makes the UK amongst the most attractive destination countries in the world, capturing around 12% of the global market share of internationally mobile research students[81] – second only to the United States.

9. International postgraduate researchers coming to the UK are not only undertaking a programme of study, they are also contributing to the UK's world-class research base. Being able to attract the best students from around the world therefore plays a significant role in ensuring the UK stays at the forefront of world-leading innovation and research.

10. Some international postgraduate researchers will go on to research positions in UK HEIs. UUK estimated that in 2005-06, more than one quarter of academic staff appointed were non-UK nationals.[82] Others will move out of academia to work in the UK's research-intensive industries. Although there is limited data available on the destinations of international postgraduate students after completing their studies, anecdotal feedback from researchers and employers is that even those students who leave the UK will often go on to undertake collaborative work with UK universities and businesses.

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79 Kemp, *The UK's competitive advantage: the market for international research students*, UK Higher Education International Unit (2008)

80 British Academy, *That full complement of riches: the contributions of the arts, humanities and social sciences to the nation's wealth* (2004)

81 OECD, *Education at a glance* (2009)

82 UUK, *Talent wars: the international market for academic staff* (2009)

The experience of an international postgraduate researcher

Heather Daniell: Entrepreneur

Heather grew up in Hamden in the United States, and received a joint Bachelor of Science in Chemistry and Molecular and Cellular Biology from the University of Connecticut. She joined Magdalen College, Oxford in 2003, where she was funded by the Magdalen College Student Support Fund, and a US-based educational trust to undertake a Doctor of Philosophy degree in organic chemistry.

While at the university she served on Magdalen College's Middle Common Room committee as Vice President, and was a member of Oxford's polo team. Her training at Oxford gave her the opportunity to think about the different possible applications of her work, both in its research implications and its wider possibilities for society and industry.

After graduating in 2007, she is now based in London and has worked in the cleantech business sector, and as an entrepreneur developing her own company, which is involved in collective bargaining for the residential solar industry.

Promoting UK postgraduate education internationally

11. The British Council currently leads on promoting UK higher education overseas, and in the development and management of the Education UK brand. Through programmes such as the Prime Minister's Initiative and the UK-India Education and Research Initiative, the British Council works with ministries, agencies and universities in other countries to develop partnerships with the UK. Many universities also have their own individual marketing strategies to promote postgraduate courses overseas – some even negotiate direct agreements with overseas governments that provide scholarships for their nationals to study abroad.

12. However, feedback from stakeholders is that efforts to promote UK postgraduate education internationally need to be more coordinated and go further in developing a strong UK postgraduate brand. This needs to include communicating more effectively the diverse range of postgraduate qualifications available in the UK. To do this, it makes sense to build on the structures already in place.

13. *New Industry, New Jobs: One Year On,* published by the UK Government in March 2010, indicates a stronger role for UK Trade and Investment (UKTI) in developing a more coordinated and comprehensive approach to helping UK higher education undertake international business. The UK Government has established an International Education and Research Advisory Forum, chaired by the Minister for Higher Education, to strengthen links between the UK agencies involved in international education and research, so that the UK provides a coordinated and compelling proposition for potential international partners. **Members of International Education and Research Advisory Forum – UKTI, RCUK, the British Council and Universities UK – should work together to identify ways to better promote UK postgraduate provision to governments, employers and students overseas.**

14. This should include supporting UK HEIs to expand their postgraduate provision overseas. In 2007-08 around 61,000 postgraduates earned a UK postgraduate

qualification delivered at least partly overseas,[83] and there is scope for this 'trans-national' market to grow. This can include joint-awards, split-site provision and franchised delivery. As trans-national delivery expands, it is important that the quality standards expected of UK postgraduate provision are upheld. The QAA – which conducts audits on overseas provision – has produced guidance for HEIs on international collaboration[84] and will be updating this in Summer 2010 to reflect new types of partnership that are developing. **The QAA should continue to work with HEIs to ensure that UK postgraduate education delivered overseas maintains its international reputation for rigour and quality,** and participate in discussions at the International Education and Research Advisory Forum.

Entry into the UK and staying on after studying

15. The new points-based visa system should make it easier for legitimate postgraduates to study in the UK. Students wishing to enter the UK to pursue a programme of postgraduate study would normally apply for a Tier 4 (student) visa. However, several HEIs have reported long processing delays, which have in some cases prevented legitimate, high-calibre postgraduates from taking up places.

16. This has the potential to damage the reputation of the UK – which is already perceived by prospective research students as one of the most difficult places to acquire a visa.[85] **The UK Border Agency should monitor operational issues with the postgraduate student visa system to ensure there are no unintentional obstacles to entry.** The British Council and HEIs also play a valuable role in communicating to prospective students how the points-based visa system operates, to dispel the perception that the system itself is a barrier to studying in the UK.

17. Under the new post-study work route of the points-based system, postgraduate students can apply to remain in the UK to work for up to two years following the successful completion of their studies. They can apply before graduating, and if re-sitting examinations or writing up a thesis. During this time, they can look for suitable employment without needing to have a sponsor. This flexibility is important for enabling excellent international postgraduates to stay on in the UK. After finding skilled work in a relevant field, applicants are able to switch onto another tier of the points-based system.

Funding for international research students

18. Scholarships and affordable fees rank highly amongst internationally mobile research students as factors which attract them to postgraduate provision. Around one third of international postgraduate researchers in the UK are estimated to receive some funding from a UK source.[86]

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83 House, G., *Postgraduate Education in the United Kingdom*, HEPI (2010)

84 QAA Code of practice section 2: Collaborative provision and flexible and distributed learning (2004) www.qaa.ac.uk/academicinfrastructure/codeofpractice/section2/default.asp

85 Analysis of *StudentPulse* database in: Kemp, *The UK's competitive advantage: the market for international research students*, UK Higher Education International Unit (2008)

86 ibid

19. One of the largest sources of support for international students is in the form of fee waivers or discounts from UK HEIs. Many HEIs also run their own scholarship schemes – some involving private sponsorship and partnerships with overseas HEIs and agencies. Until recently HEI scholarships were partly supported by the Overseas Research Student Award Scheme (ORSAS). This provided HEIs with funding to cover the difference between UK/EU and non-EU fees, and supported around 1,800 international postgraduate researchers annually. Following a review of ORSAS in 2008 the scheme was withdrawn in England, Wales and Northern Ireland; although Scotland has opted to continue with a parallel scheme.

Case studies: University and business support for international postgraduates

International Scholarships at the University of Birmingham

The University of Birmingham offers a variety of scholarships for international postgraduate students. As well as a centrally-administered scheme offering up to 23 scholarships worth between £5,000 and £10,000 in tuition fee discounts, some of the specific schemes include:

- Scholarships that are jointly funded with the Allan and Nesta Ferguson Charitable Trust (ANFCT) and provide £10,000 of tuition fee discounts to students from Africa
- Full tuition fee scholarships for postgraduate students from Hong Kong and India
- Joint alumni awards through the Canadian Chapter Scholarship

The schemes are promoted by the University's network of agents, at exhibitions and events, on the internet and by the British Council. This helps to raise the global profile of the University as well as promoting it in targeted markets. The University receives around 800 applications a year for the main scholarship schemes, and funds only a small number of the highest calibre students. As well as academic ability, the University is looking to select those students who are willing to engage with, and contribute to, University life during and after their studies.

Most of the funding for the scholarships is provided by the University, and there are several benefits that make the investment worthwhile. The schemes attract bright postgraduate students from around the world who might otherwise have not been able to attend the University. This enriches the diversity of the student population and helps to create a community of scholarship graduates who are encouraged to act as ambassadors for the University after completing their studies.

Santander Scholarship Scheme

The Santander Scholarship Scheme offers studentships and scholarships to enable students from Spain, Portugal, Argentina, Brazil, Chile, Colombia, Mexico, Puerto Rico, Uruguay and Venezuela to undertake taught postgraduate courses at selected UK universities. The scholarships are funded by Santander and offered at partner universities. Scholarships (typically £5,000) are used to partially offset the cost of tuition fees but partnerships may also include funding for international student and academic exchanges, support for business incubators, and reciprocal scholarships for UK students to study in Iberia and Latin or South America.

20. The UK Government supports more than 1,500 postgraduate researchers through its three main scholarship programmes:

    - The Commonwealth Scholarship Commission (CSC) offers opportunities for Commonwealth citizens to study in the UK and also for UK citizens to study overseas. Awards are funded by the Department for International Development (for developing Commonwealth countries), the Foreign and Commonwealth Office (FCO) and the Department for Business, Innovation and Skills in partnership with UK HEIs (for developed Commonwealth countries). The CSC has seven types of award, including fellowships for researchers as well as scholarships for postgraduate study, and makes approximately 750 awards every year.
    - The Chevening programme provides nearly 1,000 scholarships at UK HEIs for postgraduate students or researchers from over 130 countries. The programme is largely funded by the FCO and receives significant contributions from HEIs and other organisations in the UK, and from a wide range of overseas sponsors. It is managed by the British Council, on behalf of the FCO.
    - Marshall Scholarships finance students from the United States to study for a degree in the UK. Up to 40 scholars are selected each year to study at postgraduate level in any field of study. They are mainly funded by the FCO and are overseen by the Marshall Commission. The traditional Marshall Scholarship is tenable for two academic years but may be extended in exceptional circumstances. In the US, the selection process is managed by the regional Consulates General or the British Council, on behalf of the British Embassy.

21. Through their mainstream funding for postgraduate researchers, the Research Councils have traditionally recruited mainly from the UK and EU – with only around 5-8% of Research Council studentships awarded to postgraduate researchers from outside the EU. Legislation permits the Research Councils to confine full support (for fees and living costs) to students from the UK, or EU students with a relevant connection to the UK through residence; but reserves their ability to fully fund researchers from elsewhere. Some Research Councils have, to a small extent, used this flexibility in strategic areas, to provide full support to non-EU postgraduate research students.

22. The Engineering and Physical Sciences Research Council (EPSRC) has made the greatest use of this flexibility, offering some HEIs the opportunity to transfer up to 10% of their annual grant for doctoral training into an International Doctoral Scholarships scheme. The EPSRC also runs, on behalf of all Research Councils, the Dorothy Hodgkin Postgraduate Awards (DHPA). The scheme is co-funded by industry and commerce and recruits high-calibre international researchers from developing countries to study in the UK. Since 2004, around 500 postgraduate researchers have been funded through the scheme.

23. The funding available to international students in the UK through this range of sources is still relatively low when compared to the growing number of competitors who do not charge fees for postgraduate researchers. Some also offer both grant packages and salaried positions for doctoral researchers – such as Belgium, Finland and the Netherlands.

Case studies: What other countries are doing to international postgraduate researchers

Australia

Over the last decade, Australia has been extremely successful in recruiting international students, although mostly at the undergraduate and taught postgraduate level. Strategies have recently been targeted at attracting more postgraduate researchers. These include: prioritising postgraduate researchers in the points-based system for student visas; developing a national database for postgraduate scholarships (of which there are a variety on offer); and encouraging postgraduate researchers to stay on and work in Australia after studying.

Germany

Germany is the third most popular destination for international postgraduate researchers, with 9% of the global market attracted to study in its universities and research centres. These postgraduate research students are not normally required to pay fees and are often provided with living expenses. Not only are there a number of scholarships on offer, but postgraduates often have the opportunity to earn money working part-time as a researcher for their institution. The government also provides incentives to remain in Germany after completion by offering favourable residency criteria for those who can secure a permanent post at the end of their studies.

United States

The United States has seen significant growth in its international postgraduate researcher numbers over the last few years, and like the UK, much of this growth has been in engineering and the physical sciences. This is reflected in the fact that a large numbers of professionals working in these fields in the US are foreign born – suggesting many stay on after completing their studies.

The financial support available for international postgraduates comes from a range of sources, including research and teaching assistantships funded by government departments, and scholarships supported by university endowment funds. It is estimated that around 40% of international students receive some form of support from their university, but this increases to around 90% for science, engineering and technology graduates at top universities.

Source: Kemp, *The UK's competitive advantage: the market for international research students*, UK Higher Education Unit (2008)

24. In the face of increased investment by competitor countries, the UK will need to do more to attract the very best postgraduates from around the world. Whilst recognising the need to maintain a strong supply of highly skilled UK postgraduates, there is a case for offering more studentships to secure top international talent, which would add to the strength of the UK's research capability. We very much welcome the announcement of a new Newton Scholarship Scheme that will support around 100 of the world's best research students to study in the UK.

25. In addition to this, **Research Councils UK should examine ways of opening up more postgraduate research studentships to international students.** Any additional opportunities for international postgraduates should be well promoted and

used to attract people that might not have otherwise considered studying in the UK. Consideration should be given to schemes which would allow HEIs to leverage funding from business and create new strategic partnerships with universities and agencies in other countries.

The Bologna Process and the international comparability of postgraduate study

26. The Bologna Process is an inter-governmental agreement between ministers of higher education in 47 countries in Europe, which led to the creation of the European Higher Education Area in March 2010. Participating countries are encouraged to reform their higher education systems to make them more competitive in the global arena, as well as more comparable and compatible with one another. Its main priorities have been: a degree system based on three main cycles (Bachelors, Masters and Doctoral); a system of credits – such as the European Credit Transfer System (ECTS) – to facilitate mobility, transparency and comparability of degrees; and European cooperation on quality assurance.

27. Over the last 10 years, the UK Government and stakeholders have worked within the Bologna process to ensure that UK qualifications continue to be widely understood and recognised throughout Europe and beyond. However, there are still some concerns that the relatively short duration of some UK masters will place UK postgraduates at a disadvantage to nations where these courses tend to be of a longer duration.

28. However, there are also positive features of the UK masters model – arguably, its shorter length allows it to be more responsive to the needs of employers and the wider economy. And the option of completing an intensive masters course in one year is in many ways an attractive prospect for many potential students.

29. It is important that the UK higher education sector remains fully engaged in the Bologna Process through the implementation of its reforms. **HEIs should continue to ensure that their masters level courses are compatible with the Bologna Process through the use of credits and learning outcomes.** This is essential for demonstrating to potential students in other European countries and elsewhere, the continued high value of a UK postgraduate qualification.

Funding the postgraduate system

Introduction

1. In comparison to the undergraduate sector, postgraduate education relies on relatively little public funding. Although both taught and research courses are partly subsidised by government, HEIs recover most of the costs of provision via tuition fees – which unlike undergraduate fees, are uncapped. The fact that the postgraduate sector has grown 36% since 1997 suggests that for HEIs, this model of funding has operated successfully. Demand from students has risen, and HEIs have been able to accommodate this demand.

2. However, at a time when public funding will come under increased pressure, it is important to ask whether the way the postgraduate system is currently funded offers the best possible value for money for the taxpayer, for employers and for students; and is flexible enough to enable the postgraduate system to respond to growing demand for postgraduate skills.

Taught postgraduate provision

The market for taught postgraduate courses

3. Public funding for the provision of taught postgraduate courses is limited to the contribution that the UK funding bodies make towards teaching costs. The Higher Education Funding Council for England (HEFCE), the Scottish Funding Council (SFC), the Higher Education Funding Council for Wales (HEFCW) and the Department for Employment and Learning in Northern Ireland (DELNI), contributed a total of almost £250m towards postgraduate teaching in 2009-10. This funding is awarded as part of the block grant that institutions receive for teaching.

4. Broadly, this funding is calculated on the basis of the number of eligible (UK and EU) students and using variable cost bands for different subject groupings. It does not cover the entire cost of provision, but assumes that universities will recoup the remaining cost through tuition fees. Fees charged for taught postgraduate courses vary greatly by subject and between HEIs. A HEFCE survey of fees in 2009 found that the average full-time fee for a UK or EU student ranged from £3,985 to £9,855, depending on the subject.[87] But fees can be considerably more than the average, and anything up to £30,000 for some courses. The competitive nature of the taught postgraduate market means that in some cases, higher fees are perceived as an indicator of quality and are used tactically to attract students.

87 HEFCE, *Survey of fees for postgraduate taught and part-time undergraduate students* (2009)

5. The contribution that the higher education funding bodies make is of course limited by their budgets, and this effectively places a cap on the number of taught postgraduate students they are able to subsidise. HEIs can however recruit *additional* postgraduates either by passing on the full cost of tuition to the student, or by using the flexibility in the block grant to balance an increase postgraduate numbers against a decrease in undergraduate students. Growing taught postgraduate provision may be particularly attractive to some institutions at present, given the controls on undergraduate recruitment and PGCE numbers.

Better information is needed to inform the market

6. The taught postgraduate market has in many ways been a success story – expanding substantially to meet demand and generating significant fee income for HEIs (more than £1.5bn in 2008-09). However, there appear to be some areas where the mechanisms of the market do not work effectively, and where supply does not meet demand.

7. We know, for example, that a number of employers report difficulty finding people with the specific postgraduate level skills that they need, and that the higher education funding bodies and Research Councils have recognised the need to make strategic interventions to stimulate supply. To a large extent, this is caused by suppliers (HEIs) not receiving clear signals from users (employers) about what they need, and customers (students) not having adequate information about the choices available to them.

8. It would help HEIs to respond more effectively if better information were available about employer demand for postgraduate skills. There is significant scope to improve on this, and we have asked that the higher education funding bodies and Research Councils UK work together – in partnership with UKCES and employer bodies – to develop a more coherent approach to understanding and communicating employer needs for postgraduate skills.

9. The information available to customers also needs to be made more accessible – enabling prospective students to make more informed choices about which postgraduate qualifications to invest in. We have asked UUK to work with stakeholders on options for developing a single source of information on postgraduate course choices, potential career paths, and the earnings and destinations of postgraduate students.

Income from international student fees

10. HEIs receive no contribution from the UK higher education funding bodies for the teaching of non-EU students and so collect the entire cost of provision through tuition fees. As a result, fees for postgraduate students from outside the EU tend to be much higher than those charged to UK/EU students. With over 40% of taught masters students now coming from outside the EU, this represents a significant income stream for HEIs.

11. However, as competitor countries do more to market their postgraduate provision to international students and developing nations invest more in their own higher education systems, it is likely that patterns of international student demand and participation will change over the next decade. It may become more challenging for the UK to attract the same high numbers of international taught postgraduates. HEIs will need to ensure that their financial sustainability is not overly reliant on tuition fees from overseas

taught postgraduates, particularly in subjects that have traditionally attracted a very high proportion of international students.

Postgraduate research provision

Focusing research funding in areas of excellence

12. *Higher Ambitions* sets out the UK Government's intention for public funding for research in English HEIs to be increasingly targeted in areas of recognised excellence – wherever these might be. In an era of scarce resources it is important that public funding is focused so that world-class research centres can be sustained – particularly in high cost science and technology disciplines.

13. Recognising that there are examples of excellent research groups across the higher education sector and throughout the UK, *Higher Ambitions* suggests that smaller departments may add to their research strength through collaboration. Where this brings together different expertise, resources and relationships with industry it can create innovative, multi-disciplinary networks. In the Devolved Administrations, collaboration between research groups and across HEIs is already well-established as a way to develop research capacity.

Funding excellent postgraduate research training

14. To get the best value from limited resources, public funding that supports postgraduate research students should also be targeted in areas of excellence. Doing so will help to sustain our leading research centres by funding postgraduate researchers to study in those centres. This will also ensure that research students are located in stimulating environments where world-leading research takes place.

15. In some disciplines, the ability to produce excellent research is highly dependent on there being a critical mass of research capability. By targeting funding for postgraduate researchers in areas of excellence, the experience of students in these disciplines will benefit substantially from being part of this critical mass.

Collaborative provision

16. Excellent research groups may be formed from the collaboration of several smaller units, often involving multiple disciplines. Bringing research students together in these interdisciplinary centres not only enriches the student experience, but will encourage the knowledge-sharing and interconnectivity required to tackle some of the world's most challenging issues.

17. In Scotland, universities are sharing research funding within disciplines to form 'research pools'. These pools allow HEIs to share resources and facilities, and open up wider opportunities for postgraduate research students – who are able to access equipment, training and support in all of the institutions involved in the pool. By working together, HEIs have significantly strengthened what they can offer to research students.

18. In Wales and Northern Ireland smaller departments have come together to form collaborative graduate schools. By connecting several departments – sometimes virtually – these collaborations have helped to form a critical mass of academics and research students.

Case studies: Collaborative research across the UK

SINAPSE – Collaborative Graduate Training in Scotland

SINAPSE (Scottish Imaging Network – A Platform for Scientific Excellence) is a multidisciplinary research collaboration bringing together researchers in medical imaging from six universities across Scotland. The collaboration currently includes 19 PhD students. The network provides these students with a strong cohesive doctoral training programme in which to develop their careers.

The size of the student cohort has helped to develop an innovative community with plenty of opportunity for mutual support, networking and multi-disciplinary working. The training possible through a collaborative approach far exceeds individual universities' capability. This training, combined with summer schools, a residential induction programme and other activities gives SINAPSE students a truly exceptional experience.

WICN – A Collaborative Graduate School in Wales

The Wales Institute of Cognitive Neuroscience (WICN) is a partnership between the Psychology departments of three Welsh universities – Bangor, Cardiff and Swansea. It was established in 2007 with funding from the Higher Education Funding Council for Wales' Reconfiguration and Collaboration Fund, and brings together around 150 academics and researchers.

As part of its activities, WICN has established an online Graduate School to provide Psychology students in the three universities with access to the resources and expertise available across all three WICN institutions. It is open to both Masters and PhD students.

The Graduate School offers a series of online modules, contributed by each of the participating HEIs in their particular areas of expertise. It also provides graduate students with virtual and real-time access to academic colloquia and seminars, neuroscience techniques classes and cross-centre research supervision. PhD students are also able to participate in the Graduate School's exchange programme, which enables them to undertake collaborative research in one of the WICN partner institutions, outside their home institution.

Collaboration between Northern Ireland and the Republic of Ireland

In 2009, it was announced that Northern Ireland's universities were to benefit from a £17.2 million investment to enable them to develop collaborative links with research groups in the Republic of Ireland.

The aim of the programme is to create critical mass in areas of strategic interest to both Governments, with the portfolio of twelve approved projects covering a wide range of priorities including: Future Energy Systems; Mobile Information and Communication Technologies; Safe and Traceable Food; and Sustainability of Transport.

One of the twelve approved projects – Assured Safe and Traceable Food (ASSET) – is based in the Institute of Agri-Food and Land Use within the School of Biological Sciences at Queen's University Belfast. ASSET is considered vital to Ireland and Northern Ireland where the agriculture and food production industry accounts for over 10% of the total workforce.

PhD students undertaking projects as part of ASSET have the opportunity to access research and technological expertise and use equipment available at other institutions, including the School of Biotechnology at Dublin City University and the Conway Institute at University College Dublin. The students also benefit from joint supervision by institutions in both jurisdictions.

Funding body support for postgraduate research programmes

19. Funding for the supervision of research degree programmes (RDPs) is paid to HEIs by the UK higher education funding bodies. This is allocated in the form of a block grant and takes into account both student numbers and the cost-weighting of different subjects. Across the UK, this amounted to £249m in 2009-10.

20. When calculating how this funding should be distributed to HEIs in England, HEFCE does not currently take into account the quality rating of research departments. Up to 2008-09, only departments rated four and above in the Research Assessment Exercise (RAE), or receiving capability funding, were eligible. HEFCE removed this requirement for 2009-10 as a result of replacing the system of single point ratings in the RAE (2008) with a graded quality profile.

21. **HEFCE should consider how to link future allocations of the research degree supervision grant more explicitly to research quality, rather than volume as at present.** In doing so, it will help to ensure that public funding for research students is focussed in excellent research centres.

22. It is important that the training offered to postgraduate researchers is of a high quality. Currently, HEFCE funding for research degree supervision is subject to a separate condition of grant, which requires HEIs to comply with Section one of the QAA Code of Practice[88] (covering research degree programmes) in all departments in receipt of this funding.

88 www.qaa.ac.uk/academicinfrastructure/codeofpractice/default.asp

Research Council funding for postgraduate researchers

23. In 2008-09, the Research Councils funded just over 19,000 postgraduate researchers, at a cost of £376m. Increasingly, the Research Councils are allocating more of this funding in the form of block grants to Doctoral Training Centres (DTCs), thereby targeting their resources in fewer locations. The advantage of this approach is that DTCs are given the flexibility to decide on the exact number of postgraduate researchers to fund and in which disciplines – giving them the power to be more responsive to emerging needs. There are currently 69 DTCs funded by the Engineering and Physical Sciences Research Council, with more being planned. The Economic and Social Research Council is creating a network of DTCs from 2011.

24. Often, DTCs bring together multiple disciplines and provide postgraduate researchers with the opportunity to develop broader skills and knowledge by working across disciplinary boundaries. These DTCs can involve partnerships between smaller research groups, collaborating to share their strengths and create an excellent, innovative training environment for postgraduate researchers. **HEIs should work together with the Research Councils to develop more multi-disciplinary Doctoral Training Centres.**

Case study: The UK Doctoral Training Centre in Energy Demand Reduction and the Built Environment

University College London and Loughborough University host the UK Doctoral Training Centre in Energy Demand Reduction and the Built Environment – which receives £5.8m from the Engineering and Physical Sciences Research Council plus industry co-funding.

The Centre will train the next generation of highly skilled and broadly educated energy researchers to lead and support the complex, multidisciplinary task of driving down energy demand and CO_2 emissions of the UK building stock. It provides a four year programme consisting of a one year MRes followed by a three year PhD. All students spend time at an overseas partner university, and are expected to develop first rate communication skills, management capability and business awareness.

Many students will undertake research projects in conjunction with industry sponsors and will have the opportunity to work at partner research facilities. The Doctoral Training Centre has the support of many industry and international partners, including: EDF, E.ON, Ove Arup, AECOM and Barratt Developments.

Future investment in postgraduate skills

25. In the last decade, the number of people participating in postgraduate study has grown substantially, with participation amongst UK domiciles rising 14% since 1997-98 (compared to 25% growth at the undergraduate level). Analysis of the Labour Force Survey shows that in 2008, 8.5% of the working age population registered a postgraduate qualification as their highest level of qualification. This compared to just 4.3% ten years earlier.[89] At the doctoral level specifically, an OECD study of education trends worldwide found that the UK's PhD graduation rate ranked relatively highly compared to other countries – coming sixth in the list of countries that provided

89 Analysis of LFS, by Machin, S. and Murphy, R., *The social composition and future earnings of postgraduates*, Sutton Trust (2010)

data (although it also showed that the UK had one of the highest proportions of PhD graduates coming from overseas).[90]

26. These statistics are encouraging; but if the UK is to compete in the global knowledge economy and capitalise on new, emerging industries, it is likely that there will be increasing demand for the UK workforce to be trained to postgraduate level. The UKCES National Strategic Skills Audit identifies a number of areas in which higher level skills will be required to drive growth, including: life sciences and pharmaceuticals; low carbon technology; and the creative and digital industries.

27. The UK must ensure it is well positioned to respond to the opportunities this will present. Whilst competitor countries may be able to invest heavily in stimulating the supply of higher level skills, the UK Government will need to assess how to get the best possible value from existing public investment.

28. In Autumn 2010, the Independent Review of Higher Education Funding and Student Finance will advise the UK Government on the appropriate balance of public and private investment in higher education in England. **In considering its response to the Independent Review's recommendations, and within the framework of the comprehensive spending review, the UK Government should take the opportunity to consider the appropriate level of public funding that should be invested in postgraduate provision.**

29. In doing so, it should take into account global trends in postgraduate education – including what other countries are doing to promote participation. It will also be necessary to gather more evidence on the return on investment in postgraduate skills, any evidence of existing market failure, the case for targeting funding towards this area of provision relative to others, and the appropriate overall balance between public and private funding contributions.

90 OECD, *Education at a Glance* (2009)

Annex 1
Summary of recommendations

No	Recommendation	Lead	Other stakeholders
1	Universities UK and the Research Councils UK should do more to identify and promote the economic and social value of postgraduate study.	Universities UK	RCUK
2	The UK Government should consider how to better promote postgraduate study to individuals, by building on existing campaigns to promote the potential benefits of higher education and skills.	UK Government	
3	The Teaching Quality Information steering group should consider extending the National Student Survey to include taught postgraduate students.	HEFCE Teaching Quality Information steering group	Universities UK
4	The Higher Education Academy should work with UUK and Guild HE to extend its Postgraduate Research Experience Survey to more institutions and to improve the student response rate.	Higher Education Academy	Universities UK, Guild HE, HEIs
5	HEIs should use the flexibility afforded in funding from the higher education funding bodies and the Research Councils, to offer longer periods of postgraduate research funding and training where appropriate.	HEIs	HEFCE, SFC, HEFCW, DELNI, RCUK
6	HEIs need to be more pro-active in providing postgraduates with the opportunity to develop the core competencies they need to succeed in a competitive job market.	HEIs	Vitae
7	HEIs should ensure that transferable skills training is embedded as standard in the funding and design of all postgraduate research programmes.	HEIs	RCUK, Vitae
8	HEIs should work closely with Vitae, employers and other stakeholders to provide better information, advice and guidance on career choices for postgraduate research students.	HEIs	Vitae

No	Recommendation	Lead	Other stakeholders
9	HEFCE should consider extending the Teaching Quality Information initiative to postgraduate level, and work with Universities UK and other key stakeholders to promote the development of a single, comprehensive source of up to date information about postgraduate study.	HEFCE Teaching Quality Information steering group	UUK
10	If respondents to Lord Browne's call for proposals have evidence on whether cost and access to finance are barriers to postgraduate education, they should include it in their response to the Review.	All interested stakeholders	
11	The UK Government should establish a working group with the Higher Education Statistics Agency, higher education funding bodies, Universities UK and other stakeholders, to advise on what additional information should be collected about postgraduates to inform future policy decisions on widening access to postgraduate study.	UK Government	HESA, HEFCE, SFC, HEFCW, DELNI, UUK
12	HEFCE and Research Councils UK should work together and engage with the UKCES, SSCs and relevant bodies in the Devolved Administrations, to establish employer needs for postgraduate skills.	HEFCE, RCUK	SFC, HEFCW, DELNI, UKCES, SSCs
13	HEFCE should work with Research Councils UK, UKCES and SSCs, and relevant bodies in the Devolved Administrations, to identify how and where to fund provision that responds to employer needs for postgraduate skills.	HEFCE, RCUK	SFC, HEFCW, DELNI, UKCES, SSCs
14	HEIs should work with the QAA to overcome any perceived barriers to quality assuring flexible postgraduate provision delivered partly in the workplace or by more than one HEI.	QAA	HEIs
15	Universities UK and the SSCs should highlight and encourage best practice in the development and delivery of courses designed to involve and meet the needs of employers.	UUK	SSCs
16	The Council for Industry and Higher Education (CIHE) should promote the value for employers of investing in postgraduate skills, by building on existing evidence about the link between postgraduates and productivity.	CIHE	Trade Associations and Professional Bodies

No	Recommendation	Lead	Other stakeholders
17	Members of the International Education and Research Advisory Forum – UK Trade and Investment, Research Councils UK, the British Council and Universities UK - should work together to identify ways to better promote UK postgraduate provision to governments, employers and students overseas.	International Education and Research Advisory Forum	UKTI, RCUK, British Council, Universities UK
18	The QAA should continue to work with HEIs to ensure that UK postgraduate education delivered overseas maintains its international reputation for rigour and quality	QAA	
19	The UK Border Agency should monitor operational issues with the postgraduate student visa system to ensure there are no unintentional obstacles to entry.	UKBA	
20	Research Councils UK should examine ways of opening up more postgraduate research studentships to international students.	RCUK	
21	HEIs should continue to ensure that their masters level courses are compatible with the Bologna Process through the use of credits and learning outcomes.	HEIs	QAA
22	HEFCE should consider how to link future allocations of the research degree supervision grant more explicitly to research quality, rather than volume as at present.	HEFCE	
23	HEIs should work together with the Research Councils to develop more multi-disciplinary Doctoral Training Centres.	RCUK	HEIs
24	In considering its response to the Independent Review's recommendations, and within the framework of the comprehensive spending review, the UK Government should take the opportunity to consider the appropriate level of public funding that should be invested in postgraduate provision.	UK Government	Scottish Government, Welsh Assembly Government, Northerm Ireland

Annex 2
Terms of reference

The Secretary of State for Business, Innovation and Skills, the Minister for Higher Education and the Minister for Science and Innovation have commissioned an independent review of the provision of postgraduate study in the UK. This review will address the nation's future requirements for postgraduate provision, covering both taught masters courses and research degrees, and how this provision can best meet the needs of business, academia, public services and the wider economy.

The review's principal areas of investigation will be:

- to assess the competitiveness of UK institutions in the global market for postgraduate education. This should consider the factors which influence the attractiveness of the UK as a location for overseas postgraduates and which influence UK students to pursue postgraduate study in UK institutions.
- to assess the benefits of postgraduate study for all relevant stakeholders.
- to assess the evidence about the needs of business and other employers for postgraduates, whether taken from taught or research-based courses. Patterns of provision by institution and discipline will be examined for their impact on the effectiveness of the research environment.
- to examine levels of participation, in terms of who undertakes postgraduate study, and whether there are barriers affecting the diversity of participation and reducing the availability of high-quality entrants. This will include an assessment of the extent to which postgraduate (especially taught Masters) degrees are seen as the minimum qualification for entry to certain professions, and the extent of co-funding by employers.

The review should take into account the earlier contributions to the HE Debate, in particular the issues identified by Nigel Thrift and Paul Wellings. Its recommendations need to be consistent with the current context of the public finances in the coming years. Its findings are likely to form an important part of the evidence taken by the Fees Commission, to enable future postgraduate provision to develop within the longer-term funding landscape.

The review will report interim findings to Ministers in late 2009, with a final report expected in spring 2010.

Annex 3

List of contributors

1994 Group

Academy of Medical Sciences

ADS Group Ltd

Arts and Humanities Research Council

Association of Business Schools

Association of the British Pharmaceutical Industry

Aston University

Biotechnology and Biological Sciences Research Council

Birkbeck College

Birmingham City University

British Academy

British Association for Counselling and Psychotherapy

British Computer Society Academy of Computing

British Council

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Committee of Professors of Statistics, UK and Ireland

Confederation of British Industry

Confederation of British Industry, Inter-Company Academic Relations Group

Council for Industry and Higher Education

Council of Professors and Heads of Computing

Cranfield University

Professor Rosemary Deem

De Montfort University

Department for Employment and Learning, Northern Ireland

Economic and Social Research Council

Edge Hill University

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Higher Education Academy

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Higher Education Funding Council for England

Higher Education Funding Council for Wales

Higher Education Policy Institute

Higher Education Wales

Imperial College

Industry and Higher Education Forum for Life Sciences

Institute of Education, University of London

Institute of Physics

John Innes Centre and the Sainsbury Laboratory

Keele University

Keele University, Postgraduate Committee of the Research Institute for Law, Politics and Justice

Kings College, London

Lancaster University

London Business School

London School of Economics

London School of Hygiene and Tropical Medicine

Loughborough University

Medical Education England

Medical Research Council (MRC)

Million Plus

National Institute of Adult Continuing Education (NIACE)

National Student Forum

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Natural Environment Research Council (NERC)

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Northumbria University Graduate School

Nuffield Foundation

Claire O'Malley (University of Nottingham)

Operational Research Society

Oxford University Students Union

Postgraduate Issues Network of the Society for Research into Higher Education

QinetiQ

Quality Assurance Agency

Queen Mary, University of London

Research Councils UK

Rolls Royce

Royal Academy of Engineering

Royal Holloway, University of London

Royal Society of Chemistry

Russell Group

Science and Technology Facilities Council

Scottish Funding Council

Scottish Government

Skillset

South East England Development Agency

Sutton Trust

Technology Strategy Board

Teeside University

The Welding Institute

UK Commission for Employment and Skills

UK Council for Graduate Education

UK Deans of Science

UK Higher Education Europe Unit

UK Resource Centre for Women in Science Engineering and Technology

Universities Scotland

Universities UK

University Alliance

University and College Union

University College London

University of Aberdeen, College of Physical Sciences

University of Bath

University of Birmingham

University of Bradford

University of Bristol

University of Cambridge

University of Central Lancashire

University of Chester

University of Cumbria

University of Durham

University of East Anglia Research Students

University of Edinburgh

University of Exeter

University of Glasgow, Heads of Graduate School

University of Hull

University of Leeds

University of Lincoln

University of Manchester

University of Oxford

University of Plymouth

University of Portsmouth

University of Sheffield Students Union

University of Strathclyde

University of Sunderland

University of Surrey

University of the West of England

University of Warwick

University of York

Vitae

Wellcome Trust

Welsh Assembly Government

Annex 4
Glossary

Abbreviation	Definition
AHRC	Arts and Humanities Research Council
BBSRC	Biotechnology and Biological Sciences Research Council
BIS	Department for Business Innovation and Skills
CASE	Cooperative Awards in Science and Engineering
CBI	Confederation of British Industry
CIHE	Council for Industry and Higher Education
CPD	Continuing Professional Development
DCELLS	Department for Children, Education, Lifelong Learning and Skills (Wales)
DELNI	Department for Employment and Learning Northern Ireland
DLHE	Destinations of Leavers from Higher Education
DTA	Doctoral Training Account
DTC	Doctoral Training Centre
DTG	Doctoral Training Grant
ECTS	European Credit Transfer System
EPSRC	Engineering and Physical Sciences Research Council
ESRC	Economic and Social Research Council
EU	European Union
FHEQ	Framework for Higher Education Qualifications
FTEs	Full-Time Equivalent
GDP	Gross Domestic Product
HE	Higher Education
HEA	Higher Education Academy
HEFCE	Higher Education Funding Council for England
HEFCW	Higher Education Funding Council for Wales
HEI	Higher Education Institution

Abbreviation	Definition
HEPI	Higher Education Policy Institute
HESA	Higher Education Statistics Agency
IERAF	International Education and Research Advisory Forum
KTP	Knowledge Transfer Partnerships
LFS	Labour Force Survey
MRC	Medical Research Council
NERC	Natural Environment Research Council
NSS	National Student Survey
OECD	Organisation for Economic Cooperation and Development
ORSAS	Overseas Research Student Award Scheme
PCDL	Professional and Career Development Loan
PGCE	Postgraduate Certificate in Education
PRES	Postgraduate Research Experience Survey
PTES	Postgraduate Taught Experience Survey
QAA	Quality Assurance Agency
QCF	Qualifications and Credit Framework
R&D	Research and Development
RAE	Research Assessment Exercise
RCUK	Research Councils United Kingdom
RDA	Regional Development Agency
RDP	Research Degree Programme
SFC	Scottish Funding Council
SME	Small/Medium-sized Enterprise
SSC	Sector Skills Council
STEM	Science, Technology, Engineering and Mathematics
STFC	Science and Technology Facilities Council
TSB	Technology Strategy Board
TQI	Teaching Quality Information
UCAS	Universities and Colleges Admissions Service
UKBA	UK Border Agency
UKCES	UK Commission for Employment and Skills
UKTI	UK Trade and Investment

Abbreviation	Definition
UUK	Universities UK
WAG	Welsh Assembly Government

Annex 5
Additional tables

QAA Framework for Higher Education Qualifications in England, Wales and Northern Ireland

Typical higher education qualifications within each level	2008 FHEQ level	Former (2001) FHEQ level descriptors
Doctoral degrees (e.g. PhD, DPhil (including new-route PhD), EdD, DBA, DClinPsy)	8	Doctoral (D)
Masters degrees (e.g. MPhil, MLitt, MRes, MA, MSc) Integrated masters degrees (e.g. MEng, MChem, MPhys, MPharm) Postgraduate diplomas Postgraduate Certificate in Education (PGCE) – masters level Postgraduate certificates	7	Masters (M)
Bachelors degrees with honours Bachelors degrees Professional Graduate Certificate in Education (PGCE) – honours level Graduate diplomas Graduate certificates	6	Honours (H)
Foundation degrees (e.g. FdA, FdSc) Diplomas of Higher Education (DipHE) Higher National Diplomas (HND)	5	Intermediate (I)
Higher National Certificates (HNC) Certificates of Higher Education (CertHE)	4	Certificate (C)

Source: Quality Assurance Agency www.qaa.ac.uk/academicinfrastructure/FHEQ

UK higher education funding bodies' methods of calculating funding for postgraduate teaching

	Total funding 2009-10	Method of calculating funding
Higher Education Funding Council for England	£161m	www.hefce.ac.uk/pubs/hefce/2008/08_33/
Scottish Funding Council	£49.7m	www.sfc.ac.uk/funding/universities/funding_streams/generalfund/university_teaching_funding/he_teaching_funding.aspx
Department for Employment and Learning Northern Ireland	£4.2m	As per HEFCE
Higher Education Funding Council for Wales	£23m	http://www.hefcw.ac.uk/documents/about_he_in_wales/funding_he_in_wales/Teaching%20Funding%20Method%202009.pdf

UK funding bodies' methods of calculating funding for the supervision of research degree programmes

	Total funding 2009-10	Method of calculating funding
Higher Education Funding Council for England	£203m	http://www.hefce.ac.uk/research/postgrad/
Scottish Funding Council	£27.9m	http://www.sfc.ac.uk/funding/universities/funding_streams/generalfund/research_funding/funding_research.aspx
Department for Employment and Learning Northern Ireland	£12.6m	http://www.delni.gov.uk/index/further-and-higher-education/higher-education/role-structure-he-division/he-research-policy/recurrent-research-funding/quality-related-research-funding.htm
Higher Education Funding Council for Wales	£5.6m	http://www.hefcw.ac.uk/documents/policy_areas/research/pgr%20funding%20method.pdf

Percentage of first year postgraduates by ethnicity, against the general population of England, 2007-08

	Population of England aged 20 – 34	Total post-graduate	Higher degree (research)	Higher degree (taught)	Other post-graduate
White	81.8	77.8	79.6	75.6	79.9
Total of ethnic minorities	18.2	14.6	12.7	17.0	12.0
Ethnicity not known		7.7	7.7	7.4	8.1
Black or Black British – Caribbean	1.2	1.1	0.5	1.3	1.1
Black or Black British – African	2.3	2.9	1.6	4.0	2.0
Other Black background	0.3	0.3	0.2	0.4	0.2
Asian or Asian British – Indian	4.1	3.1	2.4	3.4	3.0
Asian or Asian British – Pakistani	2.8	1.5	1.0	1.6	1.6
Asian or Asian British – Bangladeshi	1.1	0.4	0.3	0.5	0.4
Chinese	3.2	1.1	1.5	1.3	0.6
Other Asian background	1.1	1.3	1.7	1.5	0.8
Other (including mixed)	2.1	2.8	3.5	3.0	2.2

Source: Re-analysis of data from HESA and Office of National Statistics in, House, G., *Postgraduate Education in the United Kingdom*, HEPI (2010)

Relative proportions of UK domiciled taught and research postgraduates by ethnicity

	Total of known ethnicity	Not known	White	Total of ethnic minorities	% white	% ethnic minorities
Taught postgraduates						
2002-3	58,780	8,935	48,615	10,165	83	17
2007-8	73,465	4,950	58,475	14,985	80	20
Research postgraduates						
2002-3	12,915	2,700	11,345	1,570	88	12
2007-8	14,635	1,030	12,455	2,180	85	15

Source: Re-analysis of data from HESA and Office of National Statistics in, House, G., *Postgraduate Education in the United Kingdom*, HEPI (2010)

Average salary of postgraduates and undergraduates who entered full-time paid employment or were self-employed by subject of study, six months after graduating in 2007-08

Subject	Postgraduate (ex PGCE)		First Degree	
	Number	Salary	Number	Salary
Medicine & dentistry	180	£26,500	865	£29,000
Subjects allied to medicine	535	£24,000	3,835	£19,500
Biological sciences	690	£22,500	4,715	£16,500
Veterinary science	15	£26,000	95	£24,000
Agriculture & related subjects	70	£19,500	390	£17,000
Physical sciences	680	£24,000	2,050	£19,000
Mathematical sciences	145	£27,000	1,060	£22,500
Computer science	335	£24,500	2,065	£21,000
Engineering & technology	580	£25,500	2,970	£23,000
Architecture, building & planning	520	£24,500	1,050	£20,500
Social studies	1,140	£24,000	4,250	£19,500
Law	750	£21,000	1,225	£17,500
Business & administrative studies	1,330	£26,500	6,355	£19,500
Mass communications and documentation	385	£20,000	1,450	£16,500
Languages	355	£19,500	3,020	£17,500
Historical and philosophical studies	320	£20,000	2,050	£17,500
Creative arts & design	315	£19,000	3,690	£16,000
Education	190	£23,500	2,305	£19,500
Combined	5	£22,500	115	£16,500
Total	**8,540**	**£23,500**	**43,560**	**£19,000**

Source: Destinations of Leavers from Higher Education (DLHE) survey, published by the Higher Education Statistics Agency (HESA)

* Numbers are rounded to nearest five, salary figures to nearest £500 and exclude those with salary over £100,000

Postgraduate covers students 26 and under

First degree covers students 22 and under

'Number' refers to the number declaring their salary

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