A Review of Business–University Collaboration

Professor Sir Tim Wilson DL
February 2012

Preface

Just as castles provided the source of strength for medieval towns, and factories provided prosperity in the industrial age, universities are the source of strength in the knowledge-based economy of the twenty-first century.

Lord Dearing, September 2002

The words of Lord Dearing continue to ring true. The economic and social prosperity of the UK depends upon a healthy knowledge-based economy. In our globally competitive economic environment, never before has there been a greater need for a talented, enterprising workforce, for constant innovation in product and service development, for a thriving culture of entrepreneurship, for dynamic leading-edge scientific and technological development and for world-class research that attracts investment. In collaboration with business, and with the support of government, the UK university sector has the capability to fulfil Lord Dearing's vision: to be the source of strength in the UK's knowledge based economy of the twenty first century.

Universities are an integral part of the skills and innovation supply chain to business. However, this supply chain is not a simple linear supplier-purchaser transaction; it is not the acquisition of a single product or service. This supply chain is multi-dimensional, it has to be sustainable, and it has to have quality, strength and resilience. These attributes can only be secured through close collaboration, partnership and understanding between business and universities.

The multi-dimensional nature of the supply chain is represented by a landscape of business-university collaboration, consisting of a number of highly diverse domains of activity. For example: the education of highly skilled graduates, applied research in advanced technologies, bespoke collaborative degree programmes, 'science' park developments, enterprise education, support for entrepreneurs, industry-sector foundation degrees, higher-level apprenticeships, collaborative research, in-company upskilling of employees. Many domains have a second dimension, defined by business sector - for example: the creative industries, agriculture, communications, bio-pharma, engineering. Universities operate in specific domains, meeting the needs of a range of businesses; no one university can operate in all domains. The needs of individual businesses align with different domains and successful businesses often collaborate with several universities to meet their needs. Increasingly universities operating in different domains collaborate with each other to provide support for a particular industry or employer; the concept of collaborative advantage is gaining momentum within the university sector and needs to become common practice.

To achieve world leadership in university-business collaboration, all domains in the landscape must attain excellence; the strength of the supply chain is defined by its weakest link. Effective joined-up policy in this field, therefore, has to be informed by knowledge of the entire landscape. Policy has to be balanced to ensure that the economic benefits derived from investment in one domain are not diluted by underperformance in others. That is both the present and the future policy challenge.

In such a diverse landscape it is not surprising that this Review contains many recommendations; the performance of a complex system can often be significantly improved by relatively small changes in its component parts. That has been my intention: to propose an agenda for change; an agenda that will help make the UK the best place in the world for university-business collaboration.

Acknowledgements

In undertaking this Review I have been supported by many people with experience, expertise and enthusiasm for the contribution of business–university collaboration in the economic future of our country. Without their support, and the endorsement of their employers, this Review would have been impossible to undertake.

The Core Team:

Alix Green (Principal Adviser to the Review)
University of Hertfordshire

Christopher Millward
Higher Education Funding Council for England

Andrew Battarbee
Department for Business Innovation & Skills

The Editorial Board:

Colin Monk
University of Brighton

Trudy Norris-Grey
IT & Telecommunications Industry

Dr Malcolm Skingle CBE
GlaxoSmithKline

The Review Panel:

Dr Graham Baldwin
University of Central Lancashire

Professor Cliff Hardcastle
Teesside University

Paul Blackmore
University of Exeter

Professor Helen Higson OBE
Aston University

Dr Richard Blackwell
Southampton Solent University

Keith Robson
Surrey University

Professor Stephen Caddick
University College London

Professor Chris Rudd
University of Nottingham

Dr Phil Clare
University of Oxford

John Widdowson CBE
New College Durham

Research Coordination and the Secretariat:

Higher Education Funding Council for England

Peter Seddon

Nicki Jackson

Fiona Gray

Chris Rowell

The Advisory Board:

Dr David Attwood, BAE Systems
Dr Charlie Ball, HECSU
Alastair Balls, Centre for Life
Professor Alan Barrell, NACUE
Anthony Baxendale, MIRA Ltd
Martin Birchall, High Fliers Research
Helen Bostock, Barclays
Dr Brian Bowsher, National Physical Laboratory
Dr Tim Bradshaw, CBI
Liam Burns, NUS
Jillian Burton, Lloyds Register
Dinah Caine OBE, Skillset
Dr Michael Cooke, Devro plc
Dr Jenny Cooper, National Grid
Professor Geoffrey Crossick, University of London
Professor Bob Cryan, University of Huddersfield
Nicola Dandridge, Universities UK
Michael Davis, UKCES
Professor David Delpy, EPSRC
Hushpreet Dhaliwal, NACUE
Dr David Docherty, CIHE
Martin Doel, AOC
Rob Farace, NHS Institute; Innovation and Improvement
Shaun Fensom, Manchester Digital
Beverley Firth, Mills & Reeve
Dr Sally Ann Forsyth, Goodman
James Fothergill, CBI
David S. Frost CBE, National LEP network
Diana Garnham, Science Council
Dr Steve Gaskin, University of Exeter
Carl Gilleard, AGR
Dr Philip Graham, AURIL/Queens University Belfast
Dr Iain Gray, Technology Strategy Board
Dr Philip Greenish, Royal Academy of Engineering
Libby Hackett, University Alliance
Professor Paul Hannon, NCEE
Anthony Harper, JaguarLandRover
Dr Matthew Harrison, Royal Academy of Engineering
Iain Heath, Centrica
Professor Ray Hudson, University of Durham
Tim Hutchings, HCCI
Professor Jim Iley, RSC
Stephen Isherwood, Ernst & Young LLP
Mark Jefferies, Rolls-Royce Group
Professor Chris Jenks, Brunel University
Dr Christopher Jones, Research In Motion UK Limited
Sarah Jones, ABPI
Professor Ewart Keep, SKOPE
Tony King, Clifford Chance Academy, Clifford Chance LLP
Dr Jeff Kipling, GlaxoSmithKline R&D
Steve Legg, IBM UKI
Andy Leonard, BP Exploration
Dr Ian Lyne, RCUK
Professor Carl Lygo, BPP
Dr Paul Mackenzie, Hexcel
Dr Adam Marshall, British Chambers of Commerce
Paul Marshall, 1994 Group/Assoc of Business Schools
Anne-Marie Martin, AGCAS
Professor Jonathan Michie, University of Oxford
Donna Miller, Enterprise Rent-A-Car
Ellen Miller, London Business School
Geoff Mulgan, NESTA
Dr David Nettleton, National Physics Laboratory
Professor Ric Parker, Rolls-Royce Group
Millard Parkinson, St Helen's College
Jeff Patmore, BT/University of Cambridge
Professor Andy Penaluna, Swansea Met University
Dr Wendy Piatt, The Russell Group
Matthew Pinner, Federation of Small Businesses
Karen Price OBE, e-skills UK
Dr Allyson Reed, Technology Strategy Board
Sameer Savani, A|D|S UK CEO Forum
Ian Shott CBE, Shott Consulting
Colin Sirett, Airbus
Timothy Slack, Airbus
Sonja Stockton, PwC/ Bright Futures
Pam Tatlow, Million +
Professor Brian Turton, Cassidian
Simon Wadey, Airbus
John Walker, Federation of Small Businesses
Sara Weller, formerly Argos
Dr Andy Westwood, Guild HE
Philip Whiteman, Semta
Dr Jackie Wilbraham, AstraZeneca
Kirsten Williamson, Petrus Communications
Dr Astrid Wissenburg, ESRC
Alan Woods OBE, Skills for Justice
Joanna Woolf, Cogent

The recommendations within the Review have been informed by many contributions, some from people with wide generic knowledge of the field, many with specialist expertise. I am indebted to them all for their support. However, the content of this Review and its recommendations remain my responsibility and mine alone.

Professor Sir Tim Wilson DL

Contents

Executive summary

1. Since the Lambert Review (2003) there has been a huge change in both the quantum and the quality of business–university collaboration. This change has not only been stimulated by government funding initiatives but also by a growing realisation, within both business and universities, of the central role of universities in providing high-level skills, a world-class research base and a culture of inquiry and innovation. Universities are an integral part of the supply chain to business—a supply chain that has the capability to support business growth and therefore economic prosperity. However, a sustainable supply chain is not a simple linear supplier–purchaser model; strength and resilience in such a supply chain is derived from close collaboration and an understanding of each party's priorities and capabilities. The objective is to attain world leadership in business–university collaboration; improvements need to be made in the supply chain to attain that status.

2. The landscape of business–university collaboration consists of a large number of highly diverse domains—for example, applied research in advanced technologies, in-company upskilling of employees, bespoke collaborative degree programmes, science park developments, enterprise education, entrepreneurial support for staff and students, higher-level apprenticeships, skills development of post doctoral staff. A second dimension of each domain is defined by industry sector—for example, the creative industries, agriculture, bio-pharma, engineering. Universities operate in specific domains, meeting the needs of a range of businesses; no one university can operate in all domains. Similarly the needs of business align with different domains and it is not unusual for a business to collaborate with several universities in meeting those needs. To achieve world leadership in business–university collaboration, all domains must attain excellence. It is necessary to understand the entire landscape of collaboration in order to ensure that policy intended to improve performance in one domain does not adversely affect performance in another. Knowledge of the effectiveness of the domains in this landscape is currently dispersed and in some domains is dominated by anecdote rather than evidence. A source of authoritative knowledge should be established, a source with a governance structure where business and university leaders sit as equals.

3. Like businesses, universities thrive on competition; competition has been a driver of performance and efficiency. However, in the field of business support the concepts of collaborative advantage also have merit and there are many examples of consortia of universities aggregating their capabilities to meet business needs. Nevertheless, in the context of the university sector as a whole, further clarity of the portfolio of each university's capability, allied with a referral system, will improve collaboration and, critically, the reputation of the university sector. To achieve optimal university performance in business support, universities should make explicit decisions about their domains of operation, ensure that their enquiry systems are effective and establish referral mechanisms to help businesses find the appropriate university support for their needs.

4. In order to enhance graduate skills levels and ensure a smooth and effective transition between university and business environments, there is a need to increase opportunities for students to acquire relevant work experience during their studies. Sandwich degree programmes, internships and work-based programmes all have roles to play in achieving this. Further, measures to promote progression into high-level apprenticeships need to be introduced in

order to meet business needs. Government has a role to play in both these fields through funding support and regulatory changes.

5. There is existing and expanding good practice in business–university collaboration in degree programme design, delivery and sponsorship. This has clear advantages for the company, the student and the university. Where the business–university collaboration supports students who are not a burden on the public purse, government should ensure that the development of such programmes, and the consequential opportunities for students, are not inhibited by regulation.

6. Strategies to ensure the development and recording of students' employability, enterprise and entrepreneurial skills should be implemented by universities in the context of the university's mission and promoted through its public literature to inform student choice. It is for universities to determine the educational context within which those skills are developed and the emphasis that is placed upon the integration of skills development within the curriculum. Extracurricular opportunities for entrepreneurial activities should be facilitated by universities in collaboration with the National Association of College and University Entrepreneurs (NACUE) and other national organisations. The Higher Education Achievement Report (HEAR) is recommended for recording each student's development, activities and achievements for the purposes of self-awareness and future employment.

7. Networking between universities and the business community is a critical component of an efficient innovation ecosystem. There are several established networking tools at national and regional levels that create links between universities, business and research technology organisations. These mechanisms need to be constantly evaluated, reviewed and updated as media innovations change communications capability and expectation.

8. Given the international mobility of corporate investment in research, sustaining research collaboration through establishing strategic partnerships and long-term investment is a measure of UK university research excellence, business commitment and government support. Within the small and medium-sized enterprises (SME) sector, growth in innovation will benefit from further specific and targeted government intervention. The long-established successful Knowledge Transfer Programme merits further investment and the innovation voucher schemes piloted in the West Midlands should be extended to other parts of the country.

9. Despite significant investments and improvements in postgraduate research student skills development, there is need for further development in the context of enterprise skills and business experience. Postdoctoral staff would benefit from similar support. PhD students and postdoctoral research staff should have the opportunity to undertake internships to maintain contact with the application of research.

10. The present investment in Catapult centres is welcomed. The existing innovation and knowledge centres have the potential to provide a pipeline of future centres. It is important that these centres engage with business, universities and other research organisations, exchanging staff expertise in a structured and planned manner.

11. There is widespread concern that the government's policies on immigration will damage the UK's research base. Whether this damage would be caused through perception of regulation or through actual regulation is unclear. This issue needs to be resolved. The UK's research base is

at the heart of its innovative capability; we cannot afford to erode the intellectual capital of our universities through the unintended consequences of our immigration policy.

12. There is a significant misalignment between the aspirations of graduates to obtain employment in the corporate sector and the number of jobs that are available in that sector. Universities have an important role in helping students understand the opportunities that are available in the SME sector or in self-employment.

13. The recruitment processes used by the largest graduate recruiters are highly selective and rigorous but have the potential to deliver outcomes that may be inconsistent with company diversity policies. A review of the parameters used within the pre-interview filters, together with consideration of the use of HEAR in the selection process, should provide the recruiter with improved reliability and therefore a lower risk of inappropriate appointments. The graduate selection processes used by SMEs are variable, normally less formal than the methods used by the corporate sector, and are often tailored by university careers services to meet the needs of the company, placing additional pressures on this service. There is a growth in the use of work experience, either through placements or internships, as a positive factor in graduate recruitment. This emphasises the need to expand work experience opportunities among the student population.

14. Universities have a key role to play in local enterprise partnerships (LEPs) and can benefit from the business connectivity that such partnerships provide. As the LEPs mature in their structures and networks, there are opportunities for universities, individually and as consortia, to support their local economy through proactive engagement, both through increased collaboration with SMEs and through partnerships with major corporates.

15. Universities are international organisations, not only in recruiting students from all parts of the world, but also through international research partnerships and joint venture investments overseas, often with the private sector. They are an underutilised resource in terms of inward investment and job creation. UK universities attract significant research sponsorship from international companies and, whilst there are direct and positive benefits through intellectual property and job creation in universities, there is insufficient attention given to the opportunity for additional investments in the UK from these activities.

16. Enterprise zones provide locations where there are financial incentives for investment and job creation. Several are located close to universities and could benefit from the strength and reputation of those universities in promotion, and from their capacity for research, innovation and high-level skills provision, to attract business. Further, local authorities are acquiring the powers to create enterprise zone conditions within existing and prospective university science parks. This is an opportunity that has the potential to achieve significant economic growth—in some ways emulating the US business clusters that exist around their research-intensive universities, but exploiting the complementary nature of excellence within the UK university sector.

17. If the potential of UK business–university collaboration is fulfilled, the next Review will report that universities are firmly at the heart of our economy, collaborating with business and government in generating the wealth that is necessary for a healthy and prosperous society.

Recommendations

Principles

The UK has made huge progress in business–university collaboration during the last decade; those who have been engaged in this field over that period have noted both the cultural change and the outcomes that have been achieved. But the challenge is to attain world leadership in this field, and further change is needed.

The UK has outstanding potential in the field of business–university collaboration; it develops and attracts some of the best talent in the world and a supply chain ecosystem is already in place. Given the diversity of the existing collaboration, it is not surprising that there are many recommendations in this report; in complex interactive systems relatively minor changes to subsystems can, together, have a profound effect upon the performance of a system as a whole. That has been my objective.

Change in practice can be stimulated by various strategies: change motivated by good management, improving an organisation's performance in pursuit of its objectives; change motivated by direct or indirect funding incentives; change motivated by regulatory requirement. In the past decade all three methods have been used to stimulate business–university collaboration. However, during the formulation of my recommendations I have been very conscious of the limitations of the public purse. And I would prefer less regulation, not more, wherever possible. Most of the recommendations within the Review therefore feature change motivated by leadership and good management: the pursuit of a mission or an objective. Relatively few require funding from the public purse, and wherever possible regulatory changes are intended to remove barriers not to introduce them.

Sustained improvements are best achieved through cultural change: promoting behaviours that may be supported or inhibited by reward, structures, regulations and procedures. But whatever system changes are made, real progress is delivered through belief, commitment and leadership—leadership in universities, in business and in government. In the context of government influence, the role of business–university collaboration in securing economic growth is not solely an issue for the Department of Business, Innovation and Skills (BIS), it relies upon the support of many different government departments; it requires joined-up government to be successful.

Recommendations are made throughout the Review; they are listed below. A reference paragraph is supplied with each recommendation to guide the reader to the section of the Review that supports it. The substantive recommendations feature in this report as italicised and coloured dark red. I have also made recommendations that require reflection by leadership of independent organisations—issues that would benefit from being revisited and re-examined. These are italicised within the text of the report, coloured grey and are set out under the heading 'reflective recommendations' in the section below.

All have a common purpose: to help UK business–university collaboration become a world leader.

Substantive recommendations

Recommendation 1, paragraph 3.2

> The Council for Industry and Higher Education (CIHE) should be invited to develop its structure and its infrastructure to become an independent subscription-based charity that becomes the focus for information on business–university collaboration. It will gather and maintain a comprehensive repository of good practice, undertake commissioned studies and provide a reliable information source for future substantive reviews.

Recommendation 2, paragraph 4.3.6

> National Association of College and University Entrepreneurs (NACUE) has the potential to be a major contributor to the development of entrepreneurialism amongst our student body. It deserves support from business sponsors, universities and government in promoting entrepreneurship. Such support should be conditional on NACUE retaining its close connectivity student entrepreneurial societies, and its active engagement in the Enterprise Alliance.

Recommendation 3, paragraph 4.5.1

> Sandwich degrees should be encouraged through a new compact between students, universities, government and employers, reflecting the benefits to all parties from the enhanced employment outcomes arising from them. The present regulations permit a fee of up to £4,500 for sandwich years. Universities are encouraged to adopt a lower fee; an initial guideline fee of £1,000 is suggested. The Higher Education Funding Council for England (HEFCE) should establish a mechanism whereby universities are incentivised to expand sandwich programmes through changes to the student number controls that it operates. The Student Loan Company should suspend interest charges on any existing loan during the period of the placement. Government should support companies that host students on full sandwich placement years through a tax credit or grant mechanism.

Recommendation 4, paragraph 4.5.2

> Ideally, every full-time undergraduate student should have the opportunity to experience a structured, university-approved undergraduate internship during their period of study. Where such internships are paid, government should examine the feasibility of supporting companies that host students through a tax credit or grant mechanism. Where internships are unpaid, universities should use their 'OFFA funds' to support eligible students rather than condone a policy that could inhibit social mobility.

Recommendation 5, paragraph 4.5.2

> The government-supported graduate internship programme should be continued. However, recognising the constraints on the public purse, it is recommended that only companies entering into the graduate internship programme for the first time are supported by a one-off subsidy. Repeated graduate internships are for the company and/or the university to fund. For the avoidance of doubt, the use of a university's 'OFFA funds' should not be permitted to support unpaid graduate internships.

Recommendation 6, paragraph 4.6.3

The sector skills council (SSC) kitemarking of programmes is to be welcomed in that it is a system of industry recognition that informs students of the nature of the programme and brings employers closer to curriculum definition. It is for universities to decide whether to engage with SSC kitemarking or not. Where individual programmes are kitemarked by a SSC, that fact should be recognised within the Key Information Set (KIS) provided for applicants and included in the university's promotional material. Given the three different business models adopted by the three SSCs, the UK Commission for Employment and Skills (UKCES) should monitor the performance of each business model in terms of recruitment, financial viability and employment outcomes. Any future SSC kitemarking should also be included in such a monitoring activity. A formal review of the effectiveness of SSC kitemarking should be undertaken by UKCES in 2015.

Recommendation 7, paragraph 4.6.5

The government-subsidised scheme for employee upskilling has now finished, and future in-house corporate programmes will fall within the new funding environment. HEFCE should monitor the sustainability of university activity in this field and report trends and significant market failures to government.

Recommendation 8, paragraph 4.6.6

Where the financial support available to a student from an employer is at least comparable to the support available through the Student Loan Company (SLC), and where there is no burden on the public purse, the enrolment of fully sponsored students on programmes that are relevant to the business of their employer should be outside the student number controls operated by HEFCE.

Recommendation 9, paragraph 4.7

Foundation degrees should be reaffirmed as a qualification in their own right rather than necessarily as a stepping stone to an honours degree. Pathways, including higher-level apprenticeships and professional qualifications, should become a priority development and be the subject of promotion amongst careers advisory services.

Recommendation 10, paragraph 4.7

Foundation degree-awarding powers should be revisited to enable consortia of FE colleges, or a national CNAA type organisation, working in partnership directly with employers and/or SSCs, to obtain such powers.

Recommendation 11, paragraph 4.8

Universities should publish the job destinations of recent full-time postgraduate taught students, by department as soon as possible. The development of a distinctive postgraduate KIS should be a priority development for HEFCE.

Recommendation 12, paragraph 4.8

HEFCE should monitor 'postgraduate taught' enrolments and identify any barriers to enrolment that have been created by the new student loan system and advise the government of its conclusions.

Recommendation 13, paragraph 4.8

The Association of Graduate Recruiters (AGR), CBI and Universities UK (UUK) should undertake research into the skills requirements of UK business of 'taught postgraduate' students to inform universities of business needs in this regard.

Recommendation 14, paragraph 5.5.3

The Technology Strategy Board (TSB) should work with universities, research funders and business to establish a boundary-scanning capability with intelligent brokering to facilitate innovation. This could include open innovation projects exposing existing research information on challenge areas, providing a valuable resource for business. When established, this facility should have the capability to reciprocate its service, linking companies in relevant sectors to universities seeking collaboration to develop applications for its research.

Recommendation 15, paragraph 5.6

The TSB, with Research Councils UK (RCUK) and UUK, should evaluate the present schemes of secondment of staff, identify strengths and weaknesses within the research portfolio and propose measures to strengthen these business–university links. Such a study should include the roles of fellows and entrepreneurs in residence within Catapult centres.

Recommendation 16, paragraph 5.6

All full-time postdoctoral research staff should have the opportunity to benefit from 8 to 12 weeks' of work experience outside academe every three years during their contract. They should receive career guidance from the university's professional staff each year of their employment as an integral part of their appraisal, and be encouraged to attend a short intensive enterprise skills programme alongside postdoctoral staff from other departments of the university. For the avoidance of doubt, these measures should be integrated within the contracts of postdoctoral research staff and, where possible, embedded within external funding arrangements.

Recommendation 17, paragraph 5.6.1

The TSB is encouraged to build on proven success and expand both the KTP and the mini-KTP programmes to meet the needs of business. The TSB should also be encouraged to find mechanisms to facilitate networking between KTP associates as part of a broader agenda to unify the people exchange programme. For a limited number of appropriate cases, the TSB should consider raising their current financial contribution for salaries where it is necessary for postdoctoral staff to be employed on a KTP programme.

Recommendation 18, paragraph 5.6.2

The innovation voucher scheme should be reintroduced under the governance structure of the TSB, working through the LEP network, which will determine local eligibility criteria. The government may wish to advise the TSB on the broad parameters of fund distribution in the light of its priorities for economic regeneration. The value of the voucher should be set by the TSB after consultation with the LEP network and experienced university providers.

Recommendation 19, paragraph 5.8

Building on the innovation and knowledge centres and other models, the TSB and RCUK should

seek to identify areas which are not yet ready or appropriate for the Catapult model but for which there is an industry appetite for research-base interaction or new market areas. Coordination of existing schemes for these smaller centres within an umbrella scheme has the potential to provide a dynamic pipeline for Catapult centres.

Recommendation 20, paragraph 5.9.2

To inform prospective doctoral students of potential career opportunities, universities should publish the job destinations of recently completed doctoral students, where possible by department, at the earliest opportunity.

Recommendation 21, paragraph 5.9.3

All full-time PhD students should have an opportunity to experience at least one 8 to 12 week internship during their period of study and should be encouraged to attend a short intensive enterprise skills programme alongside research students from other departments of the university. Universities should increase support for postgraduate students seeking to set up their own businesses.

Recommendation 22, paragraph 5.10

The government, CBI, RCUK and UUK should jointly evaluate the impact of UKBA controls upon the likely future health of our research base.

Recommendation 23, paragraph 6.3

As a matter of priority HEFCE—supported by The Association of Graduate Careers Advisory Services, the Enterprise Alliance and the Higher Education Statistics Agency (HESA)—should undertake a critical examination of the definition of graduate employment, and of the reliability of the present system of data collection and analysis, to ensure that the KIS provides a fair and accurate picture of graduate employment within six months of graduation. Further, HEFCE should undertake preliminary work, with the SLC as appropriate, to establish whether a reliable system of graduate career progression could be supported by HMRC data on longer-term earnings.

Recommendation 24, paragraph 6.4.1

Graduate recruiters using filtering mechanisms should undertake a systematic and frequent review of screening algorithms in the light of the qualities of the graduates that the company has recruited and the diversity objectives of the company.

Recommendation 25, paragraph 6.4.1

The AGR and the Chartered Institute of Personnel and Development should jointly assess the use of the Higher Education Achievement Report (HEAR) in graduate recruitment and advise their members of the changes that will be required to exploit its potential. At the earliest opportunity employers should use HEAR as a reference base for evaluating student achievement and skills.

Recommendation 26, paragraph 6.4.3

University careers services and their local enterprise partnership (LEP) should collaborate to establish a skills supply chain between universities and local business, integrating placements, internships and employment services.

Recommendation 27, paragraph 7.2.1

LEPs have the potential to have a significant influence upon economic growth in their localities. Universities are key players in the supply chain for research, innovation and skills; they should be at the heart of an LEP. Government should work with the LEP network to understand local priorities and needs for government funding, including activities supporting generic business–university engagement.

Recommendation 28, paragraph 7.3.4

UK Trade & Investment (UKTI) should reconsider the role of universities in providing critical intelligence, support and ambassadorial engagement with potential investors.

Recommendation 29, paragraph 7.3.5

As enterprise zones develop management structures and clarity around their specific offer to inward investors, local universities and UKTI should be strongly engaged to deliver coherent international promotion of each enterprise zone.

Recommendation 30, paragraph 7.3.5

Universities, UKTI, local authorities and LEPs should work together with other relevant organisations (such as the UK Science Park Association) to develop coherent routes for the international promotion of available space and development opportunities in university-linked science and innovation parks. Further, the government, in conjunction with the LEPs, should examine the benefits of using local authority enterprise zone type measures such as simplified planning or local taxation to support university-linked science and innovation parks.

Reflective recommendations

Recommendations within this section identify issues that inhibit the efficiency of business–university collaboration, but where there is no common solution. Rather each recommendation should be considered by university, business and government leaders in the context of their own organisation's role, position and contribution to the business–university supply chain.

Reflective recommendation 1, paragraph 3.3

Both business and university leaders should reflect upon their organisational knowledge of the full landscape of business–university collaboration, and on the management of the partnerships that they have. For universities this reflection should extend to strategic decisions concerning the domains that the university wishes to provide; for business it should extend to matching needs to those universities that best meet their requirements within the appropriate domain.

Reflective recommendation 2, paragraph 3.4

> Collaboration between universities in supplying business needs can only benefit the university sector as a whole. Universities may wish to reflect upon the concepts of collaborative advantage in meeting business needs and review their policies on the referral of business enquiries to other universities or relevant agencies. This policy should extend to consortia of universities and the operation of such referral systems should be assured by any government agency that funds such consortia.

Reflective recommendation 3, paragraph 3.5

> Universities that do not regularly review the effectiveness of their enquiry management systems should undertake an audit to ensure efficient first-level responsiveness; an ineffective relationship management system carries significant reputational risks.

Reflective recommendation 4, paragraph 4.3.1

> Universities should decide whether to introduce formal skills diagnostics for their students and, if they do so, whether they are discretionary or mandatory. Such practice should feature in promotional literature available to prospective students, covered at open day/applicant day/interviews and initiated early in the first year of the undergraduate programme of studies.

Reflective recommendation 5, paragraph 4.3.2

> Universities should reflect on the opportunities that are provided for students to develop employability skills through the formal learning methodologies used within the university and ensure that students are able to articulate the skills that they have developed through their learning experiences. It is for universities to ensure that their staff have the appropriate skills to support students in this process.

Reflective recommendation 6, paragraph 4.3.3

> Universities should reflect on the strategies they use to ensure that students have the opportunity to develop enterprise skills both through the formal curriculum and through optional study or practice, and reflect on the integration of enterprise education in the professional development programmes for academic staff.

Reflective recommendation 7, paragraph 4.4

> The practice of business and alumni mentors supporting undergraduate students should be evaluated by the Higher Education Academy (HEA) and the conclusions disseminated throughout the university and appropriate business sectors.

Reflective recommendation 8, paragraph 4.5.2

> Unpaid graduate internships are common in some fields of business. Universities may wish consider the boundaries of ethical practice in internships and reflect on whether they continue collaborating with companies that do not meet the university's ethical standards.

Reflective recommendation 9, paragraph 4.5.4 and paragraph 6.4.1

> Universities that have not committed to engaging with HEAR should reflect upon the impact of that decision upon the skills development and subsequent employment prospects of their graduates.

Reflective recommendation 10, paragraph 4.6.1

Universities that work with employers through industry advisory groups should consider including the existence of such a group, its membership and its influence, within the university's enterprise strategy and within the material that it provides to applicants and students.

Reflective recommendation 11, paragraph 4.6.4

The Society for Biology, responding to the needs identified by the Association of British Pharmaceutical Industries (ABPI), is developing an accreditation process for degree level programmes. The Society should reflect on measures to accelerate its development.

Reflective recommendation 12, paragraph 4.9

In the context of encouraging more UK students to study or to take an internship/placement outside the UK, universities, together with the students' unions, should reflect on mechanisms that promote international internships and placements amongst the student body.

Reflective recommendation 13, paragraph 4.9

Universities and their LEPs should reflect on how the international multilingual nature of a university community can be utilised for the benefit of local business.

Reflective recommendation 14, paragraph 5.3

BIS and UKTI should reflect on mechanisms to support international investment in the university research base and to ensure that such inward investment is fully exploited in the context of economic growth in the UK.

Reflective recommendation 15, paragraph 5.5.3

The portfolio of knowledge transfer networks (KTNs) funded by the TSB is an acknowledged resource facilitating networking in industry sectors. Although they were reviewed two years ago, the TSB may wish to re-evaluate and if necessary refresh the KTNs and reassess whether the networking tool *in_connect* provides a value for money solution to its networking activities.

Reflective recommendation 16, paragraph 5.7

At an operational level within the Research Councils, business input is sought during proposal assessment processes. Contributions to this Review report business representatives being discouraged by the amount of paperwork involved. The councils may wish to review their processes and seek new methods that will lighten the burden upon panel members from business, whilst maintaining their influence.

Reflective recommendation 17, paragraph 5.7.1

In the rapidly changing environment of research translation it is essential that there is a systematic interaction between RC and TSB governing bodies and staff in order to ensure there are ongoing agreements about which services are offered on an open basis to which markets. The strategic partnership group (director-level individuals from RCUK and TSB) should propose measures to ensure that such interaction is established.

Reflective recommendation 18, paragraph 5.9.1

A shorter postgraduate programme is worth further consideration by universities working in partnership with business. For example, a two-year masters level programme may provide a more business-focused offering and help address some of the uncertainties of the future of masters level PG programmes. This MPhil equivalent would be cost-effective and potentially encourage earlier transition of talented PG students into the world of work, whilst maintaining the benefit of research-led education.

Reflective recommendation 19, paragraph 6.3

The Key Information Set (KIS) provided to undergraduate applicants is unproven. HEFCE should review the use of the KIS by applicants on an ongoing basis in order to inform future developments.

Reflective recommendation 20, paragraph 6.3

To provide students with information about career prospects, universities may wish to establish a four-year career projection from a sample of their graduates as supplementary information for use in parallel to the KIS. To provide a common framework, universities may wish to ask UUK to commission preliminary design work in this field.

Reflective recommendation 21, paragraph 6.4

Large companies represent only a fraction of the opportunities available for graduate employment, yet are disproportionately popular in terms of graduate application. Universities should reflect on how students' perceptions of employment with small and medium-sized companies could be improved.

Reflective recommendation 22, paragraph 6.5

Given the changing nature of careers services in the sector, universities may wish to review the physical and organisational position of their careers service and the level of interaction it has with the students, employers and the academic community.

Reflective recommendation 23, paragraph 6.5

Careers and employability support will become a recognised part of the ongoing student experience, rather than an aspect that only captures the attention of students in the final year of a degree study. At that stage it may merit inclusion within the National Student Survey. At the next iteration of the National Student Survey, HEFCE may wish to consider how careers and employability support provided by universities could be included.

Reflective recommendation 24, paragraph 7.4

The influence of universities in economic growth extends across many parliamentary constituencies. Members of Parliament may wish to reflect upon their knowledge of both the present and potential contribution of their nearest universities to the economic prosperity of their constituencies and their individual roles in supporting business–university collaboration in that regard.

Chapter 1: Introduction and methodology

1.1 Introduction

We also want our universities to look again at how they work with business across their teaching and research activities, to promote better teaching, employer sponsorship, innovation and enterprise. We have asked Professor Sir Tim Wilson, former Vice Chancellor of the University of Hertfordshire, to undertake a review into how we make the UK the best place in the world for university–industry collaboration.

White Paper: Putting Students at the heart of higher education. paragraph 13, June 2011

1.2 Role of universities in business support

The economic and social prosperity of the UK depends upon healthy, wealth-producing businesses. UK companies face challenges unparalleled in recent history; constantly increasing global competition, the impacts of the financial crisis and international instability are just some of the factors that face the UK's business leaders. Never before has there been a greater need for innovation in product and service development, for heightened corporate efficiency, for risk management in investment. Never before has there been such a focus on securing, retaining and developing talent amongst the workforce. The UK university sector is a national resource that has a central role to play in supporting UK business success in addressing these challenges.

Universities are an integral part of the supply chain to business, a supply chain that has the capability to support business health and therefore economic prosperity. A thriving knowledge economy depends upon its universities in three critical dimensions: the application and exploitation of research capability; the enterprise and entrepreneurial culture that is developed amongst its students; and the applicability of the knowledge and skills of all its graduates.

The university sector cannot achieve excellence in these roles by itself; a sustainable supply chain is not a simple linear supplier-purchaser model. Supply chains that excel in performance are those where collaboration is strong and resilient; where there is constant communication in both directions, both operational and strategic; where there is a common understanding of the objectives of the other party; where there is a willingness to change existing practices to meet the needs of the collaborators; and where the boundaries of capability are transparent and respected. In these contexts there are a number of weaknesses in the present business–university supply chain and this Review attempts to identify those and makes recommendations that will strengthen the weak links.

For UK universities to take their place as world leaders in business support and interaction, we need a new covenant between business and universities: a covenant that generates partnerships and collaboration, a covenant that can only be achieved through greater communication and understanding. Government has a role to play in achieving that by creating an environment that enables and promotes such relationships. But the primary responsibility for success lies with the primary parties: university and business leaders.

1.3 'The best place in the world for industry–university collaboration'

To achieve the accolade of 'world leader' requires a notion of the attributes that justify such a status. There is no accepted definition of such attributes. For the purposes of this Review the following definition is adopted.

World-leading business–university collaboration is dynamic and interactive, leading to:

1. The design and delivery of programmes that are relevant to current and future business needs, ensuring progression opportunities at every level of achievement and a smooth transition between the different environments of universities and business;
2. Graduates who seek knowledge and skills that are relevant to their future careers and who are confident in their ability;
3. Opportunities for students to integrate work experience and study, ensuring connectivity between academic study and the world of employment;
4. An enterprising and entrepreneurial culture amongst university students and staff, where success in enterprise and entrepreneurship is celebrated, rewarded and promoted;
5. Businesses effectively and efficiently updating employee skills and seeing universities as a natural source of the expertise to do so;
6. Graduate recruitment that matches business need with graduate skills, meets the diversity objectives of employers, is seen to be fair by the student population and provides performance feedback to universities and students;
7. Sustaining world-class research within our universities, attracting the best talent to the UK, developing research informed leaders in both universities and business, and ensuring that there is a constant exchange between academe and business of research ideas and people;
8. A culture of pursuing the application of university-based research excellence, ensuring that university research capabilities are fully exploited in generating economic wealth, optimising the use of government support in research, innovation and development;
9. Collaboration with government agencies to undertake regular forward looks to co-identify areas of future knowledge and capability creation, where research investment should be allocated and, wherever possible, collaboratively developed and resourced;
10. Recognition that the university sector represents a diverse set of institutions, each with its own portfolio of business support capabilities, leading to an optimal matching of business need with university strength;
11. The creation of economic growth through partnership with government agencies and LEPs , leveraging each university's capabilities to support indigenous companies and to attract inward investment;
12. UK universities being championed by business leaders and government agencies as being world class in business support and a primary reason for investing in the UK.

If the recommendations within this Review are enacted then the objective of making *the UK the best place in the world for industry–university collaboration* will be significantly closer.

1.4 Boundaries of the Review

I am conscious that not all institutions that deliver higher education (HE) carry the name 'university' and to differentiate those institutions throughout this report would lead to unnecessary repetition. For the purposes of this Review, all institutions that hold degree-awarding powers and those FE colleges that deliver validated degree-level programmes are included within the generic term 'universities'.

I am also conscious that this Review focuses upon the business–university collaboration in the context of the English Higher Education system. I have not hesitated to use information and case studies from across the UK in writing this report and much of the content of this Review is equally valid in the context of other parts of the UK. Nevertheless some of the recommendations I make may not apply outside England.

The Review does not include any consideration of the role that universities play in meeting the needs of the public sector, although the role of social enterprise in supporting charitable organisations is included in the context of enterprise education. The mechanisms for funding the exploitation of curiosity-driven research by university-owned spin-out companies, whilst briefly examined, does not receive the in-depth study that it deserves. To do so would have driven the Review into a specialist area not consistent with the broad theme of business–university collaboration.

Universities have a wider purpose than to support economic growth, and business collaboration is only one of a set of interactions that universities have with partner organisations. Conversely, many of their partner organisations also have strong collaboration with organisations outside the university sector, and therefore outside the scope of this Review. This applies particularly in research and innovation where there are several key research organisations that are not within the university sector but collaborate with both universities and business, and could be impacted by the recommendations made in this Review. In that context, the inherent risks of "unintended consequences" have been managed through the Review's methodology of iterative consultation, a process that has included organisations outside the scope of the Review.

1.5 Methodology

The landscape of business–university collaboration changes rapidly and any study of these dynamic relationships can only be based upon the landscape at one particular moment in time. Within the landscape, universities and businesses have together developed a hugely diverse range of strategies and partnerships, often with government support. The success of some strategies has been the object of rigorous evaluation; others are so recent that such analysis does not yet exist and their benefits may not be realised for several years. This Review has been undertaken in a six-month period. It cannot claim to be a rigorous piece of academic research; its conclusions and recommendations are based upon informed judgement.

I am aware that the Review may be seen as driven by the supply side of business–university relationships. To some extent this is true; it has been a deliberate feature of the methodology. In a situation where there are around 140 suppliers and tens of thousands of clients, and where each supplier is providing multiple services to multiple clients, critical self-appraisal of the supplier is a legitimate and useful exercise. However, the Review does not depend solely upon universities' perspectives of their own collaboration with business; it has been validated by business input and

has embraced business perspectives on strengths, weaknesses and opportunities in business–university collaboration.

The Review has been supported by a number of key groups:

- A Core Team of colleagues who have not only contributed their own expertise in this field but have driven the project forward, ensuring that deadlines have been met and providing the constant challenge that I found invaluable throughout my professional career.
- A Review Panel of contributors with both in-depth experience of business–university collaboration and a culture of evidence-based research. Their contributions provide the foundations of this report.
- An Editorial Board of business and university representatives: people with considerable personal and organisational experience in the field. Their challenges and comments have been invaluable during the final stages of the Review.
- An Advisory Board of individuals with experience and expertise in the field, often in specific areas of activity. Their insights and knowledge have not only informed the Review, they have guided its direction.

During the six months of this Review, I have adopted an iterative approach to arriving at my recommendations. A period of initial research and discussions with people with a wealth of experience in this field informed the publication of a set of think pieces; documents designed to invite comments, corrections and evidence. The distribution of these think pieces to the Advisory Board and their publication on a Review website[1], together with blog and twitter conversations, provided a body of evidence and opinion from many sources, often from those with experience and expertise in the field. In parallel to this iterative process, the Review Panel moulded their contributions around the evidence being gathered through the consultation process, their own knowledge of their specialist fields and the existing published research.

Informed by this formative work, I published a set of indicative recommendations circulated to the Advisory Board and to other relevant parties for further feedback. In the final phase of the Review I have sought to consolidate the contributions from the Review Panel and the evidence received through this iterative process into a coherent report. During this latter process I have been supported by the Editorial Board, whose input and guidance has been invaluable.

This process of iterative evidence-gathering and informed judgement has served to crystallise my initial views into a set of recommendations that I believe will move the UK business–university collaboration towards world-class status.

1.6 Reflections on the Review process and outcomes

When I started this Review in July 2011 I expected to uncover a wide landscape of existing good practice in business–university collaboration. That expectation has been exceeded.

The diversity of our university sector is a huge strength and it should be recognised and celebrated; it has the capability of playing a major role in the future economic prosperity of our country. The Review identifies many areas where improvement can be achieved with relatively small changes; the real benefit will be derived from the synergy of comprehensive implementation. I trust that this

[1] http://www.wilsonreview.co.uk

Review will act as foundation for progress and enhancement; good practice benefits from positive change and world leadership in business–university collaboration is a challenging target.

If the potential of UK business–university collaboration is fulfilled, the next Review will report that universities are irrevocably at the very heart of our economy, collaborating with business and government in generating the wealth that is necessary for a healthy and prosperous society.

I look forward to reading that Review.

Chapter 2: A History of recent government policy on business–university interaction

2.1 Introduction

Since the 1990s several government policy initiatives have sought to promote business–university interaction. Those who have experienced the impact of these interventions are able to reflect upon a major shift in the environment for, and culture of, business–university interaction during this period. It is notable that business–university interaction, and its development, has enjoyed all-party support, reflecting the fundamental importance of this relationship to the UK economy. There have been many changes as a result of these policies and initiatives; the recommendations within this Review seek to build upon those changes.

The establishment of the Department for Innovation, Universities and Skills (DIUS), and subsequently the Department for Business, Innovation and Skills (BIS), has proved to be a key governance change in the field of business–university interaction. Hitherto policy in this sphere had been divided between the trade and education ministries, hence defining two different strands of activity focusing on innovation and skills respectively. Policy now emanates from a single government department, although there is a challenge for such a large department to achieve all synergies between its multiple interests in the role of universities.

In terms of direct funding, universities now receive a single funding stream of Higher Education Innovation Funding (HEIF). This funding supports a wide range of business–university interaction and rewards success in generating business income. Within this framework, universities define priorities according to their own missions and localities, and this has yielded benefits in areas such as the contribution of science and technology to business competitiveness, improving graduate enterprise and employability, and addressing specific business skills requirements.

In parallel with the evolution of the support from HEFCE, the Research Councils (RCs), coordinated by RCUK, have developed their portfolio of funding streams to promote business–university collaboration and the exploitation of research. In recent years the TSB has emerged as a major influence in research exploitation, focusing its investments in new business opportunities for the application of research and research capability.

These changes have taken place in parallel to a shift away from linear notions of technology transfer and graduate recruitment, to the more sophisticated and integrated notion of an ecosystem of business–university interactions.

2.2 Innovation and knowledge exchange: developing the ecosystem

Prior to the 1990s, government policy had already changed the research exploitation system from one in which universities published their research findings and industry managed the subsequent intellectual property and innovation, to one in which universities were encouraged to enhance their 'technology push', developing their own intellectual property methods through patenting, licensing and spin-outs. This 'linear model' of research exploitation has since been succeeded by a focus on more complex interactions between universities and business, particularly following the 1993 Science and Technology White Paper, 'Realising our Potential'[2].

[2] http://www.official-documents.gov.uk/document/cm22/2250/2250.pdf

The ecosystem approach has sought to determine the roles of contributors relevant to innovation and to establish frameworks and incentives, overseen by government, to encourage collaboration through a process of 'knowledge exchange'.

2.3 Interventions by the Higher Education Funding Council for England

A decade ago, HEFCE developed support mechanisms for knowledge exchange, both in the form of funding and in the collection, analysis and communication of activity. Measures embraced activity from the research and teaching missions of universities, capturing the contributions of universities to enhancing innovation through student and staff enterprise. Building on HEFCE's 'Higher Education Reach Out to Business and the Community (HEROBC)' fund established in 1999, and the then Department of Trade and Industry's 'University Challenge'[3] and 'Science Enterprise Challenge'[4] funds, the HEIF[5] has increased from £78 million in its first round (2001-2004) to £150 million per annum during the current spending review period (2011-2014). This funding has evolved from a competitive process to one where funding is allocated by 'success', rewarding income generation. Alongside this funding intervention, the 'Higher Education Business Community Interaction (HEBCI)'[6] survey was introduced to measure knowledge exchange activity, demonstrating a 34 percent increase in income from 2003 to 2004 to more than £3 billion in the latest survey of 2009 to 2010. For every £1 invested through HEIF, universities in England have produced a return in excess of £5[7].

2.4 Research and innovation

The long-term commitment to a specific funding stream, allied to increasing funding for the research base, was announced in the government's 'Science and Innovation Investment Framework' in 2004[8], responding to the 'Lambert Review of Business–University Collaboration'.[9] It placed business–university collaboration firmly within the portfolio of UK universities.

2.4.1 The Lambert Review

Amongst many findings, the Lambert Review identified that companies located their research and development (R&D) activities near excellent research bases and important markets. Raising the demand from business for R&D in the UK was identified as a major challenge. The review recommended a series of measures to enhance business–university interactions, including improving intellectual property negotiations and reducing the focus on university spin-out companies. The Lambert Review was followed by two subsequent reports: the Lambert reports[10] [11]on Intellectual Property, which provided template agreements for business–university research collaboration.

2.4.2 The Warry Report

The Warry Report (2006)[12], sponsored by RCUK, identified how the RCs could make a step-change in promoting and demonstrating the economic and social impact of their investments, building on the existing CASE studentships, the RC 'follow-on' funding to support research exploitation, and

[3] http://www.bis.gov.uk/policies/science/knowledge-transfer/earlier-schemes/university_challenge_seed
[4] http://www.bis.gov.uk/policies/science/knowledge-transfer/earlier-schemes/science_enterprise_challenge
[5] http://www.hefce.ac.uk/econsoc/buscom/heif
[6] http://www.hefce.ac.uk/econsoc/buscom/hebci
[7] http://www.hefce.ac.uk/pubs/hefce/2009/09_15
[8] http://www.hm-treasury.gov.uk/ent_sciinnov_index.htm
[9] http://www.hm-treasury.gov.uk/lambert_review_business_university_collab.htm
[10] http://www.ipo.gov.uk/whyuse/research/lambert/lambert-mrc/lambert-mrc-outline.htm
[11] http://www.ipo.gov.uk/whyuse/research/lambert/lambert-mc/lambert-mc-outline.htm
[12] http://www.rcuk.ac.uk/Publications/archive/Pages/Increasingei.aspx

collaborative research initiatives. Since April 2009 all applicants applying for RC research grants, are required to produce an Impact Summary and Pathways to Impact statement.[13]

2.4.3 The Sainsbury Review

The demand side of business–university collaboration was stimulated by funding targeted at business; the TSB and the Regional Development Agencies (RDAs) took active roles in promoting collaboration. The 2007 Sainsbury Review 'The Race to the Top'[14], and the subsequent 2008 'Innovation Nation'[15] White Paper, identified specific leadership roles for the TSB, working with RCs and complementing a renewed and refocused HEIF. The Sainsbury Review identified the performance of a national innovation ecosystem—including a wide range of actors extending from universities to research institutes, government funders and regulators, business and investors—as central to the country's innovation rate, and it specified the contributions that should be made by different parties.

During their existence the RDAs had a significant impact upon many universities, although the extent of this impact varied between regions: investing in universities through skills development initiatives and with capital inputs to support science/innovation parks. The TSB has now become a primary funder of collaborative research and innovation since its formation, engaging universities with business through structured networking and people exchange: roles that have been widely welcomed by both the university and business community.

2.4.4 The Coalition government

The Coalition government affirmed the commitment of previous administrations to business–university collaboration as a policy priority. In its first 'Comprehensive Spending Review'[16] in 2010 and its 'Innovation and Research Strategy'[17] in 2011 it has continued the government's support despite a climate of fiscal retrenchment, and in doing so emphasised the importance of universities in supporting the government's priority of economic growth. LEPs, targeting economic growth within localities, have undertaken many of the responsibilities of the former RDAs; their impact will be measured in years to come.

2.5 Employer engagement and skills

Much of the UK Higher Education (HE) system was founded in the context of supplying graduates with the skills needed by employers. The growth of civic universities was in part linked to providing graduates for professions such as medicine and engineering. The former polytechnics were distinctive in their links with business, providing a range of high-skill vocational provision particularly in the sciences and technologies. Now a single university sector for more than two decades, universities have evolved into a highly diverse set of institutions. In parallel, further education colleges (FECs) have become a distinctive part of the HE system, often with students with different educational backgrounds than traditional university students.

For many institutions, employer engagement has become firmly cemented within their academic culture. This has been achieved through innovation in teaching and learning; in-company programmes, industry designed courses, and placement and internships for students. In recent years

[13] http://www.rcuk.ac.uk/kei/impacts/Pages/home.aspx
[14] http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/d/sainsbury_review051007.pdf
[15] http://www.bis.gov.uk/assets/biscore/corporate/migratedD/ec_group/18-08-C_b
[16] http://www.hm-treasury.gov.uk/spend_index.htm
[17] http://www.bis.gov.uk/assets/biscore/innovation/docs/i/11-1387-innovation-and-research-strategy-for-growth.pdf

there has been a growth of whole curriculum-based approaches to developing graduate employability, and a rapid growth in enterprise education and entrepreneurship amongst the student body. In parallel, foundation degrees, which provide employer-relevant qualifications, have grown from 4,300 enrolments in 2001 to 103,000 by 2010.

2.5.1 Following the Dearing Review: employability skills

The enhancement of employability skills has been a constant target of funding interventions. During the 1990s, these included the Enterprise in Higher Education (EHE), and the Fund for the Development of Teaching and Learning (FDTL). Responding to one recommendation in the Dearing Review[18], HEFCE established the Teaching Quality Enhancement Fund (TQEF)[19], which had graduate employability as one of its priorities. The fund supported the establishment of new agencies—the Learning and Teaching Support Network and the Institute of Learning and Teaching—to support subject-level initiatives and staff development, including communities of practice on employer engagement. These agencies, alongside the Enhancing Student Employability Coordination Team[20], which developed academic approaches to employability development, were subsequently merged into the HEA, which continues to support HE today.[21]

The Government's 2003 White Paper 'The Future of Higher Education'[22] launched the Centres of Excellence in Teaching and Learning (CETLs), which included 22 centres focused on employability, enterprise and work-based learning.[23] In addition to enhancing teaching excellence in these areas, there was a focus on encouraging more students to progress into and through university, particularly students following vocational routes. In 2004, HEFCE also launched the Lifelong Learning Networks[24], which established collaborations between universities and FECs, with a particular focus on curriculum development to support progression for vocational learners.

2.5.2 Postgraduate skills

Investment to enhance the employability of graduates was extended to postgraduate students and post-doctoral researchers following the 2002 'SET for Success' report[25], which identified the need for better training and support for the diversity of research careers. This need was subsequently emphasised by both the Warry Report (2006) and the Leitch Review of skills (2006). Responding to these reports, the RCs have invested £120 million in research training activities to enhance employability over an eight-year period. Although the RCs only support around one quarter of the postgraduate research students registered, this funding was made available for the support of all such students; it was intended to become an established feature of research careers. From 2007, more emphasis has been given to support in areas such as business planning, intellectual property and entrepreneurship, in response to the 'Excellence with Impact'[26] report. These allocations are now embedded within the RCs' funding processes.

---

[18] National Committee of Inquiry into Higher Education http://www.leeds.ac.uk/educol/ncihe
[19] http://www.hefce.ac.uk/learning/enhance/tqef.asp
[20] Association of Graduate Careers Advisory Services, the National Union of Students, the Association of Graduate Recruiters, the Centre for Recording Achievement, the Higher Education Academy (then the LTSN)
[21] http://www.heacademy.ac.uk/employability
[22] http://www.bis.gov.uk/assets/biscore/corporate/migratedd/publications/f/future_of_he.pdf
[23] http://www.heacademy.ac.uk/resources/detail/employability/EEL_CETLs_Review
[24] http://www.hefce.ac.uk/widen/lln
[25] http://webarchive.nationalarchives.gov.uk/+/http:/www.hm-treasury.gov.uk/d/robertsreview_introch1.pdf
[26] http://www.rcuk.ac.uk/Publications/archive/Pages/TheWarryReport.aspx

2.5.3 The Leitch Review

The 2006 'Leitch Review of Skills'[27] signalled a shift of emphasis away from the broad employability of graduates towards specific workforce skills, including macro targets for workforce participation in HE through to 2020. The report noted that the supply of graduates from the traditional 18 to 21 year cohort would be insufficient to meet the country's high-level skills needs, and recommended a rebalancing of priorities to include the whole adult workforce. A substantial proportion of the workforce in 2020, it was argued, had already left compulsory education, so those in employment should be a focus for upskilling.[28] Leitch also recommended joint funding for this education, with employers contributing more in recognition of the returns to them from a more highly skilled workforce.

As part of the government's response to the Leitch review, HEFCE sought 'to develop a new model for funding HE that is co-financed with employers, achieves sustained growth in employer-based student places and introduces the principle of employer demand-led funding.' A Workforce Development Programme[29], invested over £150 million over 2008-2011 in universities to develop their operations with employers around a new co-funding model. Through funding on the supply side, universities were challenged to generate sufficient demand to meet a government target of 35,000 new workforce entrants by 2011. It is anticipated that this target will be achieved, with £38 million co-funding contributions from employers. This activity was supplemented, following the 2008 recession, by an economic challenge investment fund (ECIF)[30], which included measures to enable graduates to work in small businesses as interns.

2.5.4 The Coalition government

The implementation of the reforms detailed in the White Paper 'Students at the Heart of the System'[31] will have a significant impact upon business–university collaboration. A key aspect of the reforms is a shift from government grants to universities, to loans and grants to students, including part-time learners. The government's aspiration is to create a system within which the employment expectations of fee-paying students, allied to enhanced information on employment outcomes, will encourage universities to increase support for students in the context of employability and their transition into work. The reforms also seek to enhance the role of FECs and the private sector in providing vocational HE, creating a competitive HE market. In parallel, the government's November 2010 skills strategy 'Skills for Sustainable Growth'[32] promotes apprenticeships, including an additional 10,000 at the higher level.

2.6 Non-governmental interventions

Whilst the importance of business–university collaboration in the context of economic development has prompted government interventions described in this chapter, university and business organisations have adopted their own policy frameworks. There has been a parallel growth in intermediary bodies, both from the public and the private sector; UUK has formed a specialist standing committee, which develops UUK policy in this field; universities have key representation within the CBI's innovation and skills committees; the CIHE has established itself as a body where

[27] http://www.official-documents.gov.uk/document/other/0118404792/0118404792.pdf
[28] This required an increase in the proportion of people qualified to Level 4 and above from 29 percent in 2006 to > 40 percent in 2020
[29] http://www.hefce.ac.uk/econsoc/employer
[30] http://www.hefce.ac.uk/econsoc/challenge/ecif.htm
[31] http://bis.gov.uk/assets/biscore/higher-education/docs/h/11-944-higher-education-students-at-heart-of-system.pdf
[32] http://www.bis.gov.uk/assets/biscore/further-education-skills/docs/s/10-1274-skills-for-sustainable-growth-strategy.pdf

business and university leaders attend as equals, promoting and evaluating collaboration; the majority of LEPs have university representation at board level. CBI HE taskforce report (2009) set an agenda for improving business–university collaboration[33]; The CBI's annual skills survey[34] and the UK Commission for Employment and Skills (UKCES) annual skills surveys[35] are now both core publications in evaluating the congruence of high-level skills within our workforce and the skills profiles of our graduates.

2.7 Reflections

Universities are not the only suppliers of high-level skills and research/innovation services to business. In education and training there are many private sector providers, not accredited by universities, which make a valuable contribution to the skills supply chain. Similarly in research and innovation there is a thriving research and technology organisations (RTO) sector, which has a major impact upon our research capacity and exploitation. Both these communities fall within the influence of government policies, but outside the boundaries of this Review.

Government policies and interventions have been critically important in the development of successful business–university collaboration; they act as catalysts in creating an environment for effective business–university interaction, but it is the actions of the universities and business that determine success.

As we face a future where the capability of government to intervene with funding incentives is limited, universities and business have to build upon the strong foundations formed in the last decade if the potential of collaboration is to be achieved. Seeking government financial intervention or mediation is unlikely to meet with the same success as it has in the past.

Chapter 3: The Landscape of business–university collaboration

3.1 Introduction

The landscape of business–university collaboration is hugely diverse; it has grown immensely in both breadth and depth since the 2003 Lambert Review, as the content of this Review demonstrates. However, the totality of evidence collected during this Review cannot be reflected in a single document; the vast majority of the submitted work will receive neither praise nor acknowledgement here, but that does not diminish its quality or its impact.

3.2 Landscape and domains

The landscape of collaboration consists of a wide variety of domains where there is real expertise and strength, often of a highly specialist kind. These domains are wide ranging:

- From future-oriented research in advanced technologies, to in-house upskilling of employees;
- From university science park developments, to support for entrepreneurial research students finding their way in the business world;
- From providing progression routes to higher-level apprenticeships, to enhancing the skills of post doctoral staff for their transition into the business world;

[33] 'Stronger Together: Businesses and universities in turbulent times' CBI (2009)
[34] http://www.cbi.org.uk/business-issues/education-and-skills/in-focus/education-and-skills-survey
[35] http://www.ukces.org.uk/publications/er25-employer-perspectives-survey

- From improving enterprise skills amongst our undergraduates, to enabling small companies to recognise the value of employing a first graduate;
- From supporting spin-out companies from research teams, to helping government agencies attract major employers to invest in the UK.

Whilst the teaching, enterprise and research domains are familiar within the university sector, domains for business collaboration are not defined solely by a typology of activity; they may be defined by a professional field, an industry or by specialisation within an industry, particularly in research. No one university operates in all domains within the landscape. Some specialist institutions will operate in very few; it is for each university to make a strategic decision about its domains of activity.

During this Review, it has become increasingly clear that many individuals and organisations working within this landscape have detailed knowledge of specific domains but limited or no knowledge of other domains, or even knowledge of their existence. This is understandable, and indeed may be considered a strength, as further development within the specialist domains of business–university collaboration requires a focused approach. However, in the context of broader policy formulation, knowledge of the entire landscape is absolutely critical if we are to realise the full potential of universities in supporting UK economic growth. Without that broader knowledge, economic policy cannot be reliably informed by evidence, good practice cannot be readily disseminated, and the supply chain of high-level skills, innovation and research from universities to business will continue to be incoherent and suboptimal. Further, at a time when economic growth is our greatest priority, and the contribution that universities make to the economy is under intense scrutiny, inadequate knowledge of that landscape is untenable. Without such knowledge there is a risk that positions are derived from narrow personal experience or information provided by an interested third party, uninformed by a wider understanding of the landscape. There is a pressing need for government, businesses and universities alike to recognise this context and to commit to a collaborative approach to ensure the linkage of partial areas of knowledge and a full understanding of the landscape is developed and maintained.

However, currently, there is no substantive national forum where such knowledge is assembled and can be consulted. There is no reliable information base that can be a reference point for business, universities and government alike; that can provide objective analysis and advice and that can operate outside a lobbying environment.

An organisation that operates only in a limited set of domains within the landscape cannot have the breadth of interest to represent the entire landscape and clearly, sector interests and obligations prevent either a business-, or a university-led organisation from fulfilling such a role. Such a forum has to be one where business and university leaders sit as equals within its governance structure and which covers the entire landscape.

The only forum that meets these criteria and has a distinct and comprehensive mission in this field is the CIHE[36]; a subscription organisation that has evolved from being a think tank into a body that undertakes research in specific areas of business–university collaboration. Critically, its governing council includes many prominent business and university chief executives, people with standing and authority in their organisations. It is respected within both the university and business communities

[36] http://www.cihe.co.uk

and its governance structure meets the criteria of representation, balance and objectivity. However, presently it lacks capacity, which means that its potential value remains untapped. Such a forum has the capability to become a prominent and systemic national influence upon future business–university collaboration, policy and development, complementing the activities of sectoral, business, academic and policy organisations that are active in this sphere and drawing on their expertise.

Recommendation 1

CIHE should be invited to develop its structure and its infrastructure to become an independent subscription-based charity that becomes the focus for information on business–university collaboration. It will gather and maintain a comprehensive repository of good practice, undertake commissioned studies and provide a reliable information source for future substantive reviews.

Government may need to provide short-term funding to establish CIHE in this role.

3.3 Relationship management and the emergence of strategic partnerships

In terms of ongoing collaboration management, universities operate most frequently in a 'one-to-many' model. A university will establish multiple partnerships, operating in the various domains where it has expertise. The reciprocal model for a complex business is the partnership with different universities for different domains of activity; corporates seek collaboration with the university that best meets their needs in a particular field. The challenges are similar in the context of risk management: there is potential for fragmentation of activity and an increasing overhead of managing multiple relationships.

Clearly specific business needs require direct contact between the specialists within the business and the specialists within the university, typically in research collaboration, in staff development or in recruitment. For both parties there is a need for institutional knowledge of these multiple relationships; for the university to ensure that its other domains of expertise are exposed to an existing partner; for the business to ensure that it obtains optimum benefit from its knowledge of the university sector and its expertise.

In some corporates, for example BAE systems, AstraZeneca, Rolls Royce, QinetiQ, and Glaxo Smith Kline, this corporate knowledge is held within an executive position that has explicit responsibility for university collaboration. This role is not only beneficial to the business but also a clear reference point for university collaborators. In some other businesses the responsibility and the contact points are less clear.

For some universities knowledge of business partnerships is also held at executive management level, providing a clear reference point for business contact, regardless of the domain of collaboration. In other universities that executive reference point is less clear.

I make no formal recommendation here; it is for business leaders to decide how they identify the appropriate partners for their business needs and how they ensure that their connectivity remains optimal. Similarly I make no recommendation about university structures in managing collaboration; it is for the university to decide how it best manages its multiple relationships and optimises its existing partnerships by extending its collaboration.

However, both business and university leaders may wish to reflect upon their institutional knowledge of the full landscape of business–university collaboration, and on the management of the partnerships that they have. For universities this reflection should extend to strategic

decisions concerning the domains that the university wishes to provide; for business it should extend to matching their needs to those universities that best meet their requirements within the appropriate domain.

In recent years a model of strategic partnerships has evolved whereby a single university is able to meet the collaboration needs of a business in multiple domains. These are not exclusive partnerships, but explicitly cover more than one domain with possibility of extension into others. The potential efficiency of such partnerships is clear and the next substantive Review may wish to assess their success.

Case study: Siemens - University of Lincoln

The Siemens–University of Lincoln partnership involves multiple layers across a broad spectrum of activities. A collaborative R&D commissioning framework has generated six times the turnover in the original business plan, with significant business benefits generated for the company and research outcomes for the university, whilst protecting intellectual property and observing commercial sensitivities. Siemans have co-located with Lincoln's engineering department; engaging in the teaching of students and in providing scholarships, internships and consultancy projects, graduating 'industry-ready' students. The Siemens technology needs are reflected in the Lincoln's engineering undergraduate programmes and the partners have co-designed an MSc Energy Renewables and Power.

Case study: Proctor and Gamble - Durham University

A Master Collaboration Agreement established Durham University as a core strategic research partner of Proctor and Gamble (P&G). Durham was recognised by P&G as Global Business Development University Partner of the Year in 2011 following an innovative approach in which the research needs and research capabilities of both partners have been mapped and core areas of mutual interest identified. More than 80 Durham academics are now linked with a similar number of P&G researchers in locations ranging from Newcastle to Frankfurt, Brussels, Beijing and Cincinnati in areas including surface sciences, biophysical sciences electronic goods, manufacturing and consumer psychology. The partnership has already secured more than £5.7 million in external funding for a series of projects and studentships with a similar volume of projects currently under development with the company. The partnership has launched a programme disseminating new ways of integrating industrial and academic teams through existing collaborations of both partners and RCUK.

Case study: BAE systems - University of Bristol

BAE Systems and the University of Bristol have agreed a Memorandum of Understanding that defines areas of strategic collaboration. The memorandum defines a wide range of activities within areas of engineering and science where there is common interest in design, manufacture, operation and through-life support and capability of engineered systems. It includes both long-term fundamental research projects; medium/short-term projects requiring the application of generic knowledge to specific issues; reciprocated staff secondments; supervision of projects and theses by BAE staff at BEng, MEng and MSc levels; placements of the University's MEng students and postgraduate education through MSc, PhD (DTC and CASE), EngD.

3.4 Collaborative advantage

Many would argue that competition within the UK university sector has driven efficiency, effectiveness and diversity over the last two decades whilst maintaining excellence. No one university covers the entire landscape of university business collaboration, and yet each domain is important to the businesses that rely upon it for their development. Diversity is a strength of our university sector in that it enables specialisation in strengths; it ensures that the entire spectrum of business support can be found somewhere within the university system.

Whilst it is the role of university leaders to promote the excellence of their own universities, our university sector as a whole is a key asset in the economic future of our country. The efforts of UUK to promote these strengths are admirable and regional associations, where they exist, attempt to present a complementary profile of university missions. It would be helpful if university leaders could emphasise the complementary strengths of UK universities in terms of meeting business needs. Without mutual recognition of the expertise of others, the competitiveness of UK universities has the potential to become a weakness.

Specifically, in terms of the reputation of the sector as a whole, it is critically important that universities are open about the domains in which they operate and refer demands that they cannot meet to another university or a source of guidance where such information may be found. Collaboration between universities in supplying business needs can only benefit the university sector as a whole. *Universities may wish to reflect upon the concepts of collaborative advantage in meeting business needs and review their policies on the referral of business enquiries to other universities or relevant agencies.*

Following the demise of the RDAs, many regional associations of universities closed; there was no business need to collaborate on a regional basis. Others sustained their associations[37][38]. New alliances may be formed in order to supply a more comprehensive response to business needs than any one university could achieve alone, recognising the strengths of diversity and collaborative advantage. The recent N8 Research partnership[39] has launched a new Industry Innovation Forum working with global companies and SMEs. It is supported by the TSB and is an example that may provide a template that others will follow. This is to be welcomed; but the issue of a comprehensive coverage remains. Such partnerships have an obligation to ensure that enquiries that are outside its domains of activity are referred to other universities, or consortia, which may be able to meet those business requirements. I make no formal recommendations in this regard but *the consortia of universities may wish to consider how to ensure that such a referral system is efficiently and effectively operated, and government funders of these consortia may wish to reassure themselves that such systems are operational.*

3.5 First enquiry connectivity

For the 'first enquiry' there are many routes into a university, both formally through direct enquiry and informally through business networking. Every university website examined in this Review has a portal for potential business clients, but the existence of such a portal does not ensure efficient connectivity and development. Practice in enquiry management varies within universities according to their structures, processes and procedures. Some universities rely upon

[37] http://www.universitieswm.co.uk
[38] http://www.unis4ne.ac.uk
[39] http://www.n8research.org.uk

a centralised and monitored information flow with a comprehensive CRM system, others on distributed authority and information maintenance; all will have many different business collaborations to manage on an ongoing basis, alongside new enquiries. In the context of a healthy portfolio of business collaboration, it is vital that enquiry management systems are reliable and provide information for management purposes. *Those universities that do not regularly review the effectiveness of their enquiry management systems may wish to undertake an audit to ensure efficient first-level responsiveness; an ineffective relationship management system carries significant reputational risks.*

3.6 Responsiveness of universities to business needs

Despite the significant volume of evidence of successful business–university collaboration, a belief that our universities are 'unresponsive' remains in some quarters. This disconnect requires examination.

There are many reasons why collaborations do not progress beyond the stage of initial discussions; indeed Imperial College has promoted specific research in the field[40]. In summary, there are a number of generic reasons; some may believe that they are largely a consequence of the culture of universities and the business models that they operate; others may view many of them as not uncommon in supply chain management:

1. The needs of the business do not align with the mission and strategy of the university.
2. Time scale and capacity mismatch; a university has already committed its resources and does not have the available capacity to meet the timescale that the business needs.
3. Capability mismatch; a university does not have the skill set or the facilities to meet the needs of the business.
4. The cycle of bureaucracy: where external funding is required, the bidding cycle does not meet the timescale the business needs.
5. Financial constraints: a university is unable to provide the service required for the price the company is willing to pay. This is particularly apparent in the context of full economic costing in research collaboration where business input to the research merits valuation.
6. Sustainability: the investment required by the university to provide the service does not have an acceptable payback period.
7. Mismatch in expectations and objectives: expectations of outcomes from collaboration are not mutually recognised.
8. Failure to agree on the future of the intellectual property that may be generated. Although much progress has been made in this area since the publication of the Lambert Intellectual Property agreements [41][42], it is still reported as a significant issue in some negotiations.
9. Contrasting views on the management of indemnities and liabilities between prospective partners; viewed as being an increasing problem

[40] http://www3.imperial.ac.uk/innovationstudies/researchthemes/featuredresearchuniversityindustrylinks
[41] http://www.ipo.gov.uk/whyuse/research/lambert/lambert-mrc/lambert-mrc-outline.htm
[42] http://www.ipo.gov.uk/whyuse/research/lambert/lambert-mc/lambert-mc-outline.htm

These are all legitimate reasons for non-realisation of potential collaborations. Informed businesses recognise that the objectives of universities in collaboration are different from those of the company; successful collaboration requires a duality of interest. In the context of research collaboration the CBI have published a good practice guide for collaboration for that purpose.[43]

As several respondents have noted, responsiveness can be achieved by saying 'No, because...' quickly, followed by a referral to another university if appropriate. A non-response or prevarication has an impact not only upon the reputation of the university concerned but upon the university sector as a whole, compounding the 'folklore' of the 'unresponsive university'.

In order to make their services more flexible and responsive, many universities have established arms-length subsidiary companies that provide services within a commercial envelope often, but not invariably, using the resources of the university. This form of outsourcing provides an organisation that can mediate between the business client's objectives and those of the university. As universities apply more commercial business models to their operations, I would foresee a growth in this activity, with a high level of responsiveness, rapid redirection to another university where necessary, and potentially a lower rate of the use of 'No, because...' in the future.

3.7 Reflections

The landscape of collaboration is growing in breadth and depth in a dynamic manner. However there are many areas in the collaborative landscape that need to be improved if our economy is to gain optimal advantage from our university sector in the context of global competition. Addressing these areas through individual targeted actions, without reference to other related parts of the landscape, carries significant risks; this is an integrated ecosystem. In order to make sound policy, proposals intended to improve performance in one domain of the landscape have to be evaluated in the context of the landscape as a whole. To achieve that, knowledge of the entire landscape has to be established; we need to develop an authoritative source of knowledge in that regard.

Universities operate in various domains of the landscape; an individual university's excellence in one domain does not mean it achieves excellence in other domains. Excellence in the university sector as a whole requires excellence across all domains; and that means each university has to define the domains in which it operates and achieve excellence in them. For the university sector as a whole to be the world leader in business–university collaboration there can be no place for second-class performance anywhere in the landscape.

The supply chain concepts of collaboration in the delivery of skills, research and innovation to business is increasingly relevant to universities, and the business models of strategic alliances are emerging as sustainable relationships. In order to optimise the exploitation of this capability and ensure that the wider benefit of business need transcends the competitive culture of our universities.

Meanwhile the reputation of 'unresponsiveness' has to be proactively addressed. The celebration of collaborative success is too often diluted by accusations or examples of failure. Universities cannot deliver all the services that business needs in a manner that business may wish; that is the nature of supply chains. The solution to this disconnect, where it exists, is through clear and open communication between the principals at executive level and mutual

[43] 'Business–University Collaboration for research and innovation: a guide for members' July 2010

respect of the needs and constraints of the other party. To achieve that, transparency of the responsibility for business–university collaboration at executive level is a prior necessity.

Chapter 4: Development of skills and knowledge for employment

4.1 Introduction

'Graduates of today just don't have the necessary skills to meet the needs of business today'

This has been a consistent message from employers for decades. Each generation of graduates, as they become managers themselves, repeat the judgement that their predecessors made.

As employability climbs up the agenda of university applicants, today's university leaders seek to ensure that their graduates are equipped with the right knowledge and skills for employment. This chapter analyses the strategies being adopted to address this long-standing issue. It considers graduates at both honours and foundation degree levels. The employability skills of research students are considered as having a sufficiently different emphasis to be considered in chapter 5.

This chapter, inevitably, focuses largely upon best practice strategies that the supply side (the universities) adopts to meet the needs of employers. However, these strategies cannot be implemented in isolation; an active participation by employers is required, not least in defining the knowledge and skills needs of future employers, but also in providing mentoring, sponsorship, curriculum advice, work experience and feedback on performance for tomorrow's graduates. Without that participation by business, the authority of business leaders to comment on the qualities of future graduates will be diminished.

4.2 Career aspirations and skills development

The evidence that students expect that their degree study will enhance their careers is strong: 79 percent of students surveyed for the CBI/NUS Student guide 2011[44] indicated that they went into HE to improve their job opportunities. By selecting a programme of study at a particular university, a student is committing to a specific agenda of knowledge acquisition and a specific style of learning during their studies. But the skills of the graduate are not solely driven by the programme studied or the university attended. Personal skills are also a consequence of social and family background, the environment within which study is undertaken, and the extracurricular activities of the student during their undergraduate studies. For example, a mathematics degree on a campus-based rural university may well have similar content to one of an inner city university located in an area of deprivation; reflecting QAA subject benchmarks. But the social demographic of the student and the study experiences of that student may well be very different. This difference may become even greater when the mode of study is considered. For example, a graduate from a three-year, full-time degree programme on a campus-based university is likely to have a significantly different skill set and experience from a student who has been studying on a part-time programme whilst having a full-time job sustaining her/his study. Similarly, a student who studies at a university whose learning philosophy is centred on the parallel development of enterprise skills and knowledge acquisition will develop a different skills set from one who studies at a university whose learning philosophy is centred around knowledge acquisition.

[44] CBI/NUS (2011) 'Working towards your future: making the most of your time in higher education' http://educationandskills.cbi.org.uk/reports

As an individual student enters HE, she (or he) has a particular skills set. The challenge, then, is how to improve that individual student's employability skills during her (his) university experience and ensure that those skills meet the aspirations of the student and the expectations of the future employer. That is the theme of this chapter of the Review.

4.3 Employers' views on employability skills

Employers value degree-level study. Indeed, one in five jobs now requires a degree, a figure that rises to 70 percent in professional services.[45] However, for graduate recruiters a degree alone is not enough. The CBI Education and Skills Survey 2011[46] found that 82 percent of employers surveyed rated employability skills as the highest graduate recruitment factor. Self-management, teamwork, problem solving, communication skills, application of IT, application of numeracy all featured consistently in employer needs. Nevertheless, whilst employability skills rated the highest priority, specific degree subject was the second highest factor, reported by 68 percent of employers in the survey.

Skills development and the subject studied are not independent; students develop a 'mindset' relating to the subject and employability profiles of graduates are related to the degree studied.[47] Teaching 'generic skills', in isolation from the subject studied, introduces a silo approach to learning, an approach incompatible with integrated knowledge and skills development; an approach where the student will see skills development as an adjunct to the main subject being studied, that is 'just another module'.

4.3.1 Skills profiling and diagnostic tools

The CBI/NUS Student Guide[48] defines employability, its value and how to enhance it. It demonstrates the value of extracurricular activity, undertaking work experience and accessing support to develop employability skills. It defines employability as 'a set of attributes, skills and knowledge that all labour market participants should possess to ensure that they have the capability of being effective in the workplace—to the benefit of themselves, their employer and the wider economy'. This should not be interpreted as a proposal for a universal skills threshold; different employers have different interpretations of threshold levels for different graduate jobs. Nevertheless this variability of threshold skills should not diminish the importance of this employability skills profiling and the attention that this issue should command. The CBI/NUS guide has the potential to become not only a useful self-awareness tool for students, but also to be developed into a wider skills assessment measure.

To achieve skills enhancement requires self-awareness of strengths and weaknesses from personal skills profiles. An early use of diagnostic tools within a student's programme can set this context by highlighting areas of strengths and those in need of further development. The NUS/CBI framework provides one tool that can be used to introduce and develop that awareness; others are available (for example, Career EDGE Employability Development Plan[49] [50], FIT{student}[51]). In parallel to this

---

[45] CBI/EDI (2011) Education and Skills Survey: 'Building for Growth -business priorities for education and skills'
[46] http://www.cbi.org.uk/business-issues/education-and-skills/in-focus/education-and-skills-survey
[47] Higher Education Academy: Student employability profiles
[48] CBI/NUS (2011) 'Working towards your future: making the most of your time in higher education' http://educationandskills.cbi.org.uk/reports
[49] Dacre-Pool L. and Sewell P. (2007) 'The key to employability: developing a practical model of graduate employability', *Education and Training*, Vol. 49, No. 4, 277-289
[50] Dacre-Pool L. and Sewell P. (2010) 'Moving from conceptual ambiguity to operational clarity: Employability, enterprise and entrepreneurship in higher education', *Education and Training*, Vol. 52, No. 1, 89-94

initiative, employability awards, supplementing the academic degree, are offered by a growing number of HEIs and appear valued by their graduates and employers. It is not clear, however, how well these are embedded across the sector, and there appears to have been little systematic evaluation of them.

It is for universities to decide whether to introduce formal skills diagnostics and whether they are discretionary or mandatory. Clearly if they are to be used it is preferable for such a diagnostic to be introduced at the earliest opportunity in the student's HE career and to be regularly reviewed. Such practice should feature in promotional literature available to prospective students, covered at open day/applicant day/interviews and initiated early in the first year of the undergraduate programme of studies.

4.3.2 Developing employability skills through formal learning environments

UKCES Employability Challenge[52] sought to provide practical approaches to the question of 'how do students develop employability skills?' It concluded that the primary methodologies are: reflection and integration, experiential action learning and work experience.

Reflection on skills and the development of that reflexive approach is key to higher-level learning, in developing 'graduateness' and in meeting employers' demands for analytical skills amongst graduate employees. Dean[53] emphasises the need for students to be taught to recognise their employability skills and articulate them. 'Being able to articulate, and sell those skills to an employer is an employability skill in itself'. Supporting students to reflect (effectively) on their studies and work experience is crucial. It is not just the possession of knowledge or skills that define a graduate and the contribution she (or he) makes to the workplace, it is the capacity to articulate them, to think about how they relate to other forms of knowledge and skills, and to reflect upon the different domains in which they may be applied. Being reflective requires a thinking process that understands strengths and weaknesses and seeks means for their enhancement.

The contextualisation of subjects provides particular opportunities for skills development and reflection; team project work, case study analysis, assessment through presentation and research tasks are all established pedagogies that contribute to generic skills development whilst, in parallel, developing the mindset skills associated with the subject studied. There is much existing good practice in these fields, often developed with the support of the HEA subject centres[54]. These are commended. However, it is critical that the student is engaged not just in the learning experience of such pedagogy but also in the context of skills self-realisation and self-evaluation. *It is for universities to provide optimal opportunities for students to develop employability skills through the formal learning methodologies used within the university and to ensure that students are able to articulate the skills that they have developed through their learning experiences. It is also for universities to ensure that their staff have the appropriate skills to support students in this process.*

4.3.3 Developing enterprise skills

Whilst surveying to establish key employability skills the CBI study found that graduates' lack of commercial awareness remains an issue for many employers[55]**.** This distinction between

---

[51] http://www.herts.ac.uk/about-us/case-studies/full/fit-student.cfm
[52] UKCES (2009) 'The Employability Challenge' http://www.ukces.org.uk
[53] Dean L. (2008) 'An employability perspective'. *Psychology Teaching Review*, Vol. 14, No. 2
[54] http://www.heacademy.ac.uk/disciplines
[55] CBI/EDI (2011) Education and Skills Survey: 'Building for Growth—business priorities for education and skills' http://www.cbi.org.uk

employability skills and enterprise skills provides a useful basis for further analysis. Although the study of an academic subject leads to the implicit development of a particular skills mindset, enterprise skills do not reside solely in a business school environment. This is fundamentally important in terms of student interest and motivation; the development of enterprise skills is best achieved within the context of the subject studied and tutored by academic staff from that discipline who have enterprise mindsets and experience, and who can promote the interconnection between subject knowledge, the associated skills and their application in the wider world.

The development of strategies to introduce enterprise skills development has been the subject of special funding from both HEFCE (through CeTL) and from the HEA. Broadly, two forms of enterprise learning may be identified. Embedding enterprise skills within an existing curriculum provides real-time relevance between the discipline and its application in an enterprise environment: sometimes in real-time business environments, sometimes through simulation. In circumstances where the curriculum does not lend itself to such an approach, modules with the explicit role of introducing enterprise thinking and skills development may be used as an addition to established subject curriculum. This 'bolt-on' approach has the potential to detach enterprise skills from the primary subject being studied; an approach that is pragmatic but suboptimal. To detach such skills development entirely from the formal curriculum and providing it as an optional decontextualised separate study is not a recommended option; indeed such policy may be perceived by students as the university placing a low value on skills development.[56]

Case study: Swansea Metropolitan University (SMU)

SMU achieves over 80 percent student engagement in curriculum-based enterprise activities and takes a national lead in developing and delivering initial teacher training for enterprise and entrepreneurship. The HEA, Enterprise Educators UK and The United Nations Conference for Trade and Industry are amongst those who draw upon this expertise. SMU's creativity-based approach to enterprise education evolved from practical experience combined with academic research and draws heavily on extensive alumni engagement. The institution's enterprise pedagogy evolved from well-established creative design-based courses and the associated assessment strategies; it is an integrated contextualised approach to enterprise education. SMU has one of the highest survival rates for graduate start-ups in the UK.

Enterprise Educators UK is a network of university staff that promotes and supports enterprise education. Its members undertake a range of activity from embedding enterprise skills in the curriculum through to running dedicated units to support, advise and mentor student and graduate business start-up. It is commended as resource to inform best practice in enterprise education[57].

Universities should reflect on the strategies they use to ensure that students have the opportunity to develop enterprise skills both through the formal curriculum and through optional study or practice and also reflect on the integration of enterprise education in the professional development programmes for academic staff.

4.3.4 The role of social enterprise

Social enterprise engages a wide range of students and staff including those who are reluctant to be active in a purely commercial agenda. It is consistent with the anchor role that universities play in

[56] Purcell K., Elias P., Atfield G. and Behle H. (2009) 'Plans, aspirations and realities: taking stock of higher education and career choices one year on', findings from the second Futuretrack survey of 2006 applicants for UK Higher Education

[57] http://www.enterprise.ac.uk

their communities, a role that is considered further in chapter 7, and has seen rapid growth in recent years, both within the curriculum and outside it. However, this is not a completely new development. Students in Free Enterprise (SIFE) UK[58] has been active in this field for a decade, with sustainable SIFE teams in 48 UK universities, and almost 3,000 students engaged in the programme. SIFE (UK) is a not-for-profit company, funded solely by donations from private industry; companies that recognise the philanthropic value of the programme, and also recognise the enterprise and employability skills the students develop through social enterprise.

Recent growth in on-campus social enterprise has been stimulated by a HEFCE special initiative—the Higher Education Social Entrepreneurship (HESE) programme—delivered with the support of UnLtd, a charitable foundation for social entrepreneurship. The evaluation of this programme indicated improvements in enterprise skills amongst the student participants, particularly project management, communication, budgeting, business planning, networking and leadership. For many universities, social enterprise is an extracurricular opportunity for motivated students and staff; for others, social enterprise features in its academic portfolio. In an assessment exercise that identified best practice in the HESE programme, a third of award winners were studying social sciences and a further third arts and creative subjects, demonstrating that enterprise skills are not necessarily focused in business schools. Some universities now have social enterprise companies within their portfolio of commercial activities alongside a commitment to their continuation as both learning vehicles for students and as part of their community interaction. The sustainability of social enterprise activities within universities will depend upon the policies and missions of individual universities.

Case study: University of Northampton

Northampton has an explicit aspiration: 'to be the number one university in the UK for social enterprise by 2015'.[59] The university is integrating social enterprise into teaching, learning, and research, whilst at the same time improving the economic, social and cultural life of its community. Students have the opportunity to complete accredited work placement modules with existing or start-up social enterprises, enabling them to earn money, and apply their skills to benefit regional social enterprise whilst simultaneously enhancing their employability. The university has social enterprise hatcheries, where new social enterprises can benefit from affordable start-up premises before growing into the university's innovation centre, or other premises.

Social enterprise within universities is gaining momentum, as a volunteering activity, as a vehicle for developing enterprise skills, and as an academic study in its own right. The National Centre for Entrepreneurship in Education (NCEE) is shortly to launch its Social Enterprise University Enterprise network with Plymouth, Salford and Northampton Universities, SERCO and the Cooperative Group. The European Commission is funding NCEE and Coventry University to promote this model across Europe. This is recognition of the UK's leading position in this field and is to be welcomed.

4.3.5 Promoting entrepreneurship

8.5 percent of the 2009/2010 graduate cohort was unemployed six months after graduating[60]. However, graduate self-employment rose, with 4.3 percent of graduates running their own

[58] http://www.sife.org/Pages/default.aspx
[59] http://www.northampton.ac.uk/about
[60] http://www.prospects.ac.uk/what do graduates do.htm

businesses from this same cohort.[61] The National Centre for Entrepreneurship in Education (NCEE) reported[62] that 77 percent of HE institutions support students and graduates in creating new business ventures. Estimates by HEFCE[63] indicated 2,350 start-ups by recent or new graduates in 2009/2010 and an increased survival rate after three years. This data indicates that entrepreneurship is becoming more recognised as a career choice for students, but there is considerable potential for further expansion.

The support of entrepreneurial development amongst the student body has been derived from diverse sources. National level competitions that sponsor enterprise and student start-ups attract competitors from across the sector (for example SIFE and Shell Livewire[64]). The new Entrepreneur First programme[65], sponsored by a range of prominent businesses, extends financial support to graduate entrepreneurs through a competitive process. At a local level there are many diverse initiatives—for example, the SPEED programme[66] operated in the West Midlands. Several universities employ an 'entrepreneur in residence' to act as a focal point for entrepreneurial activity, a significant number now provide 'easy-in easy-out' accommodation in enterprise/incubation centres for student and graduate use, and successful graduate entrepreneurs are increasingly being featured on university websites.

Case Study: University of Huddersfield

Founded in 2004, the University of Huddersfield's Business Mine supports students and graduates starting up their own business through a series of events: one-to-one business advice, hot-desk office space, and access to micro-finance. An Enterprise Placement Year helps students start up their own business during their placement year. The Business Mine is supported by the Huddersfield-led ERDF-funded Graduate Entrepreneurship Project—a collaboration of start-up units across the ten universities of Yorkshire and the Humber, providing funds for micro-finance, delivering regional events and sharing best practice. Enterprising students and graduates may join the University's new Enterprise and Innovation Centre—a 'business-to-business-to-university' facility for new start-ups, SMEs and corporates, and based on open innovation principles.

The National Centre for Entrepreneurship in Education (NCEE) has long been a champion of enterprise education. The Council provides high-quality programmes for senior personnel in the both the leadership and management of enterprise and entrepreneurship within universities, it creates networks linking businesses and universities, advises universities on enterprise strategies, awards annual prizes to high-performing universities and joins Enterprise Educators UK in celebrating excellence through awards to educators and students.

NACUE is funded by a number of well-known sponsors and government. It focuses on student enterprise/entrepreneurial societies, a 'bottom-up' activator within the student community. NACUE supports over 70 student enterprise societies, 40,000 entrepreneurial students and 85 institutions in

[61] http://www.hesa.ac.uk/index.php?option=com_content&task=view&id=2206&Itemid=278 table K
[62] See Enterprise and Entrepreneurship in Higher Education 2010 National Survey available at http://www.ncee.org.uk/publication/enterprise_and_entrepreneurship_in_higher_education.1.pdf
[63] HEFCE's analysis (available at http://www.hefce.ac.uk/pubs/hefce/2011/11_25/11_25.pdf)
[64] See Shell Livewire website at http://www.shell-livewire.org
[65] http://www.entrepreneurfirst.org.uk
[66] Originally a HEIF-funded programme involving consortia of HEIs to promote student start-ups. The SPEED West Midlands programme based at the University of Wolverhampton continues: http://www.wlv.ac.uk/default.aspx?page=10623 and adapted schemes exist elsewhere.

the UK[67], and delivers mentoring, training and stimulating student-led enterprise activity. It has received many international accolades for its work. With a student-led approach, NACUE has the potential to change the enterprise culture of our campuses in a manner that a top-down management approach cannot achieve. Connectivity to the student body is essential for its success and the maintenance of this connectivity will be a continuous challenge for NACUE as it matures as an organisation. It has been highly effective to date, possibly because it was seen as an independent student-led organisation, supported by arms-length sponsorship. Now it is in receipt of direct government funding, its position in the enterprise and entrepreneurship landscape will largely depend upon how it is perceived by the constituency that it serves: the aspiring entrepreneurial students on our campuses.

4.3.6 The Enterprise Alliance

With several organisations operating in the enterprise/entrepreneurial education space, there is risk of overlap and potentially an inefficient use of public money. The Enterprise Alliance[68] has been formed by three key membership organisations operating in this space: The Institute for Small Business and Entrepreneurship, Enterprise Educators UK and NACUE. Collectively, these organisations represent undergraduate and postgraduate students, educators, academic researchers and those who support enterprise development. The formation of this alliance is welcomed; it is imperative that collaboration between these organisations is successful at national and local level.

Recommendation

NACUE deserves support from business sponsors, universities and government in promoting entrepreneurship. Such support should be conditional on NACUE retaining its close connectivity student entrepreneurial societies, and its active engagement in the Enterprise Alliance.

NACUE has the potential to be a major contributor to the development of entrepreneurialism amongst our student body.

The trustees and executive of NACUE may wish to develop and publish performance indicators for its activities.

4.4 The role of business mentors

The role of business mentors is growing across the enterprise and entrepreneurial agenda of universities. Mentors are drawn from both alumni networks and the business community, normally without remuneration or position. Research would be worthwhile to determine best practice and consider the extension of such schemes.

Case Study: HBJ Gateley Wareing and Birmingham City University

Law firm HBJ Gateley Wareing and Birmingham City University have worked in partnership for over five years developing and promoting the Inspiring Futures mentoring scheme. Being mentored by professionals from all industry sectors in the Birmingham area has enabled students to develop their confidence and their workplace competencies. HBJ Gateley Wareing LLP is expanding the mentoring programme across its regional offices throughout the UK. It intends to secure kitemark accreditation for the scheme, as well as professional accreditation for its

[67] 'State of Student Enterprise Report' 2011 NACUE
[68] http://www.enterprisealliance uk.co.uk

mentors. The company Law firm HBJ won the AGCAS Award for Excellence in Careers Service Engagement 2011 for this work.

Case Study: *ifs School of Finance* industry-student mentoring scheme

The *ifs School of Finance* student mentors are all employed in the banking industry and drawn from a range of employers. All are trained in mentoring and have been available to *ifs* distance and flexible learning students. They are now being deployed to support full-time students, during their transition from school to city-based study. Moreover, the mentors function as role models and 'future selves' to the full-time students, informing students of the challenges of the industry and the possible shape of their future careers and professional identities.

The practice of business and alumni mentors supporting undergraduate students should be evaluated by the HEA and the conclusions disseminated throughout the university and appropriate business sectors.

4.5 Work experience as a formal part of a programme: placements and internships

The evidence that placements, internships and other work experience are extremely valuable to students, both in terms of their academic performance and their employability skills, is strong (for example, Driffield et al 2011[69], Green 2011[70], Reddy and Moores 2010[71], Little and Harvey 2006[72], NCWE 2003[73]). These analyses are supported by Alan Milburn's report on fair access to the professions[74] and the CBI and university UK's joint study on preparing graduates for work.[75] There are many different types of integrated work experience opportunities that may be included in a programme of study. This section focuses upon the provision of placements (a one-year work experience) and internships (normally two to six months' work experience).

The UK is not alone in promoting work experience embedded within academic programmes. A study by Hannover Research[76] clearly indicates the strong commitment of some of our competitor economies to developing this form of learning and skills development. Indeed in some instances this commitment is shared by government using tax credits to incentivise participating companies.

4.5.1 Placements

The evidence that a placement year improves employability opportunities is strong[77][78]. Indeed, lack of work experience appears as a key barrier to young people, including graduates, in securing employment.[79]

---

[69] Driffield N., Foster C. and Higson H. (2011) Aston University: 'Placements and degree performance: do placements lead to better marks or do better students choose placements?' http://www.asetonline.org/documents/HelenHigson-2.1.4.pdf

[70] Green P. (2011) University of Ulster: 'Initial findings of survey of final year University of Ulster students who had undertaken a placement' (unpublished)

[71] Reddy P. and Moores E. (2006) Aston University: 'Measuring the benefits of a psychology placement year' *Assessment & Evaluation in Higher Education*, Vol. 31, 551–567

[72] Little B. and Harvey L. (2006) 'Learning through work placements and beyond', a report for HECSU and the Higher Education Academy's Work Placements Organisation Forum; Sheffield, England: Centre for Research and Evaluation

[73] National Council for Work Experience (2003) 'Work Related Learning Report' DfES

[74] The Panel on Fair Access to the Professions, Cabinet Office (2009) 'Unleashing Aspiration: The Final Report of the Panel on Fair Access to the Professions' http://www.cabinetoffice.gov.uk/accessprofessions

[75] 'Future Fit: Preparing Graduates for the World of Work' CBI/UUK (2009)

[76] International Practices in university-business collaboration; prepared for the University of Hertfordshire. Hannover Research 2011

[77] Hall M., Higson H. and Bullivant N. 2009 'The role of the undergraduate work placement in developing employment competences: Results from a five-year study of employers' Aston Business School, Birmingham

[78] Mason G., Williams G. and Cranmer S. (2006) 'Employability skills initiatives in higher education: what effects do they have on graduate labour outcomes?' London: National Institute of Economic and Social Research

Despite the undoubted advantages of undertaking a placement, there has been a decline in this practice in recent years from 9.5 percent of the total full-time cohort in 2002/2003 to 7.2 percent in 2009/2010[80] A small number of universities in the UK provide the majority of sandwich placements, in particular those with a tradition of sandwich courses: for example, Loughborough University, University of Surrey, University of Bath, Brunel University, Aston University, Bournemouth University and Ulster University (HESA); interestingly five were Colleges of Advanced Technology 40 years ago and two have the genes of a Polytechnic.

Research into sandwich programmes in Higher Education[81] highlights a range of perceived barriers to students taking up placements. These include the time pressures of application, uncertainty in securing a placement, strong peer group pressure to opt out, and difficulties in finding a placement close to the university or parents' home. Yet certain universities succeed in maintaining a student profile in which the majority of undergraduates enjoy a sandwich placement year, and the subsequently enhanced employment prospects that such an experience provides. Given this clustering of sandwich practice within certain universities, as opposed to a uniform decline, one has to conclude that sustaining a sandwich course structure is a consequence of university culture, strategy and course portfolio.

However, there are barriers to increasing placement opportunities and investments are required by universities, companies and students to overcome these barriers. Clearly the university has to invest to provide placement opportunities for students; and developing and maintaining relationships with employers is not cost free. However, although creating new placement destinations requires significant investment, good experiences lead to repeat placements, at a lower cost, and can lead to further collaboration in other areas of university services.

There is an emerging new model of placement practice: the consortium model. The model is designed for SMEs in a flexible manner: students enjoy three or four 12-week internships at different companies rather than a full year at one company. This innovative practice is to be welcomed in that it provides students with a variety of experiences, and the companies involved find such placements useful, although the university's direct costs are likely to be higher than for a single placement.

Barriers for employers to providing placement opportunities are usually associated with the costs and time required for supervision; the time to set up and to monitor projects or work tasks that students undertake; the time and effort to make links with Higher Education institutions and subsequently the potential students. However, the benefits in terms of the contribution of the students and the opportunity to engage in a 'year-long interview and induction' are also strong. Indeed, there is no evidence that there is presently a shortage of placement opportunities for students, although a strong reversal of the present downward trend in demand for placements from students may create such a constraint. The benefits for students are clear in the context of improving employment opportunities, but there are heightened costs for the student, especially in the new funding system, in the form of increased tuition fees and interest charges on the student loan during the sandwich year.

---

[79] CIPD Labour Market Outlook, August 2009 http://www.cipd.co.uk/NR/rdonlyres/B825A8B2-7022-4D8A-B321-1AB38F1999B2/0/Labour_Market_Outlook_summer_09.pdf

[80] Higher Education Statistics Agency (HESA) Performance Indicators http://www.hesa.ac.uk/index.php?option=com_content&task=view&id=1650&Itemid=278

[81] Education for Engineering (E4E) (2011) 'Sandwich Courses in Higher Education: A report on current provision and analysis of barriers to increasing participation'

It is in the interests of students, employers, universities and government that barriers to increasing the number of students benefiting from sandwich placements are removed.

Recommendation

Sandwich degrees should be encouraged through a new compact between students, universities, government and employers, reflecting the benefits to all parties from the enhanced employment outcomes arising from them. The present regulations permit a fee of up to £4,500 for sandwich years. Universities are encouraged to adopt a lower fee; an initial guideline fee of £1,000 is suggested. HEFCE should establish a mechanism whereby universities are incentivised to expand sandwich programmes through changes to the student number controls that it operates. The Student Loan Company (SLC) should suspend interest charges on any existing loan during the period of the placement. Government should support companies that host students on full sandwich placement years through a tax credit or grant mechanism.

4.5.2 Internships

For the purposes of this paper, an undergraduate internship is taken to be a short period of professional experience during a degree programme, a graduate internship as a post-graduation professional experience. Internships may be paid or unpaid, depending on the nature of the placement, and the employer's policy.

An undergraduate internship arranged through the university and integrated within the degree programme is recognised as a valuable asset in future employability. Indeed they are now being identified explicitly in the employability 'offer' of universities. Many corporates offer internships and advertise them through the web and through university careers offices; the majority are paid internships and are informally viewed as an opportunity to assess potential future employees. (This is evidenced in chapter 6.)

Graduate internships have become increasingly popular, and have acquired a strong reputation for helping students into full-time work. Unpaid graduate internships are common in some fields of business. This practice is controversial in two ethical respects: first in the context of social mobility, especially when the internship leads to employment;[82] second where there is no intention of the organisation employing the intern, rather recruiting sequential interns at no (or marginal) cost to fill a single vacancy. *Universities will wish to reflect whether they continue relationships with companies that do not meet the university's ethical standards in the context of unpaid internships.*

There are a number of intermediaries filling the space between students and companies in the provision of internships: some operated by commercial companies[83]; some created by consortia of universities; and the government initiative The Graduate Talent Pool (GTP)[84]. The relative merits of each have not been assessed within this Review.

Case study: Graduate Advantage[85]

Funded and supported by ten West Midlands' Universities, Graduate Advantage is a one-stop shop for both students seeking an internship and employers seeking to employ an intern. It is

[82] Milburn A. 2009 'Unleashing Aspiration: The Final Report of the Panel on Fair Access to the Professions'. Available at http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/21_07_09_fair_access.pdf
[83] For example, see http://www.enternships.com
[84] See http://graduatetalentpool.direct.gov.uk/
[85] http://www.graduateadvantage.co.uk/

based at Aston University and part-funded by the European Regional Development Fund—the services are only available to private sector SME businesses, registered charities or social enterprises based in the West Midlands region. Graduate Advantage operates a web interface that provides advice and guidance on internship management to employers and also comprehensive support to students in the context of CV preparation and personal presentation. To ease the administrative burden on SME employers, Graduate Advantage also offers a free payroll and HR service for 12-week internships.

The HEFCE-sponsored graduate internship scheme, based on three months' paid work, in which the pay investment was split between public purse and employer on a one third–two thirds basis, was fully subscribed by students. It was oversubscribed by employers, including employers with no history of graduate recruitment. 46 percent of HEFCE internship graduates secured long-term employment following the internships; 81 percent of the employers involved in the scheme were small businesses.[86] This scheme has supported small companies who realise the added value that graduates can provide to their companies, whilst containing the risk of their initial investment to manageable proportions. For many it was their first engagement with a university and an opportunity to create a lasting relationship.

Recommendation

Ideally, every full-time undergraduate student should have the opportunity to experience a structured, university-approved undergraduate internship during their period of study. Where such internships are paid, government should examine the feasibility of supporting companies that host students through a tax credit or grant mechanism. Where internships are unpaid, universities should use their 'OFFA funds'[87] to support eligible students rather than condone a policy that could inhibit social mobility.

Recommendation

The graduate internship programme should be continued. However, recognising the constraints on the public purse, it is recommended that only companies entering into the graduate internship programme for the first time are supported by a one-off subsidy. Repeated graduate internships are for the company and/or the university to fund. For the avoidance of doubt, the use of a university's 'OFFA funds' should not be permitted to support unpaid graduate internships.

4.5.3 Skills developed through extracurricular activities

Skills development is not constrained to formal learning environments. Interactions with a community outside the university add further dimensions to self-confidence, experience and skills. Volunteering develops skills for education, employability and life (Melling 2008)[88] and is therefore inextricably linked with generic skills development. University participation in networks of volunteering associations can facilitate student involvement with projects linked to local communities to underpin peer leadership, increase the social capital and the social mobility of students, and prepare students for employment through relevant links to local communities.

[86] HEFCE report by Oakleigh Consulting and the Careers Research Advisory Centre http://www.hefce.ac.uk/pubs/rdreports/2011/rd07_11
[87] funding committed by the university to support access, defined within its Agreement with the Office for Fair Access
[88] Melling A. (2008) 'Engage, Empower, Enable: Student Volunteering within the Curriculum'. Paper given at the Student Volunteering in Higher Education: Transitions and Turning Points Conference. Wolverhampton, September 2008

Examining practice in other countries, BIS[89] noted that accrediting volunteering and extracurricular activities is a tangible way of evidencing skills gained from these activities. This approach of accrediting extracurricular activities as part of their degree programme has been adopted by some universities. In others, volunteering provides a different form of credit, one that contributes to separate university recognition of skills competence.

Case study: University of Central Lancashire (UCLan)

UCLan's Futures Award is a 20 or 30 credit extracurricular employability and enterprise award, available to all students; 1,500 have enrolled since 2009. The award, a fully accredited university certificate, has been specifically designed to meet the individual personal and career aspirations of students and covers a wide range of employability competencies—transferable skills development, work-related activities, enterprise, career preparation, volunteering, mentoring and languages. Modules are available in traditional settings, online or in blended learning environments and students are guided through a diagnostic tool based on the 'CareerEDGE' model of employability. Students can be awarded either Bronze, Silver and Gold accreditation according to achievement. To attain the Gold Award students participate in a formal interview involving external panel members.

4.5.4 Recording skills development and academic achievements

The absence of a consistent cross sector record of student development and achievement is being addressed through the introduction of HEAR[90]. This electronic record contains a wealth of personal and university information and academic information on the qualification, its level, and details of each of the modules or units studied, the form of assessment, marks awarded, and their relative weighting towards the final summary mark or grade. Critically it also includes information on activities that provide academic credit—for example, volunteering and work experience—and is both a formative and a summative document, evolving throughout the student's experience at university. This record will give future employers detailed information on the skills, progress and attainment of their prospective employee. This document has the potential to be a major change agent in both student self-awareness and in graduate recruitment. *Universities that have not committed to engaging with HEAR practice should reflect upon the impact of that decision upon the skills development and subsequent employment prospects of their graduates.*

4.6 Developing curricula to meet employer needs

The curricula of degree programmes within a university are designed by the academic staff of that university. It is a fundamental role of academe. A university's degree programme will be approved within the context of that institution's quality assurance procedures and it will meet the QAA benchmarks for that discipline, in order to receive QAA approval. This is a non-negotiable situation; the university is accountable for the standards of its awards and the quality of its provision. Those degree programmes that lead to a licence to practise will also be subject to professional body accreditation, reducing the number of elective dimensions that can be introduced by the university. In programmes where there is no licence to practise, there are a range of other professional bodies which provide a professional status or exemptions to successful students. Several universities systematically pursue such accredited status in the belief that it enhances the employability of their

[89] Department for Business, Innovation and Skills (2011) 'Supporting graduate employability: HEI practice in other countries'. [BIS Research Paper]
[90] 'Beyond the Honours Degree classification'. The Burgess Group Final Report; Universities UK October 2007

graduates and therefore the attractiveness of their programmes to applicants. However, such accreditation constrains further the freedom of the academic staff to design the degree programme—it adds a further layer of prescriptive curricula requirements.

Although these requirements may be seen as limiting the freedom of employers to further influence the curriculum, experience indicates that there is sufficient common ground between employer needs, QAA benchmarks and professional body requirements for there to be little reason why employer needs are not integrated within the process of degree programme design. The level of engagement is clearly at the discretion of the university and occurs at variety of levels of prescription.

4.6.1 Employer advisory groups

Many universities operate employers' advisory groups, often at departmental level. These groups may act as 'critical friends', monitoring the activities and development of the department; others act as industry advisors in research fields and in curriculum design. This is a demonstration of business–university collaboration that is often invisible outside a university department. In terms of future employment prospects, the existence of such a group is of legitimate interest to students.

Universities that work with employers through industry advisory groups should consider including the existence of such a group, its membership and its influence, within the university's enterprise strategy and within the material that it provides to applicants and students.

4.6.2 Certification by industry 'brands'

Particularly in technological subjects, degree programmes are occasionally certified by industry brands—a form of endorsement of the skills of graduates from these programmes. For example: CISCO certification is integrated within the University of Sunderland School of Computing and Technology; the University Centre at Blackburn College integrates Apple authorised training within degree programmes; the Caledonian ICT Academy at Glasgow Caledonian University integrates Microsoft certification within its computing programmes; Bedfordshire integrates PRINCE2 certification within its postgraduate project management programmes. All these are seen as adding value to the employability skills of graduates.

4.6.3 Kitemarking by sector skills councils

SSCs represent the interests of specific sectors of industry. Three SSCs have ventured into kitemarking degree-level programmes: e-skills UK, Cogent and Skillset. These are recent developments and merit scrutiny. Each SSC has adopted a different strategy and business model to applying its kitemark to programmes.

e-skills UK developed a degree entitled Information Technology Management for Business (ITMB). This programme is now offered by 14 universities in England and Wales to over 850 students. It is supported by 60 employers and has a strong and influential high-level employer advisory group to ensure that the curriculum is updated to meet evolving industry needs. In some universities the first cohorts are yet to graduate; in those that have graduated, the employment record is reported as being above their peers.

Cogent, the SSC for biosciences and process manufacturing, has followed an alternative path. It has developed foundation degrees in partnership with five different universities, after a national competition: Chemical Sciences (Manchester Metropolitan); Polymer Technology (London

Metropolitan); Process Engineering Management (Hull); Nuclear Engineering (UCLan); Applied Bioscience Technology (Kent). These programmes are targeted primarily at employees of companies operating in these sectors. This dictates delivery models involving work-based learning and part-time attendance. Cogent has published a national foundation degree framework specification for each of its five industries, an exercise that other SSCs may wish to consider.

Skillset is the SSC for the creative media industries—a sector that largely delivers its products through networks of small companies operating with niche expertise, yet one of the largest industries in our economy. Skillset identifies degree programmes that best meet the requirements of the various industries in the sector. Unlike e-skills UK it does not determine the curriculum, but advises on current industry need, skills shortages and perceived curriculum gaps; it also assesses the university's curriculum and the strength of links of the university with industry. Skillset presently accredits specific animation, computer games, screenwriting and film production courses, as well as accrediting wider non-sector specialist media and interactive degree courses through the Skillset Media Academies. Skillset kitemarking has recently been included in the KIS information for prospective Higher Education applicants in 2012. This is a welcome recognition of the standing of SSC kitemarking.

Beyond its kitemarking of programmes, Skillset also recognises and licenses centres of excellence. It endorses film academies and media academies where there is excellence and innovation in pedagogy, a high reputation with creative media employers, provision of professional development programmes and 'thought leadership'.

Recommendation

The SSC kitemarking of programmes is to be welcomed in that it is a system of industry recognition that informs students of the nature of the programme and brings employers closer to curriculum definition. It is for universities to decide whether to engage with SSC kitemarking or not. Where individual programmes are kitemarked by a SSC, that fact should be recognised within the KIS provided for applicants and included in the university's promotional material. Given the three different business models adopted by the three SSCs , the UK Commission for Employment and Skills (UKCES) should monitor the performance of each business model in terms of recruitment, financial viability and employment outcomes. Any future SSC kitemarking should also be included in such a monitoring activity. A formal review of the effectiveness of SSC kitemarking should be undertaken by UKCES in 2015.

4.6.4 Accreditation by professional bodies

The accreditation processes and standards required by UK professional bodies have a high international reputation; they are respected by employers, students and universities alike and feature in the KIS provided for applicants. Amongst the professional bodies examined, no causes for concern were found in the engagement with business, the transparency of requirements for progression through levels of accreditation or the university support for such progression, where it is needed. However, in the critical area of life sciences, the emergence of the Society for Biology as an accrediting body, responding to the needs identified by the Association of British Pharmaceutical Industries (ABPI), is perhaps overdue *and the acceleration of its development would be welcome.*

4.6.5 Corporate programmes: upskilling

Responding to the Leitch Report, over the last four years HEFCE has supported upskilling of employees with the workplace through a co-funded scheme, whereby companies and HEFCE each contributed 50 percent to the cost of the provision of the projects undertaken. These projects focused upon the development of higher-level skills within the existing workforce and were evaluated in 2011.[91] Not only were the ambitious targets of the programme met, but the participating universities established an infrastructure and culture that should be able to continue this form of business–university collaboration and apply their expertise to new clients, differentiating themselves within the sector. There is no evidence that the withdrawal of the co-funding facility will inhibit the future of this provision; indeed, other such schemes in the postgraduate field have been founded without such an incentive.

Case study: Halifax Community Bank—Middlesex University

Halifax Community Bank and Middlesex collaborate to deliver an innovative and sustainable approach to workforce development. The bank identified the need for higher-level training for around 1,000 of its managers. This major investment in workforce development, called 'Journey in Practice' (JIP), was designed to raise the standards of retail banking practice across the company. The combined use of the University's accreditation services and work-based learning framework has meant that Middlesex has the academic infrastructure to deliver high-quality learning that is responsive to the needs of the employer and their employees, and award credit towards university qualifications: Advanced Diploma and Postgraduate Certificate in Retail Banking Practice programmes.

Recommendation

This government-subsidised scheme has now finished, and future in-house corporate programmes will fall within the new funding environment. HEFCE should monitor the sustainability of university activity in this field and report trends and significant market failures to government.

4.6.6 Corporate programmes: on campus

Company sponsorship of students has been a feature of Higher Education for decades. However, a new level of corporate activity is expected in the light of the new student funding arrangements.

For employers, the advantages of sponsorship are clear: gaining a competitive edge in recruitment through early recruitment of talented people; widening the talent pool; meeting diversity objectives; supporting students who may not otherwise progress to university; engaging in the development of employability skills through placement and internship; reducing long-term staff turnover by developing loyalty; and planning a secure talent pipeline[92]. All these may be secured by scholarship or sponsorship arrangements between the sponsoring company and students. They take a variety of forms, from financial scholarships to support subsistence expenses to full financial support, including a remuneration package. Currently, these forms of sponsorship do not exclude the student from the student loan system or from being counted within the HEFCE student number control.

[91] Evaluation of the Higher Education Transforming Workforce Development Programme, CFE/KSA, October 2011
[92] CBI Roundtable 'Promoting a diversity of routes to achieve a high skilled, highly productive economy', October 2011

To influence the content of a programme and secure a dedicated and bespoke degree requires a greater investment and a strong collaborative arrangement with a university. This level of collaboration requires a long-term commitment and a mutual understanding of constraints and objectives. The company will seek to ensure that the knowledge and skills developed by the student will be appropriate to company needs and the university has to place those needs within a framework that meets its standards and quality requirements. Both parties, of course, have to commit to long-term sustainable funding of such programmes. An increased level of student sponsorship and an increased number of bespoke degree programmes are now emerging as companies seek to secure talent at an early age and students seek to gain both relative employment security and avoid a long-term significant student loan. Collaborations of this type may prove to be a significant way of allowing companies and indeed entire professions that have recruited from a narrow social stratum to widen their reach.

Case study: Merchant Navy—Southampton Solent University

Southampton Solent University's Warsash Maritime Academy (WMA) is a specialist college for Merchant Navy officers. It has an international reputation and a multinational student body. Warsash-trained officers can be found on the bridges and in the engine rooms of some of the world's largest and most sophisticated commercial ships. 300 new entrant cadets enrol each year, and a total of around 8,000 students pass through annually on a range of courses from short practical modules through to a distance-learning postgraduate programme to help mariners make the transition to specialist roles ashore. Teaching is kept current by research and consultancy, and most of the teaching staff are experienced officers in their own right, many with command experience. Programmes are developed and approved through the industry-led body, the Merchant Navy Training Board.

Such activity, at individual company and at business sector level is to be encouraged as it provides students with direct career opportunities and financial support during their degree studies; it ensures heightened levels of knowledge and skills directly relevant to employment and provides a partnership arrangement that can lead to the development of further collaboration in wider fields of activity.

In the context of financial viability, the critical mass needed for a bespoke programme limits the opportunities to create such programmes. However, employers may conclude that a 'normal' university programme is appropriate for their needs and the needs of their sponsored student. This is also a practice that should be encouraged.

Recommendation

Where the financial support available to a student from an employer is at least comparable to the support available through the Student Loan Company, and where is no burden on the public purse, the enrolment of fully sponsored students on programmes that are relevant to the business of their employer should be outside the student number controls operated by HEFCE.

4.7 Pathways for progression: meeting student aspirations and employer needs

Progression routes into Higher Education from the GCE A level course are well understood by schools, parents, students and universities. Over 90 percent of A level students progress into HE. As a consequence, many programmes of study in HE are designed to deal with students with academic

skills but perhaps lacking vocational experience, skills and awareness; many of the recommendations in this chapter are focused on addressing this issue.

The role of level 3 vocational qualifications in preparing students for HE is less well understood with progression standing at 50 percent. Progression from work-based routes such as apprenticeship is even less well developed. These qualifications have not generally been seen as direct pathways to higher-level study and in many cases vocational students who do progress experience difficulty in dealing with curriculum models which use more traditional methods of delivery and assessment than those to which they are accustomed. This may have the effect of detracting from the value of those qualifications and make their holders less likely to consider higher-level study.

Participation in vocational and employer-related HE is needed to increase the pool of people with higher-level skills available in the economy. To achieve this, greater progression opportunities from level 3 vocational qualifications are required. This can be achieved by creating a more diverse range of HE provision than currently exists.

A decade ago foundation degree programmes were introduced to the HE portfolio, without all-party support. However, they have now established a brand and have been embraced by employers through their engagement with these programmes. A growth in foundation degree programmes, designed and targeted at students with vocational qualifications, will provide progression routes and, in parallel, meet the high-level vocational skills needed by industry.

The requirement that a foundation degree must articulate with an honours degree is a requirement that understates the relevance of advanced professional qualifications—qualifications where the requirements are not congruent with the requirements of an honours degree but are equal in rigour and esteem. Higher-level apprenticeships are such a route and work-based pathways have the potential to address the needs of employers and meet the aspirations of individuals. These could be developed to provide a highly valued alternative for school leavers who wish to combine work with gaining a higher qualification. Work-based pathways to higher qualifications have the potential to be a prominent feature of the HE landscape, addressing some of the long-term skills needs of employers and the aspirations of individuals.

Recommendation

Foundation degrees should be reaffirmed as a qualification in their own right rather than necessarily as a stepping stone to an honours degree. Pathways, including higher-level apprenticeships and professional qualifications, should become a priority development and be the subject of promotion amongst careers advisory services.

Recommendation

Foundation degree-awarding powers should be revisited to enable consortia of FE colleges, or a national CNAA[93] type organisation, working in partnership directly with employers and/or SSCs, to obtain such powers.

4.8 Postgraduate education

The business need for employability skills does not reside solely at undergraduate level. Postgraduate education forms a considerable part of the UK HE provision, with the number studying

[93] The Council for National Academic Awards (CNAA) was a degree awarding authority from 1965 until 1992.

for higher degrees increasing by 36 percent during the last 12 years, a higher growth rate than that in the undergraduate sector (CIHE, 2010).[94] The taught postgraduate programmes account for almost 20 percent of all HE students in the UK, and for over 75 percent of all postgraduate students (UUK 2009).[95] Perhaps unsurprisingly, students' main motivation for undertaking postgraduate study is to improve their employment prospects (HEA 2011)[96]. Employability skills development within the research student community is considered in chapter 6 in the context of business–university research collaboration. The skills development of 'taught' postgraduates merits separate consideration.

There is uncertainty amongst contributors to the Review about the sustainability of UK students postgraduate taught programmes in the light of the student loan system for undergraduates and the absence of a similar support system at postgraduate level. There are indications that this is an area where business collaboration and in-work provision may grow in importance but it is unlikely that this form of provision can replace the present volume of postgraduate taught education in the near future. Meanwhile, students applying for postgraduate programmes deserve more consistent and comparable information about likely careers than they presently receive. There is a gap in information about the destinations of postgraduate taught students, a gap that has been addressed at undergraduate level in the form of the KIS. The information needs of postgraduate students are not identical to those of undergraduates and merit specific attention.

Recommendation

Universities should publish the job destinations of recent fulltime postgraduate taught students, by department as soon as possible. The development of a distinctive postgraduate KIS should be a priority development for HEFCE.

The value and impact of postgraduate skills are reflected in attracting new business (BIS 2010)[97] and in driving a high-performing economy (Leitch 2006).[98] Postgraduate education equips students with a range of skills, and enhanced knowledge valued by employers (BIS 2010).[45] In addition to subject knowledge, postgraduate study can nurture self-motivation, resilience and understanding, though employers may be unaware of the breadth of what a postgraduate can bring (Barber et al. 2004).[99] The requirement for specific management high-level skills and managers able to operate at corporate level is seen as a high priority (UKCES 2010).[100]

The generic skills needs, therefore, have been the subject of considerable research. However, there is relatively little research undertaken about employers' perspectives of the knowledge and skills of postgraduate masters students, and the research that exists is contradictory. Archer & Davison (2008)[101] note 'the minor importance employers attach to possession of a postgraduate

[94] CIHE (2010) 'Talent Fishing: What Businesses want from Postgraduates' http://www.cihe.co.uk/category/knowledge/publications
[95] Universities UK (2009) 'Higher Education in Facts and Figures' http://www.universitiesuk.ac.uk/Publications/Documents/Facts09.pdf
[96] HEA (2011) 'Postgraduate Taught Experience Survey (PTES)' http://www.heacademy.ac.uk/assets/documents/postgraduate/PTES_report_2011.pdf
[97] BIS (2010) 'One Step Beyond: Making the most of Postgraduate Education' http://www.bis.gov.uk/assets/biscore/corporate/docs/p/10-704-one-step-beyond-postgraduate-education.pdf
[98] Leitch Review of Skills (2006): 'Prosperity for all in the global economy – world class skills' http://www.official-documents.gov.uk/document/other/0118404792/0118404792.pdf
[99] Barber L., Pollard E., Millmore B. and Gerova V. (2004) 'Higher Degrees of Freedom: the value of Postgraduate Study'. Brighton: Institute for Employment Studies
[100] UKCES (2010) 'A theoretical review of skill shortages and skill needs' http://www.ukces.org.uk/assets/bispartners/ukces/docs/publications/evidence-report-20-a-theoretical-review-of-skill-shortages-and-skill-needs.pdf
[101] Archer W. and Davison J. (2008) 'Graduate employability: what do employers think and want?' CIHE

qualification, in their study'; yet CIHE (2010)[102] note a high demand for higher degrees, but also employers' reservations about the skills of postgraduates—particularly in leadership skills and work experience. There is a need for further research into the employability skills gap of postgraduate students.

Case Study: Rolls-Royce – Cranfield University

Rolls-Royce plc and Cranfield have collaborated for many years on research, innovation and skills. A strategic dialogue around enhancing innovation across its supply-chain resulted in an investment in an MSc programme on 'Operations Excellence' accredited by the Institution of Engineering and Technology (IET), the Institution of Mechanical Engineers (IMechE), and the Royal Aeronautical Society (RAeS). The programme; open to employees of Rolls-Royce and its supply-chain partners, focuses on all aspects of the supply-chain, from introducing new products and operating effective factories, through to managing new technology and working with suppliers. The programme provides an environment in which participants, all of whom are company sponsored, can collaborate with other professionals and industry experts to undertake confidential cases, consultancy and company focused project work.

Recommendation

HEFCE should monitor postgraduate taught enrolments and identify any barriers to enrolment that have been created by the new student loan system and advise the government of its conclusions.

Recommendation

The AGR, CBI and UUK should undertake research into the skills requirements of UK business of 'taught' postgraduate students to inform universities of business needs in this regard.

4.9 Language skills and cultural awareness

In the context of market globalisation, the skills of multicultural awareness feature strongly in employers requirements; a survey by the AGR placed a premium on the possession of 'cultural sensitivity' with 75 percent of multinational companies valuing international study or work experience as an important way of developing employability skills[103] [104]. However, it is not foreign language skills that make students with such experience attractive nor is their attractiveness confined to multinationals. The experience is seen as an excellent way of developing wider employability competencies such as the ability to adapt to changing situations, understanding cultural difference in the workplace and gaining new knowledge from different experiences. One of the key attributes developed by the European Union's ERASMUS study abroad students and recognised by all stakeholders (students, academics and employers) is an increased level of 'maturity and personal development'[105].

http://www.cihe.co.uk/wp-content/themes/cihe/document.php?file=0802Grademployability.pdf

[102] CIHE (2010) 'Talent Fishing: What Businesses want from Postgraduates' http://www.cihe.co.uk/category/knowledge/publications

[103] AGR 'Graduate Recruitment Survey 2008: Summer Review' (p35)

[104] QS Global Employer Survey Report 2011. 'How Employers value an International Study Experience'. Moloney J. et al. QS Intelligence Unit

[105] 'The professional value of ERASMUS mobility', final report. INCHER, 2006 (p78) http://ec.europa.eu/education/erasmus/doc/publ/evalcareer.pdf

The research that exists does not cite language skills as the most prominent required skills by business. Indeed the Institute of Directors (2007)[106] cited foreign languages as the attribute perceived to be the least significant in terms of graduate competences. Even 'global organisations' rated multilinguism as low as 1.7 out of a score of 10 when ranking those considered the most important 'global competencies'[107]. Working collaboratively with teams of people from a range of backgrounds and countries' scored the highest with a mean of 8.2—highlighting the level to which overseas study or experience can enhance a wide range of employability skills of students and graduates.

UK university campuses are multicultural environments. Although there is no public information on the degree of multiculturalism on university campuses, many large universities host more than 100 different nationalities amongst their staff and students, often with a similar number of native languages available on campus, and often languages of the developing world. However, despite the UK being the second highest receiver of international students worldwide, the UK is ranked 34th for external mobility. This issue is further evidenced by the lack of UK domicile students undertaking ERASMUS placements overseas; British are below half that of France and Germany.[108] However, research funded by the British Council identifies that UK students have a strong awareness of the wider world and would describe themselves as having an international outlook. But equally the belief that an international outlook helped employability was not realised.[109]

There are two major issues that arise from this analysis. First, we should raise the importance of the skills acquired through international experience amongst our students and encourage more UK students to study or to take an internship/placement outside the UK in order to provide work experience and therefore skills development in a different business environment. *Universities, together with the students' unions, should consider how to promote international internships and placements amongst the student body.* Professor Colin Riordan, Vice Chancellor of the University of Essex, is currently examining strategies to enable a greater number of UK students to spend a year overseas as part of their degree programme. This will be a valuable contribution to the improvement of graduate skills development.

Second, we should examine how business can best use the multilingual skills of our indigenous UK students. There is anecdotal evidence of employers using bilingual university students to support their trading activities, but insufficient evidence to claim that this support has real potential.

Universities and their LEPs should reflect on how the international nature of a university community can be utilised for the benefit of local business.

4.10 Diversity of universities in enterprise profiles

Diversity in the university sector used to be defined by a simple model related to research intensity. This model has become outdated, partly through the development of the wide range of strategies by universities to address the enterprise agenda. A group of universities has defined themselves as 'business-engaged'[110]; Plymouth University has branded itself The Enterprise University.[111] This

[106] Institute of Directors skills briefing: December 2007. 'Graduates' employability skills' (p14)
[107] *'Global Graduates into Global Leaders' 2011. AGR, CIHE, CFE (p5)*
http://www.cfe.org.uk/uploaded/files/Global%20Graduates%20Full%20Report.pdf
[108] QS Global Employer Survey 2011. 'How employers value an international study experience'. Molony J. et al. QS Intelligence Unit, London http://content.qs.com/qs/qs-global-employer-survey-2011.pdf
[109] http://www.britishcouncil.org/new/PageFiles/15492/YouGov_Report_v3.pdf
[110] http://www.university-alliance.ac.uk

branding impacts upon the culture and the ethos of the university; it is an explicit statement of purpose and mission.

But employability, entrepreneurship and business-defined curricula are not confined to these branded universities; they are shared by all universities, but with an emphasis and an investment that is appropriate to the mission of that university. For example, not all universities deliver embedded in-company degree programmes; others have invested to provide a service to such clients. Not all universities see social enterprise as an academic subject but rather as an optional extracurricular activity; others consider it a subject worthy of degree-level study and practice. Not all universities consider the generation of placements to be a worthwhile investment; others consider it a priority in fulfilling their mission. Not all universities have incubator facilities for student start-ups; others have extensive accommodation for that purpose. Not all universities consider that high achievement in enterprise and entrepreneurship should be included in the criteria for academic career advancement (regrettably few recognise these activities through readership and professorial appointments); in others such recognition is integrated within the promotion criteria and excellence in enterprise is celebrated through that system. Some universities consider that their enterprise ecosystem is sufficiently embedded that it can deliver dynamic innovation without 'central' interventions; others retain a centralised enterprise function to influence and support activities at faculty level.

Just as all universities will claim to be research active, all universities may claim to be enterprise active. Diversity in the sector is not just defined by research profiles; it can also be defined by the breadth and depth of enterprise activities within its knowledge and skills development activities. Diversity of practice within our universities is not confined to research intensity.

Where there is such diversity there is an inevitable wish to measure, to evaluate the degree to which a university is promotes enterprise. I add a caution to the issue of measurement, especially in the context of the inevitable league tables that will follow. Presently, growth in the enterprise and entrepreneurship education agenda is strong and increasingly innovative. Measuring what exists will focus universities upon the activities being measured; it has a strong potential to inhibit innovation, not to drive it. If enterprise culture, which is the essence of successful enterprise education, is to be measured, it cannot be a simple process; it requires a rigorous and comprehensive study, engaging with students and universities during the process.

I add a further caution in the context of development of enterprise and entrepreneurship education in our universities. UK universities have the highest international reputation for quality, a reputation that is sustained by the standards and quality of its HE and supported by the renowned quality assurance system. Assessment approaches in universities focus upon known schedules and requirements, published in a student handbook. That is an underpinning foundation of our quality system. Yet in an enterprise skills context, this is not a realistic environment.

Enterprise skills require responsiveness to unexpected pressures and tasks; they require reaction to changing circumstances and disruptive interventions. These attributes are contrary to the established framework of assessment processes. Enterprise skills do not presently lend themselves to formal assessment methods. Although this issue could be addressed by the addition of an 'enterprise module' to an established curriculum with the associated planned learning and

[111] http://www.plymouth.ac.uk

assessment tasks, such a model defeats the very principles of enterprise and entrepreneurial education. Implementing such a model would be a retrograde step. QAA have shown leadership in commissioning Professor Andy Penaluna to lead a team of experts who are developing guidance for the development of enterprise education in UK universities and highlighting the quality assurance issues that it raises[112]. I have confidence that his report will be balanced and progressive.

4.11 Reflections

Three interconnected themes have reoccurred throughout this chapter: relevance of programmes to the world of employment; skills development and awareness; and the importance of work experience. The recommendations made in this chapter are not seismic in their individual impact upon universities, business or government. But together they will bring huge advantages in preparing students for employment in the world of business, to the benefit of themselves, of business and ultimately of our economy.

[112] http://www.heacademy.ac.uk/assets/bmaf/documents/news/HEA-BMAF_QAA.pdf

Chapter 5: Business–university collaboration in research and innovation

5.1 Introduction

Government support in research and innovation is a dynamic environment, reflecting its importance to the nation's economic future. This Review has been undertaken at a time when the government has been producing its Innovation and Research Strategy[113]. During this period there have been regular exchanges between these two studies and, in so far as they do overlap, they are intended to be complementary. In parallel the UK Strategy for Life Sciences has been developed and published[114]; it identifies a series of measures targeted at delivering growth to that sector.

The BIS Select Committee in Science and Technology has also announced an inquiry into the translation of research into commercial application, particularly into the lack of sustained funding for this activity—the so-called 'valley of death'. This inquiry is to be welcomed. A detailed examination of this field extends beyond the boundaries of this Review.

5.2 Research and technology organisations

A full examination of RTOs falls outside the scope of this Review, but their importance as part of the innovation ecosystem should be acknowledged. RTOs are positioned between academia and business users of technology. They are a range of companies and organisations whose activities bridge gaps in the process of converting research outcomes into innovation and new technologies for use. Examples include: QinetiQ Group plc, providing technology-based services in the defence and security markets; BSRIA (the Building Services Research and Information Association), focusing on construction and building services; and the National Physical Laboratory supporting applications of science and technology through better measurement. RTOs frequently have close relationships with universities—for example, South East IP, a collaboration between National Physics Laboratory and four research-intensive universities in the South East[115]. The RTO sector is reported as contributing £3 billion per annum to UK GDP[116]. The recommendations within this Review should not inhibit the contribution that RTOs make to our innovation ecosystem.

5.3 Business investment in research and development

Business R&D in the UK is concentrated in relatively few large companies and a small number of industrial sectors; the ten largest investors account for 34 percent of all business R&D and the top 50 account for 56 percent; independent SMEs account for only 3.5 percent of expenditure.

By comparative international standards the UK has a relatively high proportion of its R&D expenditure undertaken by subsidiaries of international companies[117]. This reflects the international profile of the R&D market; global companies will invest their research budgets where they can obtain the best returns and networks of research partnerships can be established on a global basis.

Case Study: Rolls-Royce and university partners

Since 1990 Rolls-Royce has been investing in a university partnership model for its research: the university technology centre network. Today the company supports 28 university research centres worldwide, 19 in the UK, with over 400 PhD students and academic and research staff at

[113] http://www.bis.gov.uk/innovatingforgrowth
[114] http://www.bis.gov.uk/news/topstories/2011/Dec/government-boost-to-uk-life-science-industry
[115] http://www.southeastip.co.uk/
[116] Oxford Economics: 'Study of the Impact of the Intermediate Research and Technology Sector on the UK economy', May 2008
[117] The UK R&D landscape, Report of the CIHE task force Hughes and Mina. CIHE/UKIRC 2011

> all levels.[118] Further, with support and funding from government agencies, and in collaboration with other leading businesses and universities, Rolls-Royce is a partner in a network of seven advanced manufacturing research centres (five in the UK), established to help Rolls-Royce and other industrial partners achieve a leading position across the full portfolio of manufacturing technologies. The physical infrastructure of the seven centres provides the ongoing capacity and the capability to support public and privately funded applications engineering programmes.[119]

Global competition in the corporate R&D market provides both threats and opportunities. The UK university sector is acknowledged for its excellence and is able to attract investment from international companies and their subsidiaries to support its research. However, for the UK to obtain the full benefit from its university system, the country needs to attract international business to locate or expand in the UK and create employment. There needs to be some 'stickiness' in this inward investment in R&D if the country is to fully benefit from the capabilities of its university sector. *BIS and UKTI should reflect on mechanisms to support international investment in the university research base and to ensure that such inward investment is fully exploited in the context of economic growth in the UK.*

5.4 Impact evaluation of university research

This Review is also being undertaken as universities prepare to submit to the Research Excellence Framework (REF) in November 2013, within which 'impact measures' will have a material influence on the outcome for each university department and therefore for its reputation and funding over the forthcoming years. Alongside this, the RCs have developed a complementary 'pathways to impact' approach, which is intended to ensure that researchers give full consideration to the potential avenues for exploiting their research at the time they are developing proposals.

The 2008 Wellings Report[119] recommended that universities should publicise the wider benefits of their activity on a wider scale than hitherto and several adopted that recommendation through both traditional publication and in the wider media. The introduction of an impact element to funding and RC processes has caused institutions to invest in systems that systematically evaluate the impacts of research on an ongoing basis. These measures will also raise the profile of the benefits of the UK research base to a wider audience. In the view of some university leaders the exercise of evaluating research impact is, in itself, changing behaviours within the research community. The strategies that universities will use to optimise the impact of their research in future REF exercises are yet to emerge into the public domain, but may lead some to move further along the value chain of exploitation activity with business, with a view to optimising the consequences of their research. Such strategies would also be welcomed as they would strengthen business–university collaboration.

5.5 Networks that connect businesses to universities in research matters

Fundamental to business–university collaboration is the process of networking: 'the human process that creates and maintains relationships based on trust for the exchange of valuable knowledge and collaborative working'.[120] This concept goes well beyond the traditional models of IP exploitation, achieved through a transactional process involving intermediaries.

---

[118] http://www.rolls-royce.com/technology_innovation/uni_research_centres/key_academic_partnerships.jsp
[119] http://www.bis.gov.uk/assets/BISCore/corporate/docs/H/he-debate-wellings.pdf
[120] 'Innovation by networking: why this critical capability must no longer be misunderstood or undervalued', R. Smith, *The VIEW Journal* Xplor European edition, Issue 2, Oct 2007

5.5.1 The role of intermediaries

Intermediaries, in this context, are organisations or individuals that occupy the space between the researcher and commercial exploitation of that research. They are able to operate in both academic and business cultures. In many cases intermediaries may be an in-house technology transfer/research commercialisation office, in others a third-party service and occasionally they are a blend of both.

It is important to recognise that there is no one intermediary model that suits all situations. Sometimes third-party intermediaries are necessary to mediate an arrangement; in strong collaborative relationships an environment of integrated working is developed. Where there is common understanding of the motivation of respective partners and a common language, limited mediation is required.

The barriers to collaboration presented by the ownership of intellectual property were examined in chapter 3. It is important to put the IP issue in context. In revenue terms, university income from joint research with industry and the third sector (£1.7 billion including governmental co-funding) greatly exceeds that generated from traditional linear technology transfer providing IP income (£84 million).[121] Further, there is growing evidence that businesses value collaborative relationships with HEIs above linear university IP transactions in their innovation processes.[122]

5.5.2 Informal networking

The vast majority of knowledge exchange interaction follows direct contact between academics and external organisations, rather than being mediated by knowledge exchange offices[123], so networks and mechanisms of exposure and engagement between academia and industry are crucial. In this context networking, and establishing and sustaining trusted relationships, becomes a key role for research academics and businesses alike.

Such relationships can only be achieved if there is a culture of such real-time networking amongst academic staff. This culture is not as thin as is sometimes believed; survey data indicates that external engagement by academics is widespread and 'the ivory tower is indeed a myth', with more than 40 percent of academics from all disciplines interacting with private sector businesses.[124] The most important constraint identified by academics in engagement in knowledge exchange activities is perceived lack of time, perhaps a reflection of the priority given to networking amongst competing objectives. Significant effort and funding has, however, been redirected toward these engagement activities as a critical part of ensuring effective knowledge exchange and much of this has been funded through public subsidy. Analysis of the HEIF strategies indicate that £62 million (around 10 percent of HEIF) is to be spent on knowledge diffusion activities in the period 2011 to 2015, helping universities address the 'lack of time' obstacles identified. It is for universities to ensure that these funds are used to create time availability for this critical work, prioritising support for those whose work is most relevant to commercial use.

5.5.3 Structured networking

[121] HEBCI 09/10, HESA

[122] 'University–industry relationships and open innovations: towards a research agenda' Perkmann M. and Walsh K., *International Journal of Management Reviews*, 2007, Vol. 9, 259

[123] 'Understanding the Knowledge Exchange Infrastructure in the English Higher Education Sector' working paper for HEFCE, PACEC/CBR, 2011

[124] 'Knowledge Exchange between Academics and the Business, Public and Third Sector', Abreu M., Grinevich V., Hughes A. and Kitson M., Report for UK-Innovation Research Centre, 2009

However, interaction between universities and companies is an ever-changing market as businesses seek to be leaders in their particular fields and researchers seek to ensure that the potential of their work is realised. The increasing adoption of open innovation models[125] demands that even greater attention is paid to networking between research academics and business. Structured opportunities to network are taking a heightened importance. Whilst collaborations in the past were often the result of *ad hoc* connections and personal relationships[126], the importance of individuals with 'boundary scanning' capabilities—identifying early stage technology developments or technologies used in other industries—by both universities and businesses has been recognised,[127] and needs to be accommodated within a networking system. This emergence of industry boundary scanning positions (sometimes known as technology catchers or scouts) provides opportunities for additional models for proactive networking, both for companies seeking technology-related innovation through university research and for researchers seeking companies that could use their research and/or innovation to enhance their performance. Such 'smart' networking is possible using the expertise and knowledge base of the TSB.

Recommendation

The TSB should work with universities, research funders and business to establish a boundary-scanning capability with intelligent brokering to facilitate innovation. This could include open innovation projects exposing existing research information on challenge areas, providing a valuable resource for business. When established, this facility should have the capability to reciprocate its service, linking companies in relevant sectors to universities seeking collaboration to develop applications for its research.

At a national level the portfolio of KTNs funded by the TSB is an acknowledged resource facilitating networking in industry sectors. There are some examples of excellence, but the networks vary hugely in scope, membership and interconnectedness. Although they were reviewed two years ago, some are still considered sub-scale and generally there is a question about external awareness in business and universities. *The TSB may wish to re-evaluate and if necessary refresh the KTNs.*

TSB has created a platform for networking *in_connect* and there is evidence that it is being used successfully. However, it is not clear how it can be distinguished from other readily available social networking tools. *In the context of its investment priorities, TSB may wish to re-assess whether in_connect provides a value for money solution to its networking activities.*

At a local level, the LEPs provide opportunities for structured networking and should gain momentum as they mature and good practice is disseminated through their national network. The potential role of LEPs will be examined later in this chapter and in chapter 7.

It is important to recognise that networking activities are not the exclusive domain of government-funded organisations. Membership of subscription-based industry clubs enable effective networking, exposing members to mutual learning and university capacity. The CBI has two committees covering business–university collaboration, one specifically focused on innovation and technology. The long-established *Cambridge Network* links together innovative companies in the Cambridge area*; ProfitNet* is a network created by the University of Brighton and is now being franchised nationally

[125] 'Open Innovation' Chesborough H., Harvard Business School Press, 2003
[126] 'Open innovation networks between academia and industry: an imperative for breakthrough therapies' Melese T., Lin S.M., Chang J.L. and Cohen N.L, *Nature Medicine*, 2009, Vol. 15, 502
[127] 'Valuing Knowledge Exchange' Termouth P., Garner C., Report for CIHE, 2009

and internationally; member organisations of the High Value Manufacturing Catapult centre also use such models. A number of universities also use the networking facilities of trade associations to raise awareness of their capabilities.

5.6 People and knowledge exchange

Placements, internships and secondments are recognised as some of the best ways to achieve knowledge exchange.[128] Experience of secondments amongst postdoctoral researchers is low[129] and academics' competing commitments limit their availability to undertake such placements. Again the allocation of time for this amongst academic research staff is often reported as a problem. However, the issue is not one of time constraint, it is one of time and goal prioritisation. Set in the context of career development, impact realisation and the rapidly developing world of business collaboration, such secondments should be promoted and encouraged.

Funding for secondments and people exchange is available from a variety of sources: for example, the RCs, the Royal Society and Royal Academy of Engineering industry fellowships. However, these initiatives do not provide comprehensive coverage across the research spectrum and there should be potential to link these to positions such as 'entrepreneurs in residence' in a complementary manner.

Recommendation

The TSB, with RCUK and UUK, should evaluate the present schemes of secondment, identify strengths and weaknesses within the research portfolio and propose measures to strengthen these business–university links. Such a study should include the roles of fellows and entrepreneurs in residence within Catapult centres.

The situation of postdoctoral research staff merits further consideration. Many postdoctoral researchers experience a series of short-term contracts, dependent upon research grants. In the context of 21st century good practice in the management of human capital, it would be beneficial if these employees were offered the opportunity of an internship with an employer in a relevant field of activity in order to maintain real-time connectivity with the business world, and also receive additional support from their employer in terms of enterprise education. Such activity would both support the development of the individual and potentially improve the impact of the research undertaken.

Recommendation

All full-time postdoctoral research staff should have the opportunity to benefit from 8 to 12 weeks' of work experience outside academe every three years during their contract. They should receive career guidance from the university's professional staff each year of their employment as an integral part of their appraisal and be encouraged to attend a short intensive enterprise skills programme alongside postdoctoral staff from other departments of the university. For the avoidance of doubt, these measures should be integrated within the contracts of postdoctoral research staff and, where possible, embedded within external funding arrangements.

[128] 'Stronger Together: Businesses and Universities in turbulent times' CBI, 2009
[129] 'Careers in Research Online Survey (CROS) 2011: Analysis of UK aggregate results' Vitae, 2011

5.6.1 Knowledge transfer partnerships

The well-known and established knowledge transfer partnerships (KTP) scheme places recent graduates with companies under joint academic and company supervision to undertake a research project, with the goal of improving the competitiveness of the company. Now managed and co-funded by the TSB, but running for over 30 years, the benefits of these partnerships are well established. KTP is an intensive intervention with a highly structured management; this ensures that it is suitable for businesses with low absorptive capacity. Its client businesses are predominantly SMEs. Analysis indicates that engagement in KTP schemes by Russell group universities has not been at the level that may be expected; only Queen's University Belfast and Manchester have a significant profile[130].

I regard this as another demonstration of differentiation in the sector: the KTP programme is highly successful but is not prominent in the priority list for our largest research-intensive universities, possibly because its associates are normally graduates rather than postdoctoral staff. Appointing postdoctoral staff to these programmes may require the TSB's salary contribution for associates to be increased, with the consequence of a lower number of schemes, unless the budget were increased. The KTP programme (and the associated mini-KTP programme) has a track record of successful knowledge exchange between universities and academia, deploying graduates to support innovative companies and is commended for that performance. The introduction of a postdoctoral level of input should only be undertaken where the skills associated with that level are required.

Case Study: Knowledge Transfer Programme: Cherry Pipes Ltd and Queens University Belfast

The highest award winning KTP in 2011 was a collaboration between Cherry Pipes Ltd and Queens University Belfast. The KTP, part-funded by Invest Northern Ireland and the TSB, has transformed the company from being a producer of precast concrete pipes to becoming a market leader in the plastic pipe and plastic recycling industry. The company is now a leading plastics recycler in the UK and the most technically proficient recycler in Ireland. The company's workforce has increased from 20 to 60 and turnover quadrupled to £10.56 million. The R&D investment by Cherry Pipes has risen from zero to £200,000 and it now leads an EU project to change the technology associated with polymer recycling.

Recommendation

The TSB is encouraged to build on proven success and expand both the KTP and the mini-KTP programmes to meet the needs of business. The TSB should also be encouraged to find mechanisms to facilitate networking between KTP associates as part of a broader agenda to unify the people exchange programme. For a limited number of appropriate cases, the TSB should consider raising their current financial contribution for salaries where it is necessary for postdoctoral staff to be employed on a KTP programme.

5.6.2 Innovation vouchers

The innovation voucher scheme, trialled in the UK within the West Midlands but subsequently provided widely through the former RDAs, has proved to be a success; the estimated economic impact is significantly higher than the national average for R&D innovation-related

[130] http://www.innovateuk.org/_assets/pdf/corporate-publications/ktp%20strategic%20review%20feb%202010.pdf

interventions[131][132]. These vouchers, worth £3,000, support an SME, working with a university, to develop innovation within the company and are often a first venture into university collaboration. The evidence indicates not only a record of successful interventions but often also a consequential ongoing relationship between the university and the SME concerned.

Recommendation

The innovation voucher scheme should be reintroduced under the governance structure of the TSB, working through the LEP network, which will determine local eligibility criteria. The government may wish to advise the TSB on the broad parameters of fund distribution in the light of its priorities for economic regeneration. The value of the voucher should be set by the TSB after consultation with the LEP network and experienced university providers.

5.7 Business–university collaboration in Research Councils and the Technology Strategy Board

The UK structure of RCs and the TSB is widely considered to be an underlying strength of UK research and its exploitation[133]. University and business representatives play key roles in both governance and in the operations of these bodies and it therefore sits within the scope of this Review.

The RCs' Royal Charters make clear their responsibility for supporting basic, strategic and applied research. There is no obligation in the charters to recruit representatives from particular backgrounds, but the councils are characterised by a balance between disciplinary specialists and 'user' representatives, many of whom are from business.

The councils have strategic advisory boards for generic and specific purposes, which have varying proportions of business representation depending on the focus. BBSRC, for example, has a 'bioscience for industry' board, which is entirely business-focused, but it has a stronger university focus on its other boards; EPSRC has a single strategic advisory network, which has a minority of business members but also 23 strategic partnerships involving over 30 companies. The councils also have business representatives on their peer review colleges, and they include business reviewers on their panels for specific initiatives.

RC chief executives are normally, but not always, recruited from universities, and most of their staff have a background in the civil service or the research base. In an environment where boundary scanning is becoming a specific role in many industries, it may become possible for the councils to recruit and develop a greater proportion of staff with experience within the business community, as well as an understanding of university research.

At an operational level within the RCs, business input is sought during proposal assessment processes. Contributions to this Review report business representatives being discouraged by the amount of paperwork involved. *I recognise the importance of rigour and fairness in decisions that involve the distribution of public funding, but I encourage the councils to review their processes and seek new methods that will lighten the burden upon panel members from business, whilst maintaining their influence*.

5.7.1 Complementarity of the Research Councils and the Technology Strategy Board

[131] Ecorys Evaluation of Innovation Vouchers Round 5; Aston University
[132] Ecotec Research and Consulting, Final Evaluation of the INDEX Innovation Voucher Scheme pilot
[133] http://rd-review.ca/eic/site/033.nsf/eng/00288.html

The 2007 Sainsbury Review identified an increase in the RCs' knowledge transfer activity as one of four key ways to strengthen science and innovation performance, and it recommended that the RCs should deepen and strengthen their investment in knowledge communities and centres that integrate universities and business. It also recommended the introduction of targets for RC knowledge transfer activity, including for spending in collaboration with the TSB to support new products, processes and services. This, allied to the growth of the TSB and its location, has yielded an increase in formal collaboration between the RCs and TSB.

Although it is recognised that the RCs collaborate with many organisations other than the TSB, and vice versa, the relationship between RCs and the TSB is considered vital in the context of this Review.

The obligations of the RCs to ensure that the research they support is informed by and has tangible benefits for business are clear; they are defined by the breadth of their charters, reinforced by the imperatives set by Sainsbury and refined by the Coalition government. But the responsibility is wider than the translation of research into application. In an environment where the future health of our economy depends to an extent upon our research outputs and our ability to capitalise upon them, the decisions about which fields to support and, by inference, which not to support, carry a heavy burden of responsibility. They need to be informed by leading-edge thinking and in-depth experience. The RCs fulfil that role. Indeed, business representatives have highlighted to the review that they see the RCs' leadership in this territory as a distinctive source of competitive advantage for the UK. Similarly the role of the TSB is highly respected and, together with the RCs, it forms a strong structure of government-funded agencies facilitating the application of research in industry and commerce.

The RCs and TSB have produced a summary of the areas and ways in which they collaborate[134], but there is no definitive statement of how they interact. Indeed, there is an understandable wariness about producing one, given the fluidity and diversity of knowledge exchange activity and the perception that this may reflect an outdated linear 'technology transfer' model. However, as business input to this Review has made clear, in some areas linear development is effectively what happens, either through technology push or through market need pull. In these cases it may be more appropriate for the TSB and universities to lead on research translation with business, and for the RCs not to be involved. In others, a more porous relationship is required, with business engagement throughout, or even business involvement in basic research, in which case direct engagement with RCs may be necessary. Different models will be appropriate for different circumstances and a flexible approach is essential; the key issue is complementarity and that requires the various parties to maintain an effective dialogue and collaborate to achieve mutual goals.

However, there appears to be a looser relationship between the RCs and TSB than Sainsbury envisaged and there is a risk that the market may be confused if an RC and the TSB offer similar services on an open basis. In practice the relationship works through formal and informal arrangements. The TSB chief executive attends the meetings of the RC chief executives and also meets with each of his counterparts. RCUK and TSB jointly run a strategic partnership group, which brings together director-level lead individuals from RCUK and TSB. There have also been productive secondments between the TSB and the RCs. But such arrangements, even at executive level, whilst

[134] http://www.innovateuk.org/_assets/pdf/other-publications/transformingresearchinnovation_web%20final.pdf

welcome, carry inherent risks and need strengthening through formal arrangements. *In the rapidly changing environment of research translation it is essential that there is a systematic interaction between RC and TSB governing bodies and staff in order to ensure there are ongoing agreements about which services are offered on an open basis to which markets. The strategic partnership group should propose measures to ensure that such interaction is established.*

5.8 Creation of centres of excellence

In the light of the current economic circumstances it is timely to consider the types of schemes and networks that have been established and focus on those activities that are successful and business- or market-led, rather than recommend creating new systems.

A HEFCE study on global innovation environments noted that the establishment of centres of excellence offers immediate recognised access to expertise. Such centres can play a key role in providing opportunities for networking and facilitating meaningful interactions, but the explicit technical themes of the centres need to be presented in a manner that make them more recognisable to corporate partners.[135]

The Hauser[136] and Dyson[137] reports advocated the establishment of a high-profile linked network of national centres to facilitate the commercialisation of research and to support the growth of specific business sectors of tomorrow through the provision of publicly subsidised facilities, analogous to the German system of Fraunhofer institutes but with a greater degree of business–university interaction. Consequently the TSB announced funding for six technology and innovation centres (TiCs),[138] and the first pilot centre in advanced manufacturing is already established. Many UK centres already exist: 50 were identified in the Hauser report as receiving funding since 2008. These centres often had RDA funding and regional focus, and some are examples of excellence (for example, Warwick Manufacturing Group). The RCs have also contributed to the creation of centres: EPSRC has funded six innovation and knowledge centres (IKCs) over the last six years; AHRC has funded four exchange hubs for the creative economy; and NERC, STFC and BBSRC all have centres of research and innovation excellence. The Catapult centres will raise the national profile of such activity and it will be helpful if the established centres in this space can align with these new investments.

Recommendation

Building on the Innovation and Knowledge Centres and other models, the TSB and RCUK should seek to identify areas which are not yet ready or appropriate for the Catapult model but for which there is an industry appetite for research-base interaction or new market areas. Coordination of existing schemes for these smaller centres within an umbrella scheme has the potential to provide a dynamic pipeline for Catapult centres.

5.9 Employability skills of full-time research students

Doctoral students will normally have graduated from a first-degree programme and therefore will have developed a set of skills during this period of study. The skills to be developed during their period of doctoral study are supplementary to those of undergraduate study and therefore merit separate consideration.

---

[135] 'Global Innovation Environments (study A)', Report to HEFCE, Knee P. and Meyer M., 2007
[136] 'The Current and Future Role of Technology and Innovation Centres in the UK', Hauser H., report for BIS, 2010
[137] 'Ingenious Britain: Making the UK the leading high tech exporter in Europe', Dyson J., Report for the Conservative Party, 2010
[138] 'Technology and innovation centres: Strategy and implementation plan', TSB, 2011

Conventional doctoral research (PhD, DPhil) degrees typically last for between three and four years with a student carrying out a substantial research project in order to make an original contribution to knowledge. The choice of the research topic is made by the student, in conjunction with the supervisor. Although there may be an explicit or implicit message about future career prospects, in many cases there may be little or no structured information regarding the career destinations of previous doctoral students.

Recommendation

To inform prospective doctoral student of potential career opportunities, universities should publish the job destinations of recently completed doctoral students, where possible by department, at the earliest opportunity.

5.9.1 Recent developments in PhD programmes

There has been a range of developments in the types of PhD programmes on offer in the UK in the last 20 years, primarily focused on increasing the development of research and transferable skills. The engineering doctorate, or EngD, was established by SERC/EPSRC[139] in 1992 in order to provide postgraduate engineers with an intensive, broadly based, research programme incorporating a taught component, relevant to the needs of and undertaken through sponsorship with industry. An EPSRC review in 2007[140] found these programmes equip their graduates for 'powerful, creative leadership roles', and recently the concept has been extended outside engineering and thus has been rebranded as an industrial doctorate. Universities have also developed other professional doctorates.[141]

The RCs—and in particular EPSRC, ESRC and BBSRC—also provide significant investment into centres for doctoral training in thematic areas, thus giving greater visibility of this activity to industry. Of particular note are the engineering doctorate (EngD) and industrial doctorate centres. These are strongly business-focused: all students are co-supervised and spend 75 percent of their time working with a company on project work. The recruitment of students in cohorts of critical mass together with the applied focus of the centres' themes (for example, efficient fossil energy technology, machining science) increases the capability of these centres to create communities for business–university interaction. A distinctive feature of these centres is the size cohort of students training together, creating an environment that can place an emphasis on team working and problem solving. Cohort working was noted in the EPSRC delivery plan 2011-2015 as a factor that puts these students in high demand by business and industry.

The concentration of studentships in this manner does, however, reduce the ability of universities to maintain a comprehensive portfolio of research activities to serve their local business needs. There is an important balance between concentration and distribution here: concentration should ensure value for money and efficient intellectual exchange but can restrict competition; distribution adds resilience and the potential for further specialisation, but also has the potential for inefficiency and dilution of expertise. The mixed model of hub and spoke may provide an alternative, but such models require clear protocols for efficient operation. This balance of risk is a judgement that has to be made on a case-by-case basis by the RC that has expertise in the field.

---

[139] The Engineering and Physical Sciences Research Council (EPSRC) was formed in 1994 following a reorganisation of the Research Councils

[140] 'Report of a Review of the EPSRC Engineering Doctorate Centres', EPSRC 2007

[141] http://www.professionaldoctorates.com

Integrated programmes, or 'new route PhD' have also been gaining popularity in the last ten years, through which students undertake structured training in research methods and transferable skills as part of an initial taught programme. Both new route PhD and professional doctorate employ '1+3' models, with an integrated taught masters degree, leading to a four-year course.

It is in the applied research context where there may be a space for an intermediary research qualification—a qualification based upon collaboration between a supervising university and a sponsoring company, compatible with the pace of business practice. This proposal has not been pursued further within this Review but is worthy of further investigation.

A shorter postgraduate programme is worth further consideration by universities working in partnership with business. For example, a two-year masters level programme may provide a more business-focused offering and help address some of the uncertainties of the future of masters level PG programmes. This MPhil equivalent would be cost-effective and potentially encourage earlier transition of talented PG students into the world of work, whilst maintaining the benefit of research-led education.

5.9.2 Careers of research graduates

In his review of world-class skills in 2006, Lord Leitch highlighted the importance of postgraduate skills to the economy. A comprehensive overview of the postgraduate landscape was recently undertaken in the BIS review 'One Step Beyond: Making the most of postgraduate skills'.[142] Research student numbers have increased by 14 percent between 2002 to 2003 and 2007 to 2008, to a level of 30,000 entrants per annum, but most of this increase is attributable to the increase in non-UK domiciled students. Destinations of Leavers in Higher Education (DLHE) surveys show postgraduates are more likely to be employed six months after leaving and enjoy a salary premium. The 'One Step Beyond' study highlighted the lack of information on employer demand for postgraduate researchers' skills, and called for more activity from HEFCE and RCUK in this area.

In the 2009 Postgraduate Research Experience Survey (PRES),[143] 44 percent of respondents were planning an academic career in HE (research and teaching, or teaching alone) and 14 percent a research career in HE. However, enhanced analysis by Vitae[144] of the longitudinal DHLE survey shows that 3.5 years after completion, only 23 percent were employed as academic staff. There is a distinct disconnect between the aspirations of research students and the reality of their future career pathways[145]. It is critically important that the UK benefits from this highly qualified group of people by supporting their wider skills development. Although advances have been made with programmes such as RCUK academic fellowships[146], the career path for researchers within a business environment or in academe needs further definition.

Where industrial sector engagement is integral to the PhD programme, there has been positive feedback from employers in that sector. The CBI report, 'Stronger Together' on business–university interactions welcomed the developments of EngD and DTC programmes.[147] CASE (Collaborative Awards in Science and Engineering) studentships is another long-running collaboration mechanism whereby the student would have supervision input from their sponsor company and undertake a

[142] 'One Step Beyond: making the most of postgraduate education', BIS, March 2010
[143] 'Postgraduate Research Experience Survey', The Higher Education Academy, 2009
[144] 'What do researchers do? Career paths of doctoral graduates', Vitae, 2011
[145] http://royalsociety.org/uploadedFiles/Royal_Society_Content/policy/publications/2010/4294970126.pdf
[146] 'Report on the RCUK Academic Fellowships Scheme', RCUK, 2006
[147] 'Stronger together: Businesses and universities in turbulent times', CBI, 2009

placement with them.

Case study: GSK—University of Strathclyde

From 2012, GlaxoSmithKline, in collaboration with the University of Strathclyde will provide a novel approach to postgraduate chemistry training. The programme provides 12 chemistry graduates an opportunity to work towards a PhD through novel research conducted on GSK projects whilst being Strathclyde students. Eight will be funded by GSK, spending the majority of their 3½-year studentship at GSK, the remaining four by GSK/EPSRC CASE (engineering and physical sciences RC's collaborative awards in science and engineering) and spend the majority of their studentship at Strathclyde. All students will have an academic and an industrial supervisor. This new doctoral programme provides a cadre of chemists working towards a PhD, and benefiting from both industry and academic experiences and influences and they will benefit from being alongside the GSK chemists who are also studying for an MPhil/PhD.

Although some sectors, particularly those in research-intensive, high technology areas, recruit PhD graduates for specific skills, employers also recruit postgraduates for wider attributes including analytical thinking and problem solving skills.[148] Indeed, there is evidence that many PhD graduates are employed in sectors that do not have direct engagement in their research topics. Research by the UK Grad Programme[149] (now Vitae) found that in 2005, among physical sciences and engineering PhD graduates, 18.9 percent found employment after graduation in finance, business and IT compared to 22.8 percent in manufacturing.

5.9.3 Employability considerations in the structure of PhD programmes

Since the Roberts review, progress has been made towards increasing the training of PhD students through the allocation of ring-fenced 'Roberts money' in the period 2004 to 2010. In the Review of this funding,[150] the review panel expressed concern at the lack of employer engagement by HEIs in planning the needs for skills development or development of programmes. Skills such as communication abilities, language skills and advanced numeracy were identified as key to employers[151], and were not sufficiently emphasised. The CIHE 'talent fishing' study noted that postgraduates lack 'work wisdom' including commercial nous, understanding of the market and work experience. Key barriers to recruiting PhD students have been noted as a lack of commercial awareness, difficulty in adapting to non-academic work culture, overspecialisation, unrealistic expectations[152].

The Dyson Report in 2010 highlighted the need for more entrepreneurs. Many HEIs have made a commitment to entrepreneurship training as part of their HEIF strategies. In addition to RCUK funding for postgraduate transferable skills training, EPSRC has provided entrepreneurship training funding[153] (£1.4 million in 2007 rising to £2.9 million to 54 organisations in 2009). Interest and take-up of this training varied greatly between institutions. There are other examples of promoting entrepreneurialism amongst research students; for example: the Biotechnology Young Entrepreneurs Scheme (YES) is an annual business plan competition. It has been running for 15 years

[148] 'Talent fishing: what businesses want from postgraduates' CIHE, 2010
[149] 'What do PhDs Do? – Trends', The UK Grad Programme, 2007
[150] 'Review of progress implementing the recommendations of Sir Gareth Roberts, regarding employability and career development of PhD students and research staff', RCUK, October 2010
[151] 'Emerging stronger: the value of education and skills in turbulent times'. Education and skills survey, CBI, 2009
[152] 'Survey of employer attitudes to postgraduate researchers', University of Sheffield Careers service, 2006
[153] 'EPSRC funding for Enterprise and Entrepreneurship transferable skills training for researchers', RCUK, 2009

with some success[154] and it is a model that is being adopted on a wider basis.

Notwithstanding these initiatives, the level of preparation for PhD students outside academe remains disappointing. In the UK there may be a deficiency in demand for higher-level skills,[155] but there is also a skills imbalance between the research skills of our doctoral students who do not take up a position in academe and the enterprise skills required by business. In this respect, many of the issues relating to undergraduate students, and addressed in chapter 4, are also relevant to postgraduate research students, particularly in the need to provide experience with a working environment outside academe through internships. There are good examples of such practice. BBSRC professional internships for PhD students (PIPS) provide BBSRC-funded PhD students the opportunity of working in a role not directly related to their PhD project. The BBSRC Industry Interchange Programme supports the short-term exchange, in either direction, of researchers between the science base and industry. Such initiatives are to be welcomed and their extension encouraged.

Recommendation

All full-time PhD students should have an opportunity to experience at least one 8 to 12 week internship during their period of study and should be encouraged to attend a short intensive enterprise skills programme alongside research students from other departments of the university. Universities should increase support for postgraduate students seeking to set up their own businesses.

5.10 Recent changes in government policy: immigration controls

Non-EU domiciled students make up circa 30 percent of starters in postgraduate research courses with most not receiving stipends or fee support from a UK source. Our universities are populated by academics from many different nations, enriching our campuses through their intellectual expertise and cultural perspectives. The effect of recent changes to the visa process on the recruitment of academics, research staff and postgraduate students remains unknown. DHLE surveys have not followed the destinations of international graduate student leavers so there is a lack of evidence on the impact they make, how many stay in the UK and how many return to influential positions in their home countries where their connections to the UK may be beneficial to future international relations (discussed in chapter 7). At a time when it is critical that our country attracts and retains talented people, we must not create unnecessary barriers to entry for highly skilled and qualified people, especially at PhD and post-doctoral levels. I note that there are ongoing discussions in this regard and I reflect that highly skilled people are internationally mobile. In the context of our future economic prosperity, our objective should be to attract and retain such talent through positive incentives, and perceptions that we do not welcome such talent are not consistent with future economic prosperity.

Recommendation

The government, CBI, RCUK and UUK should jointly evaluate the impact of UKBA controls upon the likely future health of our research base.

5.11 Reflections

[154] 'Evaluation of Biotechnology YES'; final report. DTZ. July 2010
[155] 'Skills for Jobs: Today and Tomorrow. The National Strategic Skills Audit for England', UKCES, 2010

The UK has one of the strongest university research sectors in the world. The momentum towards exploitation of that research potential is tangible and can be evidenced. Many global companies have established collaborative research partnerships with UK universities, particularly with the research-intensive sector. These 'flagship' partnerships are highly valued and require continuous monitoring and support to secure their retention. Compared to our competitors the R&D investment by the SME sector is disappointing; strategies within the government's Research and Innovation strategy and recommendations within this Review are designed to improve this situation.

I question whether our economy is gaining full benefit from the inward investment in the research capabilities of our universities; companies that invest in UK research excellence should be encouraged to exploit the fruits of that research within the UK, creating new jobs as they do so.

There is general respect and support for the RC–Technology Board structure that exists; improvements can be made in operations, but it is not in need of fundamental review.

Recommendations in this chapter are designed to expand the innovation base of UK companies through new business–university collaboration and to improve the enterprise skills of our postgraduate research community. Investments in these skills have met with some success, but there remains a mismatch between the aspirations of PhD students and the realities of the academic employment market. There is still work to be done to ensure that this talent is fully exploited and research students contribute as positively as they can to our economy. As a nation we need to develop and attract the best researchers and innovators that we can; universities, business and government all have roles to play in achieving that goal.

Chapter 6: Graduate recruitment: the interface between students, universities and employers

6.1 Introduction

Conceptually, the process of graduate recruitment by employers appears to be a relatively straightforward issue: employers constantly advertise vacancies and recruit to fill them. However, for many companies the graduate recruitment cycle has become a separate exercise, an annual filling of the talent pool within a company. Conversely, for the graduate, often seeking a first substantive job, the challenge is significant, especially in a world of increasing student loans, heightened competition and uncertain futures.

It is self-evident that a 100 percent efficient graduate recruitment system would lead every graduate to obtain a position that is congruent with her/his skills, talents and aspirations and every recruiting company to employ the graduate who best fits its vacancy. The reality, of course, is driven by more pragmatic matters.

The appropriateness of graduate skills to employment was examined in chapter 4. The analysis here relates to the roles of the various parties in supporting graduates to obtain their first position and ensuring that the recruiting company obtains the right graduate for its vacancy. It is a process that features risk, reward, time and cost. Recommendations made within this chapter are intended to improve this system and manage the inherent risks to the benefit of students, employers and universities alike.

6.2 Student awareness of graduate employment prospects

The process of managing graduate employment prospects starts before university entrance: at the point of university application, or even earlier. In the new student funding environment, it is expected that students will be increasingly focused on their graduate employment prospects, assessing career opportunities at an earlier stage than hitherto and evaluating the value of a degree in a new framework. This implies a greater imperative for robust information about the characteristics of a degree programme and its associated career opportunities. Several measures have been taken to address this expected demand.

6.3 Advice, guidance and the Key Information Set

In terms of personal advice, the government has announced that an all-age careers service[156] will be introduced to meet the needs both of young people (aged 13 to 19) and adults, a service that will include advice on HE progression. Universities will wish to engage with this new service in order to support students to make informed choices about future studies and the likely careers that could follow.

In terms of online information HE applicants will be provided with a KIS, including not only National Student Survey results but also data on tuition fees, employment and salary figures; accommodation costs; and information on the students' union[157]. Developed by HEFCE, the KIS is intended to become a significant information source for applicants to universities and those supporting the applicants. In parallel, universities have been reviewing their website information to ensure that the

[156] http://nds.coi.gov.uk/content/detail.aspx?NewsAreaId=2&ReleaseID=416365&SubjectId=15&DepartmentMode=true
[157] http://www.hefce.ac.uk/learning/infohe/kis.htm

information provided to applicants is relevant and accurate. The increase in references to employability within this information is already noticeable.

The collection of data and the publication of information on graduate employment and salaries has been a contentious area for some time. Its publication in the KIS has made the matter even more contentious. This information is gathered from the DLHE, where it is submitted annually by every university. HEFCE then processes the data to identify which graduates have obtained a 'graduate job' within the six months since their graduation. This data, together with salary information, is used in the published KIS for each programme. The KIS will also include some information on employment outcomes after 40 months from the Long Destinations of Leavers in Higher Education (LDLHE), although this is based on a smaller cohort and cannot, therefore, be used at a detailed course level.

There are three major issues here. First, it is argued by many parties that this six-month horizon is not a fair indicator in the context of career success. Indeed, there is a body of research that shows that the key indicator for graduate employability over a seven-year horizon is not 'having a graduate position at six months' but rather 'being in employment at six months'[158]. Second, the definition of graduate employment is highly contentious and remains unsatisfactory; the default codification for self-employment should be that it is a graduate job and exceptions to that situation should be tested. Further, there appear to be a number of professional positions that have not been classified as of graduate level, yet these positions are populated by graduates. Third, one of the strengths of the information within the KIS is that it can be audited at an acceptable expense. This is challenging in terms of the graduate employment indicator as it depends upon collection of information by the university and the codification of this information against national occupational codes, which requires judgement.

Recommendations

As a matter of priority HEFCE, supported by The Association of Graduate Careers Advisory Services, the Enterprise Alliance and HESA, should undertake a critical examination of the definition of graduate employment and of the reliability of the present system of data collection and analysis, to ensure that the KIS provides a fair and accurate picture of graduate employment within six months of graduation. Further, HEFCE should undertake preliminary work, with the SLC as appropriate, to establish whether a reliable system of graduate career progression could be supported by HMRC data on longer-term earnings.

A question remains about the utility of the KIS. The provision of comparative data is consistent with the increasing marketisation of HE; it positions applicants as consumers, basing their decisions on the available public evidence. Yet a report to HEFCE in 2010 concluded that 'only a minority of prospective students currently use online comparison sites'[159]. This may suggest that the KIS is likely to be of minor interest when students decide on the university applications. However, extrapolating past behaviours into the future, when the future funding system is so radically different from the present one, is not a sustainable argument. Nevertheless, *HEFCE should review the use of the KIS by applicants on an ongoing basis in order to inform future developments.*

[158] http://ww2.prospects.ac.uk/downloads/csdesk/members/reports/seven_years_on.pdf

[159] Page 11, para 47 of 'Understanding the information needs of users of public information about higher education' (August 2010) by Oakleigh Consulting Ltd and Staffordshire University: http://www.hefce.ac.uk/pubs/rdreports/2010/rd12_10/rd12_10b.pdf

Whilst the KIS becomes established, there remains a need for applicants to receive information about the careers that are possible with a degree from particular programmes. A census approach to careers analysis, several years after graduation, is an expensive and challenging exercise. However, students deserve better information about potential careers than is generally available to them at the present time. *To provide students with information about career prospects, universities should establish a four-year career projection from a sample of their graduates as supplementary information for use in parallel to the KIS. To provide a common framework, universities may wish to ask UUK to commission preliminary design work in this field.*

This analysis focuses upon the 'open market' approach to university applications. However, as identified in chapter 4, there are a growing number of employer-sponsored programmes, where recruitment of students is not necessarily a two-way (that is, student-university) process, but rather a three-way process, one involving the employer. This provision is relatively small but growing; it is for universities and sponsoring companies to determine the requirements for entry to these programmes, agree an appropriate admissions strategy and respond to requests for information from regulatory bodies as they arise.

Case Study: KPMG–ICAS and Universities of Birmingham, Exeter and Durham

KPMG, the professional services firm, in collaboration with the Universities of Birmingham, Durham and Exeter and the Institute of Chartered Accountants have developed an innovative new school leavers' programme. The initial intake has started the six-year programme with the firm, which will lead to both a degree and a professional chartered accountancy qualification from ICAS. University tuition and accommodation fees, and professional qualification fees are paid for by KPMG in addition to a salary paid throughout the six-year period. The programme is intended to be a positive contribution to promoting access in the professional services sector.

6.4 Absorptive capacity of UK business

Studies by The Work Foundation [160] indicate that the growth in student numbers entering the HE sector is in line with the growth of the knowledge economy and its need for graduate skills. Yet many commentators believe that we have too many graduates pursuing too few graduate jobs. Clearly there is an inconsistency between these positions.

The AGR is a highly respected and strong organisation; it has many leading brands amongst its membership of 700. AGR members received an average of 83.2 applications per vacancy in 2010/2011—an increase of 14.7 applications per vacancy in one year—implying that there is an oversupply of graduates to the labour market. These 700 companies account for 30,000 vacancies[161] per annum, 17,000 of which are recruited by the Times Top 100 Graduate Employers.[162] Whilst the applicants-vacancy ratios data may be interpreted as supporting the view that there are too many graduates pursuing too few vacancies, this conclusion is not necessarily correct. The vacancies available from these employers alone are clearly not enough to meet the career expectations of a cohort of over 300,000 graduates each year; only 10 percent are destined to join an AGR member organisation.

[160] 'Shaping Up For Innovation: Are we delivering the right skills for the 2020 knowledge economy?' http://www.theworkfoundation.com/Assets/Docs/Publications/Skills%20report%20-%20FINAL.pdf
[161] AGR 'A manifesto for graduate recruitment' (2010) http://www.agr.org.uk/Content/AGR-A-manifesto-for-graduate-recruitment
[162] 'The Times Top 100 Graduate Employers, 2011-12'. High Fliers Research Ltd

There is a clear mismatch here between the aspirations of graduates and the realities of the job market: only 19 percent[163] of finalist job hunters look for jobs in SMEs, whilst over half seek employment in major national or international companies. Large companies represent only a fraction of the opportunities available for graduate employment, yet are disproportionally popular in terms of graduate application, providing those companies with a large degree of choice but also a heavy burden of selection. Importantly, it also leads to frustration amongst graduates whose early career aspirations are unlikely to be met. *Universities should reflect on how students' perceptions of employment with small and medium-sized companies could be improved.*

6.4.1 Graduate selection by corporates

The competition amongst graduates to be employed by a 'high brand' corporate is reflected by the competition between these employers to recruit the best talent available; it is a highly competitive process for both parties. The volume of graduate applications managed by a large recruiting company can be measured in thousands. Intermediary organisations and software solutions are often used to undertake the preliminary selection process and, following this initial screening process, many companies use online testing for competencies and/or strength-based analysis as a second round of selection. Subsequent interviews are frequently based on judgement testing to identify personal decision-making and values. As the process progresses it becomes increasingly personalised, assessing the skills and values of a screened individual. It is a rigorous risk-management process, reflecting the significant financial and human costs of making a wrong appointment.

Initial screening of applications assures the efficiency of the process but not necessarily its effectiveness. An algorithm that includes a profiling filter may reduce the selection task to manageable proportions and hence an acceptable cost, but it also has the potential to exclude graduates with skills profiles that are appropriate to company needs. For example, a filter that limits recruitment to a particular set of universities, a '2-1 standard' and a defined UCAS entry threshold to the corporate sector are not uncommon requirements. In the context of reducing the applications to manageable proportions this is understandable, but it has flaws. The recruitment cycle is normally undertaken before graduation, so the degree classification is projected, not actual. A defined UCAS entry points threshold militates against a widening access agenda, and a filter on university or university-type requires constant review in the context of the skills set of the graduates from those universities. Neither is necessarily consistent with a diversity agenda that the company may operate. Such screening may be effective in managing the cost risk but not necessarily in managing the risk of diversity imbalance. There is genuine concern amongst companies, especially the professions, that access needs to be improved and screening algorithms are not necessarily consistent with that objective.

Recommendation

Graduate recruiters using filtering mechanisms should undertake a systematic and frequent review of screening algorithms in the light of the qualities of the graduates that the company has recruited and the diversity objectives of the company.

[163] UK Graduate Careers Survey 2011, High Fliers Research Ltd.

The sector-wide introduction of The Higher Education Achievement Report (HEAR)[164] - also referred to in chapter 4 - provides a far greater granularity of achievement and currency than the blunt instruments of UCAS points or projected degree classification. Furthermore, it has the capability to record extracurricular activities and skills development in a common structure. The potential impact of HEAR upon the efficiency and effectiveness of graduate recruitment is significant. However, the systems deployed by companies, especially the large corporate graduate recruiters, will require adaptation to exploit this potential.

Recommendation

The AGR and the Chartered Institute of Personnel and Development should jointly assess the use of HEAR in graduate recruitment and advise their members of the changes that will be required to exploit its potential. At the earliest opportunity employers should use HEAR as a reference base for evaluating student achievement and skills.

Students from the universities that piloted this system graduated in 2011, not only providing prospective employers with a greater information base on their achievements than hitherto, but also providing evidence of self-awareness in skills development. *Universities that have not yet scheduled the introduction of HEAR may wish to reflect on the potential impact of the absence of such a record on the employability of their graduates.*

As part of the recruitment cycle, graduate recruiters frequently engage with the university and its students through presentations and skills development programmes. During the Review it has become clear that companies do not always see this interface as being of two-way benefit. Rather it is seen as the university providing an opportunity to the company. In terms of improving 'the system' of graduate recruitment, it is important that such activity is seen as an important collaborative marketing activity for the benefit of the students, the university and the company, not as a one-way benefit for the company. Universities and companies may wish to examine their feedback systems to ensure that such matters are identified before the relationship between the university and the company is affected.

In the context of university-level feedback, some companies undertake an analysis of the aggregate performance of a university's applicants during the application process. AGR would be the right forum for the extension of this practice to be encouraged and universities may consider it helpful to integrate such feedback into their careers department reporting cycle.

6.4.2 Internships and placements: changing recruitment practices

The recruitment process shows indications of change through the increased use of internships and placements. The subject of skills development through internships and placements was discussed in chapter 4. The new agenda for these work experience opportunities extends beyond skills acquisition; it is becoming an established route to employment. 85 percent[165] of AGR members offered placement or internship programmes in 2009/2010 with 20 percent reporting that they filled more than 60 percent of their 2009/2010 vacancies with the previous year's placement students or interns. Discussions during this Review indicate that this is a growing trend with risk management being addressed through the investment in undergraduate internships and placements. If

[164] 'Beyond the Honours Degree classification'. The Burgess Group Final Report; Universities UK October 2007
[165] The AGR Graduate Recruitment Survey 2011: Summer Review (p5)

substantiated, this trend would be of significant interest to students and universities will wish to reflect on how such information should be disseminated to their students.

6.4.3 Graduate recruitment by the small and medium-sized enterprise sector

Whilst large corporates have significant profiles on campus, the majority of students gain their first graduate job in the SME sector. Research into the scope of recruitment and selection processes amongst SMEs is sparse and ad hoc in comparison to the research services provided by AGR. Whilst corporates have to use complex recruitment and selection processes to reduce huge application numbers to a manageable level, SMEs will often use less formal selection methods and the level of competition amongst applicants is significantly lower. These opportunities often lie in the 'hidden job market' and, without systematic support, graduates are frequently unaware of these vacancies.

The challenges facing the university careers service in this context are significantly different from those presented by the corporate graduate recruiter. The support needed by the SME company will vary according to its expertise and need. Some will not have the capacity to interview a large number of candidates and will require a pre-selection to establish a short list; others will seek support in structuring a contract of employment—both services offered by some university careers services. The marketing of vacancies will differ also. SMEs rarely advertise at careers fairs, events that are dominated by the corporate recruiters; they tend to use alternative means of recruiting the talent that they require. University careers services provide such employers with access to their student body, often through consortia arrangements[166]. These are normally free at the point of service and are unsurprisingly attractive for those who use them. Research is limited in this field but the proportion of SMEs that use this service is estimated at around 25 percent[167]. This highlights the importance of 'first engagement' as companies that use this service successfully are likely to generate repeat business. As in other university services, such first engagement may be stimulated through many different channels: web pages; personal contacts; structured organisations. All channels are worthwhile pursuing.

The use of graduate internships for SMEs was discussed in chapter 4. This form of first engagement has proved to be a success; it has the potential to fundamentally increase the recruitment of graduates within this sector. As with the corporates, internships help businesses to manage the risks inherent in graduate recruitment.

The importance of university engagement with small and medium-sized companies is a recurring theme throughout this Review. The LEP structure provides opportunities to build local business–university collaboration in this market, collaboration that has the potential to extend across a wide range of university capability, including the talent supply chain.

Recommendation

University career services and their LEP should collaborate to establish a skills supply chain between universities and local business, integrating placements, internships and employment services.

6.5 The changing nature of careers services

The focal point for graduate employment is frequently a university's careers service. With an intense focus on graduate employability, the effectiveness of this service is under scrutiny. Many universities

[166] See http://www.graduateadvantage.co.uk; http://www.gradsouthwest.com; http://www.graduatesyorkshire.co.uk; http://www.gowales.co.uk

[167] 'Generation Crunch: the demand for recent graduates from SMEs' (2010) CFE

have addressed the issue of organisational and physical location of their careers service. A prominent on-campus location, convenient for student access, makes a statement about the importance of the careers service to the university, to the student body and to visiting employers. More subtly, the organisational location of such a service impacts upon the culture of the service; a careers service will take a different character if it is placed within a student support services environment, a teaching and learning development environment or an external, business development environment. The two dimensions of a careers service, the advisory role and the employment agency role, may be increasingly incompatible. *Universities may wish to review the physical and organisational position of their careers service and the level of interaction it has with the students, employers and the academic community.*

Throughout this Review professionals in this field have advocated early engagements between the students and the university careers service, providing students with a framework of career-focused development from the earliest days of their university experience. The evidence in chapter 4 indicates that there is innovative work in the field of skills development, in some cases accompanied by career-focused advice. I expect such activity to accelerate as good practice is disseminated through the university sector and careers support becomes a recognised part of the ongoing student experience, not an aspect that captures the attention of students in the final year of a degree study. At that stage it may merit inclusion within the National Student Survey. *At the next iteration of the National Student Survey, HEFCE should consider how careers and employability support provided by universities could be included.*

6.6 Reflections on key developments

The graduate recruitment environment is evolving rapidly and careers services in universities have to adapt. There is a very clear priority to align student aspirations with the reality of the graduate recruitment market and to highlight the importance of small and medium-sized companies in graduate recruitment. For employers, the introduction of HEAR has the potential to enable graduate recruiters to manage their recruitment risks in a different way than hitherto and the use of internships and placements is becoming a key feature in their recruitment practices.

It is in the interests of risk management for all parties that existing systems and processes are constantly reviewed and updated, and that feedback systems are established. Retaining legacy systems and attitudes because of their familiarity will not meet the aspirations of our graduates, or talent or diversity needs of companies or the widening access needs of our society.

Chapter 7: Universities in their local communities: enabling economic growth

7.1 Introduction

Just as castles provided the source of strength for medieval towns, and factories provided prosperity in the industrial age, universities are the source of strength in the knowledge-based economy of the twenty-first century.

Lord Dearing, speech at Newcastle University, September 2002

In towns and cities there are institutions that have fundamentally shaped, and been shaped by, the character of their communities. These institutions have influenced the structure of the economy, the quality of the public realm and the 'feel' of each of these communities; they are often termed 'anchor institutions'[168].

Many universities meet the requirements to be classified as an anchor institution: an important presence in the community; a key cultural centre; a major impact on employment; a gatherer and spender of significant revenue; a role as a major employer; a purchaser of goods and services; an attractor of businesses and talented individuals. A university provides economic, environmental and cultural benefits to its community and, critically, should play a central role in rebalancing the economy of a community under stress and promoting growth in one that is prosperous. This is a particularly important role in those communities that are heavily dependent upon public sector employment and where there is an imperative in the current climate for the private sector to grow[169].

However, this does not imply a common level or form of contribution; universities choose to engage in their communities in different ways. For example, some universities have a stronger focus on international links and world-class research, whilst others are rooted within the economy of their cities or regions, playing a central role in driving economic growth and social regeneration. Individual university missions will dictate the priorities of each university but each has an obligation to its local community as a major employer, a source of high-level skills and a centre of research and innovation. The precise form of the contribution will depend upon the university's strengths but, as an anchor institution, its influence is material. Other institutions, particularly local authorities and major employers, are also recognised as anchors in the context of the roles that they play in economic prosperity. But recognition as an anchor institution does not ensure collaboration and synergy in their local communities. Anchor institutions have to fuse their efforts in the context of economic growth; herein is a role for LEPs.

Case Study: Plymouth University

Plymouth University has an explicit enterprise mission, driving innovation, economic growth and social inclusion across its region. Reflecting its local economy, the university's investment in marine and maritime research engages over 400 academic staff and researchers and includes a new £19 million Marine building, complementing other maritime renewable energy facilities. The university, in partnership with the *Western Morning News*, secured the only university-led round one Regional Growth Fund bid, providing grants to SMEs to stimulate business expansion and create new jobs. Plymouth's Growth Acceleration and Investment Network (GAIN) facilitates

[168] 'Anchoring Growth: The Role of "Anchor Institutions" in the Regeneration of UK Cities', The Work Foundation
[169] 'No City Left Behind? The Geography of the Recovery – The Implications for the Coalition', The Work Foundation 2010

access to university assets, including a regional network of innovation and business incubation centres: a business ecosystem connecting people, ideas and money, catalysing action and creating critical mass in a dispersed regional economy.

Case study: Glyndŵr University

Glyndŵr University is explicitly committed to industry support, supplying both high-level skills and undertaking collaborative research with companies located across North Wales. At the university-managed OpTic research centre, collaboration focuses upon new advanced manufacturing methods in optical, solar and diamond drum technologies. R&D projects in the field of composite materials are undertaken with Airbus at a new £29 million research centre, supported by the Welsh government. The university also provides support for many SMEs in the region. In the context of jointly designed degree and postgraduate programmes, Glyndŵr works with Airbus, United Utilities and Corus, ensuring that industry needs are integrated within the skills portfolio and knowledge base of the university's graduates. The announcement of an enterprise zone in Deeside will extend the university's contribution to its local economy.

7.2 Local enterprise partnerships

LEPs, established by the Coalition government, are business-led organisations with an economic growth objective. In terms of maturity they are at an early stage of development; all are dedicated to generating growth through synergy and partnership. They have the potential to be invaluable in helping universities improve their collaborative relationships with business, especially in supporting ambitious SMEs, a market that many universities find challenging. The potential of LEPs needs to be realised if universities are to contribute to local economic development in an optimal manner.

In pursuit of support for research, innovation and skills development, corporate business has established mechanisms to work collaboratively with universities, but few SMEs have the necessary infrastructure to do so without support. Many business organisations—such as, the Confederation of British Industry, Chambers of Commerce, Federation of Small Businesses, Engineering Employers Federation, Institute of Directors and others—recognise the SME/university connectivity challenge, but do not have the comprehensive coverage required to facilitate it.

LEPs have the potential to provide that connectivity. They have agendas that are congruent with many of the outputs of universities and the potential to leverage the strengths, capabilities and brands of universities to the economic benefit of their locality. They have the capability to consolidate the business voice within their localities and thereby create the effective portal between universities and the local business community that is necessary to respond effectively to the growth challenge.

The majority of LEPs already have representation from universities on their boards and the more advanced LEPs have already drafted economic, innovation and skills strategies for their areas. Where there is more than one university in an LEP area, there is a mutuality of benefit; diverse universities can complement each other, providing a wider range of services than either could in isolation. SMEs working together under the umbrella of their LEP should be able to exploit the strengths of each university in the area.

Given the influential role that universities play in economic development, an LEP that is not closely engaged with its universities is neglecting key assets.

7.2.1 Connectivity with small and medium-sized enterprises

SMEs make a very significant contribution to the UK economy. They represent 99.9 percent of all enterprises and 58.8 percent of private sector employment, with approximately £1.5 trillion turnover[170]. The challenge in the context of economic growth is the identification of those companies that have the capability, the capacity and the motivation to grow. This issue has been the subject of a number of reports by NESTA[171], Experian[172], The Work Foundation[173] and the CBI[174].

Within the SME community those firms that seek to grow do so through a variety of strategies: upskilling their workforces; the exploitation of new markets; increasing worker productivity; improving leadership skills; employing more staff; and developing new products[175]. The dominant elements that drive growth in SMEs are innovation and skills. As NESTA established, the defining feature of the fastest growing 7 percent of businesses from 2002 to 2008, generating half of all new jobs created during this time, was a passion for innovation[176].

The challenge for universities seeking to support these potential high-growth companies is one of connectivity: engaging with these businesses and being able to support them in achieving their growth objectives. Companies with established connections into the research and innovation community may access university capability through the TSB's KTNs or one of the other established sector-specific networks. For many, however, the first contact and creating the awareness of the capabilities of a university is a challenge in itself.

A number of universities have sought to tackle the issue of engagement with SMEs through the creation of 'business–university clubs', sometimes funded on a subscription basis, sometimes simply acting as a network organisation; a more widespread approach has been through brokerage. Historically, Business Link has played a role here but not with universal success[177]. To make a successful connection, the broker has to fully understand the capabilities of the supplier and the requirements of the client.

In Scotland, the 'Interface' project[178] appears to have achieved this, linking business and the Scottish universities on the basis of a close understanding of the expertise of the universities, working through dedicated contacts and acting as a network and a filtering organisation.

Brokerage solutions incur manpower costs. A low-cost passive solution is being piloted in the North East[179]. This is an entirely technology-based model that does not attempt brokerage but rather displays case studies of successful collaboration. Its performance will be worth evaluation.

However, there will be many cases where the nature of the skills or research or innovation requirements of the company call for specialist expertise that is not available at the local university, or universities, within the LEP area. It is necessary, therefore, to have another dimension of connectivity beyond that of geographical proximity. This dimension could be provided by mechanisms proposed elsewhere in this Review (chapter 5: TSB KTNs, RC industry clubs). However,

---

[170] Department of Business, Innovation and Skills, 'Statistical release: Business population estimates for UK and Regions' 2011
[171] http://www.nesta.org.uk/home1/assets/features/geography_of_growth
[172] http://www.experian.co.uk/insight-reports/index.html
[173] http://www.theworkfoundation.com/research/publications/publicationdetail.aspx?oItemId=285&parentPageID=102&PubType=
[174] http://www.cbi.org.uk/media/1125696/cbi_future_champions_report.pdf
[175] Department of Business, Innovation and Skills (April 2011), 'Small Business Survey 2010'
[176] Shanmugalingam S. et al, 'Rebalancing Act', NESTA 2010
[177] NECC, 'Bridging the Gap – NECC's Skills Policy report'
[178] http://www.interface-online.org.uk
[179] http://www.SkillsToGrowNE.co.uk

the critical factor for the company and for the university is that there is 'no wrong door'. As an anchor institution in its community, there is a fundamental obligation for the university to support its local business community, if necessary by referring a business to another university that has the capability to fulfil its needs. Universities are competitive organisations, but the support of the local business community should transcend such competition.

Case Study: Coventry and Warwickshire Local Enterprise Partnership

The Universities of Warwick and Coventry have a long history of working successfully together to support local businesses especially those engaged in boundary pushing, high-value manufacturing. This is typified by the Low Carbon Vehicle Technology Project (LCVTP), which revolutionises the way vehicles are powered and manufactured. Warwick and Coventry Universities; Jaguar Land Rover; Tata Motors; Zytek Automotive; Ricardo; and the Motor Industry Research Association form a core consortium for this project with over 25 smaller local companies involved. The Coventry and Warwickshire LEP appointed both universities at board level from its formation, and both are actively involved in driving forward the LEP agenda. Warwick Manufacturing Group and Ansty's Manufacturing Technology Centre are partners in the new high-value manufacturing Catapult centre. Complementing this, Coventry University, in partnership with MIRA Ltd, secured enterprise zone status and a £20 million Regional Growth Fund bid to develop an 874 acre technology park for Advanced Transport Technologies, supported by two adjoining LEP areas.

Recommendation

LEPs have the potential to have a significant influence upon economic growth in their localities. Universities are key players in the supply chain for research, innovation and skills; they should be at the heart of an LEP. Government should work with the LEP network to understand local priorities and needs for government funding, including activities supporting generic business–university engagement.

7.3 Universities in export generation and inward investment

Universities are large employers in their own right, often amongst the largest in their communities. The direct economic impact of their presence is significant, regardless of the added value that they bring through high-level skills, research and innovation. However, their impact in terms of trade should be examined further. In the context of export generation they play a very significant role in our economy; in the role of inward investment they are an underexploited national resource.

7.3.1 Universities as businesses: a major export sector

As an export industry, HE contributed £7.9 billion in 2009 and this figure is expected to rise to £16.9 billion by 2025. Tuition fee income alone from international students is almost £4.5 billion per annum (more than most 'high visibility' export sectors) and, through their spending, international students are estimated to inject £10 billion annually into the UK economy. The market for internationally mobile students is expected to reach 7 million students by 2020, from a baseline of 3.7 million in 2009[180].

In 2009/2010, 16 percent of nearly 2.5 million students in Higher Education Institutions were non-UK domiciled, with non-EU countries accounting for 11 percent (281,000 students). Students from two

[180] Universities UK, December 2011, 'Driving Economic Growth: Higher education – a core strategic asset to the UK'

of the 'BRIC' countries, China and India, accounted for over a third of all non-domiciled students. The growth rates in student registrations from some regions are high: 11.7 percent for all non-EU domiciled students, and showing dramatic increases in specific countries—China (21 percent), Nigeria (16 percent), Saudi Arabia (60 percent), Thailand (18 percent).

There are threats, however. The UUK report 'Driving Economic Growth'[181] identifies that, despite retaining its position as the second most popular destination for international students (after the US), the UK lost market share between 2000 and 2009 as many competitor countries—such as Australia, Canada, New Zealand and Korea—recruited aggressively overseas.

The importance of international students within our HE system is recognised by the Coalition government:

> *The international focus of our universities is important, and the government is supporting it by forging links with the HE systems of countries like Indonesia and Brazil, as well as China and India.... As part of the Growth Review, we also announced our intention to maximise education export opportunities in the priority markets of Brazil, China, India, Indonesia, Mexico, Turkey and the Gulf. The recent agreement with Brazil to accept 10,000 students to study STEM subjects in the UK is a signal of intent—and I congratulate Universities UK for negotiating this deal on behalf of our HE sector.*
>
> *Dr Vince Cable, Secretary of State, International Skills speech, 8 December 2011*

7.3.2 International connectivity

The economic benefits of being a leader in international education are not confined to the direct financial impact of international students, important though they may be. Many universities have a highly diverse international faculty, making our campuses truly international in every perspective of intellectual and cultural life. The importance of this international community is clear and not solely in the direct economic and cultural benefits that such a diverse student population brings. The relationships established between students, alumni and their universities endure well beyond their student experiences, and are a key factor in the UK's continuing influence in global affairs. I made recommendations in respect of the present UK immigration policies in chapter 5; the importance of establishing these relationships serves to emphasise the importance of that recommendation.

The international business expertise in universities extends well beyond attracting international students to study on UK campuses. Many UK universities, from all parts of the sector, have international networks of educational, research and commercial partnerships. Several have invested in campuses overseas, often through joint ventures with international business, and have gained valuable experience of working with other governments. The UK university sector is a rich source of international experience in business operations, especially in the developing economies. It appears to be an underexploited national resource.

7.3.3 Agencies for inward investment

The government's Plan for Growth[182] makes clear the UK's ambition to grow our trade and inward investment, ensuring the UK remains one of the top destinations for foreign direct investment (FDI);

[181] Universities UK, December 2011, 'Driving Economic Growth: Higher education – a core strategic asset to the UK'
[182] Plan for Growth, March 2011

increasing exports to key target markets; and delivering an increase in private sector employment, especially in UK regions outside London and the South East.

The UK is acknowledged as having some of the leading research universities in the world but there is a question about whether they are as widely recognised as a magnet for inward investment as they would be in the US, where such institutions have long been acknowledged in this role.

It is not a coincidence that those communities possessing the best research and graduate facilities—from MIT to Cal Tech—tend to attract the new and growing industries.

Speech by President John F. Kennedy, undelivered, Dallas 22 November 1963

The UK has 25 of the top 150 research universities globally[183] and the diversity of universities in this country provides a rich supply chain of high-level skills and innovation capability to companies; yet it is not apparent that UK universities are the magnet for inward investment in a manner that meets their potential. Some places, notably Cambridge[184], can claim such a status, but this phenomenon does not appear to have been created through strategic policy, rather through the initiative and activities of entrepreneurial individuals, supported by the civic authorities at that time.

UKTI works with UK-based businesses to ensure their success in international markets, and to encourage overseas companies to consider the UK as their global partner of choice. The recently released UKTI five-year strategy 'Britain Open for Business—Growth through International Trade and Investment'[185], sets a new strategy: UKTI working in partnership with other government departments and business to realise the government's ambitions for growth through trade and investment. Regrettably, this document makes little mention of the role our universities can play in delivering increased benefit to UK plc through international trade and investment.

Specifically, the strategy identifies the need to improve UKTI's performance and to develop 'partnerships for success'. Existing partnerships include the China–Britain Business Council (CBBC) and Asia Task Force. New initiatives include the recently established UK–ASEAN Business Council (November 2011).

Currently, UK plc overseas missions are serviced by the plethora of international representative agencies reporting into BIS and Foreign and Commonwealth Office (FCO). Universities can and do work with UKTI, the Science and Innovation Network (SIN), the British Council and the RCUK's international offices, the CBBC. But this is scratching the surface of university capability, especially in the context of the priority sectors identified by UKTI as having growth potential.

7.3.4 Specialists in sectors and technologies

The UKTI's 'Britain Open for Business—Growth through International Trade and Investment' identifies a number of priority sectors (with associated sector group task forces) to rebalance the economy to a broader base that builds upon the UK's strengths in a range of innovative and high-growth sectors. These fall into five groupings, underpinned by two crosscutting themes (see Table).

In all these areas the UK's Higher Education research base excels[186], providing a backdrop of world-leading technical expertise. Further, through their wider global networks, universities possess

[183] THE World University Rankings 2011/12
[184] http://www.cambridgephenomenon.com
[185] UKTI, May 2011 'Britain Open for Business – Growth through International Trade and Investment. The UKTI's five-year strategy'
[186] Research Assessment Exercise, 2008

internationally recognised experts with access to sector leaders, which can add value to investor relationships.

UKTI priority sectors

Advanced manufacturing	**Defence and security**	**Infrastructure**	**Healthcare and life sciences**	**Services**
Aerospace Agrifood Automotive Chemicals Energy	Defence Security	Construction Environment and water Transport (airports, railways, logistics, marine, ports)	Healthcare Industrial biotechnology Pharmaceuticals and medical biotechnology	Creative industries Education, skills and training Financial services Professional and business services Retail
Technology				
Low carbon				

Source: 'Britain open for business—growth through international trade and investment', UKTI 2011

The UKTI 'Smart Cities of the Future in Asia'[187] targets regions where UK universities have extensive reach and presence. Many business and political leaders are UK alumni and several universities have invested locally, forming strong relationships and opportunities for further development (for example, the University of Nottingham's research and teaching campuses in Semenyih, Malaysia and Ningbo in China). Such experience and expertise should be a valuable asset in implementing UKTI strategies.

Recommendation

UKTI should reconsider the role of universities in providing critical intelligence, support and ambassadorial engagement with potential investors.

Case Study: Chang 'An UK research and development centre

Discussions brokered by the University of Nottingham led to the establishment by Chongqing automotive giant Chang 'An of an East Midlands based R&D centre in June 2010. Rapid expansion of this centre will create up to 250 high tech jobs over three years as part of Chang 'An's £1 billion R&D investment plan. The Chang 'An case study provides an exemplar for other large Chinese companies seeking to internationalise their technology and supply chain partnerships. Chang 'An has been very supportive of University of Nottingham investment activity, hosting Chinese delegations and sharing its experiences of setting up in the UK. Chang 'An has also supported recent University of Nottingham Asia-focused business engagement activity, giving enthusiastic testimonials and providing direct support to bilateral trade missions. Further, the university provides ongoing site services to Chang 'An—including training and technical support, and is currently discussing long-term R&D arrangements. Chang 'An has made a significant impact on the UK automotive supply chain, working with a number of leading companies.

[187] To be published in February 2012, interim findings released in November 2011

7.3.5 Enterprise zones and science parks

In 2011 the Coalition government announced that it would establish 21 new enterprise zones in LEP areas[188]. Subsequently a number of specific enterprise zone developments have been announced, with LEPs developing specific plans for additional sites. Enterprise zone areas will benefit from a range of measures, such as business rate discounts, superfast broadband provision, simplified planning approaches and ring-fencing of business rates.

In welcoming these developments a number of commentators have referenced the opportunity these zones bring for international inward investment. There is strong alignment of the proposed enterprise zones to UKTI priority areas. UK university research strengths have the potential to add value to such strategies (for example, the Humber Estuary Renewable Energy Super Cluster or MIRA Technology Park in Hinckley, Leicestershire). Further, some of the enterprise zones are located in proximity to universities. The Bristol, Harwell–Oxford and Alconbury enterprise zones are clear examples where the presence of local universities with global standing has the potential to support inward investment proposals, emulating the Daresbury science campus enterprise zone where Liverpool, Manchester and Lancaster universities are engaged.[189]

In parallel, UKTI[190] has stated that in the next five years it intends to create a pipeline of 750 FDI projects per year—nearly 4,000 in total. This will create significant demand for suitable space/development land and these projects will be high quality and R&D intensive. The need to effectively promote enterprise zones and university-linked science and innovation parks will be great. The international promotion of these enterprise zones will be significantly enhanced through strong engagement and proactive involvement of key UKTI and university staff.

Recommendation

As enterprise zones develop management structures and clarity around their specific offer to inward investors, local universities and UKTI should be strongly engaged to deliver coherent international promotion of each enterprise zone.

There has been considerable investment in university science parks over the past ten years. Typically co-located alongside or close to universities, they provide facilitated access to the full range of university services: R&D expertise and facilities; staff upskilling; graduate recruitment; often a university brand that has international standing. Universities have the ability to be magnets in inward investment and employment growth.

Case Study: BioPark, University of Hertfordshire

When Roche Pharmaceuticals closed its research centre in Welwyn Garden City there were significant job losses. With the support of Roche and the local authorities, and a grant from the Regional Development Agency, the University of Hertfordshire purchased the centre and converted it into BioPark—a facility to accommodate spin-out and spin-in SMEs in the life sciences and health sectors. Managed by a university subsidiary company, Exemplas Ltd, the research centre has since been further modernised and expanded in 2011, with the university and Hertfordshire County Council both investing. BioPark now hosts over 20 companies and the

[188] http://www.communities.gov.uk/documents/localgovernment/pdf/1872724.pdf
[189] http://www.daresburysic.co.uk/about-us/stakeholders/stfc.aspx
[190] UKTI, May 2011 'Britain Open for Business—Growth through International Trade and Investment. The UKTI's five-year strategy'

enlarged facility has 80 percent occupancy: growing companies seeking high-quality scientific facilities, often relocating from incubators elsewhere in the Cambridge–London pharma corridor.

The Localism Act will broaden the discretion of local authorities to grant relief (or discounts) on business rates. Local authorities already have powers to make local development orders (LDOs) granting planning permission for certain developments within given areas. Further, the Local Government Finance Bill, when enacted, will facilitate the local retention of a percentage share of business rates, putting a clear incentive in place for local authorities to promote local economic growth. Essentially, local authorities will have the powers to create enterprise zone conditions in their local areas, albeit without any government subsidy for the initial business rate discounts.

It is not unusual for companies to locate close to a university in order to achieve connectivity and gain from the skills and expertise of their neighbour (MAN group with Oxford University, for example). Some universities with substantial land holdings, on or off campus, have indicated that the new planning environment may provide an opportunity for the creation of increased employment opportunities. This would have advantages in the context of university-leverage in increasing economic activity and financial returns to the university, and potentially foster a strong business presence on campus culture.

Terman came up with this great idea that did more than anything to cause the tech industry to grow up here.

Steve Jobs[191]

[Steve Jobs was referring to the Dean of Engineering at Stanford University, Frederick Terman, who in 1951 created a 700 acre industrial park on university land for private companies that could commercialise the ideas of his students, now called Stanford Research Park.]

Recommendation

Universities, UKTI, local authorities and LEPs should work together with other relevant organisations (such as the UK Science Park Association[192]) to develop coherent routes for the international promotion of available space and development opportunities in university-linked science and innovation parks. Further, the government, in conjunction with the LEPs, should examine the benefits of using local authority enterprise zone type measures such as simplified planning or local taxation to support university-linked science and innovation parks.

7.4 Reflections

Prior to the Lambert Review, the linkage between business and universities lacked structure and focus. As shown within this Review, the last eight years have seen a huge expansion in collaborative activity in many dimensions, to the benefit of business, students and universities alike. The sceptics who voiced their doubts at that time have been proven wrong.

However, in the broader aspects of economic growth, the global reputation of UK universities remains underexploited. Just as the first decade of this century has demonstrated the immense benefits of business–university collaboration, the second decade should build on those achievements to attain world-class status and see the global reputation of the UK university sector being utilised as a stimulus for both indigenous economic growth and inward investment.

[191] *Steve Jobs* Biography by Walter Isaacson 2011
[192] UK Science Park Association (UKSPA) founded in 1984 now comprises over 70 full science park members

To succeed in such an ambitious agenda strong and resilient leadership is required, not just amongst the vice chancellors of our universities but also amongst business, amongst government-funded agencies, amongst civic leaders and amongst our elected representatives. Many universities have excellent relationships with local civic leaders and Members of Parliament, but that is not always the case.

LEPs have the potential to improve the bond between civic leaders and universities in the promotion of economic growth; the linkage is clear. For the benefit of economic growth it is critically important that LEPs establish their authority with government and become agents for business–university collaboration.

The influence of universities extends across many parliamentary constituencies. *Members of Parliament may wish to reflect upon their knowledge of both the present and potential contribution of their nearest universities to the economic prosperity of their constituencies and their individual roles in supporting business–university collaboration in that regard.*

This publication is also available on our website at www.bis.gov.uk
Any enquiries regarding this publication should be sent to:

Department for Business, Innovation and Skills
1 Victoria Street
London SW1H 0ET
Tel: 020 7215 5000

If you require this publication in an alternative format, email enquiries@bis.gsi.gov.uk, or call 020 7215 5000.

URN 12/610