

# BEST OF BOTH WORLDS

GUIDE TO BUSINESS-UNIVERSITY COLLABORATION



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Main Contact:

David Williams

Director for Corporate Engagement

Centre for Business Development – Corporate

Middlesex University

The Burroughs

London NW4 4BT

E: [corporate@mdx.ac.uk](mailto:corporate@mdx.ac.uk)

T: 0208 411 5050

Twitter: @CorporateMU

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## Foreword



Neil Carberry  
Director, Employment & Skills, CBI

A handwritten signature of Neil Carberry.



Professor Michael Driscoll,  
Vice-Chancellor  
Middlesex University

A handwritten signature of Professor Michael Driscoll.

In a world of intense global competition and accelerating technical change the UK needs to be at the forefront of innovation. That means we must ensure that our workforce is equipped with the best possible technologies and expertise. Our universities are a key strength – they offer business a world-class resource which is increasingly valuable. Helping businesses understand how to get the best from the opportunities universities offer, whether for collaboration on research, innovation or skills, is the reason we have prepared this guide. This guide sets out to help make that potential more visible and accessible.

In recent years, the UK's universities have made huge strides in developing the ways in which they can support business innovation and the research which underpins it. More and more businesses of all sizes recognise this, but others are held back from doing so by uncertainty over how to get the best from what universities have to offer.

At the same time, the growing skills crisis threatens to put economic recovery and rebalancing in jeopardy. Nearly half of all businesses lack confidence in finding enough recruits to fill the high-skilled jobs of the future. Addressing this challenge will require innovative approaches – not only new ways of ensuring that recruits have the skills employers need, but a fresh approach to raising the skill levels of the existing workforce.

Here again universities are helping to respond to business needs. As the 2013 CBI report *Tomorrow's Growth* pointed out, there is a burgeoning community of interest in new forms of business-university collaboration for skills development, and a dynamic marketplace in 'learn-while-you-earn' models of study which enable students to support their study and career development by remaining in work or building links with the workplace. More and more businesses are working with universities in a variety of ways to build a competitive edge around the skills of their current and future employees.

This guide aims to signpost some of the ways in which businesses and universities are working together to provide skills to meet current and future needs, and to take maximum advantage of the enormous potential universities have to support innovation by businesses, whether large, small, or medium-sized. It does not offer all the answers but aims to give useful advice and information on how to get the best out of the opportunities which exist. Businesses of all kinds stand to gain by taking a fresh look at what is on offer, and this guide furnishes a selection of ideas on how to go about doing so.

# 1 Collaboration can boost competitiveness and growth

**Effective collaboration between the higher education sector and business has a crucial contribution to make, not only to individual firms' competitiveness but also to UK economic growth. This guide is designed to help businesses which are interested in establishing or further developing collaborative relationships with universities in support of their research and innovation work or to support the development of the higher-level skills of their current and future employees.**

In this guide we show how:

- Links with universities give firms a competitive edge
- Universities play a vital part in the innovation ecosystem
- Research and innovation partnerships come in many forms
- Collaboration can also help win the 'war for talent'.

The guide draws in part on work undertaken by the CBI's Inter-Company Academic Relations Group, which brings together managers responsible for their companies' links with universities for research partnerships, across a wide range of business sectors. The guide is intended as a source of advice and information on business engagement with universities for research, innovation and skills purposes. It sets out some general principles, best practice tips and details of specific schemes and initiatives that businesses may find useful. The guide is not meant to be exhaustive, but it focuses on areas that CBI members themselves have found to be of greatest value.

## BACKGROUND

### INTER-COMPANY ACADEMIC RELATIONS GROUP (ICARG)

The Inter-Company Academic Relations Group is a CBI working group made up of executives who have responsibility for managing their companies' research links with universities. It serves as a forum to exchange experience and intelligence with colleagues from a wide range of sectors, and provides opportunities to pick up useful knowledge and ideas, and also to learn about and influence policy on research funding and similar areas. It is valued by the CBI, policymakers and funding organisations as a forum for discussion on business-university research links based on practical experience, and meetings are attended by representatives of the Department for Business, Innovation and Skills (BIS), Innovate UK, Research Councils UK, the Higher Education Funding Council for England (HEFCE) and others.

The first part of the guide deals mainly with partnerships for research and innovation, where there are a number of organisations and programmes which can offer financial and other kinds of support. The second part looks at the growing area of business engagement with universities over skills and training, where the landscape is still developing but has great potential to expand further.

This guide is a source of advice on business engagement with universities for research, innovation and skills purposes.

## 2 Links with universities give firms a competitive edge

**Businesses must compete in a world of rapidly changing markets, technologies and customer requirements. Building and sustaining competitive advantage in this fast-paced environment requires innovation, and people with the skills to support and deliver it.**

**UK universities are a world-class resource for business research and innovation...**

In order to develop an innovation pipeline businesses need to invest in research, which can often be risky and expensive. Even large businesses are constrained in their ability to afford the people, resources and equipment needed to bring new ideas and emerging technologies to market, and there is growing awareness of the need for 'open innovation' which draws on the full range of knowledge and facilities available in the wider world. For medium-sized and smaller businesses the challenge is even more acute. Universities play a critical role in the innovation ecosystem, and can help to de-risk early-stage research and development, share the cost burden, and mobilise valuable knowledge and skills.

With less than one per cent of global population and only 3.2 per cent of world research and development (R&D) expenditure, the UK accounts for 6.4 per cent of all articles in the world's academic journals, but 11.6 per cent of citations and 15.9 per cent of the most highly-cited articles.<sup>1</sup>

This volume and quality of research derives from a highly productive and economically efficient research base, which gives excellent value for money: the UK is ahead of comparable major countries, including all in the G8 group, in terms of published articles, citations, and highly-cited articles per pound spent on R&D and per researcher. The World Economic Forum's Global Competitiveness Report<sup>2</sup> for 2014/15 ranks the UK in the top four places for the quality of scientific research institutions and for university-industry collaboration in R&D (second and fourth respectively).

Businesses in the UK are increasingly aware of the strength of this resource and the benefits that can be gained by working with universities. One index of this is the rising volume of university research which is directly commissioned by businesses as customers, with universities as crucial elements in the 'R&D supply chain'. In the three academic years up to 2012/13, the amount spent by businesses of all sizes on 'contract research' at UK universities grew at an annual rate of over 6 per cent, to more than £440m. Businesses also spent growing amounts on consultancy services, use of facilities and equipment, and training and professional development – a total of over £400m in 2012/13.<sup>3</sup>

But involvement is deeper and wider than these measures alone can convey.

## ...and can also help firms win the “war for talent”

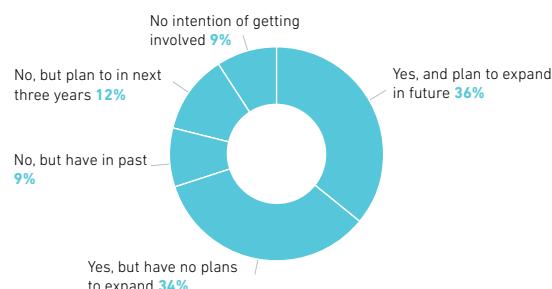
People are fundamental to business and economic success. Without a talented workforce equipped with the right knowledge, skills and attitudes, the ability of firms to innovate and grow is severely diminished.

More flexible, business-relevant provision in universities has the potential to unlock this talent – and, to this end, an increasing number of firms are building partnerships with the higher education sector. For example, more than two-thirds (70%) of the businesses taking part in the 2014 CBI/Pearson Education and Skills Survey<sup>4</sup> had developed links of some kind with universities, and nearly half (48%) were looking to grow their university ties in the future (**Exhibit 1**). These high levels of engagement are common across all parts of the UK (**Exhibit 2**).

Collaborating with universities enables us to keep abreast of the long-term changes that will impact our company, our industry and our customers; it enables us to undertake longer-term research using skills that we are unable to maintain in-house; and it provides us with a network of trusted partners with whom we can engage in wider collaborations in European programmes.

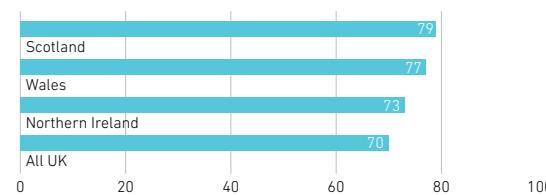
**Jonathan Legh-Smith, Head of Partnerships & Strategic Research, BT Technology, Service & Operations**

### Exhibit 1 Employer links to universities (%)

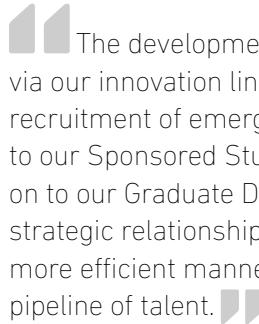


Source: CBI/Pearson Education and Skills Survey 2014

### Exhibit 2 Employers with current links to universities (%)



Source: CBI/Pearson Education and Skills Survey 2014



The development of our university relationships via our innovation links has supported our recruitment of emerging talent, whether it be on to our Sponsored Student Programme or directly on to our Graduate Development Programme. This strategic relationship has enabled us to recruit in a more efficient manner, enabling us to build a stronger pipeline of talent. 

**Indy Lachhar, Group Talent Manager, Costain plc**

Links take many forms, including activities to enhance the business-relevance of higher education by providing 'real-life' projects and resources to help students understand the practical relevance of their courses, creation of bespoke programmes inside the company, and taking part in degree programme advisory boards or contributing to course content design.

These developments have been supported by changes in recent years in the culture of universities and the way they are funded. A key reform was the introduction of a new system for assessing and rewarding research quality (the Research Excellence Framework or REF), which now incorporates a weighting for the impact of research, including economic and business impact. This gives a new incentive to universities and individual academics to partner with businesses in their research and to demonstrate the impact of their work.

## BACKGROUND

### RESEARCH EXCELLENCE FRAMEWORK (REF)

Most funding for research in UK universities comes either from one of the 7 Research Councils or from 'quality-related' (QR) funding provided by the Higher Education Funding Council for England (HEFCE) or other funding bodies in Wales, Scotland and Northern Ireland. This QR funding, which is provided for the university to use at its discretion, is allocated on the basis of an assessment of the quality of research across universities, which is conducted every five or six years. As part of the most recent assessment, the Research Excellence Framework (REF) included a specific measure of the impact of research, including commercial and economic impact as well as other kinds of wider societal impact. The REF website contains detailed information on the outcomes for each university.



University engagements, ranging from participation in Industrial Advisory Boards to sponsoring PhD/EngD students, are an essential part of the Open Innovation process at Thales. The interactions are a vital source of new ideas and are often the catalyst for further innovations within Thales. We also run a thriving campus recruitment programme, aligned with our other university activities, offering some of the most exciting engineering and business careers for graduates. 

**Professor Chris Firth, Chief Scientist, Thales UK Research & Technology**

Universities are also increasingly willing and able to work with employers on ways to boost the skills of the current and future workforce at all levels, developing more flexible degree programmes and expanding the market in a range of 'learn-while-you-earn' models, including at both undergraduate and postgraduate levels. This aligns with increased interest among students in value for money and the employment outcomes of different options. The market for university provision of training and professional development for employees and managers is also growing. However, as described in our report *Tomorrow's Growth*,<sup>5</sup> a number of major barriers still need to be addressed if we are to make real headway in expanding the take-up of learn-while-you-earn options.

 Universities have an extraordinary potential to enhance economic growth. The full diversity of institutions have a role to play from local SME support and supply chain creation to primary technology leadership and breakthrough invention.<sup>6</sup> 

Sir Andrew Witty, CEO, GSK



Building and sustaining competitive advantage in this fast-paced environment requires innovation, and people with the skills to support and deliver it.



### 3 Universities play a vital part in the innovation ecosystem

**There is a well-developed institutional landscape in support of effective business-university partnerships, whether for large companies with extensive networks of strategic partner universities, medium-sized businesses with less established connections, or small businesses which may have no previous involvement with universities.**

**There are a number of ways in which businesses can engage with universities on research and innovation...**

One of the key challenges for business is how to locate and access the people and institutions who are best equipped to support business R&D or innovation. Valuable long-term relationships may well originate from chance encounters, but there are a number of approaches which can be useful in identifying sources of expertise, and most universities have dedicated business development offices which can help in identifying specific academic capability.

Some of the main ways businesses can access the benefits of partnering with universities include:

- The use of consultancy services provided by academic experts – small and medium-sized businesses may get funding for this through 'innovation vouchers'
- The creation of Knowledge Transfer Partnerships (KTPs) to undertake a strategic project – these are described in more detail in section 4 below
- The commissioning of contract research – where the business is a paying customer and owns all resulting IP

- The commissioning of collaborative research – where there is a partnership between one or more universities and one or more companies, often with involvement of a public funding body, and IP ownership and use is a matter for negotiation
- The sponsoring of doctorates of various kinds
- The use of university equipment or facilities, normally for a fee.

#### BACKGROUND

##### THE 'LADDER OF ENGAGEMENT'

There is a scale of levels of engagement, ranging upwards from fairly short-term and arm's length activities like consultancy and paid-for use of equipment and facilities, through Knowledge Transfer Partnerships and contract research, to long-term collaboration on substantial research programmes, exchange of staff, and sometimes co-location of research facilities. The rising degree of commitment and emphasis on co-creating new knowledge rather than accessing and exploiting existing knowledge tends to be reflected in the size of the investment and the level of in-house expertise required to manage the relationship. This often (but not always) corresponds to the size of the business and the importance of its commitment to research and development, as well as its degree of sophistication and the extent of its prior experience of engagement with universities.

In addition to the above, there are also other kinds of interaction which can help to promote relationships more generally. These include: exchanges, placements and secondments; sponsorship of academic posts and honorary positions, including visiting professorships for company researchers; sponsored prizes for students; and company researchers joining departmental advisory boards. Working directly with a university society can also help develop a relationship with a target audience of students, raising the business's profile and communicating its research interests.

In the same way that individual firms vary hugely in size and approach, so too do individual universities. Indeed, different departments within the same university can vary, as can individual academics, with widely different qualities, aptitudes and interests. Those who are academically at the top of their field of research may not always be best fitted to work with business – or may be better suited to work with some businesses than others. When working with world-class experts, the key to successful collaboration is to find a mutually interesting research topic that can satisfy the academic's scientific curiosity and at the same time generate relevant insights for industrial application, making it a win-win partnership for all those involved.

### **...and they can all deliver benefits for business...**

Businesses are constantly seeking to improve competitiveness and productivity and to attract and retain talented employees. Engagement with universities can help to do this in three major ways:

- By reducing cost and risk
- By providing access to new ideas and horizon scanning
- By supporting the development of research skills, capability and profile

More detail on these business benefits are set out in the table on page 12. However, all of these are closely inter-related and are associated with the idea of 'open innovation', in which a company may maintain some core R&D activities in-house to focus on priority issues and to provide capacity to absorb, adapt and use new ideas, but actively seeks to benefit from knowledge and expertise elsewhere. An open innovation approach is valuable because it helps businesses break out of siloed or bounded views on innovation and look to solutions in other sectors, industries, or disciplines that would not normally occur to internal specialists. Academic perspectives can be helpful in identifying novel ways of tackling problems and broadening the scope of potential innovation.

Participation in collaborative work with universities can also open the way, and provide neutral ground, for developing useful collaboration with other businesses, whether in the same or different business sectors. In particular there can be scope for developing relationships with other businesses across the supply chain.

As with all R&D, the ultimate objectives for businesses include a range of goals; lower capital costs, longer product lifetimes, lower operating costs, reduced risk and development of new business. By informing and enhancing investment decisions it is possible to derive future competitive advantage through enhanced ability to provide new and better or cheaper services, products and technology for customers.

## BUSINESS BENEFITS OF COLLABORATION

### **1 REDUCED COST AND RISK:**

- Provide a flexible and cost-effective extension of the R&D resources (expertise, equipment, facilities) available to the company
- Save costs and time, by making comparatively short-term, arm's-length use (for example, through consultancy) of skills, knowledge and expertise which would be expensive to bring in-house by recruitment of full-time staff
- Share or reduce risk and cost by collaborating until there is a clear route to exploitation
- Benefit indirectly or directly from funding for collaborative research, including from the Research Councils and Innovate UK, as well as European funding such as the €79bn Horizon 2020 programme.

### **2 ACCESS TO NEW IDEAS AND HORIZON-SCANNING:**

- Get advance notice of emerging potential business opportunities and early warning of potential threats
- Help to develop early understanding of what will ultimately be required to take a new technological development to market
- Learn about new areas of research, and track topics which are relevant but not central to a business's current internal research priorities
- Test the potential of, and explore, ideas and options for possible new directions of future R&D
- Bring new perspectives to problems, including otherwise intractable ones
- Benchmark the quality of the company's in-house research
- Inspire teams around new topics through thought leadership, by accessing leading academics to describe new and emerging themes
- Develop cross-disciplinary engagement on business-relevant challenges
- Engage supply chain to increase opportunities for new ideas from strategic partners

### **3 SUPPORT IN DEVELOPING RESEARCH SKILLS, CAPABILITY AND PROFILE:**

- Update internal capability
- Identify possible new recruits
- Build reputation and promote a positive image of the company
- Support and influence the supply of relevant skills
- Extend capability by working with experts in disciplines where the business lacks expertise
- Develop networks with academics and access expertise through global academic networks
- Career development of corporate staff through university appointments
- Create the basis for partnerships directly focused on training and skills for the current and future workforce

### **...as well as benefits for universities**

Benefits flow in both directions, and university partners also benefit from these relationships in a variety of ways. Engagement with business-relevant research challenges provides new opportunities for the university, its staff and students. Research which has demonstrable impact can improve an institution's reputation, level of market awareness and potential for wider engagement. It can also lead to new ideas for teaching and training, and help to create a more relevant curriculum, and contribute to increased employability of students and researchers. Access to company knowledge, resources and data can be of direct help to academic researchers – and better understanding of how businesses are organised and operate is of value both internally and in future engagement.

### **Measuring impact, however, remains challenging**

Some companies have systems in place for assessing and summarising benefits from their research partnerships with universities. Increasingly, universities are also interested in understanding more about the impact of work they undertake with business, partly because this can help them in securing public research funds.

However, it is difficult, and may also be misleading, to try to directly measure commercial outcomes of research partnerships. Many of the indicators which companies use involve proxies, such as research outputs, or inputs to the engagement. Measuring value is largely a matter of professional skill and judgment. It often happens that very informal types of interaction can lead to important breakthroughs.

Setting appropriate milestones for research projects is difficult and requires a high level of expertise. If they are set, it is possible to appraise the progress of research activity with university partners in terms of timeliness in meeting them: whether early, on time, late, or not achieved.

Delivering value from business-university research partnerships depends on many factors. It is important for the value propositions on both sides of the partnership to be aligned and mutually understood, and for there to be clarity on the challenge and the potential channels of exploitation. Other factors to consider include: the stability of ownership and management (on both sides); the handling of IP and due consideration of commercial and other sensitivities; and the speed of response, as market changes may mean that quick answers are sometimes needed.

# BUSINESS-UNIVERSITY INTERACTIONS FOR RESEARCH AND INNOVATION: AN ICARG SWOT ANALYSIS

## STRENGTHS

- New ideas and innovations of all kinds – not bounded by industry mind-set
- Networks and knowledge of international, cutting edge research
- Highly specialised research and test facilities
- Excellent teams of researchers, constantly being refreshed with new talent
- Growing levels of experience of working with business and understanding of the potential benefits
- Specialist consultancy to complement the research work
- Wider benefits and new contacts can arise from engagement
- World-class researchers can be interested in business-relevant problems, and help to solve them, if they are attracted by the scientific challenge – this is a win-win
- In addition to core strengths at 'technology readiness levels (TRLs) 1-3', there is growing competence at higher TRLs

## WEAKNESSES

- Academics are largely 'free agents'; if there are problems don't expect to 'go to their boss' to sort it out
- Not all academics collaborate well with industry – some just want to go in their own direction
- Some academics may be unfamiliar with business timeframes and market focus
- Experienced researchers are often busy with teaching and other commitments, while junior research staff and students may lack depth or breadth of expertise and tend to have high turnover
- Resource may not be 'on-tap' and they may have to recruit for specific pieces of research
- University capability and excellence is scattered and not easy to spot – and universities compete with each other, so some are reluctant to recognise that a rival may be a better place to go

## OPPORTUNITIES

- Universities are being encouraged to demonstrate impact from their research — and incentives for academics to work with business are growing
- Possibility of gaining the benefits of funding from Research Councils, Innovate UK, and others, specifically for industry-university collaboration
- Opportunity to influence the direction and agenda of future research programmes
- University links to other industries, allowing research consortia to be created
- Ability to spot and recruit the brightest young talent
- Joint publication by academic and industry researchers can raise the profile and reputation of the business
- Research-related links can offer scope to build wider engagement, for example in raising the skills and qualifications of the existing workforce

## THREATS, RISKS AND HAZARDS

- Negotiation of collaboration agreements can cause delays and add to business costs – which have to be written off if agreement is not reached
- Academics want to publish something from their research (it's what they are judged on) – and may sometimes be unfamiliar with commercial approaches to IP
- A university will work with the whole industry, including, potentially, your competitors – though competence in operating 'Chinese walls' is growing
- Universities (naturally) want to make money out of what they invent
- A proper contract MUST be in place to control these risks

## A key challenge for many businesses lies in locating the right expertise...

The world of academic research is 'a jungle, not an orchard', and it can be hard for businesses to identify appropriate sources of expertise – and even harder to ascertain which potential partners are most suited to collaboration with business.

Most academic research is intended for publication, typically in peer-reviewed publicly available journals. This means that most of the new knowledge which universities produce can be accessed easily and largely for free. Open access to research results is increasingly a requirement for public funding, so businesses of all sizes can expect to find ready access to the fruits of publicly funded research.

The challenge for businesses seeking expertise is knowing where to look and how to use the knowledge available. There is also a challenge in finding individual academics who combine the required technical expertise with an understanding of how to work with business. Many business-university research relationships arise from chance encounters and discovery of complementary interests – so creating opportunities for company R&D staff to meet university researchers can pay dividends. Many universities hold open days or networking events where they showcase their offerings – these can be an excellent way of getting to know more about universities in your region.

The Research Excellence Framework 2014<sup>7</sup> (initial results published 18 December 2014, with more detailed information becoming available in the course of 2015) has produced rankings of research quality profiles for different disciplines in each university. The assessment criteria used do not necessarily correspond to the requirements of businesses, but the Framework has been designed to give a measure

of recognition to commercial and other forms of research impact. More information on the Framework is provided on page 8.

One useful tool for finding out which researchers have received funding from one or more Research Councils or Innovate UK, and for what kind of research, is the Gateway to Research<sup>8</sup> portal of Research Councils UK, which has an easy-to-use and versatile search functionality. Detailed information can also be accessed through the Visualising our Portfolio<sup>9</sup> searchable webpage of the Engineering and Physical Sciences Research Council (EPSRC) – and the EPSRC Grants on the Web<sup>10</sup> webpage may also be useful.



The Gateway to Research is a brilliant tool for finding out about really useful research in all sorts of areas that you wouldn't have imagined. It enabled us to learn about work we knew nothing about but which is highly relevant to our business, including work funded by AHRC, BBSRC, ESRC, NERC and Innovate UK.

**Steve Harris, University Collaborative Programme Manager, BAE Systems**



The Gateway to Research is a really useful resource. Easy to use, clear interface, excellent use of links, and useful for us when working on specific areas and identifying where expertise lies.

**Helen Ferrier, Chief Science and Regulatory Affairs Adviser, NFU**

The 'Partnership Info'<sup>11</sup> page of the Knowledge Transfer Partnerships (KTPs) website has a searchable database which gives information on past and current KTPs, including the name of the company, the university and the academic, and a brief description of the objective of the partnership.

For Scottish universities there is the Interface<sup>12</sup> programme which is well regarded for its free and independent brokerage service. The Scottish universities also offer University Technology<sup>13</sup> a collaborative website which showcases new technology opportunities available from Scotland's academic research base. The website provides a single location to enable companies and investors to find new technologies and technology transfer opportunities. A service similar to Interface exists in Wales, Expertise Wales.<sup>14</sup>

Individual universities usually have offices for technology transfer, knowledge exchange, business and enterprise, or research and innovation, which can act as initial points of contact for businesses and can help to facilitate access to university expertise. They and their staff are well placed to provide a rounded view of what opportunities may exist, what funding might be available and under what criteria, what legal frameworks might underpin some types of collaboration, and what events and opportunities for meeting academics there are. They can also help to support relationships, make the processes work smoothly, and potentially identify opportunities to broaden a business's engagement for mutual benefit. However, sometimes these offices may not have full visibility of all research within their own university, and they are unlikely to be well informed on research at other universities.

The Knowledge Transfer Networks,<sup>15</sup> administered on behalf of Innovate UK, provide an online business networking and open innovation portal, which businesses can use as a space to meet and network with other organisations and to find business partners for collaborative projects.

The UK-wide network of Catapult centres<sup>16</sup> is an increasingly useful resource for businesses of all sizes. The Catapults have extensive links of their own with universities, and a number of them are either embedded in the structures of individual universities or closely associated with certain universities. They are able to give guidance on which universities to turn to for expertise or assistance in specific areas.

### **...and in locating other resources, including equipment and facilities**

Many universities have excellent equipment which they use for research but is also available to businesses, usually for a fee. Facilities and equipment range from fashion studios and product design and development suites to lasers and flight simulators. It can be highly cost-effective for a business to gain access to facilities which it only needs to use occasionally. Some research-intensive universities have established regional groups which offer the opportunity to search a database for a range of different kinds of equipment. These include the N8 group<sup>17</sup> of universities in northern England and the M5 group<sup>18</sup> in the Midlands.

There is also a national database<sup>19</sup> with information on equipment at a number of universities and research institutes across the UK.

Finally, EPSRC has published a list of public databases<sup>20</sup> with information on equipment at a number of universities and research institutes across the UK, as well as the equipment databases of a number of individual universities.

## TOP TIPS

### GENERAL PRINCIPLES: PARTNERSHIPS FOR RESEARCH AND INNOVATION

Different types of engagement vary in intensity, commitment level, cost, and potential outputs and benefits. Among the general principles which are conducive to a successful relationship are the following:

#### Keys to success:

- The alignment of goals and objectives, and having the right people on both sides is absolutely vital.
- A confidentiality agreement helps to create a culture of trust and openness in which both sides are able to appreciate the needs of their partners and work in a way that brings benefits all round.
- Sustaining effective engagement with a university can take a lot of time and a personal commitment – if it's not going to be you who will develop this relationship, be sure to choose the right person to nurture it.
- High input at the early stages of the project to shape and steer the research ensures the relevance of final outcomes. Phased projects with interim reviews, rather than one long project, may be advantageous.
- Understand that research and its outcomes are only part of a bigger picture of the benefits of interaction – personal interactions and personal relationships underpin the value which flows from a company's university engagements.

- Active participation on both sides, both formal and informal and involving a wide range of staff, is crucial to maximising the benefits – staff visits and exchanges can help bring this about and foster the chances of progressing to longer-term engagements.
- A university that is committed to your business should allocate a 'sponsor' to make sure interests and opportunities of both sides are aligned.
- Direct involvement of appropriate internal specialists in the management of projects helps to ensure effective transfer of knowledge back to the company.
- Communication between the partners is essential for the successful management of a collaborative project – management structures and procedures should foster adequate levels of contact between researchers and managers of all the partners.
- The academic world out there is bigger than the company – an externally-facing mind-set is required.
- You need to think through quite carefully at the start how intellectual property (IP) arising from the interaction, and background IP you may put into the interaction, is to be managed.

## 4 Research and innovation partnerships come in many forms

**There are a number of ways in which to transfer knowhow and research talent from universities into business. This section provides some details and illustrations of specific tools, schemes, approaches and initiatives that businesses may find useful when seeking to build or strengthen relationships with universities for innovation and research.**

### Knowledge Transfer Partnerships can work for firms of any size...

Knowledge Transfer Partnerships (KTPs)<sup>21</sup> are designed to facilitate the transfer of knowledge and innovation and stimulate business-relevant research and training. The KTP programme is well established and has a 40-year track record of success.

Typical KTP projects include:

- Improving existing products or developing new products
- Developing and implementing a marketing strategy to enter new markets
- Developing new systems and frameworks to improve efficiencies in staff and processes.

Funding for a KTP is shared between a company and a sponsoring partner such as a Research Council, government department, devolved administration, or Innovate UK. Most of the money is used to fund the employment of a qualified KTP associate who is recruited to work in the company for between 6 and 36 months on a strategic project, but it also covers supervision of the project by an academic with relevant expertise and, in the case of a long-term strategic KTP, expert guidance from a KTP Adviser. For small and medium-sized companies two-thirds of the cost is met by the sponsoring partner, with the company covering one-third of the total, while in the case of large companies the sponsor pays half the cost. The average annual cost to the company is £20,000, or £30,000 for large companies.

An effective KTP enables the company to obtain the services of an excellent associate and also to gain access to a university department with a high level of expertise in the relevant field. About 75 per cent of KTP associates are offered a permanent full-time job by the company on completion of their project, often in senior roles in the organisation. Recruiting a suitable KTP associate is a crucial factor for the success of a partnership.

## BACKGROUND

### INTELLECTUAL PROPERTY AND THE 'LAMBERT TOOLKIT'

Determining how to manage IP in a business-university collaboration, and thus what sort of contract is required, can be a time-consuming process adding to your opportunity costs. To help firms through this, a set of model agreements has been developed for use in negotiating the terms of collaborative business-university partnerships and is available online. This 'Lambert toolkit'<sup>22</sup> consists of five model research collaboration (bilateral) agreements, covering a range of possible scenarios for IP, and four consortium (multi-party) agreements, together with guidance notes and a decision guide.

The objectives of the toolkit are to:

- Facilitate negotiations between potential collaborators
- Reduce the time and effort required to secure agreement
- Provide examples of best practice.

The toolkit also includes outlines to help in identifying the main issues that may need to be discussed internally and with collaboration partners before drafting an agreement to ensure that expectations are suitably aligned.

The model agreements are entirely voluntary and businesses may still wish to use their own bespoke contracts, but at the very least, the model agreements and support material allow firms to see what universities are likely to expect from a formal interaction with business. The agreements themselves were designed and written by businesses, universities, legal and IP experts working together. They have been tried and tested by CBI members and are used both in the UK and abroad.

There can be scope to work with universities – for example through research networks – without having agreements on IP in place, but it is something that needs to be given consideration in advance.

*"Lambert model agreements have saved my team weeks of negotiation and I have now signed in excess of 250 in mainland Europe and the UK."*

**Malcolm Skingle, Director of Academic Liaison, GSK**

**CASE STUDY****KTP CASE STUDY 1 – BIOCATALYSTS AND UNIVERSITIES OF BATH AND NOTTINGHAM**

Biocatalysts, a speciality enzyme development and manufacturing company based in the UK with a subsidiary in the USA, has made extensive use of KTPs as part of its commitment to open innovation. The focus for Biocatalysts is on seeing a commercial output at the end of the KTP project that contributes to growth plans of the company. A highly successful KTP with the University of Bath on potential commercial use of enzymes from extremophile organisms was followed by a KTP with the University of Nottingham's Department of Food Science which complemented an earlier CASE sponsored PhD project. The KTP associate developed research relationships across a range of departments and universities and was able to increase Biocatalysts' academic networks and identify new areas of research on novel enzymes for food applications. On completion of the KTP he joined Biocatalysts as Business Development Manager for novel enzyme development.

*"KTPs enable Biocatalysts to exploit the up-to-date technical expertise of talented graduates, by providing them with an opportunity to build on and extend their knowledge whilst applying it to a commercial context. There is a considerable focus placed by the Government on supporting the research, development and exploitation of knowledge transfer for the benefit of business and academia with the aim of increasing economic growth for the UK. This so far has been seen through technical knowledge and use of equipment which increases project capabilities at Biocatalysts."*

**Stuart West, Managing Director, Biocatalysts**

**CASE STUDY****KTP CASE STUDY 2 – WEDGE GROUP AND THE UNIVERSITY OF SHEFFIELD**

B. E. Wedge Holdings Ltd, a group of leading galvanizing businesses based in the West Midlands with a growing international presence, has completed two KTP projects with Sheffield University, both related to combustion engineering. One of them was awarded the highest possible accreditation of 'Outstanding' by the independent KTP assessment panel. The company has recently begun a third KTP. The work concerns the advanced technology which underpins the market leadership of its subsidiary Hasco Thermic in the specialized field of galvanizing furnace design.

*"The results of the investigations undertaken in partnership with the University, which is a world leader in this field, have been instrumental in advancing thinking on improving the performance and energy efficiency of the company's products. In addition to the KTP's direct benefit to us, we perceive great value in the opportunity to work closely with the experts in Sheffield because it encourages us to think even more widely and perceive further possibilities of advancement. We are great supporters of KTPs."*

**Angela Curtis, Managing Director, Hasco Thermic**

## CASE STUDY

### KTP CASE STUDY 3 – RANDOX AND QUEEN'S UNIVERSITY BELFAST

Globally, chronic obstructive pulmonary disease (COPD) affects 330 million people and is the third leading cause of death, with an associated socioeconomic burden exceeding \$2 trillion. Chronic lung diseases are exacerbated by infection, for which there are no effective rapid tests. Randox Laboratories, an international clinical diagnostic company based in Northern Ireland, is working with Queen's University Belfast (QUB) to develop diagnostics for respiratory infection. Through the KTP programme Randox has developed strong partnerships with clinical academics and the Research and Enterprise Unit at QUB. These collaborations currently employ three KTP-funded associates to conduct novel R&D to assess the capacity of identified biomarkers to generate cost-effective diagnostic products. The initial goal of these collaborations will be the successful launch of rapid cost-effective diagnostic products into the global marketplace. Low cost and ease of use are essential, as chronic lung disease is predicted to become more prevalent in emerging economies given increased tobacco use and air pollution.

### **...though innovation vouchers can be a first step on the engagement ladder for smaller firms**

The KTP programme is effective and suitable for businesses of all sizes, from micro enterprises with fewer than 10 employees to large corporations. The programme does however require a commitment of at least 6 months, and even smaller businesses must bear at least one-third of the cost. For a business unwilling to make such a commitment there may be benefit in a lower level of engagement.

There are a number of schemes offering 'innovation vouchers' to small and medium-sized businesses entitling them to a limited amount of specialist advice and assistance to address a business challenge. A national scheme<sup>23</sup> is operated across the UK by Innovate UK and pays for £5,000 worth of consultancy or similar services from a university or other 'knowledge provider' for businesses in certain sectors such as high value manufacturing, agri-food, the built environment, and energy, water and waste.

Many individual universities run similar schemes, offering vouchers for consultancy or other services which they can provide. Scotland and Northern Ireland have schemes of their own, and there is a regional voucher scheme operated by universities in the South West of England.<sup>24</sup>

It is important to have a realistic expectation of what may be achieved by a relatively small amount of consultancy. However, even if the advice is less like 'this is the answer to your question' than 'this is the question you really ought to be asking', that can still be valuable and money-saving advice.

Small and medium-sized businesses need to be aware of European 'de minimis' rules on state aid when applying for certain kinds of voucher. These rules cap the total grant funding a business can receive at €200k (approximately £165k) in any three-year period.

### **Working directly with students is a simple but effective way to build engagement**

Many universities welcome opportunities for their students to conduct projects on behalf of a local business as part of their studies. If well handled this can be an effective way for a business to secure useful help and insight, and to develop a relationship with the university which may evolve into something more substantial and long-term. In the best cases it may help with recruitment of skilled graduates as well as forging links with academic expertise.



Costain recruit about 80 undergraduate students a year across 15 different disciplines. For the final year dissertation or group project, students are encouraged to focus their work on an area that relates to Costain's markets. This allows interaction with operational teams, and lets business leaders engage with students and get to know their potential as individuals. The students can have access to company knowledge and support from experienced people that make their work more beneficial. This approach has allowed Costain to develop stronger links with universities, shape research areas and access academics who have an interest in Costain's business.



**Tim Embley, Group Innovation and Knowledge Manager, Costain plc**



Arup has regularly engaged Master's students from Management Science and Innovation at University College London to work in assessing the feasibility of some early stage ideas in our corporate venturing portfolio. The engagement with the Master Director was key to pick the best students. In most cases it was an enriching experience for both the students and our in-house entrepreneurs.



**Marta Fernandez, Global Research Leader, Arup**

## Firms can commission research from universities...

Contract research – also known as commissioned research – is where a business commissions a university's researchers to work on a specific challenge. The relationship between company and university is a commercial one of customer and contractor rather than true partners. Universities' cost base and pricing structure may deter some businesses, but the total amount spent by businesses for university contract research services has been growing strongly in recent years and now exceeds £440m per year. A major advantage of this kind of arrangement is that the business's requirements can be clearly specified and research can be carefully monitored, with no risk of researchers being distracted. It can be flexed year-to-year depending on the state of the R&D budget. The university is however treated like a supplier, not a partner, so the full benefits of partnership may not be realised.

## ...or engage in more collaborative forms of research

There are many formats for collaboration on research, which frequently involves an element of funding from a Research Council, Innovate UK, the EU or other public sector source. Collaborative research projects are typically led by academic researchers, but with business or other partners, who generally contribute either cash or 'in-kind' services to the cost of the research. Research Councils and Innovate UK support collaborative research through a range of mechanisms aimed at encouraging academic collaboration with industry. Collaborative research can take a variety of forms, from a basic collaboration between two partners to a complex multi-partner research programme.

## Sponsored doctorates can be highly cost-effective...

Businesses can be involved with PhD studentship projects in UK universities in a variety of ways. For example, projects can be carried out in collaboration with companies, which typically contribute resource and/or intellectual support and mentoring for the project and/or student.

### CASE STUDY

#### COLLABORATIVE RESEARCH: P&G AND DURHAM UNIVERSITY

Procter & Gamble (P&G) have 'master collaboration agreements' (MCAs) with global strategic academic partners including Durham University. Under this agreement P&G have been able to apply the capability and expertise of the University to projects simultaneously. Of particular interest has been Durham's expertise in biology, astronomy, chemistry and physics to solve technical challenges people face in their home. Novel optical techniques, normally used in biological and astronomical imaging, have been applied to provide a detailed analysis of the process of grease removal and laid the basis for development of a new enzyme. This new enzyme has now been patented and is being used for removing fats, such as butter, in cold water washing. About 100 Durham students and faculty and P&G employees have worked together to build integrated teams of researchers. Through P&G's financial commitment Durham has been able to attract additional funding from government and other major businesses.

Most research councils fund 'Industrial CASE studentships' where the student can be sponsored by a business and spend at least three months working in the business during the PhD. Universities are also able to convert standard PhD studentships funded by the Engineering and Physical Sciences Research Council (EPSRC) to 'CASE studentships'. The business is expected to contribute at least one-third of EPSRC's funding, but if the collaboration is well managed may benefit in a variety of ways. The Industrial CASE scheme gives PhD students an excellent and challenging training experience within the context of a mutually beneficial collaboration between academia and industry.

### BACKGROUND

#### RESEARCH COUNCILS

The seven Research Councils are committed to ensuring that the maximum impact, including economic impact, is delivered from their portfolios. Most of them have sections on their websites on 'working with business' or innovation, with links to relevant contacts, and they actively seek to broker and develop relationships between the academic and business research communities. Each research council has funding streams available to universities to support working with business and delivering knowledge transfer activities.

EPSRC and some other Research Councils also provide business sector contacts who may be a useful source of information – for example, which research groups at which universities the Research Council is funding, advice on procedures, and information about funding opportunities and other activities.

## ...and supporting Engineering Doctorates, Industrial Doctorates and Centres for Doctoral Training can deliver benefits

EPSRC Centres for Doctoral Training<sup>25</sup> (CDTs) bring together diverse areas of expertise to train cohorts of engineers and scientists with the skills, knowledge and confidence to tackle today's evolving issues and future challenges. Most CDTs involve a high degree of collaboration with industry.

There are 115 centres, where students carry out a Doctorate-level research project together with taught coursework. In particular, about 20 CDTs are industrial doctorate centres, which offer the Engineering Doctorate (EngD) qualification where students spend about 75 per cent of their four-year programmes working within a company and their training includes management skills to help their professional development. The EngD qualification is highly valued by employers.

The centres themselves cover a wide range of business-relevant research, including digital technology and its applications, new energy technologies, 'nano-applications', complexity science, plastic electronic materials, advanced composites, chemical synthesis, and the interface of engineering and the physical sciences with medicine and biology.

For businesses involved in aspects of engineering or physical sciences engagement with relevant CDTs can have multiple advantages, including the opportunity to develop links not only with a university but also with other businesses, and the chance to contribute to the shaping of the agenda for a substantial research programme rather than a single project.

## Collaboration spans the simple sharing of resources to the creation of complex multi-partner programmes...

At its simplest, collaboration can encompass the provision or sharing of equipment, knowledge or other resources. At its most complex, it may comprise multi-partner programmes for the 'co-creation' of knowledge. This is when multiple industry partners come together with one or more universities and other organisations to help shape the wider research agenda. Both approaches are however equally valuable.

### CASE STUDY

#### MULTI-PARTNER PROGRAMME: UK INFRASTRUCTURE TRANSITIONS RESEARCH CONSORTIUM (ITRC)

ITRC is developing a new generation of infrastructure system simulation models and tools to inform the analysis, planning and design of National Infrastructure. With support from EPSRC, and working with partners in national and local government, business, professional organisations and a number of universities, ITRC research examines energy, transport, water, waste, and information and communication technologies systems at a national scale to provide a basis for cross-sectoral and long-term decision-making for infrastructure planning, design and operation in the UK and abroad. The Natural Environment Research Council (NERC) has launched an analogous programme, the Environmental Risks to Infrastructure Innovation Programme, to meet the needs of businesses and decision-makers faced with improving the resilience of national infrastructure and mitigating the effects of extreme weather and climate change. It aims to tackle the opportunities and challenges posed by the changing environment, by translating the latest research into industry-relevant outputs.

## CASE STUDY

### SHARING RESOURCES: SEAGATE AND QUEEN'S UNIVERSITY BELFAST

Seagate Technology, one of the world's largest manufacturers of hard disc drives, employs over 1,300 people at its Springtown facility in Northern Ireland where it produces read/write heads and conducts R&D. In 2010 Seagate provided £7.5m worth of state of the art equipment to Queen's University, Belfast, to help set up ANSIN, a centre within the university, together with business development funding and support for a £1.7m collaborative research project. The main objectives were: for ANSIN to act as a hub for future collaboration with Seagate's R&D; and for the centre to develop further non-competitive collaborations in areas outside data storage and so build activity on advanced materials with wider reach and aligned with Seagate's broader interests. Benefits for both sides have included opportunities to influence and benefit from European research funding streams, and the establishment of a Centre for Doctoral Training with support from EPSRC and the Department for Employment and Learning of Northern Ireland together with Seagate and other industry partners. An additional benefit for Seagate and the wider society is support for the university as a source of highly educated, relevant and employable PhDs in science and technology.

*"Seagate Technology believe that interactions with our academic partners provide a fantastic mechanism to develop the technological breakthroughs and skilled staff required to undertake research that could contribute towards our next generation products."*

Brendan Lafferty, R&D Director, Seagate Technology

### ...but the best forms of collaboration often involve, to differing degrees, the exchange of personnel

As a number of the case studies in this guide make clear, many of the benefits arising from increased business-university collaboration derive from the exchange of individuals. This can be achieved in a number of ways to different degrees. For example, research professionals within companies are sometimes appointed visiting professors at universities with which they interact. This provides good exposure for the company and can be an excellent career enhancement for staff. It also provides a closer engagement between the company and the university department.

Likewise membership of departmental advisory boards by company staff may cost a company no more than the time and travel involved, but give early warning of potential business opportunities and threats emerging in academia.

There are also a number of programmes which promote and fund industrial secondments and fellowships for university researchers, enabling them to spend time in companies. This can be a highly effective way of developing relationships and getting better mutual understanding of each side's objectives, priorities and mode of operating. Among the funding schemes which specifically promote this are the Royal Society's Industry Fellowship Scheme,<sup>26</sup> the EPSRC's Knowledge Transfer Secondments<sup>27</sup> and BBSRC's Flexible Interchange Programme (FLIP). The first two can also be used to support researchers in industry, including for academic secondments.

Some companies also organise opportunities for their staff to take part in workshops featuring the latest thinking from top academics, either on technical topics or more frequently on management topics from academics at business schools. This can work particularly well with strategic academic partners with whom the company has established a deep and long standing relationship.

### **Finally, letters of support for research bids can offer early access to new possibilities**

University researchers submitting proposals for Research Council funding are increasingly being encouraged to indicate the relevance of their proposed research to business, and whether there is any involvement of potential business users. This can be useful, for example in the case of research which is within the scope of a business's internal R&D programme but too speculative to justify funding.

The involvement of business as a potential user of the research offers firms the opportunity to gain early insights into basic and more 'upstream' research.

The level of input received from the company is relatively low but can involve, for example, the provision of low-level funding or 'in-kind' support such as materials, data, equipment or facilities, or the informal monitoring and mentoring of the research – which will involve the commitment of a limited amount of staff time, such as attending project steering meetings.

It is important to clarify from the outset (i.e. at the application stage, when the participating company or companies are asked to provide a letter of support) how results emerging from the project will be treated, in what way IP might be exploited, and who might take forward this activity.

In the three academic years up to 2012/13, the amount spent by businesses of all sizes on contract research at UK universities grew at an annual rate of over 6%.

## TOP TIPS

### TIPS FOR GETTING STARTED AND POINTS TO WATCH

Some final thoughts from CBI members based on their experience:

#### **Getting started**

- Universities contain extensive expertise and knowledge: it may not be necessary for them to embark on a major research programme before offering useful information and guidance for a business.
- Try contacting the business development or enterprise offices of nearby universities, explaining your interests and attending the next industry open day to find out more.
- Getting started often depends on research collaborators finding each other and realising the scope for working together. But finding who does what within a university is not always easy – nor is identifying the right university. Good engagement often begins from chance encounters – but it need not be so. Research Councils can play a useful role in helping to find academics with the necessary skills, expertise and mind-set.

#### **Tips for success**

- Successful collaborations are clear at the outset about what impact they want to achieve.
- Ensure the university team are able to understand how the collaboration can help the company.
- Personal relationships and mutual understanding are usually critical—time and understanding are required to build links, which can be weakened or broken by changes of personnel.
- Proximity often helps – both at organisational and individual levels – and having a presence within the university through secondments or other staff exchanges (including PhD placements in the business) and regular visits in both

directions can improve the quality of collaboration. Proximity can also make it easier for the academics to develop a clearer understanding of the commercial needs of the activity – which may increase the chance of successful outcomes from a business perspective.

#### **Points to watch**

- Universities have an open culture—this can conflict with commercial sensitivity.
- Publication is often a requirement for universities (academic literature, theses, project reports).
- Handling intellectual property (IP) is often a key area for negotiation. The 'Lambert toolkit' may be helpful.
- Academic researchers' and university administrators' business and market knowledge may be limited.
- Breaking a project into phased parts reduces risk, but may be incompatible with university staff and student contracts.

#### **Seeing the benefits**

- Absorbing and embedding new knowledge within the business pose a distinct set of challenges.
- Not all research will be successful—and success may take a long time, so much so that when it comes the university contribution is hard to perceive. This is one good reason to review value one or two years after completion of a research project, to track impact which might otherwise be undetected and to assess the lessons learned in longer-term perspective.
- Even a negative result is still a result and may be as useful and informative as the result which was hoped for.

## 5 Collaboration can also help win the ‘war for talent’

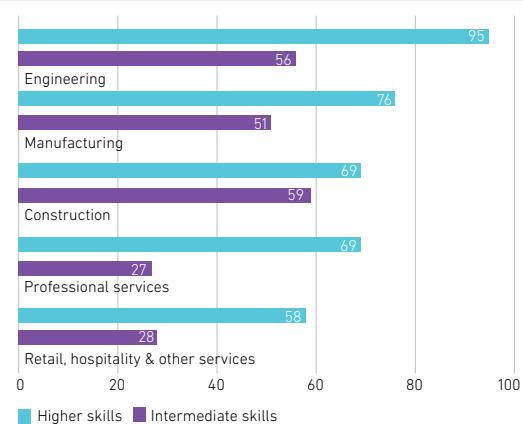
**Businesses understand the value of a skilled workforce: driving productivity, supporting innovation and creativity, providing great customer service and delivering competitive advantage. However, if British businesses cannot access people with the right skills and abilities on a sufficient scale, the UK's capacity to prosper and succeed in international markets will be undermined.**

### The ‘war for talent’ calls for innovative approaches...

In the years ahead, British businesses will need more people able to filled skilled roles. UKCES research suggests that the number of jobs requiring no formal qualifications has nearly halved over the last ten years, and by 2022, around half of all jobs will require some form of higher education: a degree, a higher apprenticeship, a higher national certificate or diploma. Skills that were adequate in the past will not suffice for the future.

Whilst this is the case across all sectors of industry, the demand for people with higher level skills is particularly strong in those sectors that should lead the rebalancing of the economy – such as engineering and manufacturing (**Exhibit 3**).

Exhibit 3 Increased employer demand for skills over next 3-5 years by sector (%) \*



\* Firms reporting increased demand minus those reporting decreased demand

Source: CBI/Pearson Education and Skills Survey 2014

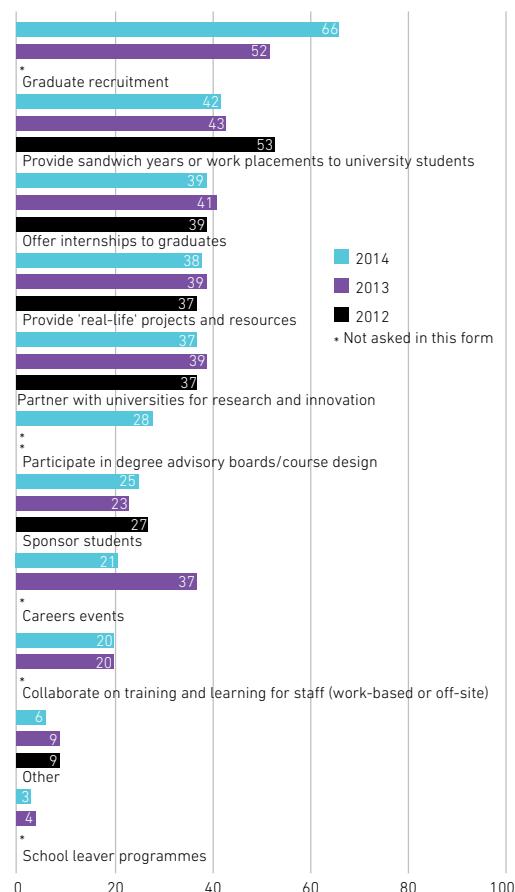
One way to address the skills challenge is by developing more partnership-based provision, with greater levels of business involvement in universities, as well as by boosting apprenticeships. Undergraduate study at university can be a great route to building career-relevant skills, but it takes investment to achieve a better match between course content and the skills businesses need. At the same time, there is a pressing need to upskill and re-skill the existing workforce, and to devise ways in which non-graduate recruits can be given the knowledge and competence which employers require.

### **...and many businesses are responding to the challenge...**

The 2014 CBI/Pearson Education and Skills Survey found that far more firms planned to increase their investment in employee training and development during the coming year than plan to cut back. The CBI 2013 report on *Tomorrow's Growth* also identified the growing trend in partnership-based provision for higher skills development and in 'learn-while-you-earn' models.

As a result, increasing numbers of businesses are now working with universities on ways to meet their skills requirements, and universities are evolving more ways to partner with employers to support them in developing their talent pipelines. This includes businesses offering undergraduates internships or work placements, sponsoring students, supporting course design and collaboration on training and development for existing staff (**Exhibit 4**).

**Exhibit 4 Nature of employer links with universities**



Source: CBI/Pearson Education and Skills Survey 2014

## **...but more action is needed – and collaboration with universities offers a solution**

Although the institutional infrastructure to support business-university partnerships for skills and training is less developed nationally than it is for collaboration on research and innovation, there are a number of different approaches which can be taken to support the development of skilled graduates and enhance the skills and motivation of current employees. The remainder of this section provides details and examples of some of these approaches which businesses may find useful in working with universities.

### **Attracting talent is the starting point...**

CBI research suggests that four in ten firms offer students internships or work placements.

Not only does this enhance individual students' employment prospects, but provides a great opportunity to attract graduates into the business. In an ever more competitive jobs market, and with skills gaps in key sectors growing, offering internships and placements has become a central part of many firms' recruitment and HR strategy.

### **CASE STUDY**

#### **INTERNSHIP: SANTANDER UNIVERSITIES SME INTERNSHIP PROGRAMME**

The Santander Universities SME Internship Programme offers small and medium-sized enterprises (SMEs) the chance to recruit students and recent graduates who can benefit from a paid first work experience for a period of 3 months. Once the internship is finished students might be offered a permanent role or move on to work in a different company. For students and graduates taking part, the programme is an ideal platform to enter the job market. At the same time SMEs can benefit from the new ideas and entrepreneurial mind of the students. Santander contributes to 2,000 internships in 2014-15, paying half of the intern's salary while the SME pays the other half. An SME which is interested in hiring an intern can register at <https://becas.agora-santander.com/company/sme-uk2015/home>.

### **CASE STUDY**

#### **INTERNSHIP: PLYMOUTH GRADUATE INTERNSHIP PROGRAMME**

Some universities run internship programmes specifically for graduates, such as the Plymouth Graduate Internship Programme (PGIP) which creates paid internships for graduates of any UK university or further education college. Interns are appointed for a short term contract to focus on a particular project or to take on specific responsibilities. In addition to the benefits for the graduate intern, employers get an opportunity to expand their workforce and tap into graduate learning, while also receiving financial assistance towards the intern's salary. The scheme can also be a basis on which employers can build confidence in working with the university.

## ...although universities can also help retain talent, by reskilling and upskilling employees...

As well as helping to attract graduates, building partnerships within universities can help businesses make the best use of the talent they already have. The reality of longer and multiple careers over a lifetime means older workers will have to reskill and upskill as technologies and ways of working change. Lifelong learning and continuing professional development are vital to businesses in the fast-changing global economy – and universities are well-positioned to help.

Many universities, for example, offer short training programmes for employers. These can be intensive one- or two-day programmes aimed at a specific skill requirement and which keep employees' time away from work to a minimum, or possibly delivered on-site.

At the same time, a number of universities have developed 'off-the-peg' learning programmes which businesses can use to develop employees' skillsets in particular areas. These may offer the opportunity for interaction and networking with employees of businesses in a range of sectors with overlapping skills requirements. Sometimes courses of this kind have been developed in concert with relevant industry sector bodies. From a cost perspective, off-the-peg courses may enable businesses to benefit from economies of scale, particularly when only a small number of a business's employees are involved.

More and more businesses however are making use of jointly designed, tailored university programmes, delivered either part-time or full-time for full-time employees, incorporating day-to-day workplace practices, frequently leading to degree-level or other qualifications. Advantages of this kind of programme include the additional benefits of having provision tailored to a business's specific requirements. In addition, when a significant number of employees are involved it may be possible to negotiate favourable terms.

### CASE STUDIES

The **University of Portsmouth** offers a number of leadership and management courses including sales and marketing and board member development, and a range of half-day courses for property professionals including surveyors, builders and housing managers.

The **University of Bath**'s Centre for Power Transmission and Motion Control runs short courses focusing on hydraulics, electrical drives, and control. In addition to the standard courses, offered in partnership with the Institution of Mechanical Engineers, the Centre also provides bespoke courses at customers' premises.

**Teesside University** offers technical masterclasses for the process and pharmaceutical sectors, and executive masterclasses for managers.

*"The beauty of the masterclass series is that individuals can pick and choose which modules suit their needs. The range of personal development we'll see across all areas will be quite significant."*

*"Highly trained and developed managers are key to the success of our business and our ability to achieve our aims. Giving individuals the opportunity to grow and develop means that they see SABIC as a company in which they can build a long and rewarding career."*

**Kathryn Harper, Career Development Specialist, SABIC**

**CASE STUDY****SKILLS: ASDA AND MIDDLESEX UNIVERSITY**

Middlesex University and Asda have jointly developed two BA honours degree courses in Distribution and Retail Operations, following introduction of a new structure giving greater responsibility to Asda shift and department managers. Asda were looking for a degree programme to add value and rigour to management training, and to provide an incentive to high-performing staff. Course content includes health and safety, relationship management and stakeholder engagement. Under the programme, which is fully funded by Asda, 30 staff from retail stores and distribution centres study together on the three-year work-based award. The retail degree covers areas such as merchandising, developing people and managing retail operations, while the distribution degree includes modules in supply chain management and logistics. Applicants are selected by Asda based on their performance and potential, rather than past academic achievement. The course complements their workplace experience with workshops, projects, assessments, online study and peer networking. By sharing modules and workshops with the Retail Operations degree, managers from distribution centres are able to create networks and promote understanding of the activities and impact of distribution in a way which was not previously possible.

*"The current economic climate – coupled with the spiralling costs of higher education – means that many of our colleagues have missed out on university degrees. By providing the opportunity to study for a degree, we hope that we can open more doors for our colleagues, developing their skills for the future. Through the programme, we hope to create a pool of home grown talent, the future leaders of Asda."*

**Hayley Tatum, Executive People Director, Asda**

**CASE STUDY****SKILLS: ANGLIA RUSKIN UNIVERSITY**

Anglia Ruskin University partners with many organisations to provide bespoke work-based learning programmes. For example, working with Ridgeons, a timber and builders merchant group based in East Anglia employing 780 people over 27 locations, the university developed a fast-track 2-year Foundation Degree enabling staff to build key management skills. A cohort of 23 Ridgeon group employees studied and worked full-time throughout the duration of the course, delivered through a combination of online learning and face-to-face teaching at a university campus.

*"The Foundation Degree in Management represents an excellent and logical progression from our existing management development tools. By focusing on development of our staff through this tailored programme, we aim to equip our staff and the company to react stronger and faster to market changes and create a structure that facilitates future company growth."*

**Angela Rushforth, Managing Director, Ridgeons Group**



**CASE STUDY****SKILLS: MCDONALD'S AND MMU**

McDonald's partners with Manchester Metropolitan University (MMU) to develop and accredit the business's Foundation Degree programme for its restaurant managers. The two-year course which is fully funded by the company and its franchisees includes modules on people management, financial control, operations, business planning and marketing. This is an innovative programme which offers the company's restaurant managers a rigorous, academic grounding in managing a business. It is unique in its approach as McDonald's delivers the course itself with assessment and accreditation carried out by MMU. As a work-based learning programme the skills and knowledge it delivers are very relevant to the individual and ensure the learning is applied to the business they manage. Previous academic achievement is not considered essential to access the course, thus enabling McDonald's employees to gain a nationally recognised qualification when other traditional academic routes may not have been suitable or available to them earlier in life.

*"The Foundation Degree in Managing Business Operations has been specifically designed for our managers who want to take that next step to gain academic recognition and to equip them with the skills and confidence they need to continue to enhance the performance of their businesses."*

**Jez Langhorn, Senior Vice President, Chief People Officer,  
McDonald's**

**CASE STUDY****SKILLS: ARUP AND MIDDLESEX UNIVERSITY**

Arup's Master's Module programme has involved developing a number of MSc courses with universities in areas of top business priority for staff development. Long-term relationships with universities help the business to target the right sources of expertise. A cohort of 22 Arup staff currently make up a cohort on the Middlesex University Postgraduate Certificate in Building Information Modelling Management. This programme is new to the University and was developed in consultation with Arup to meet the business's needs. Teaching is delivered via distance learning, through virtual tutorials and lectures weekly, with an additional Arup workshop and check-in points to ensure maximum transfer of academic learning. Arup employees are able to apply their learning to 'live' project work as they go. Students are highly motivated to achieve an externally recognised qualification, and Arup's capability is built in an area of strategic importance to the business globally.

*"We collaborate with academics to design postgraduate learning which will challenge Arup staff, allowing them to step outside of their day job and explore a topic in more depth or gain breadth of knowledge from leading thinkers."*

**Catharine Carew Hunt, Masters Modules, Arup University**

## ...and this is increasingly through new, more flexible and more bespoke forms of provision

If high skill sectors in the UK are to take advantage of growth opportunities, then businesses need to be confident about the supply of people with the right skills. This means developing new routes to higher skills – such as higher apprenticeships.

As set out in our *Tomorrow's Growth* report, there is a growing community of interest in widening gateways into highly skilled work for the young and enabling skills development in mid-career for others. Universities already offer a range of options for part-time study towards a degree, but an increasing number are also involved in designing ways of delivering tuition which can largely be provided to employees on-site. As with work-based learning programmes, provision can be tailored for employees of a particular business or in a given sector.

### CASE STUDY

#### SKILLS: ROLLS-ROYCE AND HIGHER APPRENTICESHIPS

Rolls-Royce has maintained relationships with a number of universities for many years to support delivery of engineering HNCs, HNDs, Foundation Degrees and Bachelors Degrees. In recent years the extent and importance of these relationships has increased significantly, following the growth of Higher Apprenticeships. In 2008 the company recruited 5 Engineering Higher Apprentices; in 2014 this had grown to 65 including new programmes in Programme Management, Planning & Control and Manufacturing Development. This growth has required significant engagement and collaboration with higher education providers to ensure that the company's specific needs can be met, including the involvement of Rolls-Royce business specialists in module selection and content. Currently the Foundation Degree is delivered at Derby College and validated by Sheffield Hallam University, which also provides the top-up two-year BEng programme in Sheffield for large numbers of Engineering Higher Apprentices.

### CASE STUDY

#### SKILLS: JAGUAR LAND ROVER TECHNICAL ACCREDITATION SCHEME

Jaguar Land Rover's Technical Accreditation Scheme (TAS) brings together eight universities to deliver skills development in specific key technical disciplines which are needed to support future product strategy and low-carbon technologies. The scheme's modular structure offers flexibility and convenience by enabling employees to mix and match modules according to their needs within the business, as well as their individual and professional development needs. Over 70 Master's level accredited modules are offered, which can all be taken separately and combined to qualify for an MSc from one of the partner universities. Modules typically carry 15 credits each, equivalent to 150 hours of study, with 180 credits being required for an MSc. Since the scheme was launched in 2010 over 50 per cent of Jaguar Land Rover's R&D engineers have undertaken TAS modules, equating to over half a million hours of Master's level learning.

*"This is a significant investment by the business in not only monetary cost but time out of the office and private study by the individual, but the return on investment is huge, with the programme paying for itself twice over in money and in time saved."*

**Jo Lopes, Head of Technical Excellence, Jaguar Land Rover**

**CASE STUDY****SKILLS: NEWCASTLE UNIVERSITY AND PWC**

Newcastle University's Flying Start Degree programme has been running since 2002, and is delivered in partnership by the university's business school, PwC and the Institute of Chartered Accountants in England and Wales (ICAEW). The programme prepares students for professional accountancy careers. Students graduate with after four years with a degree, 12 of the 15 professional exams of ICAEW's ACA qualification, and paid work experience during years two to four with PwC. After graduating students may be offered a full-time graduate job with PwC and complete their ICAEW Chartered Accountancy qualification. The company took a conscious decision to keep students in university education to ensure a balance between academic learning and structured work experience. The programme trains students to qualification level at 40 per cent less cost than PwC's mainstream graduate programme.

**CASE STUDY****SKILLS: BRITISH AIRWAYS ENGINEERING AND UNIVERSITY OF SOUTH WALES**

British Airways Engineering has partnered with the Glamorgan campus of the University of South Wales to offer a BSc degree in Aircraft Maintenance Engineering. Students at the University can obtain the BSc degree having also completed the industry-standard European Aviation Safety Agency's Part 66 training under British Airways' certification license. The initiative is accredited by the Civil Aviation Authority, and also provides British Airways Engineering employees with the opportunity to study academic modules from the University of Glamorgan at undergraduate and postgraduate level.

**Provision covers young people...**

In some cases employers hire school leavers at 18 and train them on a tailored degree course. The school leavers are employees from day one and spend part of their time in the workplace while pursuing their studies.

**CASE STUDY****SCHOOL LEAVER PROGRAMME: KPMG**

KPMG has partnered with Durham and Birmingham Universities to offer a six-year training contract that includes a relevant university honours degree and a professional accountancy qualification. From the outset of the programme and for its duration students receive an annual salary and have all their tuition fees and university accommodation costs paid by KPMG.

*"The KPMG school leaver programme has identified some exciting talent. I have been impressed with the maturity of the individuals who have joined us and have been really proud that the feedback from their universities shows they stand out from other students in their peer group. I have high hopes that we have recruited a number of leaders for the firm in years to come."*

**Mike Froom, KPMG Partner**

**CASE STUDY****SCHOOL LEAVER PROGRAMME: ROLLS-ROYCE**

The Rolls-Royce A-Level entry programme is designed to develop the next generation of manufacturing specialists and leads to a Master's degree at the University of Warwick. Alongside part-time university study, students undertake a series of mentored placements in areas such as forecasting and production planning.

### ...as well as existing employees

Some universities offer accreditation to in-house business training, building course content around existing provision and giving academic credits to employees which may then count towards a university qualification. In addition to enhancing training quality this can contribute to improving employee engagement and helping firms to attract and retain talent. Often this will be at Master's level, building on the existing knowledge and skills of more senior staff.

There are also a number of Professional Doctorate programmes which can be tailored for working professionals and can be undertaken on a part-time basis to suit their needs. Candidates use their current knowledge and abilities to develop interests and become change-makers within their communities of practice and within their professional areas. This can benefit not only the individual but also their employer, both directly and through the impact on professional and leadership competence.



### CASE STUDY

#### CO-LOCATION FOR SKILLS AND R&D – UNIPART AND COVENTRY UNIVERSITY

Coventry University and Unipart Manufacturing have built on their existing relationships to set up a new Institute for Advanced Manufacturing and Engineering (AME) on a Unipart manufacturing site. The new 1700 square metre building is part-funded by £7.9m from the HEFCE Catalyst Fund and is used for teaching and research:

The Institute enables undergraduates to apply theory learned in the classroom by working on live projects on the Unipart shop floor. The experience a graduate might gain from a placement year in industry or in a graduate training programme is embedded throughout the new three year BEng course in Manufacturing Engineering.

A co-located team of university researchers and Unipart engineers work together in AME on projects aligned to Unipart's technology roadmaps. A professional approach to project management and customer focus, as well as business metrics and KPIs, ensures delivery on commitments for both organisations.

Over £2.5m investment in state-of-the-art equipment in AME enables new technology to be taken through the TRLs, supporting delivery of new products and research outputs that allow both Unipart and the University to position themselves amongst their world class peers.

*"There is a real buzz in our new facility, with researchers, engineers and students working alongside one another. This will be central to driving change, developing my employees and creating growth in the business through innovation and new technology"*

**Carol Burke FREng, Managing Director, Unipart Manufacturing Group Managing Director**

## TOP TIPS

### TIPS FOR GETTING STARTED AND POINTS TO WATCH

#### General

- Research-based relationships can provide the basis on which a skills-focused partnership may be built.
- Company staff lecturing at universities allows the company to get students familiar with the company, and supports staff career development and also provides visibility of the company's research focus or business priorities.

#### Getting started

- Work with a university that is flexible and responsive, and tailors its offer to suit the organisational needs of the business – not the universities' past experiences.
- The starting point of a partnership should be identification of a business strategic challenge or employer skills need. Collaboration with a university may be the best way to address it, or it may not – and the solution may be available already, or may require development of a new product. Articulating the need and the possible solutions requires good communications between both parties.

#### Funding and planning

- Funding – who pays how much for what, and to whom – needs exploration and may need negotiation. In some cases financial support may be available, for example from the Catalyst Fund of the Higher Education Funding Council for England (HEFCE), Local Enterprise Partnerships (LEPs), various sources of EU funding, or the Advanced Manufacturing Supply Chain Initiative (AMSCI).

- Planning a new course can be time-consuming for both sides. There can be unforeseen cultural differences in the approach of businesses and universities, which require development of mutual trust and understanding to overcome.
- Video-conferencing can be a helpful tool when the parties involved in planning are in a variety of different locations.

#### Points to watch

- In some universities the careers and industry liaison offices don't have very effective communication with individual teaching departments, and this can cause problems.
  - Universities have to consider governance requirements and accreditation issues around qualifications, which may be of secondary concern to businesses which are focusing on employee skills. But employees can be given additional motivation by the opportunity to work towards new qualifications.
  - A business which is paying for its employees to study part-time may want feedback on how their studies are progressing – for example, in order to be able to give them extra support in the workplace where appropriate – but this may challenge some universities' concerns about data protection.
  - Be challenging – you are the customer!
- Sources of advice and information**
- The UK Commission for Employment and Skills<sup>29</sup> (UKCES), Universities UK<sup>30</sup> and the National Centre for Universities and Business<sup>31</sup> (NCUB) are all potential sources of advice and guidance, as are some Sector Skills Councils.

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Universities have an extraordinary potential to enhance economic growth. The full diversity of institutions have a role to play from local SME support and supply chain creation to primary technology leadership and breakthrough invention.

**Sir Andrew Witty, CEO, GSK**

For further information on this guide,  
or for a copy in large text format, contact:

David Cairncross  
Senior policy adviser  
CBI employment and skills  
T: +44 (0)20 7395 8151  
E: [david.cairncross@cbi.org.uk](mailto:david.cairncross@cbi.org.uk)



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