UNIVERSITY OF CAMBRIDGE

Impact where it matters

The economic, social and cultural benefits of higher education in the UK

A report for the Higher Education Funding Council for England drawing on a high level workshop involving senior officers of UK Higher Education Institutions, representatives from companies, social enterprises, central government, local and regional authorities, and other stakeholders

This report draws on a workshop that brought together senior representatives from Higher Education Institutions (HEIs), companies, social enterprises, central government, regional authorities and other stakeholders. The meeting, at the Royal Society in the summer of 2009, was a free and open debate on just what society should expect from, and require of, HEIs. The workshop focused on how HEIs through their individual strategies have added impact on a diverse range of communities. The speakers came not just from HEIs but from a diverse range of communities and organisations which engage with universities and are on the receiving end of the 'impact' of higher education.

Keynote speakers

David Sweeney, Director of Research, Innovation and Skills, HEFCE

Professor Julia King, Vice Chancellor at Aston University

Speakers

Tim Wilson, Vice Chancellor, Hertfordshire University

Caroline Tapster, Chief Executive of Hertfordshire County Council

Professor Madeleine Atkins, Vice-Chancellor, Coventry University

Bob Joyce, Group Engineering Director, Jaguar Land Rover

Professor Ian Leslie, Pro Vice Chancellor for Research at University of Cambridge

Walter Herriot, former Managing Director of St John's Innovation Centre, Cambridge

Professor Ray Hudson, Pro Vice Chancellor for Regional Strategy, Durham University

Kate Welch, OBE, founder and Chief Executive of Acumen Development Trust

Professor K Michael Spyer, Vice Provost for Enterprise, UCL

Professor Jeremy Watson, Director Global Research, Arup

Chairs and panel members

David Sweeney, Director of Research, Innovation and Skills, HEFCE

Stian Westlake, Executive Director for Policy and Research, NESTA

Peter Saraga OBE, formerly Managing Director, Philips Research Laboratories UK

Professor K Michael Spyer, Vice-Provost (Enterprise) UCL

Professor John Murphy, Head of University Partnerships, BAE Systems

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Foreword

David Sweeney, Director of Research, Innovation and Skills, HEFCE

The UK invests so much in higher education, that it is only natural to ask about the result of that expenditure of mostly public money. Just what, then, is the impact that universities have in the UK – on people, businesses, public bodies or the many other parts of society that they touch?

Any attempt to unravel the impact of higher education (HE) must consider at what level that impact happens. Does impact arise primarily from projects and programmes, or do higher education institutions, by the nature of their synergies and missions, add value that can be achieved in no other way?

Does impact come from big companies engaging with big universities, or does it come from broad based engagement across all higher education institutions, with their economic drivers in the region locally and through understanding at a very detailed level the needs of business?

Does it make sense to support that activity fully in all institutions or do we have to have specialist functions located in so-called hubs with business development activity more widely spread?

And there are technical challenges – to understand what we mean by impact, and whether we can measure it reliably. We can count the numbers of students who graduate from higher education, start-up businesses, patents filed or research papers that universities add to the growing body of human knowledge. The notion of 'impact' encompasses much more than these outputs, including as it does the many intangible, and sometimes unrecognised, ways in which higher education touches society.

The impact of HE on society and the economy is very important to HEFCE; we have worked for many years to support HE institutions in their engagement with the wider world through the Higher Education Innovation Fund (HEIF), and now through developing our new Research Excellence Framework. When we looked at the strategies that universities provided to us in the fourth round of HEIF, we found that universities really did strive to include 'impact' in their strategies and mission statements. However, while they have made considerable improvement in their strategies in gaining economic and social impact, they have made less progress in how they measure that impact.

We are a long way from systematic and comprehensive approaches to gaining feedback from beneficiaries in the economy and society and measuring the value created. In the light of this, HEFCE commissioned the workshop to share ideas between HEIs and users in our wider communities of how we can move forward. This document draws on that event.

When we do try to look at the impact of higher education we should avoid any temptation to look for a 'magic number' or even a handful of numbers. We also have to avoid measurement systems that add costs without delivering any real benefits. The objective should be to realise the considerable value that can come from having a little bit of burden of measurement. Then we can begin to understand, and make the case for, the value created by universities, our academics, our students and by working with economic and social partners.

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Executive summary

This report draws on a workshop that brought together senior representatives from Higher Education Institutions (HEIs), companies, social enterprises, central government, regional authorities and other stakeholders.

The meeting, at the Royal Society in the summer of 2009, was a free and open debate on just what society should expect from, and require of, HEIs. The workshop focused on how HEIs through their individual strategies have added impact on a diverse range target communities. The speakers came not just from HEIs but from a diverse range of communities and organisations which engage with universities and are on the receiving end of the 'impact' of higher education.

The following sections of this report highlight the key themes and issues that arose during workshop discussions and – through a series of case studies – illustrate some of the many ways in which universities affect local, national and international communities. The report begins by discussing the concept of 'impact' itself, and the origins of this document. The report concludes by reflecting on the workshop discussions and debate, in particular listing some of the most important messages and comments that arose during the day, including:

- The most successful universities, in terms of impact, are those that make economic and social engagement a core part of their mission statement, and then back it up with leadership at the highest level
- HEI impacts extend beyond industrial and economic benefits, there is also a diverse range of societal benefits including: advances in healthcare, social regeneration, informed policy-making, and contributions to the creative arts
- The sheer diversity of impacts (and associated beneficiaries) means that there will never be a "one size fits all" way of assessing HEI impact
- HEIs have demonstrated significant progress in terms of understanding the added value ways they make a difference to the economy and society; and there has been considerable innovation in both strategies and initiatives to enhance this institutional impact
- Without effective communications, HEIs will not convince society of the benefits it derives from higher education

In addition, the workshop discussion and the case studies suggested a number of common themes with respect to the diversity of ways that universities affect society:

Open interactions: HEIs provide meetings places and forums where the wider community can come together 'on neutral territory'

Facilitating innovation: HEIs often set out to use their expertise to create networks and communities of interest around specific subjects and themes, often building the capacity to address important social or economic challenges that no one group could hope to address alone

Strategic partnerships: Many HEIs make deliberate effort to develop relationships and strategic partnerships to enhance their institutional impact

Introduction: The challenge of measuring impact

Try to list the many ways in which universities have an impact on society, and you quickly face the challenge of how to put numbers on the economic benefits, let alone less tangible impacts such as the contribution to the creative arts - often held up as one of the UK's 'crown jewels' - social regeneration or work on social projects with local groups. Does it even make sense to try to place an economic value on impacts where even the activity itself is hard to quantify, let alone in monetary terms?

For example, if the 'impact' of a university's work with the local community is to change the life of an individual, of which there are a multitude of case studies, how can you put a value on that intervention? Similarly, can you put an economic value on the work that a university does when working with a local authority on a "sustainable community strategy"? Do you compare the academic contribution with the cost of hiring commercial consultants to do the work? And how much does that academic input add to the strategy?

When considering the impact of universities it is also important to think about the many different mechanisms in place. For example, does impact arise primarily from projects and programmes, such as those supported by grants from Research Councils, or do HEIs, by the nature of their synergies and missions, add value that can be achieved in no other way?

> *"Most approaches to valuing the contribution of universities miss out the fact that part of our value is in being different. Rolls-Royce recognised that universities could do something that they couldn't do."*
>
> Professor Julia King

An HEI is, of course, more than just the sum of its research projects and education programmes. How do you measure the added value of the institution itself? In particular, how do you assess the impact of those collective endeavours that deploy a range of HEI expertise and activities to make a difference in a chosen area? How do you sensibly compare HEI strategies that set out to affect local regeneration, regional economies, entire industry sectors, fields of the creative arts, or global grand challenges?

Any attempts to analyse the non-financial impacts of universities are hampered by the diversity of universities themselves. In reality, no two universities are the same. While all universities will play an important part in their local community, in the broadest sense, others have their greatest impacts on an international stage.

So while it is reasonable to question the impact of higher education on society, it is very much more than a simple profit and loss exercise.

Even if you can begin to assess the impact of higher education, where do you focus your attention? Does impact arise primarily from the projects and programmes that receive Research Council funding, or do HEIs add value that can be achieved in no

other way? In reality, the greater impact of higher education is a combination of both. Without clear missions, projects and programmes cannot hope to deliver their full potential.

Some of the many ways in which higher education affects us all feature in the report on the allocation of the fourth round of the Higher Education Innovation Fund (HEIF) which set out to support a broad range of knowledge exchange activities resulting in economic and social benefit to the UK.

While universities employ many different mechanisms for knowledge exchange, the review of their strategies in HEIF 4 shows some common themes in successful approaches. Knowledge exchange does not just happen; it requires a positive and deliberate effort. The fact that most HEIs are serious about knowledge exchange and have put in place strategies to make it happen is itself a sign of significant progress in recent decades.

More recently, university leaders have become more active and have promoted knowledge exchange through incentive schemes, recruitment and promotions criteria, and training and development. These are all important ways of increasing the participation and effectiveness of staff in knowledge exchange.

> *"The term 'impact' is not clearly understood and is ambiguous, not least because it is multi-dimensional in nature. However, it is often used as if it were well defined and could, indeed, be quantified. In our view, the methods of assessing and quantifying 'impact' have not been sufficiently developed and justified. We therefore have reservations about the use of 'impact' as a criterion in prospective assessments of individual applications for funding to research councils."*
>
> House of Lords Science and Technology Committee: 'Setting priorities for publicly funded research'

In this way, vice chancellors and other senior members of the academic community have provided a vision for knowledge exchange in their institutions. Universities simply could not build a coherent ability to make a difference without real leadership and vision.

Universities conduct a wide range of activities from entrepreneurship and enterprise education, both at the staff and student level, to consultancy, contract and collaborative research, to training staff, business development and participating in networks.

The origins of this report

A meeting of senior representatives from higher education, business and other organisations provided the input for this document.

This report draws on presentations and discussions between vice chancellors, pro-vice chancellors and senior managers from higher education, representatives from companies, government officials, people from local and regional authorities and others. Brought together in the summer of 2009 by the University of Cambridge on behalf of the Higher Education Funding Council for England (HEFCE), the meeting, at the Royal Society, was an opportunity for a free and open debate on just what society should expect from, and require of, higher education.

Since the event, the issues discussed have become even more important as universities come under pressure to contribute to the new government's focus on "rebalancing the economy". As well as making an economic case for their activities, universities need to convey the message that higher education makes a broad contribution to many different aspects of society, one that you cannot turn on and off to match the fluctuating fortunes of the economy.

Participants from all sectors shared experiences and effective practices related to assessing the impacts of higher education on society. They also considered ways of enhancing the dialogue between higher education and its many stakeholders.

The meeting showed that higher education institutions are engaged in a broad range of activities. Indeed, the breadth of these activities is such that no two organisations are the same.

Universities adapt their interactions to match the nature of the communities that they engage with, local, national and international. These interactions reflect the diversity of institutional missions and the many ways of employing different combinations of activities that they use to achieve their goals – from teaching to research to enterprise training. These activities offer significant value to beneficiaries from the private, public and voluntary sectors within the local, regional, national and even global communities

The meeting itself came out of an understanding that effective feedback from users is essential if we are to optimise the impact of higher education without excessively distorting its primary roles of education and scholarship. Universities and those who benefit from their activities, need to understand the motivations and goals of everyone involved.

In the same way, we need better performance indicators if we are to assess the many ways in which universities bring benefits to society. It became clear in the meeting that economic impact is by no means the only yardstick for assessing the value of higher

education. Such evidence is essential if we are to devise effective strategies and funding regimes for higher education.

The meeting, and this document, which also draws on some of the reports and observations that have contributed to the wider debate on the impacts of higher education, set out to promote a continuing discussion and greater understanding of the contribution that HEIs make to society, especially those impacts that are less easily recognised.

An important theme in the meeting was the need to understand the difference between the 'outputs' of higher education, the qualified graduates and research results, for example, and the 'impacts' of higher education, a concept that encompasses many other activities, including the economic impacts on the local community, for example, as well as the non-economic impacts that make up much of this review.

The event underlined just why analysis of this topic is so complex, a consequence of the diversity of HEIs, and the very different needs of their many beneficiaries. The impacts of higher education happen over many different timeframes, making it very difficult to quantify all but the most immediate effects. This is especially true of less tangible forms of value creation, such as the growing role in higher education in promoting a culture of entrepreneurship. Changes in attitudes such as this take generations to show up, by which time it is all but impossible to quantify the impact in any meaningful way.

The same difficulty (in trying to quantify the impacts of higher education) applies to the growing importance that universities, companies and other organisations place on strategic research alliances. Universities cannot hope to produce meaningful numbers for such activities if, as the meeting heard, the companies they work with do not try to calculate the costs and benefits of their strategic alliances with academic institutions.

In his first major speech on science, David Willetts, the new Minister for Universities and Science, summed up the issue in a way that many people at the event would endorse. "The surprising paths which serendipity takes us down are a major reason why we need to think harder about impact. There is no perfect way to assess impact, even looking backwards at what has happened."

Impact where it matters

Considerable effort has gone into measuring the impacts that higher education has on the economy and society as a whole. The one thing that all these exercises show is that it is a difficult task. No two universities are identical. Each lives within in its own unique environment.

It is also clear that impact assessment exercises can be coloured by the questions asked and who is asking them. If academics are challenged to prove that higher education delivers economic returns, then a survey will show just that. There is, however, a risk that a survey will overlook other impacts that are harder to measure but are more important locally, or to some other community.

There is also the temptation to think mostly in terms of the 'outputs' of higher education, because these are easier to measure, while overlooking impacts that could be more significant, especially in the longer term. For example, it takes decades for a high-tech cluster to seed itself and grow into a recognisable entity.

A further risk of concentrating on those impacts that we can identify and enumerate is that universities will then focus on those activities. Give academics credit for starting up companies and they may well be tempted to 'tick boxes' and focus on these activities rather than those impacts that might be more significant and of greater value to the whole of society, albeit harder to measure.

What are universities for?

Any impact assessment has to start from the role of higher education. It does not exist primarily to fuel the economy, but, at its most fundamental, to educate and to advance knowledge. For example, Cambridge University defines its mission as:

- Education – the transfer of knowledge
- Research – the creation of new knowledge, scholarship
- Ensuring that knowledge is used and accessible

These activities, of course, have their own impacts, economic, societal and in other ways. This report does not go into this well trodden territory but instead concentrates on the ways in which, by working with universities, other organisations can achieve more than they might on their own.

Impact channels

Education and research go on to create impacts at different levels. For example, scientific research delivers much more than academic papers, it also delivers tools and techniques, including new scientific instruments and methods, that go on to become a part of the repertoire of processes available to industry.

There are many examples where academic research has yielded new measurement techniques that have gone on to create large industries. Magnetic resonance imaging, for example, arose out of work funded by the Medical Research Council and conducted at the University of Nottingham. DNA fingerprinting and monoclonal antibodies, now standard techniques in many applications, have similar origins in academic science.

In recent years, Research Councils and other organisations have assembled many case studies of where academic research has delivered long-term benefits to society. These demonstrate a remarkable diversity and underline the fact that it can be decades between the discovery and first use of these techniques in the academic world and their widespread adoption.

In a review of the research literature on innovation, Science and Technology Policy Research (SPRU), at the University of Sussex, identified seven "channels" through which benefits from research flow into the economy:

- Increase the stock of useful knowledge
- Supply skilled graduates and researchers
- Create new scientific instruments and methods
- Develop networks and stimulate social interaction
- Enhance problem-solving capacity
- Create new businesses
- Provide social knowledge

These channels are not mutually exclusive. For example, new technology based businesses build on useful knowledge and depend on the supply of skilled graduates and researchers.

Economic impacts

Universities UK (UUK) has, since 1997, conducted regular analyses of the impact of the UK's universities. The most recent study, the fourth in the series, includes data for 166 universities and colleges up to 2008. This showed that the sector had an income of £23.4 billion a year in 2007/8, compared with £16.9 billion in 2003/4.

"In terms of its wider economic impact the sector generated over £59 billion of output. The equivalent figure five years ago was nearly £45 billion, confirming a rapid growth in economic impact."
Professor Steve Smith
President, Universities UK

They employed more than 1 per cent of the UK's workforce. In 2007/08 universities accounted for around 670,000 jobs, with some 372,000 of these directly employed by universities and colleges. According to the report, the total employment generated was equivalent to "around 2.6 per cent of all full time equivalent employment in 2007".

International students are an increasing important part of the university population in the UK. These students alone accounted for off-campus expenditure of some £2.3 billion in 2007/08. In all, the gross export earnings of the UK's universities amounted to £5.3 billion in 2007/8.

It is much harder to gauge the economic effects of knowledge transfer from universities into the wider economy. The UUK survey shows that the 54 institutions that reported royalties from exploitation of intellectual property yielded £37 million in 2007/08, with nine universities reporting incomes exceeding £1 million.

Universities earned much more from consultancy activities than from IPR and licensing. According to the higher education-business and community interaction survey for 2007/08, income from consultancy amounted to nearly £335 million.

One survey found that one in four academics in the UK were involved in consulting work, spending about one twentieth of their time, and with earnings that added between 5 and 10 per cent to their income.

"Foresight's role is to help government to think systematically about the future. We could not complete Foresight projects without support from the hundreds of academics from many different disciplines and universities who have contributed their expertise and time over the years."
Professor Sandy Thomas
Head of Foresight
Government Office for Science

Academics can provide advice in many ways that do not show up in the consultants' role. For example, most of the government's departmental scientific advisors have come from universities. Also within government, such activities as the Foresight Programme within the Office of Science would find it impossible to work without significant, often unpaid, contributions from academics.

Yet another mostly invisible use of expertise developed in higher education is in companies that recruit academics to serve on their various boards and high level advisory groups.

A related activity where universities affect their communities in ways that are hard to measure is as board members on local charitable groups and social ventures. For example, the board of Acumen includes an academic from the Newcastle Business School at Northumbria University.

These are just some of the many ways, formal and informal, in which universities are, in the words of Cambridge's remit for itself, "ensuring that knowledge is used and accessible".

An overlooked impact of higher education is the role of some academics on the boards of companies, for example:
Professor David Gann, Head of Innovation and Entrepreneurship in the Imperial College Business School, is also Group Innovation Executive with the construction company Laing O'Rourke plc and is a member of the Technology Advisory Board of QinetiQ plc.
Professor Michael Kelly, Prince Philip Professor of Technology in the University of Cambridge, is a non-executive director of Laird plc.

Secondary economic effects

Economic development also arises from higher education in the creation of new businesses that come into being to exploit academic research. Despite their visibility, and the relative ease of counting them, spin-out companies can never be more than a small part of the economic impact of university research.

While spin-out businesses often take up residence in a local science park or incubator, they are rarely the only tenants. These facilities often attract businesses with no obvious formal connection to the local academic community. The fluid nature of the links between these companies and universities mean that it is impossible to trace any economic impact back to an individual research council grant or particular project.

Universities and their science parks also create an environment that attracts large multinational companies that want to establish R&D facilities in the UK. Cambridge alone has acted as magnet to bring in such major companies as Microsoft, Pfizer, Phillips and Genzyme.

While science parks can be an important part of the local technology community, they are often surrounded by other high-tech companies. Businesses set up operations at other locations in the area. This growth of communities of businesses, often working in related areas of science and technology, can give birth to clusters..

Clusters

Currently marking its 50th anniversary, the Cambridge technology cluster is perhaps the best known, but by no means the only example, of a trend for businesses in related technologies to come together. The area accommodates many more technology businesses than the local science and business parks can house. And many of these business have only tenuous links to the university. As Walter Herriot, a veteran of the university's technology transfer scene, puts it "Out of the 1,500 companies now in the Cambridge cluster only about 150 of them can trace their roots back directly to the university or the university has some sort of charge on the intellectual property or shares in the business."

The cluster effect often involves businesses in a similar area of operation. In the case of Cambridge, information and communications technologies and biotechnology are major players. The area around Glasgow, Edinburgh and Dundee in Scotland – sometimes dubbed Silicon Glen – is a focus for optoelectronics businesses. As well as major IT companies, the region is the home of start-up business, often building on research conducted in local universities.

Another example is the creative industries cluster in Dundee., where 350 companies work in computer gaming and related fields. Based around Abertay University, whichhouses the IC CAVE, the International Centre for Computer Games and Virtual Entertainment. The area around Dundee has attracted an investment of more than £1 billion over the past decade or so and is now home to about three quarters of all British jobs in computer game development. Dundee is responsible for 10 per cent of Britain's digital entertainment industry, with an annual turnover of £100 million.

The status and reputation of a university can have other commercial impacts unrelated to its academic role. The University of Hertfordshire, for example, working with the Regional Development Agency, played a part in the "rescue" of a redundant commercial

research laboratory and its conversion into an incubator for small businesses.

As in many of the impacts of higher education, the creation of clusters takes time. The Cambridge Cluster started with just 20 firms employing a few hundred people, taking half a century to reach the stage where it now 'houses' 1,500 companies employing around 45,000 people.

Service economy

Universities have superb and sometimes expensive laboratory equipment operated by skilled technicians and researchers. By professionalising their own use of these services, some universities have made it possible to provide services to companies. For example, at the University of Ulster, the School of Biomedical Sciences organise its own analytical laboratories on a service basis. This not only improves the facilities for the university's researchers, it makes it much easier for companies to buy time for analytical services that are beyond their own capabilities.

Coventry University is also involved in the "service" side of R&D. The Health Design and Technology Institute (HDTI) supports small and medium-sized enterprises in designing products and services to improve community healthcare and manage health at home. The HDTI opened in 2008 and moved into new purpose built premises on the university's technology park in 2009. The institute brings the university's research expertise in community-based therapy into direct contact with businesses.

The bigger picture

Many activities within universities can have impacts with very little immediately obvious economic effects. As sometimes one of the larger employers in a region, universities are important parts of the community.

A university's impact can be as a result of its main missions – education, knowledge creation and its dissemination – but it can also come through "extracurricular" activities of staff and students. How do you put an economic value on the fact that a university's students are the mainstay of the local Girl Guides? Students sometimes act as ambassadors performing outreach activities at local schools and recruiting future generations of undergraduates.

"One of the great success stories of that programme was working with a woman in East Durham who hadn't been out of her house for about three years, and at the end of six months we got her across the front door. The problem is how do you capture the value of that."

Professor Ray Hudson
University of Durham

Activities arising from knowledge creation include the universities' work with local businesses. Universities are often key players in local knowledge transfer networks. Aston University, for example, works closely with local SMEs which still make up large percentage of the UK's manufacturing companies. One assessment of this sort of activity has shown that £1 million spent yields £2.9 million additional profit.

Universities can also play an important part in helping to form local regeneration strategies. They can provide opportunities for public and private sectors to come together

to develop plans to revive regional economies. For example, in County Durham, the Regional Development Agency, One North East, funds the Phoenix Programme to support regional regeneration. Durham University is a major partner in this initiative, along with Northumbrian Water and the county council. Phoenix supports research into the area's community linkages as well as practical development projects. Phoenix Sport uses sport activities to tackle problems of disadvantage and social exclusion.

The Sustainability Officer at Durham University works with Acumen, a charitable enterprise set up to tackle some of the regions socioeconomic challenges, on a healthy growing and living project. A nutritionist at Newcastle University works with Acumen to support the Green Leaf Café, a social enterprise that operates a comprehensive outside catering service as well as a café and is one of a number of social ventures that helps local people gain jobs and skills through training and business start-ups.

Universities can also act as a focus for local discussion of issues such as climate change. For example, Aston University works closely with Birmingham City Council on its climate change strategy. Trying to assess impacts can be even harder when you start to consider the arts and humanities. How do you try to put a value on the academic contribution to, say, a major exhibition?

The Arts and Humanities Research Council has considered this and has created its own series of case studies. One of these looks at the contribution of the Centre for the Study of the Domestic Interior to At Home in Renaissance Italy, a major exhibition at the Victoria and Albert Museum (V&A). The centre, a collaboration between the Royal College of Art, the V&A and Royal Holloway, University of London, made many contributions to the exhibition, from funding curators and providing computer equipment to providing an intellectual base for the development of ideas about the exhibition.

Creative industries

Museums are but a part of the creative industries where academic research is important. In all, says Professor Elaine Thomas, Vice-Chancellor, University for the Creative Arts, "We generate more than 16 per cent of our GDP from the creative industries, much of that in the form of creative content. Computer game sales have risen despite the slump."

When the Arts and Humanities Research Council (AHRC) asked PwC to look at the economic impact of its work, the estimates suggested that "for every £1 spent on research by the AHRC, the nation may derive as much as £10 of immediate benefit and another £15-£20 of long-term benefit". As the AHRC said in its report Leading the world – The economic impact of UK arts and humanities research, "in 2006-7, the AHRC invested £60.3 million in new research, which implies immediate returns of over £616.9 million and a possible additional return over 25 years of around £1 billion".

The nature of the creative industries makes it even harder to assess the impact of universities on the sector than it is for science. By their very nature, audience engagement is at the heart of the creative industries and the creative arts.

As with other sectors, the flow of trained people may be where the creative arts have their biggest impact. As Uwe Derksen, of the University for the Creative Arts, puts it: "Most of our students go on a placement or take a live project with industry. Staff provide design consultancy, do public art projects, all sorts of things. Some of them run

their own businesses. So it's a huge contribution to UK plc."

In the creative sector, universities are also active in taking the message out to a wider community. The University for the Creative Arts, for example, ran the project Women in Digital Entertainment (WiDE). In all, 375 women participated in this venture which included workshops and activities designed for practitioners at different stages of their career, to enable them to develop vocational, technical and business skills; networking opportunities and master-classes.

Festivals of Britain

Higher education is also a natural home for many cultural activities within local communities. For example, each year universities across the country are the driving force behind the many activities that make up National Science and Engineering Week.

This annual event has now grown to encompass other academic disciplines. The Economic and Social Research Council supports the Festival of Social Science which in 2010 involved over 130 events in over 40 different cities in the UK.

Individual universities have also built on their science festivals to create wider events. For example, at Cambridge the success of the Science Festival led to the university's Festival of Ideas which is a celebration of the arts, humanities and the social sciences.

Cambridge's Festival of Ideas is one of the activities organised under the university's Community Knowledge Exchange. Under this scheme, voluntary and community sector organisations can gain access to research services free of charge whilst students have the opportunity to apply academic skills in the community and make a real difference.

The programme has stimulated new programmes such as Rising Stars to train and encourage young academics to engage with the public.

Impact in action

Examples of the effects of higher education, based primarily on presentations[1] at the workshop "Making a Difference" by senior representatives from HEIs and organisations or communities that work with them.

What are universities valued for?
Professor Julia King, Vice Chancellor Aston University

The University of and for Hertfordshire
Tim Wilson, Vice Chancellor, Hertfordshire University, and Caroline Tapster, Chief Executive of Hertfordshire County Council

Coventry – A business facing university
Professor Madeleine Atkins, Vice-Chancellor, Coventry University and Bob Joyce, Group Engineering Director, Jaguar Land Rover

Cambridge phenomena
Professor Ian Leslie, Pro Vice Chancellor for Research at University of Cambridge and Walter Herriot, former Managing Director of St John's Innovation Centre, Cambridge

Durham – Regional engagement and regeneration
Professor Ray Hudson, Pro Vice Chancellor for Regional Strategy, Durham University and Kate Welch, OBE, founder and Chief Executive of Acumen Development Trust

UCL – Global challenges
Professor K Michael Spyer, Vice Provost for Enterprise, UCL and Professor Jeremy Watson, Director Global Research, Arup

University of the Arts London – Creativity in action

[1]The full set of workshop presentations are available online at:
http://www.ifm.eng.cam.ac.uk/free/hefce/

What are universities valued for?

Professor Dame Julia King gave the keynote address at the 2009 "Making a Difference" workshop. Dame Julia is Vice-chancellor of Aston University, a member of the Management Board of the Department for Business Innovation & Skills, and has held senior executive positions at Rolls Royce plc.

Universities are under pressure to justify the money that they receive, and to demonstrate their impacts on society.

There have been various approaches to assessing the effects of higher education. NESTA, for example, has identified four economic roles for universities:

- to generate local employment & purchases from local suppliers
- to produce skilled workforces & transfer knowledge though graduates
- to be leading sources of knowledge
- to act as powerful network builders.

While it is relatively easy to measure local procurement, that's not why you want a university. We should not get hooked on the things that are easy to measure. Let us focus on the really important things, many of which are hard to measure and won't all come out as numbers. There are, though, some specific areas where numbers do show the extent of the economic impact of higher education.

For example, a study for the Institute of Physics and the Royal Society of Chemistry of the lifetime earnings of graduates showed a 23% increase in lifetime earnings from having a degree rather than having two or more A-levels and going straight into the workforce. Another report from the Higher Education Policy Institute showed that the UK's universities are an important export industry, equivalent to an injection into the economy of about £3.8 billion per annum – a bigger export industry than the UK's cultural and media industries. Higher education is, of course, also important in the continued success of those industries.

Value in being different

Much of the value of universities is intangible, equivalent to what business describes as 'goodwill'. While companies acknowledge the existence of goodwill, in a business's brands for example, they find it hard to value it.

One area of university activity that is hard to measure is actually one of the most highly rated. Research, the creation of new knowledge, is a fundamental role of higher education. We can learn something here from how companies value research. There are very few situations where industry can put a precise monetary value on research. Indeed, in some cases you could spend more time trying to find the value than it would cost to do the research.

At Rolls-Royce, for example, we tried hard to put a value on our investment in research. When I ran the Materials Lab, for example, I wanted to know the value of improving a material's temperature capability or its strength. With that sort of information, I could defend my research projects. We tried to start by looking at what the customer wanted and how much they would pay for it and work that back all the way through the "food chain" of engine manufacture and design to see how much a material improvement was worth. It took an enormous amount of engineering time to work out those numbers.

Did we use them? No. They were really not that useful. There are very few situations where you have a specific customer requirement and all of the engineering models to be able to tell me, in the Materials Lab, how much value there is in, for example, an alloy development programme in collaboration with Cambridge University.

You can waste a lot of time and energy trying to work out the value of such activity. That is absolutely not how we valued universities at Rolls Royce.

The company now has 20 University Technology Centres (UTCs) in the UK, four more in Europe and is developing a number in the US and Asia. A significant part of the Rolls-Royce research budget is now spent in universities. Indeed, the company goes to great lengths to make sure it does not reproduce that work in house.

The UTCs are, of course, also about training, about staff, about employees, and about the fact that they give rise to effective technology transfer. But perhaps the most exciting thing is that Rolls-Royce believes that UTCs give the company a competitive lead over the rest of the industry. So, it continues to invest in those centres even in difficult times.

Most approaches to valuing the contribution of universities miss out the fact that part of our value is in being different. Rolls-Royce recognised that universities could do something that they couldn't do.

Universities also bring companies into contact with people who think differently and can stimulate innovation. While it may not be a popular view, it is also important for universities to be 'zoos' for mavericks and misfits. If corporate cultures and government departments cannot accommodate these people, it is critical that universities do. Those are some of the qualities we need, maybe not in all of our staff, but certainly in some. We should recognise that as a value that is important for innovation.

A roadmap for technology transfer

The real impact of research, especially applied research, is in the transfer of the technology. There is no point in doing applied research if you do not start out with a roadmap for technology transfer. Without a clearly defined roadmap, technology all too often gets stuck in the university.

That roadmap should include a strong element of local thinking. In our community engagement, we need a stronger emphasis on the impact of the local knowledge transfer agenda, particularly in the SME sector. In the West Midlands, for example, SMEs make up something like 95% of manufacturing companies. They need innovation, these companies need their ideas challenged, they need to be moved forward if they're going to be the job creators that we want them to be.

The skills agenda is also important. The West Midlands Regional Observatory estimates that our £10 billion productivity gap in the West Midlands, when you compare us with

the average in the rest of the country, is linked to our skills gap. In the West Midlands there are 22% fewer employees than the average across the UK. The region has the highest proportion of adults with no formal qualifications in the country. So there is enormous value in universities addressing the skills gap.

In the West Midlands, SMEs account over 95% of manufacturing businesses in the region. They generate 64% of manufacturing employment, which is still a large part of our employment in the West Midlands. We need to focus on how we can support them. There appears to be a very strong business case for such mechanisms as Knowledge Transfer Partnerships (KTPs). These are hugely effective. An assessment of KTPs says that for every £1m of government spending the average benefits to the company amounted to an £4.25m annual increase in profit before tax, £3.25m investment in plant and machinery with 112 new jobs created and 214 company staff trained as a direct result of the project. We need messages like that to get through to the Treasury much more strongly.

Local knowledge exchange often goes far beyond supporting innovation and skills. There are also exciting things going on with universities working with their local authorities on policy and strategy. For example, at Aston University we work very closely with Birmingham City Council on its climate change strategy, how it is going to deliver it, how it's going to communicate it to residents in the city.

Policy development

We need to become more involved in policy and strategy development at the international, national and local levels. One way in which we can do this is by tapping into the considerable expertise of our academics. I wince every time I see another slightly half baked report from a consultancy company for a government department when the universities could have provided much better advice.

Government departments need some of that input; we should be providing it. This does not mean that they should expect us to provide cheap advice but they should recognise that we can provide outstanding non biased advice.

During my review for the Treasury on low-carbon cars, I was horrified by the poor quality of some consultants' reports. As far as I could see, some of these reports had not been through any quality review process, no peer review where they were read by somebody who had knowledge in the area. We don't do that in universities. We all have peer review processes for testing quality.

Applied versus basic – a matter of balance

I have talked about applied research, indeed very applied research. Applied research should be excellent and absolutely applicable. We don't give applied research in the UK that test often enough. However, whilst I am a passionate supporter of applied research and I think applied research is very important in the university-industry relationship, we also need pure research, an element of chance. We also need pure research and an element of chance.

At Aston, for example, we have been celebrating Temozolomide becoming one of only two blockbuster drugs to be developed in a UK university. Created at Aston, it is the only serious drug treatment for brain tumours. The development started with an Aston PhD student being told to make some interesting molecules.

On the other hand, pure research should be excellent and driven by the interests of the people who do it. We should not try to make people tell us what the impact is, or could be. Do that and you will get half baked applied research.

We have to make some tough decisions about the split between funding for pure and funding for applied. The Government has to take those decisions but it also has to listen to our advice about them. For our part, it may not be a popular view, but we do have to recognise that economic circumstances will change where that balance comes.

Clearer communication

We have got to convince the government and the public that we justify the funding we receive, and that higher education is not the place to make cuts at a time of economic recession. We need to be better communicators of that: outstanding but silent just isn't good enough.

The messages we need to get across are unequivocal. Yes, universities do have economic value, for students, locally and for the greater economy. But much that universities do is not amenable to simple cost benefit analyses.

If companies do not expect to be able to calculate the return they get from each piece of their research, what sense is there in trying to do this for academic research? And just as companies are willing to acknowledge that universities can support them in many ways, governments and others should acknowledge, and give us credit for, the benefits that they can derive from tapping into the intellectual capacity of universities.

The University of and for Hertfordshire

Working within the community can involve some subtle interactions with a university acting as a catalyst for local change. Based on presentations by Tim Wilson, Vice Chancellor, Hertfordshire University and Caroline Tapster, Chief Executive of Hertfordshire County Council, and workshop discussions.

The only university in its county, the University of Hertfordshire is firmly embedded in its local community. Its activities go far beyond those traditionally associated with a university. For example, the university runs a profitable bus service that not only moves students around but now carries but now carries twice as many members of the general public as it does students. The company's profits also support the university's work.

"We commend Hertfordshire's HEIF 4 strategy for the structures it has put in place to engage academic staff, including revisions to job specifications and annual appraisals, induction workshops and rewarding staff achievement beyond expectation, reflecting its proactive ambition in this area."
Higher Education Innovation Fund – round four institutional strategies

The intimate relationship between the university and its community opens the way to some subtle interactions. For example, Hertfordshire provides a meeting place where, away from their own environment, local politicians can put aside their party hats and dispassionately discuss common issues for the good of their community.

Forum for debate

"As a university we can participate and provide that forum for debate in an objective way," says Professor Tim Wilson, the university's Vice- Chancellor. Caroline Tapster, Chief Executive of Hertfordshire County Council, concurs. "There is something about universities being able to provide the space to have some of those conversations outside of the political hurly burly."

The University of Hertfordshire was also a key player in transforming a former disused airfield into a vibrant business community. Working with developers and the local council, the university, which grew out of the aerospace industry, has helped to create a business park which now houses a mixture of multinational companies and Small to Medium Enterprises and employs around 10,000 people.

A further move into 'property' came when a large pharmaceuticals company moved out of the area, leaving behind a suite of laboratories recently renovated to the latest standards. After a rigorous evaluation, the University and the Regional Development Agency bought the building. Nearly four years later, the venture makes money and

around 80 per cent of the 500 jobs have returned, some of them filled with postdoctoral researchers from the university.

Local community

"That's what universities can do in terms of participating with their local authority," says Professor Wilson, who is personally involved in much of the university's work with local agencies. Indeed, as he says, "It is perhaps no coincidence that here in Hertfordshire the university chairs the local economic development partnership, placing the university at the heart of economic prosperity in the local community."

These activities may seem remote from the traditional role of a university, but they come naturally to an organisation that cares about, and is an important part of, its local community. Alongside these activities, Hertfordshire has also performed the more traditional roles of a university, developing a skills base that has also brought considerable benefits to the region.

"One of the reasons that the partnership in Hertfordshire works is that we've actually built relationships across a number of years between key players, both in the county, the university and at district and borough level. There's a very high degree of trust and confidence in each other."

Caroline Tapster
Chief Executive
Hertfordshire County Council

"Universities are making a massive difference, says Professor Wilson. "This is not because of their procurement and supply chains, but because of the intellectual capacity they develop inside those communities and the forum they provide for local authorities to deliver their agendas."

Coventry: A business facing university

Coventry University has worked with industry for more than a century and continues to help local manufacturing to adapt to today's competitive environment. Based on presentations by Professor Madeleine Atkins, Vice-Chancellor, Coventry University and Bob Joyce, Group Engineering Director, Jaguar Land Rover, and workshop discussions.

With its roots in industrial design, Coventry University has plenty of experience in what it takes to have an impact on local businesses. The university certainly isn't ashamed of fostering research that supports companies. "We are absolutely about applied research in the short to medium-term, the near market research," says Professor Madeleine Atkins, the vice-chancellor of Coventry University. "For us, it is important to have a definition of research that embraces the near market and the exploitation of known ideas as well as the blue skies end."

> *"We have found that we needed to communicate differently – to build a sense of what the university can do – to our potential partners and our existing partners, as well as to our internal staff."*
>
> Professor Madeleine Atkins
> Vice-chancellor
> Coventry University

In a year, more than 7000 SMEs may have dealings with the university. When it comes to large businesses, Coventry can have around 500 active contracts at any one time, while more than 80 per cent of the university's academics will have a contract with at least one external business partner.

For the university, there is more to relationships than simply research projects; the interactions also involve work placements, internships and scholarship programmes. Then there are visiting lecturers and professors; people from industry who spend time in the university passing on their knowledge to future generations.

Company skills

One of Coventry's largest industrial partners is Jaguar Land Rover (JLR) which has collaborated with the university, for more than 15 years. An important part of the relationship for the car maker revolves around the skills of the company's employees. "Our engineers want to study, want to improve," says Bob Joyce, Group Engineering Director with Jaguar Land Rover.

Over the years, more than 500 of the company's employees have graduated from jointly developed educational programmes, with more than 200 students from across JLR's supply chain currently studying on a range of engineering programmes.

Jaguar Land Rover Coventry also recruits skilled workers from Coventry – more

than 30 Coventry designers work at JLR, , including designers who worked on the XF, XK and the new XJ cars.

In addition, the company has supported around 20 collaborative research projects at Coventry University. JLR also had one of the largest Knowledge Transfer Partnership programmes with Coventry University, supporting 12 graduates.

"The HEIF 4 strategy of Coventry University is notable for its innovative approach to managing and developing strategic partnerships."
Higher Education Innovation Fund – round four institutional strategies

The company has worked with the university on a range of technologies, including low-carbon vehicles, with projects on such topics as the electrical architecture of hybrid vehicles. Coventry's focus on design also feeds into the company's work on the future of automotive design.

Delivering expectations

Universities have to work to make such relationships successful. "We found that we were quite good at getting contracts," says Professor Atkins. "But then we didn't always deliver to client expectations. Our timescales were not always quite industry's timescales." So Coventry recruited people not just to set up projects but to manage them and to ensure that they delivered their goals.

Relationships between academics and businesses are also much more productive when both sides understand each other's needs. This is why Coventry now offers its staff an opportunity to obtain real experience in businesses that are related to their subjects. "We fund our newest and most junior academic staff almost immediately to go and spend a little time in a partner organisation to get their applied research portfolio moving," says Professor Atkins.

Cambridge phenomena

The world beats its way to Cambridge University for inspiration on how to turn research into profitable ventures, but the story is never the same. Based on presentations by Professor Ian Leslie, Pro Vice Chancellor for Research at University of Cambridge and Walter Herriot, former Managing Director of St John's Innovation Centre, Cambridge, and workshop discussions.

As a research intensive university, Cambridge puts education and the transfer of knowledge, along with research and creation of new knowledge and scholarship as the key components of its mission. A third and increasingly important constituent is the desire to ensure that this knowledge is used and is accessible. Cambridge sets out to realise this third component in a variety of ways, for example: commercializing new ideas and concepts; encouraging entrepreneurship within the University; translating new medical knowledge to the clinic through its association with hospitals; informing government policy-making; carrying out consultancy for firms; engaging with the regional economy through the new Hauser Forum enterprise hub.

Cambridge is often held up as a role model to demonstrate the impact that other universities might emulate. This concentration on a single exemplar can have its drawbacks. To begin with governments' "probably have very fixed views of how we operate," says Professor Ian Leslie, Pro-VC for Research at the University of Cambridge.

The university itself, however, does not subscribe to any single model of how to turn research into economic benefits. "We operate in different ways and we are changing some of the ways in which we operate all the time." The key factor is that there is diversity in how the university approaches its efforts to influence the outside world and to achieve its mission. "When you try to trace impact there's no single path."

"Cambridge's approach has been based – even before the use or identification of the phrase 'open innovation' – on an open innovation approach. It has been porous. It has been open to people talking. It hasn't prevented people from doing what they want to do, even if at times it hasn't been particularly proactive."

Walter Herriot, OBE, Enterprise and Innovation Champion for EEDA, formerly Managing Director of St John's Innovation Centre

Organic change

A key lesson from the Cambridge experience is that it has taken time to achieve what was, in any case, something that came about organically, almost by chance, rather than through a deliberate strategy. Walter Herriot, who has been involved in technology transfer in Cambridge for many

years, believes that "Cambridge's approach has been based, even before the use or identification of the phrase, on an 'open innovation' approach. It has been porous, It has been open to people talking. The university hasn't prevented people from doing what they want to do, even if at times it hasn't been particularly proactive." Cambridge certainly did not set out with the ambition of creating a 'cluster'.

Cambridge is changing its approach to knowledge transfer. This is in line with the changing ways in which innovation takes place in the wider world. For example, in recent years there have been growing moves to encourage an "open innovation" model. Cambridge now sees strategic relationships, rather than individual links associated with particular projects, as being increasingly important. The idea is to have "not just one academic or one person in a company, but a group of people in the company, a group of academics," says Professor Leslie.

The University continues to be a trailblazer in one of the more visible aspects of research with impact, spin-out companies. The visibility of these companies, and the fact that it is easy to count them may run the risk of placing too much emphasis on this aspect of knowledge transfer.

Business ventures

The numbers for Cambridge show just how long it can take for a university to establish a critical mass of businesses. The university was, in 1970, one of the first to set up a science park. In 1987 Cambridge added to its support for business ventures, with the opening of the St John's College innovation centre.

These activities took time to begin to have an impact. Around 30 years ago, the Cambridge cluster consisted of just 20 companies employing a few hundred people. Today there are around 1,500 companies employing some 45,000 people.

The businesses born out of research in Cambridge range from well established companies such as Plastic Logic and Campath-1H, to younger ventures like Orthomimetics and Cambridge Temperature Concepts.

Increasingly an entrepreneurial spirit pervades the university. Six years ago, some 30 students a course on 'basics of building a business' under the banner of Enterprise Tuesday. Now more than 300 people from across the university attend courses that aim to familiarise students with enterprise, skills, opportunities and networks.

A broader understanding of knowledge exchange pervades the university thanks to such activities as the Rising Stars. This training programme for postgraduates, post docs and early career faculty is intended for those wishing to pursue an academic career and wanting to hone their communication skills and to integrate public engagement with their academic discipline.

Durham: Regional engagement and regeneration

Durham University believes that it has a responsibility to support the economic development of the local community, bringing its knowledge and expertise into play without compromising its excellence in teaching, research and scholarship. Based on presentations by Professor Ray Hudson, Pro Vice Chancellor for Regional Strategy, Durham University and Kate Welch, OBE, founder and Chief Executive of Acumen Development Trust, and workshop discussions.

Even after a series of development and regeneration policies, the north east of England continues to lag behind other regions in its economic performance. Durham University, within one of the poorer parts of the region, County Durham, believes that it has a responsibility to help to do something about the area's economic decline and to overcome social and economic inequality.

The University plays an important part in the economic, social and cultural life of County Durham. With 3,500 staff, it is the third biggest employer in the area, after the county council and the National Health Service.

"We recognise that we have a responsibility to the world beyond the University, to seek to bring our knowledge and expertise to help address the problems of people in the surrounding area."
Professor Ray Hudson
Pro-Vice-Chancellor (Regional Strategy)
Durham University

Durham, a university with an international reputation for research and teaching, also takes its interests in development to other countries through its work with universities in Bangladesh, Jordan, Sri Lanka and Thailand. For example, Project Sri Lanka brings together Durham University students and staff with community and regional partners in activities that assist with both the reconstruction and regeneration of tsunami devastated communities in Southern Sri Lanka and also with the long term sustainable development of coastal and inland villages.

Local community

Durham made a deliberate effort to open its doors to the local community. "We want to open up the resources of the university to local people and organisations," says Professor Ray Hudson, Pro-Vice-Chancellor (Regional Strategy). This is in addition to the more conventional routes by which universities have an impact in their region. For example, Durham is involved in the NetPark science park which is an important centre of innovation in plastic and printable electronics and one of the Regional Development Agency's Innovation Connectors.

Science parks can be isolated ventures with little real impact on a local community made up mostly of people with limited skills and qualifications. In Durham's case, the university works with the local Acumen initiative to ensure that NetPark is more than just a cluster of high-tech businesses.

"We are working as part of a partnership to deliver employment services in the Sedgefield area right next to NetPark," says Kate Welch, Chief Executive of the Acumen Development Trust. "Even if it is about creating jobs for the catering services or creating a social enterprise landscape company to keep your grounds in trim, let's do it and let's make a real difference to people in those communities."

Durham tackles local issues in a number of ways through its Phoenix initiative. This activity involves the university working with the local voluntary and community sector.

"We commend Durham University's HEIF 4 strategy for its commitment to taking forward local and regional economic and social regeneration, clearly linked to regional and national policy contexts (with international links). Particularly inspiring is its planned work in the Phoenix project, which aims to help articulate the needs of local communities to the university and its key partners, to help empower the communities, raise aspirations and provide support for local initiatives."
Higher Education Innovation Fund – round four institutional strategies

"Phoenix is very much about changing the culture of the university on the one hand and working with a range of community groups and social enterprises and so on, on the other," says Professor Hudson.

Staff volunteers

One way in which the university supports the local community is by encouraging staff to take time off to participate in agreed volunteering activity. This adds to the positive effects of volunteering activities undertaken by many Durham students. For example, says Welch, "Their students are absolutely brilliant at running Girl Guide units in County Durham."

Phoenix also supports activities that build on Durham's highly regarded sport in the community programme. Community groups also have access to a wide range of museum, library, arts, event, and conference facilities many of which are free or low cost. "We want to open up the resources of the University to local people rather than them regarding the university as an 'ivory tower', both closed to them and indifferent to their concerns," says Professor Hudson.

UCL – Global challenges

When UCL set out to improve its relationships with the wider society, it went back to basics, rethinking its research agenda and responding to clear global challenges. Based on presentations by Professor K Michael Spyer, Vice Provost for Enterprise, UCL and Professor Jeremy Watson, Director Global Research, Arup, and workshop discussions.

There is no doubting the research excellence of University College London. UCL also has a long tradition of translating that research into useful outputs for society, through such activities as a wholly owned our technology transfer company, UCL Business. On both counts UCL is among the UK's leading academic institutions. But they are not resting on their laurels.

To maximise its impact, UCL set out to bring together different disciplines. "We have taken the approach of really looking and seeing how we can integrate our activities across our different faculties by developing very clear global challenges in terms of our research agenda," explains Professor Michael Spyer, Vice Provost for Enterprise at UCL. "We want to engender an enterprise culture right across, from undergraduates to postgraduates."

UCL is ensuring that the whole university community participates in this activity by providing education for everyone – from students right the way through to academic staff.

"We commend UCL's HEIF 4 strategy for committing to a step-change in third-stream performance through refocusing into strategic themes; extending KE beyond science, technology, engineering and mathematics disciplines; and putting in place new management and support structures. In addition, the university's strategy is clearly borne out of lessons learned from past experiences. Its Technology Innovation Forums provide a particularly interesting method for increasing participation in KE by bringing together academics, established businesses, entrepreneurs and investors with the aim of helping to initiate interdisciplinary collaborations."

Higher Education Innovation Fund – round four institutional strategies

Grand challenges

UCL's grand challenges fall into four broad areas, all of them challenges for society as well for research: Global Health, Sustainable Cities, Intercultural Interaction and Human Wellbeing. The aim is to ensure that UCL can draw upon all of its academic expertise – arts and humanities as well as science and engineering – to offer

new thinking and to make the university a rich environment for interaction with the commercial and business sector.

The university is taking forward its work on grand challenges through such activities as a two-year knowledge exchange programme on sustainable cities. With much of the work carried out in other organisations, UCL was a moving force behind the creation of a new network of policymakers, practitioners, business, NGOs, opinion formers, prospective students and other academics.

Arup, the international design business, is just one of the organisations involved in UCL's grand challenges, especially the work on sustainable cities. Arup is a major player in the design and planning of cities. It has undertaken important projects in China, for example, including work for the 2008 Olympic Games in Beijing.

Arup sees R&D as a way of differentiating itself from other businesses in design and construction. Like most companies, Arup's own research mostly addresses short-term needs. Universities are better placed to think about the longer term, according to Professor Jeremy Watson until recently Director of Global Research with Arup. The role of universities, says Professor Watson, "is to do the basic research for industry rather than just being a contract research house".

Strategic partnerships

Companies increasingly focus their academic links into strategic partnerships that involve substantial arrangements with fewer universities. Arup has taken this as far as having the only strategic partnership in the built environment with the Engineering and Physical Sciences Research Council.

In July 2009, UCL announced a strategic collaboration and training partnership with ARUP. The objective of the partnership is to enhance collaboration and training in a number of fields including design, engineering and sustainable development. The collaboration builds on earlier joint efforts including the Thames Gateway Institute for Sustainability, a research institute to be set in the heart of a new sustainability industries park at Dagenham Dock, as part of the regeneration of the area.

Arup see training and recruitment as areas where universities play an important part in the company's activities. This goes as far as working with UCL to deliver Masters and doctoral degrees accredited by the university but with the work taking place within the company.

Professor Watson believes collaboration between universities and businesses will achieve greater impact.

University of the Arts London – Creativity in action

As the leading university for the creative industries, the University of the Arts London sees knowledge exchange as an important part of being recognised as one of the foremost institutions for learning, practice, research and development in arts, design and communication. Based on workshop discussions and additional contributions from University of Arts London.

The UK's creative industries lead the world and play an important role in the economy. As an internationally recognised specialist for art, design, fashion, communication and the performing arts, University of the Arts London makes a major contribution to the sector. Through its six colleges, the university supports business development in companies of all sizes and types, from new businesses to SMEs to global corporations.

With a portfolio of centres and networks that bring together practitioners and academics, many of whom are themselves commercially active, the university supports many collective efforts that support the creative arts, locally, nationally and increasingly internationally.

The University of the Arts London offer students a range of courses at all levels, from foundation and undergraduate to postgraduate and research. Researchers and practitioners from within the creative industries train the new generations of creative people that the sector needs to retain its position as world leader. "We rely on current practitioners to make our courses as good as we can get them," says Mike Matfin, the university's Director of Enterprise.

Professional development

Through its programmes in continuing professional development, the university also helps to ensure that existing workers constantly refresh their skills and understanding. Each year the university provides more than 80,000 training days through London Artscom, a wholly owned subsidiary company with a turnover in excess of £8m a year.

The university also helps its graduates and others to make the transition from education into business, supporting those who want to commercialise their own ideas, for example. Through such activities as the Centre for Fashion Enterprise (CFE), the university supports emerging fashion designers.

The CFE operates a business incubator that nurtures the business aspirations of young designers, investing in their companies and providing technical and managerial support and the industry intelligence that they need to succeed in a competitive sector. Some 30 companies have already benefited from the CFE's support, with the emergence of several significant new fashion brands.

The Fashion Business Resource Studio at the London College of Fashion also provides technical support and consultancy to fashion and clothing manufacturers in the UK.

Knowledge Transfer Partnerships (KTPs) are an important component of the university's approach to knowledge exchange, with a special emphasis on supporting the SMEs, micro-businesses and individuals who are the driving force in the sector. The university is now the Arts & Humanities Research Council's leading centre for KTPs for the creative industries.

KTPs allow recent graduates with relevant experience behind them to lead important projects in companies. Companies that have participated in KTPs include such influential businesses as the Press Association, which turned to the university's London College of Communication when it wanted to understand the long-term implications of digital multi-media as its customers - newspaper and broadcast organisations - moved more and more activity 'on-line'.

In another KTP, the Colour Imaging Group at the London College of Communication worked with Inca Digital Printers. The partnership made it possible for the university to support the company, which makes inkjet printers for the print industry, to develop and implement new colour measurement tools to improve its quality management.

Local regeneration

The university also works with local authorities on regeneration programmes, for example. The London Development Agency (LDA) provided £1.8m to fund the second phase of Central Saint Martin's Innovation Centre and £1.5m for the Centre for Fashion Enterprise. The university also has significant involvement in the Knowledge Connect voucher scheme. Funded by the LDA, the scheme enables SMEs to tap into the university's considerable expertise to solve technical problems.

The University's Design Against Crime Research Centre grew out of work at Central Saint Martins College of Art and Design. Since 1999 this practice-led design initiative has carried out research and worked with businesses to research, design and commercialise objects, ideas and communications that prevent crime and promote the safety and well being of individuals and the wider community.

On the national scene, the university runs the Creative Industries Knowledge Transfer Network (CI KTN). Funded by the Technology Strategy Board, this network, a consortium with Imperial College, the Royal Institute of British Architects and Tiga, the trade association for the UK games industry, brings together technology developers with companies to ensure that UK creative industries maintain their leading position in a rapidly changing digital world.

A cross section of views

The impacts of higher education on society are so complex and diverse that it is impossible to be comprehensive. Nevertheless some clear messages and observations emerged in the vigorous debate that took place in London. Similar meetings with different contributors would doubtless yield further examples. The following are a collection of direct quotes and views that reflect the cross-section of perspectives expressed in the workshop.

Measuring impacts – the challenge

The meeting highlighted a number of issues related to measuring impacts.

- There isn't going to be a 'one size fits all' way of assessing the impact of universities: we need mature discussion about what would be appropriate for assessing the wide range of interactions between the universities and the world beyond them.
- Economic benefits are but a part of the picture when it comes to the impact of universities on society; there are also social benefits, particularly those arising from research in the arts and humanities.
- "I know it's difficult to think about numbers but in the end we are about the visible difference that research makes to the nation. It's got to be a visible difference."
- "If you insist on giving out money according to metrics that are income driven people will chase income."
- "Let's not get hooked on the things that are easy to measure, let's keep our focus on the really important things which are these things in that goodwill category which are hard to measure and won't all come out as numbers. It's quite easy to measure our local procurement but that 'is not the reason why you want a university. "
- "Pure research should be excellent and we shouldn't be trying to make people tell us what the impact is, otherwise we get this half-baked applied research and we don't want that."
- Is the government's idea of what industry expects of universities a true representation? "For those of you from industry, do you want from us what the government thinks you want from us? If you could tell us what you do want from us, do you think academics understand what it is that you want from us?"
- Companies have difficulty when they try to measure the impacts of their own R&D. And, unlike much university research, these are directed programmes. "There are very limited situations where industry's able to put a precise monetary value on it, and indeed if you try and do too much of it you can spend more time trying to find the value than it would have cost you to do the research."

Wider impacts

The Higher Education Innovation Fund (HEIF) - round four institutional strategies demonstrated that universities are improving their understanding of their impacts on society and are making this an important part of their strategies. However, they have made less progress in how they measure that impact. It does not help that there are so many often unrecognised ways in which universities affect society.

- "If you're working in subjects and arenas that have a huge public profile, a public presence, then the interaction with the audience is really important." "Audience participation isn't something that you're going to catch in a metric about income."
- "A lot of work in the social sciences, for example, would talk about the importance of different concepts of value and the way in which they affect social life, and in the way in which economic life is conducted."
- There is tremendous potential for the UK's universities to bring greater benefits to industry and the UK's economy and in general, but the challenge is to achieve this without compromising the universities' role.
- "If you can improve the quality and the relevance of public service delivery, you may well also improve the environment for the private sector and actually allow synergies between public and private sector to develop in a way that maybe they're not at the moment. The universities could be key intermediaries in that.
- Universities also have impacts through their input into policy making, something that is also of value to the business sector. "We have research programmes that are actually geared to influencing policy, not just tangible engineering products. Several of our top corporate partners attach great importance to that."
- Consultancy often takes place with little immediately measurable 'impact'. For example, in the creative arts – often held up by governments as one of the UK's strengths – academics provide design consultancy, do public art projects, all sorts of things. "Some of them run their own businesses. So it's a huge contribution to UK plc."
- Universities usually pursue consultancy on an individual basis. They could benefit from looking at ways in which they can collaborate and exploit the expertise that they share across many areas.
- How do you value the contribution that an academic makes as a member of a company's board? Inviting academics to be non-executive directors of company boards "strikes me as an idea that seems to have been neglected of late".
- Universities in the UK are the largest educator of overseas students at degree level, which makes them "a very important export industry, equivalent to about £3.8 billion per annum".
- Much of the impact of universities is local.

Engagement

Universities interact with companies, communities and government in many ways. Engagement is at least, a two-way process. The most successful universities are those that make engagement a core part of their mission statement and then back it up with

leadership at the highest level.

- To achieve their full potential, universities need to be engaged at all levels, from the vice chancellor through to individual academics.
- The quality of the engagement between universities and their collaborators is important. Long-term relationships have more meaning that brief encounters.
- Knowledge transfer is a two-way process. "We need to find ways of facilitating links or facilitating exchanges which would be for more than 10 minutes, between universities and companies in the private sector".
- Collaboration has to start with clear expectations and ground rules. "Partnership behaviour needs to be established before money gets on the table."
- The relationships are complex – it is not a case of "industry has problems and universities solve them" but of creating partnerships that bring together knowledge and skills from both parties to solve problems.
- Collaboration is less likely to succeed if it is seen as no more than a way of extracting money from companies, or 'marrying for money'. "Getting the lawyers in the same room kills a partnership very quickly if the partnership isn't there to begin with."

Communication

Without effective communications, universities will not convince society of the benefits that it derives from higher education. As Professor Julia King says: "We have got to convince the government and the public that we justify the funding we receive, and that higher education is not the place to make cuts at a time of economic recession. We need to be better communicators of that: outstanding but silent just isn't good enough."

- Universities have not done themselves justice in analysing and communicating their economic and social impacts.
- Any understanding of the impacts of higher education depends on continuing communication between all participants in a process that ensures that the benefits are tracked as they unfold over time.
- Communication of academic impacts has to be a sustained and long term process if the recipients are to appreciate and understand those benefits and how they can create long term benefits for everyone involved.
- Just as universities differ in their missions, any strategy for communication and interaction has to be adapted to the participants.
- Universities have a long way to go in developing systematic and comprehensive approaches to measuring the value created economically and socially.
- There is a danger that Universities may fail to communicate the full extent of their impacts. "Outstanding but silent just won't hack it."
- When it comes to evaluating the impacts of their knowledge exchange activities, universities could make better use of the internal expertise – of social science departments and business schools, for example. Universities could do much more to some articulate and assess the value in these areas.

- "Part of our community engagement is that we get the kids from the local infant schools and junior schools in through our doors as soon as we can, and we run degree ceremonies for people from age about five onwards and they make wonderful picture brochures but they're also a pleasure to have around"
- Universities need to engage much more with policy and strategy at the international, the national and the local level. "I really wince every time I see a government department getting another slightly half-baked report from a consultancy company when they could have got better advice from the universities. They shouldn't think we're going to provide cheap advice but they should recognise that we can provide outstanding non-biased advice. We need to make sure that government comes to us for that."

The role of HEIs: Some concluding themes

The discussion and the case studies also suggest a number of common themes in the roles that universities play in their impacts on society:

- Open interactions – HEIs provide meetings places and forums where the wider community can come together 'on neutral territory'
- Facilitating innovation – HEIs set out to use their expertise to create networks and communities of interest around specific subjects and themes
- Strategic partnerships – many HEIs make deliberate effort to develop relationships and strategic partnerships
- Leadership – to succeed in their attempts to 'make an impact' HEIs need to make a deliberate effort to develop an open environment, to cultivate the partnerships and to develop networks and communities.

Further reading[1]

The impact of universities on the UK economy – Fourth Report

Produced for Universities UK by Ursula Kelly, Donald McLellan and Iain McNicoll, University of Strathclyde

"The report confirms the growing economic importance of the sector, which had an income of £23.4 billion a year in 2007/08 (compared with £16.9 billion in 2003/04), gross export earnings of £5.3 billion and employed more than 1 per cent of the UK's total workforce. In terms of its wider economic impact the sector generated over

£59 billion of output. The equivalent figure five years ago was nearly £45 billion, confirming a rapid growth in economic impact."

http://www.universitiesuk.ac.uk/Publications/Documents/EconomicImpact4Full.pdf

The higher education business and community interaction survey

"The annual HE-BCI survey examines the exchange of knowledge between universities and the wider world, and informs the strategic direction of 'third stream' activity that funding bodies and higher education institutions (HEIs) in the UK undertake."

http://www.hefce.ac.uk/econsoc/buscom/hebci/

Leading the world – The economic impact of UK arts and humanities research

Arts & Humanities Research Council

http://www.ahrc.ac.uk/About/Policy/Documents/leadingtheworld.pdf

At home in renaissance Italy – An impact case study

Arts and Humanities Research Council

http://www.ahrc.ac.uk/Documents/AHRC_Renaissance_Italy.pdf

Public support for innovation, intangible investment and productivity growth in the UK market sector

Jonathan Haskel and Gavin Wallis in a report that "suggests that the £3.5 billion a year currently spent on publicly funded research generates an additional annual output of £45 billion in UK companies".

http://spiral.imperial.ac.uk/handle/10044/1/5280

[1]URL links checked on 23 July 2010

Assessing the impact of arts and humanities research at the University of Cambridge

RAND Corporation, June 2010

Independent assessment by RAND Europe of the impact of arts and humanities activities conducted at the University of Cambridge, commissioned jointly by the University of Cambridge and the Arts and Humanities Research Council.

http://www.rand.org/pubs/technical_reports/TR816/

EPSRC Economic impact reporting framework 2008-09

"This report contains information requested by the government on selected aspects of the organisation's performance. The frameworks were introduced across the research councils in 2005 and form part of the economic impact framework managed by the Department for Business, Innovation and Skills."

http://www.epsrc.ac.uk/newsevents/news/2009/Pages/economicimpact.aspx

University of California economic impact studies

http://www.universityofcalifornia.edu/economy/impactreports.html

Medical research: assessing the benefits to society

A report by the UK Evaluation Forum, supported by the Academy of Medical Sciences, Medical Research Council and Wellcome Trust. UK Evaluation Forum Medical research: assessing the benefits to society, May 2006

http://www.acmedsci.ac.uk/images/project/Medicalr.pdf

Higher Education Innovation Fund round four institutional strategies: Overview and commentary

http://www.hefce.ac.uk/pubs/hefce/2008/08_35/

APPENDIX 1: The Workshop[1]

"Making a Difference: Sharing Insights & Understanding of HEI Value Creation and Social and Economic Impact"

On May 21 2009, The Cambridge-MIT Institute and Institute for Manufacturing held a workshop designed to provide an opportunity for Higher Education Institutions to share and explore some of the interesting examples and innovative practices employed by UK institutions to understand and assess the value they create for users, beneficiaries and other stakeholders. In particular, the workshop focused on how this understanding and assessment of value can be used to inform third stream activities and HEI strategies to enhance their economic and social impact.

The format of the workshop was designed to provide opportunities to share experiences and practice as well as provide significant opportunities for networking.

Workshop Agenda

Welcome: Dr Eoin O'Sullivan, R&D Interfaces Programme, University of Cambridge

SESSION 1: BACKGROUND AND INTRODUCTORY KEYNOTE ADDRESS

Background

David Sweeney, Director of Research, Innovation and Skills, HEFCE

Keynote Address: What are universities valued for?

Professor Julia King, Vice Chancellor at Aston University (and formerly Director of Advanced Engineering at Rolls Royce)

SESSION 2: COMMUNITIES, CLUSTERS AND REGIONAL IMPACT

Chairs: David Sweeney, Director of Research, Innovation and Skills, HEFCE; and Stian Westlake, Executive Director for Policy and Research, NESTA

Case Study 1: Creating value through collaborative advantage: a new partnership between universities and local authorities

- Professor Tim Wilson, Vice Chancellor. University of Herfordshire
- Ms Caroline Tapster, Chief Executive of Hertfordshire County Council

Case Study 2: Universities and impact: Timescales, diversity and critical breadth

- Professor Ian Leslie, Pro-VC for Research, University of Cambridge

[1]The full set of workshop presentations are available online at:
http://www.ifm.eng.cam.ac.uk/free/hefce/

- Professor Walter Herriot OBE, Enterprise and Innovation Champion for EEDA (and formerly Managing Director of St John's Innovation Centre, Cambridge)

Case Study 3: Engaging with the Region: Durham University's evolving role in the north east of England AND Making a difference: A social enterprise approach to regeneration

- Professor Ray Hudson, Pro-Vice-Chancellor (Regional Strategy) Durham University
- Kate Welch OBE, Chief Executive, Acumen Development Trust

SESSION 3: COMPANY PARTNERSHIPS, INDUSTRY IMPACT AND "GRAND CHALLENGES"

Chair: Peter Saraga OBE, formerly Managing Director, Philips Research Laboratories UK

Case study 4: Innovation in HEI/Industry Collaboration: Economic and research benefits

- Professor K Michael Spyer, Vice-Provost (Enterprise) UCL
- Professor Jeremy Watson, Director: Global Research Arup

Case study 5: Making a difference: Becoming a business-facing university AND Making the industrial / academic partnership work

- Professor Madeleine Atkins, Vice Chancellor of Coventry University
- Mr Bob Joyce, Group Engineering Director, Jaguar Land Rover

SESSION 4: PANEL FEEDBACK, CHALLENGES AND NEXT STEPS

Chair: Professor John Murphy, CBI ICARG member and Head of University Partnerships, BAE System

Panellists:

- Professor K Michael Spyer, NHS London Board and UCL
- David Sweeney, HEFCE
- Professor Elaine Thomas, Rector of the University for the Creative Arts
- Tomas Ulrichsen, Senior Consultant, Public and Corporate Economic Consultants (PACEC) Ltd
- Stian Westlake, NESTA

Open discussion

APPENDIX 2: Workshop attendees

Professor Robert J Allison
Pro Vice Chancellor
University of Sussex

Dr David Arrell
Pro Vice-Chancellor
University of Portsmouth

Edward Astle
Pro Rector for Commercial Development
Imperial College London

Professor Madeleine Atkins
Vice Chancellor
Coventry University

Carole Barron
Director of Innovation and Enterprise
Kent University

Richard Braham
Senior Policy Associate
NESTA

David Cairncross
Senior Policy Adviser
Enterprise and Innovation Group
CBI

Dr Deborah Carter
Knowledge Transfer Manager
London School of Hygiene and Tropical Medicine

Caroline Chipperfield
Policy Advisor to the VC
University of Plymouth

Dr Phil Clare
Head of Contracts, Research Services Office
University of Oxford

Dr David Cleevely
Founding Director,Centre for Science and Policy
University of Cambridge

Julie Crofts
Administrative Director
Conservatoire for Dance and Drama

Dr Malcolm Cross
Director of Research and Innovation Services
University of Bath

Dr Martin Davies
Director for Research & Enterprise
University of Greenwich

Adrian Day
Policy Office, Business & Community Team
HEFCE

Uwe Derksen
Acting Head of Research & Knowledge Transfer
University for the Creative Arts

Professor Janet Druker
Senior Pro-Vice-Chancellor
Canterbury Christchurch University

Professor Martin Earwicker
Vice Chancellor
London South Bank University

Pierre Espinasse
Head Research Services (Science Area) and Associate Director Knowledge Exchange
University of Oxford

Alice Frost
Head of Business and Community Policy
HEFCE

Professor Mike Gregory
Head, Institute for Manufacturing
University of Cambridge

Anne Hall
Head of the Research School
The Open University

Dr Chris Henshall
Pro Vice Chancellor for External Relations
University of York

Professor Walter Herriot
EEDA Innovation and Enterprise Champion

Professor Sean Hilton
Deputy Principal
St George's, University of London

Professor Ray Hudson
Pro-Vice-Chancellor for Regional Strategy
Durham University

Helen Hurman
Head of Research Business Development
University of Nottingham

Dr Keith Johnson
Pro Vice-Chancellor - External Development
Southampton Solent University

Bob Joyce
Group Engineering Director
Jaguar Land Rover

Dr Michael Kenward
Science Writer and Editorial Consultant
Science|Business

Professor Julia King
Vice Chancellor
Aston University

Professor Peter Kopelman
Principal
St George's, University of London

Dr David Langley
Director, Research and Enterprise Development
University of Bristol

Helen Lawrence
Head of Business Relations
Birkbeck College

Professor Ian Leslie
Pro-Vice-Chancellor for Research
University of Cambridge

Deborah Lock
Executive Director of Enterprise
Kingston University

Professor Oisin MacNamara
Director of Research, Regional and European Affairs
Northumbria University

Ashley Malster
Assistant Director, Knowledge Transfer
DIUS

Professor Musa Mihsein
Pro Vice Chancellor, Academic Development
University of Derby

Chris Mottershead
Vice-Principal (Research)
King's College London

Professor John Murphy
Head, University Partnerships
BAE Systems

Simon Newton
Head of Regional Partnership Strategy
York St John University

Professor Ian Oakes
Pro-Vice-Chancellor for Regional Investment and Development
University of Wolverhampton

Dr Eoin O'Sullivan
Director, R&D Interfaces Programme
University of Cambridge

Professor Sir Keith Peters
Chairman
GMEC

Professor Jane Powell
Pro Warden, Research & Enterprise
Goldsmiths College

Professor Geoff Rodgers
Pro-Vice-Chancellor for Research
Brunel University

Ian Rowe
Director Research & Knowledge Transfer Support
University of Bradford

Peter Saraga
Vice-Chair of Council
University of Sussex

Professor Mike Smith
Pro-Vice-Chancellor, Research and Knowledge Transfer
Sheffield Hallam University

Professor Nigel South
Pro-Vice-Chancellor for Academic & Regional Development
University of Essex

Professor K Michael Spyer
Vice-Provost (Enterprise)
UCL

David Sweeney
Director of Research
HEFCE

Caroline Tapster
Chief Executive
Hertfordshire County Council

Professor Elaine Thomas
Rector
University for the Creative Arts

Tomas Ulrichsen
Consultant
PACEC

Dr Kathryn Walsh
Deputy PVC for Enterprise
Loughborough University

Professor Jeremy Watson
Global Research Director
Arup

Professor Julius Weinberg
Deputy Vice Chancellor
City University London

Kate Welch
Chief Executive
Acumen Development Trust

Dr Tony West
Director of Research, Development & Commercial Services
Anglia Ruskin University

Stian Westlake
Executive Director, Policy and Research
NESTA
Greg White
Head of Employer Engagement,
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University of Lincoln

Professor Richard Williams
Pro-Vice-Chancellor for Enterprise,
Knowledge Transfer & International
Strategy
University of Leeds

Professor Tim Wilson
Vice Chancellor
Hertfordshire University

Professor Diana Woodhouse
Pro-Vice-Chancellor (Research)
Oxford Brookes University

Bruce Wooding
Head of the School of Professional and
Community Development
Central School of Speech & Drama