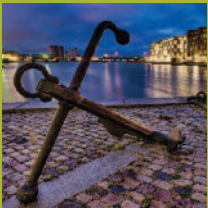


# **Growing the future: universities leading, changing and creating the regional economy**



**Universities are playing a critical role in driving the UK's economic future. Through multiple and overlapping interactions across society, they occupy a key position in the regional economy. As 'anchor institutions' they deliver many shared priorities with government.**

**'Growing the future' illustrates this vital role through the voices of the very people who have experienced first-hand the power of genuine engagement and partnership with all that the university has to offer.**

The Government's growth review published earlier this year set out some important and ambitious goals for the UK economy. We would argue that universities have a central role to play in realising these ambitions. They encourage investment, exports and a more balanced economy; create an educated, flexible workforce; and are key to making the UK the best place in Europe to start, finance and grow a business.

Indeed, the central role of universities within our innovation-based economy is a significant focus for University Alliance. We know that our universities are providing more than just a degree; and that they are more than just part of the education system.

Universities are playing a critical role in driving the UK's economic future. Through multiple and overlapping interactions across society, they occupy a key position in the regional economy. As 'anchor institutions' they deliver many shared priorities with government.

**'Growing the future'** illustrates this vital role through the voices of the very people who have experienced first-hand the power of genuine engagement and partnership with all that the university has to offer.

Leaders in business and the professions, politicians, local authorities, universities, economists and academics, from the UK and abroad all tell a compelling story of the historic, current and future role of universities in the regional economy and local enterprise; and why, therefore, universities must be central to the local, regional, and national, growth strategy.

This is not just about seeking further investment in universities. In many cases realising potential is about recognising existing investment in a significant area of strength for the UK economy, then mapping it across government priorities beyond the education and skills system. The fact is that in an increasingly competitive global and innovation-led economy, none of us can afford to ignore the rich resource that such partnerships can provide.

We are grateful to all our contributors for providing such engaging and thought-provoking pieces and to Professor Wendy Purcell for supporting the project as it has developed.

We hope you find this publication informative and inspiring as you consider the benefits to be gained in your own region through working – for mutual benefit – with universities.



**Janet Beer,**  
Chair, University Alliance



**Libby Hackett,**  
Director, University Alliance



**Universities are important for their own sake, as centres of enquiry and learning, yet the UK's higher education sector also has a vital role to play in the economy. Universities generate and transfer commercially useable knowledge. They prepare people for the world of work. They employ nearly 400,000 people around the country. Higher education is one of our great export industries.**

The Government has made a clear commitment to universities, by putting student finance on a sustainable footing and by maintaining and ring-fencing the science and research budget for the next four years.

The best universities, meanwhile, are seeking stronger links to business and making sure their graduates have the skills employers need. There is a greater understanding of the capacity of universities to provide regional economic leadership than ever before. As many of the chapters here show, much regeneration, economic development and regional employment is directly attributable to the presence of a university. That is one reason why we are pleased to see universities represented at the heart of the new Local Economic Partnerships.

Many employers questioned as part of the 2011 CBI Education and

Skills Survey expressed concern about the content of some degrees and stressed the need for greater focus on practical and team-working skills. I hope that business will become more directly engaged in higher education – sponsoring students and where appropriate helping in course design, as well as supporting research.

Indeed, I want all our universities to look more closely at how they work with business: to promote better teaching, employer sponsorship and innovation. We have asked Professor Sir Tim Wilson, the former Vice-Chancellor of Hertfordshire and one of the authors here, to review university-industry collaboration.

We will take the evidence in this important new publication into account as we prepare our research and innovation strategy, which will be published later

this year. I urge the University Alliance to participate and thank them for bringing so many experts together here.



**Rt Hon Dr Vince Cable MP,**  
Secretary of State for Business,  
Innovation and Skills

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# Setting the scene: how universities are leading, changing and creating in the regional economy

**Professor Wendy Purcell, Vice-Chancellor, Plymouth University**

Universities are critical to the future growth of our economy. I could just leave it there; it is a well-rehearsed phrase, a fact that those of us from within the sector are deeply proud.

But however much we may see this statement as indisputable; this role is often underplayed, under-utilised and misunderstood. This is the issue that this booklet seeks to address. Not just through the words of people like me, who form part of the sector, but from big businesses, small and medium sized enterprises (SMEs), think-tanks, politicians and local authorities. Those with a shared interest in the future success of their regional economy. Universities can act as catalysts for growth, working in partnership with other regional actors to drive change and deliver innovation and skills.

Through these voices, this booklet aims to map out and explain exactly what we mean when we talk about the broad and deep role universities can play towards delivering regional growth.

In **regional leadership and 'anchor' capacity**, Dr Neil Lee from The Work Foundation points

out that 'Universities are unique organisations in many cities – often the only institution with the scale and connectedness to drive economic growth and shape the physical environment'. The story Alan Qualtrough tells is testament to this as he describes his own journey as a local journalist documenting the changing economy of Plymouth through to playing an active role in bringing together a partnership between his newspaper and Plymouth University to secure significant investment via a successful bid to the Regional Growth Fund. Barry Sheerman MP places the issue in a global context arguing that universities are not only central to understanding a changing world economy but also operating in an environment where power and influence is shifting from West to East. Tony Williams, Executive Director of Bournemouth County Council brings the 'anchor' institution to life in his description of the multiple ways that Bournemouth University plays its part at the heart of the town while Sir Patrick Stewart provides a personal perspective on how the University of Huddersfield

has shaped the growth and renewal of this post-industrial region. Finally Professor John Brennan provides a more academic overview of the close links between universities and their place.

In **change agents**, Sir Tim Wilson provides his unique perspective as Chair of Hertfordshire Local Enterprise Partnership and former Vice-Chancellor of the University of Hertfordshire reflecting on how we might make full use of universities' potential. Sir Richard Lambert tells a compelling story of the role of universities in regional transformation linked closely to government priorities to rebalance the economy, support innovation and address economic inequalities. James Ramsbotham, from the North East Chambers of Commerce, tells how the region's universities are playing a central role in supporting recovery in this part of the country. From the North West, Professor Brian Longhurst focuses on the impact of MediaCity within the region, but also on the wider UK economy. David Docherty rounds off the picture by describing the transformational effect of the

networks and knowledge communities that exist around universities.

In **creating and diffusing research-led innovation**, Will Hutton makes it clear; 'true value in a knowledge economy only comes from innovation – we cannot compete on price, low-wage labour, or physical assets. So we need to invest in knowledge and compete by inventing and innovating new products, processes and services'. We next hear how this can be put into practice by BMW Group, Venture Wales and IBM Software Group. Whether this is through working with cross-disciplinary research teams, supporting graduate entrepreneurs or creating the right conditions to drive and sustain innovation. Graham Spittle concludes that greater integration and mobility is needed between universities, private sector companies and individual entrepreneurs if the UK is to compete successfully.

In **knowledge workforce**, Angela Saini, author of 'Geek Nation: how Indian science is taking over the world', brings an international perspective. Angela reflects on her travel between India and Britain while writing her book and the extent to which we in Britain take our universities for granted while

India desperately tries to meet a surging demand for university places. Closer to home, Mike Emmerich from New Economy discusses the impact of fresh talent brought to Greater Manchester by its universities. Sam Laidlaw, Chief Executive of Centrica focuses on the high-level skills needs of engineering and manufacturing as well as the opportunities of collaboration between businesses and universities. Finally, Nick Wilson, from Hewlett Packard, reflects on the company's experience of working with the University of the West of England to create courses relevant to business needs, promote social mobility, positively impact the local community and support other businesses in the region.

In **attracting inward investment**, we reflect on the role of universities as one of the UK's major export industries. Ed Cox, Director of IPPR North, provides an overview of the five drivers of productivity and the role of universities against each of these. Ed notes that university representation is integral to most of the recognised Local Enterprise Partnerships as well as IPPR North's Northern Economic Futures Commission. Lena Wilson from Scottish Enterprise and Tony Gallagher from Queen's University Belfast reflect on the vital role

universities in Scotland and Northern Ireland have played to attract investment and help build growth. Professor Andrew Atherton, Deputy Vice-Chancellor at the University of Lincoln, describes the experience of working with Siemens on a partnership to establish the first purpose built engineering school in more than 20 years.

Altogether, these contributions paint a powerful picture of the role universities can play towards growing our future. The economic downturn and recession have given regions and countries across the world reason to rethink and consider their future economic strategies. The UK also has difficult decisions to make about our future direction but we have much to be confident about and many tools to utilise. By playing a leadership role, changing future patterns of economic growth, creating research-led innovation, building the knowledge workforce and attracting inward investment, universities will surely be central to any successful plan for driving a competitive future economy.



# Regional leadership and 'anchor' capacity

As 'anchor' institutions within their regions, universities have fundamentally shaped the character of the places where they are located. Through their intellectual contribution, brand, role as a major employer and active contribution to the development of regional economic strategy, universities are playing a critical leadership role.

# Universities as ‘anchor institutions’ in the knowledge economy

Dr Neil Lee, Senior Economist, The Work Foundation

The UK economy is undergoing long-term structural change. The production, use and dissemination of knowledge has become increasingly important, while routine production has become less so. Knowledge-based sectors are increasingly important: at the start of the 1970s, less than a quarter of economic activity was in ‘knowledge based services’ – it is now closer to half.

Much of the UK has benefited from this transition, with successful knowledge-intensive industries creating new jobs paying higher wages. Universities have been critical in this change, creating the skilled, adaptable workers who can profit. Cities with strong universities and concentration of skilled workers – ranging from London to York – have done well from this economic transition.

Yet other cities have been less successful in the transition to the knowledge economy. Cities such as Middlesbrough or Hull have fewer of the knowledge-based industries which are driving the economy. These places will often have been

reliant on the public sector as a driver of growth in the past. And it is in these cities where the role of universities is equally important, but different.

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**The ability of universities to influence the local economy is particularly important in a knowledge-led economic recovery, even more so in cities which are declining.**

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Universities are unique organisations in many cities – often they are the only institutions with the scale and local connectedness to drive economic growth and shape the physical environment. In the US, the term ‘anchor institution’ has been used to describe this role. The fact they are fixed in a particular territory allows them to play an important, sustained role in local economic development.

Universities play multiple roles in local areas. Universities help educate the population and create the skills needed for successful urban economies. The traditional role of universities as an educator of the select few has been expanded to include a broader educational remit, a function improving social mobility. Firms are placing increased value on intangible assets and investing more in research. Linking the expertise of universities to the needs of local firms has rightly been seen as important for firms to grow and succeed. The role of universities in urban economies – in particular the money spent by students – is crucial in maintaining many city economies.

While education, research and student expenditure are important, the role of anchor institution relies on a broader notion of the importance of universities in cities. Any institution relies on the success of the town or city in which it is located, and this can provide a powerful incentive for local engagement. The economic benefits of anchor institutions come

from demand for local goods and services, both from staff and students. They can also shape the physical environment, as universities have the scale to influence the built environment of a city in the way smaller landowners cannot. And universities serve as ambassadors for towns and cities, bringing in talent and investment to an area and building its reputation.

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**Universities are unique organisations in many cities – often they are the only institutions with the scale and local connectedness to drive economic growth and shape the physical environment.**

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Universities have recognised this role, and there are some great examples of good practice both in the UK and abroad. The University of Pennsylvania provided home loans for staff to ensure they lived locally, but also to help regenerate the area near the campus. Institutions such as Manchester Metropolitan University have linked plans for new buildings with long-term regeneration strategies.

The challenge will be to sustain efforts in the face of public sector cuts. In the context of low private sector confidence and a public sector which is likely to shed jobs, making the most of existing assets, such as universities, will be vital for many places. The ability of universities to influence the local economy is particularly important in a knowledge-led economic recovery, even more so in cities which are declining. Yet, as the financial support structures under which much of this work has happened is being removed, the role of universities as ‘anchors’ becomes more, not less, important. Universities have realised that it is in their interest to anchor local economies. The government needs to continue to provide incentives for this to happen.

*Neil Lee is Senior Economist at The Work Foundation. He runs the Ideopolis team whose work helps cities and regions understand how the knowledge economy affects them and what they need to do to grow their economy further.*



# Out of the lecture theatre and into regional growth

Alan Qualtrough, Editor, Western Morning News

In my experience as a regional newspaper editor I have witnessed in recent years one of the biggest changes of influence towards creating the conditions for enterprise: the emerging dominance of universities over local authorities.

I say this not supported by research or statistics but from experience; because running a newspaper and gathering stories depends on understanding and using the pressure points of local influencers and plugging in to the lines of power, politics and decision-making.

The development of management and research skills appropriate to the business landscape of the regions they serve and the building of the networks necessary to encourage enterprise has increasingly been undertaken in universities. At the same time local councils have struggled with public spending cuts and declining service provision.

The stories in the Western Morning News reflect this: much gloom and doom in town halls; optimism, expansion, enterprise and

innovation in higher education. So if story content is a measure, the focus of regional economic development can be said to have moved away from the municipal towards the academic.

My journalistic life began in the committee rooms of Liverpool City Council at a time the left-wing activist Derek Hatton was driving a politically charged economic and social agenda.

As a junior reporter at the Liverpool Echo there was only one place to go for economic or business stories and that was the chair of the economic planning committee or the dedicated team of departmental officials because it was here that all the policy decisions were played out.

Hence reams of copy were produced with political conflict and not consensus at the heart and with little thought on sustainability; a change of administration abruptly ended local plans, and the politically-driven process then veered to the left or right to start again.

Many years later when I arrived in Plymouth to edit the evening paper

I found a city that was underperforming but full of potential, circumstances also recognised by the University, which set about changing the university's relationship with its stakeholders.

Professor Wendy Purcell championed an enterprise mission for Plymouth University and is delivering 'enterprise in action'; taking theory out of the lecture theatre and translating it into activity through partnership working. In other words, the University is standing up and taking a lead on the economic regeneration of the region.

Two examples of this agenda are the Cornwall Enterprise Institute, a joint venture between Plymouth University and Cornwall College that will drive a "new economic dynamism" and Plymouth University's Growth Acceleration and Investment Network (GAIN), the partnership with Plymouth City Council and Tamar Science Park that brings together the networks required to underpin a healthy business ecosystem. This work has to be put into the context of recent central and local government economic

development and policy making in Plymouth. There had been central government intervention in the form of the Plymouth Development Corporation but this folded in 1995 after its performance was described as 'poor stewardship of public funds'.

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**I have witnessed in recent years one of the biggest changes of influence towards creating the conditions for enterprise: the emerging dominance of universities over local authorities.**

.....

The principle was revisited nearly ten years later with the formation of the Plymouth City Development Company which was wound up last year without making an impact on the city.

This is not to say there have not been major economic initiatives in the city. The Devonport district received government New Deals for Communities funding of £48.7 million; and the South West Regional Development Agency and the European Union have made investments. The Plymouth 2020 local strategic partnership has worked steadfastly for improvement.

But despite the best efforts Plymouth's economic indicators remained average and in general there has not been a joined-up approach to creating an enterprise culture. This is not a criticism of Plymouth city council's economic regeneration policies or personnel. They are positive and work hard but are faced with reduced budgets and reduced staff numbers and a subsequent decline in influence.

So when I was encouraged to make an application to the Regional Growth Fund for a £1 million grant to create jobs in areas affected most by public spending cuts it was an obvious choice to ask Plymouth University to partner the Western Morning News because the enterprise networks and professionalism were in place.

The idea of the media linking up with higher education was novel and persuasive and was the classic case of partnership working to encourage enterprise that the university had anticipated. And the timing was right. The Coalition had just declared that growth in the SME sector was a key part of UK economic policy combined with devolving power to the regions in the form of Local Enterprise Partnerships. The university had anticipated this and had a regional enterprise policy in place.

And so it proved because when Business Secretary Vince Cable launched our Plymouth University and Western Morning News Growth Fund in July he described it as the 'first and best'.

The Western Morning News has strong regional business coverage and we see the newspaper as a forum or vehicle to discuss and encourage economic and social change. As part of our routine reporting we have written about the economic impact of the universities in our region – Plymouth, Exeter and the Combined Universities of Cornwall and know their capabilities well. And they each have ambitious and successful growth strategies that influence and shape the regional economy.

Given that we have not yet experienced the full effects of public spending cuts and the relative decline of local authorities, the pre-eminence of universities in regional economic development is assured for years to come.

***Alan Qualtrough is Editor of Western Morning News, who have teamed up with Plymouth University in a project aiming to create jobs, support businesses and drive growth in the heart of the South West and the Cornwall and Scilly Isles local enterprise partnership regions.***



# Facing the challenges of a rapidly changing world

**Barry Sheerman MP**, Labour and Co-operative member of Parliament for Huddersfield

The last enquiry my Education and Skills Select Committee undertook on Higher Education was one that attempted to evaluate the international market in the sector and the UK's ability to remain a leading global player in an increasingly competitive environment. We concluded that our universities were robustly competitive and widely respected and admired, but that there was no room for complacency in a fast developing situation.

Imprinted on my memory is a conversation with a senior Chinese Academic who had worked in Britain. He was deeply envious of the breadth and depth of our university system and what he called our "higher education culture". He asked me what I thought would be the impact if overnight our universities ceased to exist. A nightmare scenario indeed, but one, which forced our Committee to think very seriously about the increasingly vital strategic role of the sector in 21st Century Britain.

How essential are our universities to our towns, cities and regions

and to our country? The stats take us a little way towards the answer, 133 universities, 170,000 directly employed staff and an expenditure of £25billion. This however tells us very little about the huge impact these institutions have on the communities in which they sit. They are frequently, as in my own constituency, the single largest employer in the town and their spend in the local area and in the wider region is significant indeed.

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**So here we are with universities central not only to understanding a changing world economy but also operating in an environment where power and influence is shifting before our eyes from West to East.**

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Direct and indirect employment is substantial, but we should not underrate the high skills of university staff and the impact this

has on the local economy and social fabric of the community. Some aspects of the influence of a university may be less easy to calibrate, but it is clear that well led institutions are major players in the economic and social affairs of the region and are often relied upon not only for information, knowledge and wisdom, but also for strategic leadership and much more.

To set this wider role in context we must see the HE sector in the light of the rapidly changing world we live in. Globally the fruits of innovation, technology, information and communication have meant a dramatic decline in the numbers employed in manufacturing. The UK remains a wealthy country, with the sixth largest economy measured by GDP, seventh by purchasing power parity and has the third biggest economy in Europe. However like most of our competitors automation has meant we require far fewer people to produce the goods we need. The job opportunities still exist in manufacturing but the demand is increasingly for those with very

high levels of skills. The role of universities is critical in providing the high quality personnel vital to the success of major employers as well as the increasingly important emerging small and medium start-up businesses.

As the economy develops and rapidly transforms itself we look increasingly to the universities to help us understand these changes, what exactly is happening? What challenges do we now face? How do we overcome them? In the health sector alone the changing demographic, longer life and new treatments and technologies demand the highest of medical management and technical skills. In the broader educational sphere we need highly trained professionals at every stage from early years through to school, college and beyond. Health and education are traditionally viewed as part of a broad public sector and the turbulence in the manufacturing sector is replicated here too. The lines between public and private are in flux and it is to the university that we will look to provide the expertise we need.

So here we are with universities central not only to understanding a changing world economy but also operating in an environment where power and influence is shifting before our eyes from West

to East. This is a world threatened by international financial instability, global warming and climate change and by unprecedented global population mobility. Our university community now has a clear responsibility not only to help us understand the problems but also to find the appropriate levels of response.

These challenges are what we have to live with. They are not remote from our communities and regions and they will shape our lives increasingly urgently. Without the help of our universities we have no hope of surviving and thriving. To tackle the ghastly regional imbalance of our country where London and the South East increasingly resemble a different more affluent country we need high quality research to inform our politicians. In order to identify the relevant skills required to support green shoot industry, to give support to SME's that struggle to grow and to identify and support entrepreneurs we need our universities more than ever.

At the same time we rely on these same universities to ensure that we educate our people to be fully-fledged responsible citizens fit to play an active part in a mature democracy. Much has been made in recent months of the concept of localism and the Big Society.

Without a leading role for our universities I see little chance of achieving a meaningful realisation of these goals, or for the good and just society we might also aspire to.

The big question then remains. Is the sector too complacent, and is it fit for purpose? Like all systems some elements of Higher Education, are better than others and we would be foolish to deny it. Some are reluctant to commit wholeheartedly to the active strategic leadership role that I believe their communities and their regions deserve and must do better. The sector as a whole is indeed robustly competitive but there remains a clear imperative for more creative partnerships, strategic thinking and relentless effort.

**Barry Sheerman MP is the Labour and Co-operative member of Parliament for Huddersfield. He currently Chairs the Skills Commission, has extensive experience in educational issues and played a key role in education policy and debates.**

# Universities and their role in regional economies – a local authority perspective

**Tony Williams, Executive Director, Bournemouth Borough Council**

When I first accepted the University Alliance's invitation to write an opinion piece on Bournemouth University's contribution to our regional economy, I did so with great enthusiasm. After all, everyone knows that universities make an important contribution to their local area; it's just a question of quantifying it.

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**The Council and the University have been working together constructively for a number of years now, and during that time we've amassed much data and some rather impressive statistics.**

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In the end that part wasn't too difficult either. At Bournemouth Borough Council we endeavour to work in collaboration and partnership with the University, forming a relationship that we know has both local and national benefits. The Council and the University have

been working together constructively for a number of years now, and during that time we've amassed much data and some rather impressive statistics.

For example, Gross Value Added (GVA) data shows that the total that Bournemouth University (BU) contributed to the economies of Bournemouth, Poole and Christchurch in 2007 was some £166 million, and that figure increases to more than £172 million if capital spending is included. But the importance of the University to the regional economy goes well beyond income generation. Our recent Local Enterprise Partnership (LEP) brief included as a priority the need to provide high tech, high value job opportunities. The University plays a key role in training and preparing graduates to meet these demands and helping us to achieve the objectives of the LEP - employment data from 2009-2010 shows that almost half of all BU graduates go on to work in the South West.

And there are plenty of graduates in the pipeline. This year a total of 16,868 students are registered at BU

and their importance to the local and regional economy is well understood. It is estimated that in 2007 BU students spent more than £88 million in the local economy and more than £98.5 million in the South West region.

Of course a large part of the University's economic contribution comes from its staff. In a county like Dorset made up of predominantly micro businesses and SMEs - the majority of which employ fewer than five people - the University stands out as a major employer. This year they have a workforce of 1422 full time equivalents who work, live, eat and play in the region. This is good news for the Council as well as the wider area; in addition to the money spent on accommodation, food and leisure, the University's staff also contribute to the maintenance of local facilities and infrastructure.

The University's influence isn't restricted to the local area though. It is part of a network that includes twenty-four accredited language schools, together with universities and colleges in the region, that offer courses to overseas students. This

network brings approximately £200 million into the local economy and serves to raise the international profile of the area. The University also has significant independent global reach and is attracting an increasing number of students from overseas. In 2010/11 there are 1823 international students. The Council welcomes the international flavour and perspective that these students bring to the local area, and both the University's international graduates and their families play an important role in our local tourism industry.

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**Our close working relationship means that the interests of BU are closely aligned with those of our Council and the town.**

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The more I reflect on the importance of Bournemouth University in our regional economy the more significant the picture becomes; there is so much more that can't be quantified. Our close working relationship means that the interests of BU are closely aligned with those of our Council and the town. Bournemouth is committed to the green agenda, particularly when it comes to employment and business opportunities, and we

have set ourselves the goal of being the right place to nurture a green knowledge economy. Bournemouth University has established a Green Knowledge Economy centre and we are collaborating and partnering wherever possible to bring new developments to the fore.

In addition to the role of international graduates, the University also makes a major contribution to the town's tourism industry by leading on the proposed Hotel School, the development of the Tourist National Business Academy, and attending the Council's Tourism & Economy Overview & Scrutiny panel.

This year the University launched its new Vision, 'BU2018: Creating, Sharing, Inspiring', which aims to create a unique fusion of excellent education, research and professional practice, with students at its heart. This resonates strongly with Bournemouth Borough Council; the University is very much at the heart of our town.

***Tony Williams is Executive Director of Environment and Economy in Bournemouth borough council. Tony is responsible for a range of areas including economic development.***

# From Victorian mills to factories of ideas

**Sir Patrick Stewart, Chancellor, University of Huddersfield**

My home turf is the West Riding of Yorkshire and during my boyhood it was a very different place. In terms of sights, sounds and even smells it was much more obviously industrial, one of the great manufacturing regions of the North of England. My life went in a completely different direction, of course, but I still think of myself as a lad from a hard-working part of the world where we made things for a living.

Nowadays, it is more common to describe the West Riding and regions like it as post-industrial. Most of the mines and the mills have closed and the factories have been flattened to make way for superstores.

But that is not the whole picture, by any means. The fact is that Yorkshire, in common with most of Britain's industrialised regions, can still boast a great many successful and innovative firms. And to be more successful, they need to become even more innovative in order to compete in the global market and make their contribution to the rebalancing of the regional and the national economy, which we all

recognise – whatever our political outlook – as being vital to our future prosperity.

.....

**It goes without saying that unless we teach and train the next generation of experts in every field, from science and technology to arts and humanities, then regional growth will be stopped in its tracks.**

.....

So if innovation is the key, where will it come from? The R and D departments of companies play a crucial role, of course, and there will always be inspired individuals with the vision to develop new products or solve difficult problems.

But the universities of Britain, staffed by expert researchers in every field of science and technology, and equipped with state-of-the-art facilities, are surely our best source for innovation and therefore the industrial growth and the

employment that comes with it.

As Chancellor of the University of Huddersfield, I never cease to be fascinated and amazed by the amount of expertise that we have on the premises. It ranges from informatics to nanotechnology, precision engineering to organic chemistry, from biofuels to brake technology, from logistics to particle physics, from diagnostic engineering to product design...

Even if I stretched that paragraph to double its length, I would still be afraid of leaving something out, so I have given a flavour only.

We have a great many modern buildings on our campus, but many of our researchers are housed within specially-adapted Victorian mills. They are handsome structures and they are still factories – factories of ideas. They are certainly not ivory towers, because the scientists and engineers behind those stone walls are continually engaged with the real world of modern industry. There are many instances at the University of Huddersfield of our research groups forming close partnerships with leading firms,

solving problems for them and helping to develop new products and processes.

One example from many is a unit named IPOS, which stands for Innovative Physical Organic Solutions. Housed in a superbly equipped new suite of labs, it has been awarded a multi-million pound grant by the European Regional Development Fund, and a key condition is that the unit works closely with at least 50 firms in the Yorkshire and Humber region. Many other instances of partnerships between University of Huddersfield researchers and industrial companies could be cited. And while I am naturally anxious to stress the dynamism of my own institution, every other member of University Alliance is seeking and forming such partnerships. It seems obvious, therefore, that centres of excellence in higher education have a central role to play in regional and national growth.

I have stressed the research role of universities. But their other dimension, of course, is the educational one. It goes without saying that unless we teach and train the next generation of experts in every field, from science and technology to arts and humanities, then regional growth will be stopped in its tracks. But it is also

worth emphasising that even while they are engaged in their undergraduate or postgraduate studies, students on virtually all courses at Huddersfield are expected to undertake work placements and internships. This not only gives the students a feel for employment, but in many cases they can make a stimulating contribution to the companies which they join.

So it seems undeniable that universities are important engines for growth in the regions they serve. This is nothing new. If we trace the roots of the University of Huddersfield, for example, we find that they originate in nineteenth-century educational initiatives designed to meet the needs of local industry. Today those needs are more complex and diverse and universities are therefore more important than ever.

My workplace is the stage and my industry is the film industry. They both make a significant contribution to the economy and the culture of Britain and its regions. And it is vital that we continue to train and nurture talented actors, writers, musicians, artists, designers and historians, of course.

But creativity exists in every field of endeavour. As I write, building work has begun on a new structure at the

University of Huddersfield. Named the Enterprise and Innovation Centre, it will cost some £12 million and more than half of the funding has come from the European Regional Development Fund. It will be an exciting building and will serve as a space where innovative entrepreneurs, ambitious small companies and large, established firms will be able to forge closer links than ever with the research expertise and technical facilities of the host university.

It will be of immense practical benefit to the locality and the region but it will also serve as a powerful symbol of the way in which universities and enterprise can unite and work together to achieve economic growth.

***Sir Patrick Stewart has had a distinguished career in theatre, film and television. He is Chancellor of the University of Huddersfield where he is also Professor of Performing Arts.***



# The university in its place

**Professor John Brennan, Director of the Centre for Higher Education Research and Information, Open University Business School**

I have been researching universities in Britain and around the world for over 30 years. Projects have focused on topics such as the links between universities and the labour market, how quality and standards are maintained, how effective governance is achieved, and on the impacts of universities on other parts of society – the economy, social equity, social cohesion, political and social change.

In this short piece, I want to draw particularly on one current and one recent research project. The current one is an international project funded by the Economic and Social Research Council (ESRC) on 'Change in Networks, Higher Education and Knowledge Societies' which is part of a larger research programme of the European Science Foundation on 'Higher Education and Social Change'. The recently completed project was also funded by the ESRC as part of a programme of research on the impact of higher education on regional economies. It was entitled 'Higher Education and Regional Transformation: social and cultural perspectives (HEART)'.

A forthcoming book based on the project shares the title of this piece: *'The University in its Place'*.

In the case study approach adopted by the HEART project, we found considerable differences in the universities we investigated; in population, social context and local and regional settings. This is not to say that some generalisations are not possible, but considerable care needs to be taken in making them. In my experience, such care can often be absent in policy debates.

The regional economic impact of universities can be both direct and indirect. On the former, universities clearly play a part in up-skilling and re-skilling local workforces, but it is dangerous to see them as only doing so for their immediate region. Universities play an important role in enhancing the mobility of labour, across regions and, increasingly internationally. The regional impact in terms of the local labour force is often more apparent in the public sector than in the private sector, with particularly 'high tech' parts of the latter increasingly recruiting internationally. Some universities see their major role in lifelong

learning and re-skilling existing workers rather than in initial preparation for the labour market.

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**One of the key regional functions that universities play lies in 'opening up' relatively isolated communities to wider influences, and to making visible the riches and attractions located in and around the region.**

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A second important area of university impact is regional 'image' and ability to attract inward investment. For both universities and their regions, 'image' is potentially both enhancing and constraining. A poor image of place limits a university's ability to attract students from outside the region. And a poor image of its university limits the benefits which can accrue to the region from that university. Image in this context should not be confused with crude league tables

which almost completely neglect the rich diversity of universities across the sector.

Image is multi-faceted, and includes the physical impact on the immediate environment, involvement in cultural ventures (both high and popular culture) and through the presence and activities of students themselves. Universities also have a strategic impact on their regions through partnership/development opportunities with agencies concerned with regional regeneration. Many university leaders play an important regional role through their membership of local boards and committees, frequently acting as a 'neutral and objective' voice among competing local interest groups.

Universities differ in the nature and level of their regional engagement. Some are more internationally-focussed and some more regionally focussed, but research suggests that most universities combine a mixture of global and local agendas with considerable differences in the balance between the two. In many universities, a rhetoric of engagement is not dissociated from the discourse on employability. Their discourses and activities around community support, civic engagement and active citizenship also seem more explicit and very diverse, reflecting the constraints

and opportunities of particular regional contexts. These universities also tend to have a self-assigned mission of cultural regeneration (raising aspirations, entrepreneurial culture), potentially bringing a 'transformational' potential to the region.

That said, the local and the global functions of universities should not be regarded as being in conflict. One of the key regional functions that universities play lies in 'opening up' relatively isolated communities to wider influences, and to making visible the riches and attractions located in and around the region. As commented to me by one university Vice-Chancellor, "what any developing region needs is at least one successful football team and one successful university!"

Finally, a touch of realism is also needed about the impact of universities. As with all developmental interventions, there can be winners and losers. Thus, university widening participation activities tend to provide social mobility opportunities for the few without necessarily altering patterns of inequality that affect the many. In sub-regions with several higher education providers, a social stratification of institutions may map onto and reinforce wider patterns of inequality.

However, by its contribution to regional economic development and by increasing local employment and consumption levels, a university may bring advantages to all within its sub-region. By their impact on the local economy and labour market, universities may be changing who the 'winners' and 'losers' are without necessarily impacting on overall levels of inequality and relative disadvantage. But we have found universities that see their role in tackling long-term, intergenerational inequalities. They seek to be 'open' to all by broadening notions of 'access' beyond course enrolments bringing knowledge, expertise and facilities to all members of the community.

**John Brennan is Director of the Centre for Higher Education Research and Information and Professor of Higher Education Research at the Open University. A sociologist by training, he has been researching universities, in Britain and around the world, for over 30 years.**



## **Change agents: starting, growing and supporting enterprise**

**Universities are both part of a region's history and its future. Often closely linked to the region's industrial legacy, universities are in a unique position to build on this heritage but also to drive adaption, change, renewal and regeneration within the regional economy to open up new horizons.**

# Fulfilling the potential of universities to drive economic growth

Sir Tim Wilson, Chair of Hertfordshire Local Enterprise Partnership

The English university sector is facing huge changes during the next 24 months. After two decades of relative stability in terms of the government's relationship with the sector, we are about to experience a seismic shift in that relationship. This should not surprise anyone; for a governance structure to survive for two decades in a volatile political environment is almost unparalleled. But stability in governance disguises major changes in purpose and role.

Local Enterprise Partnerships (LEP) are designed as business-led organisations with agendas that are congruent with many university outputs.

Two decades ago universities were arguably at the fringe of educational policy; a comfortable place of academic autonomy and freedom. But the world has changed. Now, in the globally competitive 21st

century, universities are at the very heart of economic and social policy. Intellectual power and high level skills are non-negotiable in a prosperous modern society and universities are the primary agents in delivering these agendas. A thriving knowledge economy depends upon its universities in three critical dimensions; the application and exploitation of research capability, the enterprise and entrepreneurial culture that is developed amongst its students, and the applicability of the knowledge and skills of graduates contributing to economic prosperity. All three have evolved through a growing degree of business/university collaboration.

We can trace back the change in policy on university/business interaction to the Dearing report (1997). In this century, the Lambert review of university business partnerships (2003) identified considerable good practice but also indicated the distance that had to be travelled if the nation was to fully benefit from the potential of its universities. The Sainsbury Race to the Top report (2007) further

emphasised progress and highlighted the potential for the future if we could embrace collaboration in a meaningful and sustained manner. In recent years the Technology Strategy Board has taken a major influence by funding near market research both in generic themes and in support of specific company development. HEFCE has an established and consolidated funding stream that has gone beyond the creation of capacity to engage with business, and rewards success. The Research Councils now include impact as a measure of value and, critically, the research assessment exercise is being replaced by a new model which will include assessment of the impact of research, a factor that will materially affect future funding and hence future research investment decisions.

Many universities no longer modestly hide the impact of their research, they promote and celebrate it. The amount of collaborative research between UK business and UK universities has grown dramatically; and many of the obstacles presented by intellectual

property barriers have been removed by innovative and collaborative thinking.

Perhaps the best measure of progress is that many in the USA now look to the UK for good practice; a reversal of the situation 'pre- Lambert'. But we are scratching the surface of what is possible. Structural weaknesses remain. There has been no comprehensive business-led organisation that ensured connectivity between local economic development and universities; between wealth creating organisations and the innovation and skills supply chain that is provided by universities; until now.

Local Enterprise Partnerships (LEP) are designed as business-led organisations with agendas that are congruent with many university outputs. They have the potential to be key players in business-university relationships; to leverage the strengths, capabilities and brands of universities to the economic benefit of their locality. If LEPs are able to consolidate the business voice within their areas, then this will provide an efficient, regular and accessible communication channel between universities and the local business community; something that is notoriously difficult at the moment.

The ability of a university to present its portfolio of services and its range of skills and knowledge through one recognised and authoritative channel would bring a very significant advance in potential collaboration, to the further benefit of economic growth.

But necessary change is not limited to representation of the business community. For universities to play their full roles in economic development, further cultural change is needed on our campuses. For those universities that are committed to business support, it means establishing a campus culture where it is not only acceptable to work with business exploiting research and intellectual strengths, it is expected and it is celebrated. It means building a campus culture where it is not only acceptable to have spin-out and spin-in companies; it is the norm. It means building a campus culture where enterprise and entrepreneurship amongst students and staff is not only permitted; it is encouraged, supported and championed. Only in that way will we establish UK universities as world leaders in business support and interaction.

However, this is insufficient if universities are not recognised within their own communities as agents for change. Therein lies a

further fundamental challenge; local recognition. Has the population of a university city/town any idea of the world class research being undertaken within their community, or of the economic impact and employment effects of collaboration between their local university and local companies? Has the University sector persuaded every MP of the vitality and value of our universities? Have we persuaded the population as a whole; why isn't the media saturated with stories about research and innovation emanating from our campuses?

Universities are facing a period of huge change, of turbulence and uncertainty; such times bring huge challenges, but also huge opportunities. If our universities are to fulfil their potential, it is time for them to meet the challenge of being engines for economic growth; it is time for UK universities to take their place as world leaders in business support and interaction.

**Sir Tim Wilson, former Vice-Chancellor of the University of Hertfordshire, is a strong advocate of the role of universities in economic development and is currently leading a government review into university-industry collaboration. He is also Chair of the Hertfordshire Local Enterprise Partnership**



# From Dandy to digital: universities transforming regional economies

**Sir Richard Lambert, Chancellor of the University of Warwick and former Director-General of CBI**

A generation ago, Nottingham was a major manufacturing centre. It boasted the world's largest bicycle factory, with 11,000 employees, and was home to other big engineering companies as well as makers of textile, tobacco and consumer products. And its university had around 8,000 students.

Today, most of the manufacturing has disappeared, to be replaced by a number of large companies in the services sector, and the city's universities have around 40,000 students. They make a large contribution to the regional economy, both as big employers and through the spending power of their students. And they make at least as large an indirect contribution as leading centres for innovation and collaborative research and as the source of highly skilled graduates for the regional and national jobs market. And from their position at the heart of the region's cultural and intellectual life, they make the city an attractive place in which to live and work. This story is repeated all across the UK, and helps to explain the central

role that universities play today in driving economic growth across the regions and nations. One of the most positive features of the past 20 years has been the renewed energy and vigour of so many of our cities, a process which has been shaped in good measure by the university system. While other parts of the economy have experienced wildly volatile times, the higher education sector has provided a stable and growing base of economic activity. And universities are set to become an even more significant engine for growth in the future - provided they are not fettered by government red tape or inconsistent policymaking.

It is obvious that the rapid growth in student numbers has had a dramatic impact on some towns and cities: one striking example is Loughborough, which the university dominates. But beyond the sheer scale of their activities, their contribution to regional growth can be grouped under four main headings.

First, they have helped to rebalance economies which have had to face radical changes in their business infrastructure. For example,

following sharp declines in aerospace manufacturing in its area, Hertfordshire University set out with the specific goal of educating young people to meet the needs of new employers in the region – and has achieved real success in this respect.

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**The message of all this is that the future economic wellbeing of the UK will depend on its capacity to develop innovative new products and services and to increase the rate of productivity growth from the present lacklustre levels.**

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Second, they are in some regions just about the only institutions where investment in science is taking place. Given the links that exist between research intensity and economic prosperity, the importance of this activity can hardly be overstated. An example here is Yorkshire and Humber, where research spending by

business is well below the national average, and the government puts very little into research funding outside the university sector. By contrast, the research-active universities in the region are among the heaviest investors in science in the UK.

Universities' contribution to supporting innovation and entrepreneurial activity, especially in the technology sector, comes third on the list. Anyone who visits technology-based firms in Northern Ireland will quickly realise the extraordinary role that Queen's University has played in generating entrepreneurial talent across the province. Companies like Randox, the medical diagnostics business, and Lagan Technologies came from Queen's and have created high value jobs in an area that badly needs them. Queen's ranks at the top of the league tables for the revenues and jobs created by its spin-out companies.

In some cities, the transformation brought about by successful universities is immediately visible. My favourite example is Dundee: I am old enough to remember when it was famous for being the home of three nineteenth century industries – jam, jute and journalism, and not much else. But over the past two decades, the research excellence in life sciences at Dundee University

has attracted some of the world's great pharmaceutical companies, like GSK and Pfizer, to the region. In the same city, Abertay University has become a hub for the electronics games industry: take a look on its website at the video Dare to be Digital to see what this can mean.

Readers of Dandy and the Beano will be relieved to know that at least one of its old industries – journalism – still flourishes, with the long established publishing house D.C.Thomson making waves in the digital world. Subscribers to Dandy can now search online for Doctor Doom's Whoopee Cushion of Doom.

Fourth, the university system helps to balance the extreme differences in economic wellbeing that exist across the UK. For example, the North East remains one of the poorest parts of the country. According to research by Universities UK, the region's HE institutions provided 13,715 full-time equivalent jobs at the last count, and supported a further 14,683, mostly in the North East, making them a critical part of the region's economic infrastructure. Their total revenues amounted to nearly £1bn in 2007-08, with an additional £1.3bn being generated by knock-on effects in other industries.

On the other side of the country, the merger between Manchester University and UMIST was explicitly designed to counterbalance the so-called golden triangle of Oxford, Cambridge and London by creating a world class research-intensive university in the North West of England. And on a much more modest scale, anyone who visits business people in the city of Lincoln will quickly be made aware of the impact their new university – it was created in 2001 – has had on economic activity and civic pride. Among other things, it has created 3,000 new jobs, helped to double the local economic growth rates, and supported dozens of new businesses.

The message of all this is that the future economic wellbeing of the UK will depend on its capacity to develop innovative new products and services and to increase the rate of productivity growth from the present lacklustre levels. Research excellence and a highly skilled workforce are essential components of both these requirements. For all these reasons, the UK's university system will play a very large part in its future economic success.

***Sir Richard Lambert is the Chancellor of the University of Warwick and the former Director-General of CBI. He previously chaired the Lambert review of Business-University collaboration.***

# Supporting the economic recovery through partnership

**James Ramsbotham, Chief Executive of the North East Chambers of Commerce**

With the recovery from global recession still very fragile, it is essential that links between universities and businesses continue to strengthen. For businesses these links act as a catalyst for greater business innovation, provide a broader perspective on the challenges and opportunities industries and individual firms face and deliver our future leaders.

North East universities occupy a central role within our regional economy. The contribution of local and international students and those who choose to work in the region after completing their studies helps shape the North East's economy and its culture. Clearly our universities also play a pivotal role in training the future workforce through their academic provision and by collaborating closely with businesses.

Teesside University – recently named University of the Year for its engagement with business - has capitalised on its digital media and technology expertise to create a thriving cluster of digital and creative businesses in the Tees Valley through the DigitalCity project. The Institute

of Digital Innovation (IDI) provides specialist facilities, mentoring and financial support for graduates to make their digital or creative business ideas a reality. By engaging with industry, the IDI can target knowledge and skills gaps identified by employers as well as providing a regional, national and international network to help new businesses form contacts and grow. The other delivery organisation, DigitalCity Business, aims to make the North East the best place for digital media, technology or creative businesses by promoting the benefits of location in the Tees Valley to all enterprises from entrepreneurs to established businesses.

Knowledge Transfer Partnerships (KTP) are also used by Teesside University to work collaboratively with businesses towards achieving specific workplace objectives. This collaboration enables businesses to access university skills and expertise via a graduate. Utility provider Northumbrian Water benefited from a KTP with Teesside to design and implement a single change management process to improve the efficiency of

Northumbrian Water's information services department.

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To meet business requirements, Teesside has developed more flexible Knowledge Exchange Internships (KEI). These programmes provide a route for SMEs to benefit from university expertise in a more flexible package. Teesside has been nominated as a preferred partner of Customer First UK and has supported businesses to achieve the same national standard in customer service excellence through KEI projects.

Teesside's vision of contributing to the success of the regional

economy has been realised through the collaborative DigitalCity and KTP projects. By supporting new businesses, encouraging others to locate in the region and facilitating the dissemination of academic knowledge and expertise among regional employers, Teesside has added positive value to North East economic development.

This commitment to working closely with local business isn't limited to Teesside. Another great example is Northumbria University's partnership with Esh Group, a large construction business in County Durham. Esh employees studying at Northumbria deliver seminars to students providing industry perspectives on academic theory. Lecturers work with Esh to shape content in line with the curriculum. Northumbria students also benefit from contact with other Esh staff and those within Esh's supply chain including interviews to inform student research which can bolster the impact and relevance of student outputs. These opportunities for students to interact with professionals help strengthen the future workforce by countering the common complaint that graduates do not possess sufficient industry knowledge. To my mind, this collaboration demonstrates Northumbria's dedication to achieving its corporate strategy to strengthen the diversity and

economic success of the North East.

Whilst both Teesside and Northumbria demonstrate how universities can contribute to the success of the region, barriers exist to prevent universities occupying a greater role in regional growth. The complexity of university structures make it difficult for businesses to engage with university services, for example, forming university contacts was identified as a barrier in the North East Chambers of Commerce (NECC) skills report (Autumn 2011). By establishing an internal team within the university capable of fielding business enquiries, businesses would find it easier to approach and engage university services. Greater dialogue needs to be established to ensure that universities are providing the skills required by local businesses – Teesside and Northumbria's successful collaborative projects demonstrate the success of such dialogue.

In July, the Government published the White Paper, Higher Education: Students at the Heart of the System, with bold aims to strengthen our world renowned Higher Education sector. The Paper includes welcome actions including a review of university-industry collaboration that will inform the future research and innovation strategy. Additionally there were calls for greater

partnership working to strengthen the provision of enterprise skills at university level as well as improving careers advisory services through a quality standard. NECC welcomes these moves to review collaboration and the commitment to strengthening employability skills, both of which have been identified by businesses as issues. However, strengthening university-business connections must be aimed at supporting growth and must not be used as a facade for shifting the burden of funding to businesses.

There is a clear role for the North East's world-class universities to work with businesses and improve skill levels and regional growth. Workforce skill levels are a critical contributor to the success of any business, and many within the North East suffer from skills shortages - despite the increased levels of unemployment that are a feature of recent economic turmoil. By implementing a few simple reforms to increase the ease of interaction between universities and businesses, successful collaboration such as Teesside and Northumbria Universities' projects can become the norm.

***James Ramsbotham is Chief Executive of the North East Chamber of Commerce, who represent the interests of its 4,500 members that collectively employ a third of the region's workers.***

# Creating connections in Media City

**Professor Brian Longhurst, Director, FIRM, MediaCityUK**

I suspect that if asked about Media City, Salford and Manchester, the first response of a majority would be along the lines of 'is that the place that all those BBC employees don't want to move to from London'. This is not surprising, as the dominant media discourse has been very much along these lines. However, Media City in Salford is a hugely significant development in a number of ways and we very early decided that it was essential to have a strong base there.

Media City is an extensive operation by the Peel Group at Salford Quays. Peel controls a 200 acre site, of which phase one has been developed. This is the new home for a number of BBC departments including Sport, Children's, Radio 5 Live and Future Media and Technology. In addition, the site includes an extensive studio block under the control of SIS, and a production facility, the Pie Factory. ITV will begin to move on to the site in 2012 and are constructing a new set for Coronation Street there. The University of Salford has rented space, under a 25 year lease arrangement that will open at the

beginning of the academic year in 2011. Media City is next to the Lowry Theatre and the Imperial War Museum North. Old Trafford, the home of Manchester United is a short walk from the site.

In 2007, the University of Salford recognised the immense potential of Media City and took the decision to lease 100,000 square feet of space over four floors of a building at its heart. We are located next to BBC Future Media and Technology and ITV will be moving in directly above us in the same building. From 2011 we will be teaching 1500 students at Media City across 39 programmes at undergraduate and postgraduate taught levels. Up to 200 staff will work there at different times of the week.

We have taken a particular approach to our activities at Media City. We have brought together taught programmes from across the university. The majority come from our schools of Computing, Science and Engineering and Media, Music and Performance, though overall six of our ten schools are represented there. Moreover, we have adopted an open plan working system for all

staff including academics. We have a number of specialist spaces within our building including a digital media performance laboratory, television and radio studios, an extensive journalism suite and a space we call the EGG, which is best quickly described as a highly technologised living research and communication laboratory.

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**Media City is an innovation ecosystem. It is very important to recognise that the confluence of activity from universities and industry will produce new understandings and new practices going forward.**

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Our programmes at Media City fall into four broad areas: Broadcasting; Future Digital Technology; Games, Interactive and Pervasive Media; and Future Digital Technology and Digital Design. We also have a 'Research Hotel' within our building,

where researchers from our university and others will be located next to visitors and partners from industry. Our activities are led by a university Media City Director and a Media City Academic Director; the former with lengthy industry and commercial experience and the latter with over 20 years of academic experience.

Our approach is therefore predicated on a number of specific ideas about the role of universities in society and the economy. First, that any work from a university has to be interdisciplinary; second, that facilities have to be designed and delivered to produce the very best student experience; third, that the students in a site like Media City are likely to form an extensive source of talent for other participants and partnerships; fourth, that the students should be connected with industry partners in as many ways as possible to affirm the integration of higher education with wider activities.

Moreover, we are concerned that our research and development activity partners in sophisticated ways to provide social, economic and community benefit. A good example of how this approach is developing is in the research consortium, the Framework for Innovation and Research in Media City (FIRM), which seeks to tackle

challenges facing the digital creative media in the coming decades through promoting and facilitating transdisciplinary research and development. The aim is to bridge the communications gap between academics and businesses to produce national and global impacts in the domains of theory and practice. Another excellent example is the recently funded BBC Centre of Excellence in Audio Research. In each case a multi-university partnership is working in tandem with the BBC.

Media City is an innovation ecosystem. It is very important to recognise that the confluence of activity from universities and industry will produce new understandings and new practices going forward. The prize here is that Media City in working with other developments across the north of England should be able to generate new activities for the benefit not only of the north but for the UK globally. For this to happen there are a number of conditional factors. First, universities must adopt an approach that drives open innovation; second, student talent development will be at the core of that innovation; third, the student experience must be of high quality; fourth, research and development projects should be constructed in all ways from day one so that the

relationships between academia and external partners are as cohesive as possible.

Knowledge economies are unpredictable. Universities are at the heart of innovation. It is important that the role of universities in environments like Media City, is not simply seen in terms of skills and technology transfer for the regional economy, undoubtedly important though those are. At least as important, is to make sure that the right conditions are created for the creative juices to flow and the innovative creative connections to be made with international impact. Our approach is rooted in the forward looking combination of hard science and technology with creative insight and passion, and on the basis that 21st century universities have to work hand in hand in genuine mutually beneficial relationships with world leading companies.

**Brian Longhurst is Director of FIRM (Framework for Innovation and Research in MediaCityUK) and in his role at University of Salford he also has strategic responsibility for the development across the university of media, digital technologies, practices and futures.**



# Networks, sneak-outs and reservoirs of expertise

**David Docherty, Chief Executive, Council for Industry and Higher Education**

The modern wealth of regions will flow from their intellectual capital. Tomorrow's successful enterprise cities, regenerated regions and innovation towns will only be so because of an endless flow of talented graduates and restive researchers tied into knowledge-intensive businesses based or working in the locality. As Gordon Moore, co-founder of Intel said of the Silicon Valley phenomenon – 'The most important contribution Stanford makes to Silicon Valley is to replenish the intellectual pool every year with new graduate students.'

Students and researchers form the personal, business and social networks vital to the entrepreneurial energy of a region. They give it identity, share ideas, business-plans and battle-stories, attract cluster-capital when they are recognised as a centre of growing expertise and, when successful themselves, become the investment community of the future. In HSBC's recent report, 'The Future of Business: The Changing Face of Business in 21st Century Britain' they found that that strong personal networks (26%) were more important to business

leaders than financial backing (18%), or even having a good business idea (16%). And that one in three business leaders spends time out of the office consulting for other firms, volunteering or working in academia. These networks are the new localism when it comes to economic regeneration.

Dr. Hermann Hauser, co-founder of the hugely-successful Amadeus Capital, talks of the power of 'sneak-outs' – i.e. businesses formed by graduates, but not based on university IP – as being the vital component of regional success. Stanford measures itself as much on the consultancy it offers to such sneak-outs as it does to spin-outs or more traditional university-IP transactions. So irrespective of whether policy makers wish to use the cluster word, or enterprise zones, or economic eco-systems, knowledge-creation, development and implementation is the sine qua non of success.

HSBC's report pointed to seven supercities – Newcastle, Leeds, Liverpool, Brighton, London, Glasgow, Bristol – all of which have highly-successful universities

committed to re-balancing the economies in which their cities are located. For example, HSBC noted that Brighton could "change the traditional national and regional powerbases in the UK because of [its] proximity to the one thing that does not depend on natural resources: knowledge". The report describes Brighton as "...the deregulation capital of the UK [where] 82% of entrepreneurs, many based in the so-called MDMA industries (marketing, design, media and advertising), believe that regulations and work-related legislation is a threat to their new entrepreneurial activities"...so making Brighton an "alternative economic and innovation powerhouse".

Developing high-quality professional and technical skills are, and always will be a prime requirement of universities, but the innovative-localism cannot be built on skills alone. Vital regional economies need reservoirs of expertise. If a skill can be defined as a repeatable process in a predictable environment, an economy built on such narrow

talents, will hardly be suited for the rigors of convergence in media, service engineering, gene therapy, nanotech and de-carbonised manufacturing necessary for supercities or, indeed, super anything.

It is time for a new covenant between businesses and universities that responds actively to the connected, networking era and the collective responsibility for growth. For example, three universities in the supercities – Glasgow, Bristol and Kings – have adopted an open-IP relationship with business, in which they will make the vast bulk of their IP freely available to businesses. Building on this initiative, creating genuinely powerful entrepreneurial networks that use cutting edge social business tools like LinkedIn, Facebook and the Library of Alexandria is the logical next step.

**Irrespective of whether policy makers wish to use the cluster word, or enterprise zones, or economic eco-systems, knowledge-creation, development and implementation is the sine qua non of success.**

We must be very careful not to overlook the roles of major industrial businesses co-locating within universities and creating new cultures that break through historic divisions of the academy and business research. So Jaguar Land Rover in Warwick, Boeing in Sheffield, Lloyd's Register in Southampton, Siemens in Lincoln, and the BBC in Salford are all strong examples of businesses taking a hard, practical, profit or mission-driven view of university knowledge and backing it to be a source of major competitive advantage. The lessons learned for big companies and their supply chains about culture and new forms of practice can and should be applied to smaller businesses as they scale up.

These examples all build on historic regional capability, but equally universities have a significant role in re-clustering a region as traditional industries die – as the University of Hertfordshire is doing with biotech and Abertay successfully did with the games industry. The CIHE is working with Brighton and Sussex universities, the Arts and Humanities Research Council and two thousand creative, digital and IT (CDIT) businesses in the Brighton area attached to the Wired Sussex network on a project called the Brighton Fuse which

aims to map the drivers of regional success and initiate major change-management programmes that will provide a clear evidence base for the role of universities, but also be the basis for a tool-kit that other regions may use.

Regional growth is an immensely complex beast, and if there were easy policy answers they would have been globally implemented. Instead, we live with complexity. But in that complexity, one thing should be clear – a university intertwined in the business DNA of a region is indispensable to any growth strategy, and we need practical and policy focus on maximising it.

***David Docherty is Chief Executive of the Council For Industry and Higher Education, and Chairman of the Digital Television Group, which is the industry body for digital television in the UK.***



# Creating and diffusing research-led innovation

Universities drive new growth areas within the economy. As part of a global knowledge network, universities generate, translate and diffuse research-led innovation. By exchanging knowledge with business and enterprise, universities also support its adoption and exploitation.

# Placing universities at the heart of our innovation system

**Will Hutton, Chair of the Big Innovation Centre**

Today the UK economy faces unprecedented economic challenges and real risks to its prosperity. We have committed to a sharp retrenchment in public spending at a time of high unemployment, sluggish domestic growth and an alarmingly unstable global economy. The UK can only weather these storms if it continues to develop innovative new products and services that are valued internationally.

**Over the next three years the Big Innovation Centre will be working with universities, businesses and policy makers to consider how we can build a system in which all areas of our diverse university system can flourish.**

The 21st century will witness more transformative innovation than the last five centuries put together – such is the pace of scientific and technological advance. We need to

find ways to create value from this change. If we want to maintain our prosperity and living standards, doing the same as we have in the past simply won't be enough. The UK has worked hard to establish itself as a knowledge economy – our economic growth is now driven by activities which create value from exploiting knowledge rather than physical assets or manual labour. We have developed many world class knowledge enterprises and leading research institutions. But, we know that true value in a knowledge economy only comes from innovation – we cannot compete on price, low-wage labour, or physical assets. So we need to invest in knowledge and compete by inventing and innovating new products, processes and services which will be adopted by global consumers and global businesses.

This presents a real challenge. We understand too little; not just about the innovation processes, but the ecosystem of people, businesses and institutions in which risks are taken and innovation prospers. With the stakes so high and no available resources to gamble on speculative projects, this ignorant position has

become untenable. The Big Innovation Centre wants to put this right.

The Big Innovation Centre is a major new initiative to understand how the UK innovates. Led by business, it is drawing in the best from the university and research world to become a unique British-based network for the promotion of innovation and investment. The Centre seeks to understand how UK institutions support and develop this ecosystem. As you might expect, we view universities as a pivotal institutional block for our new economy. In common with all knowledge generating institutions, not all of their impacts can be fully quantified but it is clear that they play a number of special roles within our economy.

The number of graduates we produce each year has increased dramatically in recent years, keeping pace with the growing demand for these skills in the economy. Any further growth in our economy will create an urgent need to expand our graduate workforce. A degree teaches how to assimilate, analyse, synthesise and

communicate complex information. These are vital skills for anyone who is trying to do something different or new. A key strand of work at the Big Innovation Centre will be to better understand this notion of skills for innovation – what capacities do individuals need to create or to apply new knowledge? What mix of skills do innovators need? And how can these be best delivered?

Our universities have also embraced their role as producers of new knowledge and their position as key links to global innovation networks is well understood. Great successes have been achieved in knowledge transfer. Any business which takes in sandwich year placements or sponsors MBA students will testify that learning in academic environments is invaluable for bringing new ideas and knowledge into their businesses. But, barriers and confusion about how best to engage in the wider economy still remain. The challenge for higher education institutions must be to maintain their world class position while strengthening these relationships.

Looking to the future, our universities will be more important than ever. It is simply inconceivable that the UK economy could develop a world class innovation ecosystem by 2025 without universities fulfilling

and developing in their role as true interactive partners in our economy. Our universities must play a role in helping to rebalance our economy away from its unhealthy dependence on debt. Their role will be even more significant in less prosperous parts of the UK. In many of these locations, universities are the only credible knowledge-based institution on which lasting economic growth can be built. This means that our universities can't risk resting on past success, or becoming too inward looking.

Research needs to be inspired by the needs of our economy. Results and messages from research need to be communicated directly to businesses. This isn't just about bright research ideas generating a few billion dollar businesses, although we will need a few of these. Genuine academia-industry relationships must become business as usual across our economy. A small catering company should be totally comfortable asking their local university how to make their products go off less quickly. A struggling online content provider should know how to access the UK's experts on business model research. Productive, flexible relationships of this nature will take major investments and will often take years to develop. Too often academia-industry connections

happen in a fragmented way. We are too reliant on a few self-selected enthusiasts. This quality connection needs to be the institutional norm, not the exception.

Over the next three years the Big Innovation Centre will be working with universities, businesses and policy makers to consider how we can build a system in which all areas of our diverse university system can flourish.

If we can get these types of relationships right and if we can find new ways to fully immerse and embed all of our universities as true interactive partners right at the heart of our innovation system then we will be a long way towards cracking the innovation puzzle. So I find it incredibly encouraging that so many of our brilliant universities are keen to work in partnership with the businesses in the Big Innovation Centre. Working together like this is the only way we can answer these and many other big questions.

***Will Hutton is one of the pre-eminent economics commentators in the country. He is Chair of the Big Innovation Centre which will research and propose practical reforms with the ambition of making the UK a global open innovation hub as part of the urgent task of rebalancing and growing the UK economy.***



# What does it take to make the electric dream a reality?

Suzanne Gray, Project Manager, Mini E

As part of preparing itself for responding to social trends influencing car buying needs and desires in the future, and recognising demands for more sustainable personal mobility, BMW Group has sought to understand how people respond to electric vehicles. The Group has done so in depth, by trialling 612 fully electric MINI Es (the world's largest electric vehicle test fleet) in a number of countries where this type of vehicle is expected to have potential. Whilst BMW Group has been experimenting with electric vehicles for the last forty years, it's only now that so many factors have converged to both require and stimulate a potential market for these cars.

**The multi-disciplinary offering that a university could bring to the table was a more diverse and holistic one than the commercial sector alone can typically produce.**

The UK is seen as a likely leading market for low carbon vehicles thanks to the series of initiatives and measures put in place by the UK Government, the Mayor of London and the responsible authorities in a number of other cities and regions. Great emphasis has therefore been placed by BMW Group on UK input to shape the design for electric cars, new services related to them and the support framework to make them a genuinely attractive proposition for consumers and companies in order to drive uptake.

Creative thinking from within BMW Group about the biggest change the car industry has seen since its inception needed an important real-world check. How would private and company motorists and fleet managers get on living with a different type of car? What were their preconceptions, their real experiences and their attitudes towards a different style of motoring? Might there be unexpected benefits from having an electric car? What are potential barriers to the uptake of this type of car? What type of support is needed for drivers?

During everyday usage, a MINI E can travel around 100-120 miles on a single charge, depending on driving style and conditions and, of course, offers the typically dynamic performance for which the MINI is famous. It can sprint from 0-62mph in just 8.5 seconds and has an electronically-limited top speed of 95mph. These characteristics made this test vehicle an ideal candidate to give people a taste of just how far electric vehicles have come.

For such an important task, BMW Group sought a research partner who could complement interpretation of behavioural metrics and engineering data with strong psychological analysis. The multi-disciplinary offering that a university could bring to the table was a more diverse and holistic one than the commercial sector alone can typically produce. The combined strengths of Oxford Brookes University's Sustainable Vehicle Engineering Centre (part of the School of Technology) and of its School of Psychology led to its selection. In particular methodological expertise in research construction, selection,

delivery and analysis, as well as proven competence in the psychological interpretation of data were seen as key contributory areas of expertise.

With a field trial lasting from December 2009 to March 2011 which saw 40 MINI Es being used on UK roads, the University team and its appointed researchers have delivered very successfully on their promise and the approach they took to studying users has been rightly recognised as a benchmark. Their particular approach has gone on to form the basis for studying electric vehicle drivers across all eight of the UK trials supported by the Technology Strategy Board, of which the MINI E UK trial was one.

**The international inter-university introductions and collaborations through the global trials programme have led to a network of learning and broader interpretation.**

It was of great benefit to have these two very different schools working together to provide a holistic perspective across a range of

analysis and business modelling activities. It brought a richness of understanding that otherwise might not have been possible. University partners have also featured in BMW Group's US and German trials, as well as ongoing ones in France, China and Japan. The international inter-university introductions and collaborations through the global trials programme have led to a network of learning and broader interpretation. Oxford Brookes have additionally forged valuable new links with one of China's leading technical universities. In terms of credibility with government stakeholders and policy-makers, academia scores highly and its recommendations are taken seriously. Since it will take a concerted international effort on the part of many different stakeholders to encourage people and companies to be open to a new approach to motoring, as well as a supportive policy framework that is supportive, academia has a very important role to play in influencing thinking and education on this topic. Without a market for electrified vehicles, stringent passenger car emission reduction targets and ambitions cannot be met.

## The project

The MINI E UK Research Consortium, of which BMW Group was the lead partner, comprised

several organisations based around Oxford and the South-East of England. All played important roles in the collaborative field trial. In addition to the BMW Group, the consortium included Scottish and Southern Energy, which supplied both the electricity and the electrical infrastructure, Oxford Brookes University and the South East England Development Agency (SEEDA) as well as Oxford City Council and Oxfordshire County Council. The MINI E UK trial was one of the first of the Technology Strategy Board's Ultra Low Carbon Vehicle Demonstrator Programmes.

During the UK trial, the MINI E was tested on British roads by around 100 private, corporate and public sector drivers – all of whom gave valuable feedback to the project consortium and UK Government. Between them they covered in excess of 250,000 miles over the duration of the trial. The findings are being used to develop the engineering and infrastructure support for the future large-volume production and deployment of electric vehicles and have helped to establish the social and economic issues around running an electric car.

**Suzanne Gray is General Manager of Project I UK at BMW Group UK Ltd and lead on the Mini E project.**

# Turning pioneering ideas and technologies into commercial success

**Phil Cooper, Managing Director, Venture Wales**

Universities in Wales face unprecedented change and uncertainty; struggling with spending cuts, pressure for tuition fee hikes and, in some cases, political demands to surrender their independence and merge with neighbouring institutions. Although uncomfortable in the short term, these circumstances do present opportunities as well as challenges. They underline the need for even more engagement with the wider economy, as institutions strive for greater financial sustainability.

Higher Education in Wales has long been recognised for its contribution to local economies. But the key question remains whether the sector is fulfilling its true wealth creation potential and how much more could it achieve?

It is widely accepted that knowledge-based businesses are an important determinant of economic growth and renewal. And universities, without doubt, have an important part to play in maximising the presence of such businesses in any local or regional economy. Their role in spawning spin-out technology-led enterprises is well

documented. But perhaps of even greater significance is their role in producing the graduate entrepreneurs responsible for good quality business start-ups in general.

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**Clearly universities can make their greatest economic contribution when their graduates or staff are turning pioneering ideas and technologies, developed on campus, into commercial successes in the market place. This could be happening more than it is at present.**

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To illustrate this; Wales' overall business birth rate equates to only 79% of the British average but, surprisingly, we have a larger proportion of high-growth start-ups than the rest of the UK. Almost every study shows that graduates make up a disproportionately high number of new firm founders here,

and the number is increasing.

Wales, which accounts for 5% of UK higher education, generated 10% of all UK graduate-led business start-ups and more than 12% of estimated turnover for all UK graduate start-up firms in 2008-9 - around £16.5m. The 2009/10 figures confirm these earlier trends.

This is welcome, and probably reflects the growing focus on enterprise awareness and skills within Welsh universities. In fact almost a quarter of all graduates who take enterprise advice actually go on to launch a new venture, and the business survival rates past the three year milestone are impressive.

However, research suggests many graduate entrepreneurs, although successful and innovative, don't base their enterprises on their degree qualifications. This may reflect the limited possibilities for more sophisticated businesses in the contemporary Welsh economy or the need for more support from the universities to help them get off the ground.

Clearly universities can make their greatest economic contribution

when their graduates or staff are turning pioneering ideas and technologies, developed on campus, into commercial successes in the market place. This could be happening more than it is at present.

One prominent venture capitalist recently admitted that there is wealth of good ideas, research and intellectual property stored in Welsh higher educational institutions but they were often left rotting on the vine rather than being converted into commercial propositions. Successfully commercialising these ideas is vital both for increasing income to universities themselves and for making a substantial contribution to economic growth and job creation.

The number of businesses spun out directly from Welsh universities are actually increasing, but the total remains very small - just 4% of all new such businesses. However, their true importance lies in the high-value activity at the heart of the business concerned. All of these spin-outs were established to exploit Intellectual Property (IP) and were wholly or partly-owned by the universities.

Interestingly, the number of graduate-founded businesses based on exploiting IP but outside universities fell by 60%, although the numbers are very small. This

difference suggests that the internal university support is important in driving the numbers of graduate-founded IP-based businesses.

On the other hand, the number of new IP-based businesses started by university staff, outside their institutions, increased by a third. However, yet again, the numbers are small. This indicates appropriate support may be lacking within the universities, and engagement with private sector start-up support agencies is not strong enough.

One area where Welsh universities are unfortunately under-performing is in their working relationships with small companies, which make up 99% of all enterprises and half of all private sector employment in Wales. Such companies often have ideas that could be enhanced or accelerated to market with university help. Sadly many regard HE as aloof and bureaucratic so they stay away and miss the opportunity. This lack of engagement certainly needs to be addressed.

Overall, the business support network in Wales is substantial, but it needs to be integrated more with the universities if full potential is to be realised. Welsh universities do tend to be more "enterprise aware" these days. All have successfully accessed Government and

European funds, combined in some cases with commercial sponsorship, to develop new ideas. In addition all take part in the Welsh Government's successful Graduate Start-Up Support Programme, which benefits from the assistance of private sector advisory services. Other initiatives, such as the Prince of Wales Innovation Scholarship, although new, are also helping develop IP-based businesses.

The fragile economy may pose many challenges to early-stage firms but it also provides an excellent stimulus for public and private sectors to work closer together to harness this resource, leading to a more robust economy with a stronger base of indigenous enterprises.

To achieve this we need to remove silos and forge greater links between skills and employment, between education and economic development and between knowledge and wealth creation. We have many areas of strength and good practice in different parts of the country's HE sector. This needs to become the norm everywhere.

***Phil Cooper is Managing Director of Venture Wales, the largest business start-up and support company in Wales.***

# Enabling innovation to flourish

**Dr Graham Spittle, Chief Technology Officer and Vice President, IBM Software Group Europe**

The role of universities in the developing economies is seen as pivotal in providing a basis for economic growth. The same is true for the mature economies who are seeking to gain economic momentum in a challenging environment. When we look at universities in the UK we must do so in their wider global context to understand the challenges and also the key role they could provide in becoming economic integration points as well as places of learning.

The financial crisis of the late 2000s, which was triggered by a liquidity shortfall in the United States banking system in 2008, brought sharply into relief what many observers had begun to suspect: that we were seeing the breakdown of the old order and its systems and processes, coupled with a global shift in power. This in turn led to a rethinking of how institutions and Governments should work, the way jobs could be created or sustained and the changing nature of society.

In the private sector this placed great strain on many businesses worldwide and indeed, many did not survive. Those that did however

had undertaken a root and branch examination of their structure and processes and refocused around their core business and reengineered accordingly. Most businesses chose to focus on skill and agility to address a market that values speed and real sustainable value.

In the public sector, governments struggled and continue to struggle with the massive structural debt, high unemployment and the urgent need to restructure processes and public services. The first natural reaction was a programme to address the deficit and raise taxes. Then the key question became how do you create wealth again by stimulating growth? Two types of response have emerged. The first being targeted expenditure to stimulate key industries or infrastructure projects and the second being a longer term focus on skills and innovation.

So if we focus on the UK, where should we look for innovation? The three traditional sources are universities, private sector companies and individual entrepreneurs. I would contend that we need all three and we need far

greater mobility between all three sources as we seek to compete in a more competitive world. We need to achieve integration that provides new ideas and a new speed to market for goods and services.

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**When we look at universities in the UK we must do so in their wider global context to understand the challenges and also the key role they could provide in becoming economic integration points as well as places of learning.**

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If we focus on just one of these, universities, we are endowed with an excellent platform here in the UK. Our universities have an enviable reputation for excellence and innovation, consistently "punching above their weight" in global league tables of citations and publications. Whilst they have long been recognized as a source of innovation and creative thought,

universities have not been leveraged sufficiently to drive economic change in the economy. They sit in a unique place in both the public and private sectors and are well placed to engage and stimulate both. They also have a very strong regional significance and are often the major employer in an area and a powerful force for the mobility of labour. With their teaching and research staff, universities attract skills from all over the world and increasingly, the same is true of the students. Yet somehow we just accept this and fail to exploit this concentration of skill for the longer term. We should consider how to anchor as well as attract this top talent. We need to foster the integration capabilities of universities that have always brought people together to learn and to research. Why should it not be the same to build businesses and drive economic growth? Not just as a byproduct or a spin-out but part of the fundamental ethos, attracting funding and skills accordingly.

Historically this has been seen as the failure of the UK; with a need identified to further exploit our inventive capability in commercial terms and create wealth through innovation. Indeed this was one of the driving forces behind the creation of the Technology Strategy Board (TSB); to harness the great ideas and technologies that are produced and "priming the pump" with funds to

stimulate the commercial development of ideas or very early stage prototypes. During its short existence, the TSB has created many thousands of jobs and facilitated the start up of businesses and the development of others. Clearly fulfilling a need. This model being further developed with the creation of the newly formed Technology Innovation Centers or TICs.

There is widespread agreement on the conditions/activities that are necessary for innovation to flourish such as, the sharing and dissemination of knowledge, allowing and promoting free movement between industry and university, investing and trusting in people and skills, and a supportive fiscal environment. So what then is missing and how should we address it?

Fundamentally we have all the pieces of the puzzle but we continue to avoid putting them together and creating the fluid exchange that is needed between public and private sectors, regions and countries, industry and academia and enabling this continual linkage rather than individual actions. We must seek to value each other's contribution rather than defend our own. Until this behavior becomes second nature we must incent this interaction. Hence tax incentives for business to work with universities may change

behaviour, as would rewarding and recognising academics who work with industry in the same manner as publishing a paper. A tax regime that stimulates the creation of jobs and that encourages individuals to remain in the UK. Linking together existing economic incentives to add focus around high value sustainable activities. Making explicit use of universities as regional hubs to catalyse local economies as well as drive national growth.

This continued interchange between institutions and individuals must be accelerated if we are to increase the tempo of our economy and use the resources at our disposal. We must also learn that creating the conditions for innovation is not the same as funding R&D. Both are needed but are quite different in nature. We must seek ways to find new markets and products.

The universities have a unique opportunity to embrace the new world in which they find themselves but at the same time become powerful integrating forces for economic growth both regionally and nationally.

***Graham Spittle is the Chief Technology Officer and Vice President, IBM Software Group Europe. He is also Chair of the Technology Strategy Board Governing Board.***





# Knowledge workforce

A graduate contributes between 20 and 48 per cent greater productivity to the labour market over employees holding lesser qualifications. Together with investment in innovation and research, high-level skills are of crucial importance to productivity growth, particularly in a developed economy.

# India: a nation built on geeky graduates

Angela Saini, Award winning science journalist and author

I was a teenager when I heard a BBC reporter on the radio ask a poor child on the streets of a big Indian city – it could have been Delhi, or perhaps Mumbai – what he dreamed of becoming when he was older. He replied, without hesitation, that he wanted to go to university and make a life for himself as an engineer. At the time, India's science and technology industries were just taking off and after decades of graduate unemployment, there were finally coveted jobs available in shiny new office blocks and laboratories.

But the sad truth is that his dream most probably remained a dream. Nearly half a million students sit India's national engineering college entrance exams every year. Teenagers spend evenings and weekends revising, with many coached by private tutors in their spare time too. But places in the prestigious higher education institutes are so scarce that barely 10,000 make it through annually. This acceptance ratio is even thinner than those at Oxford and Harvard, and it breaks the hearts of many of those who don't achieve

their dream. Suicide rates amongst students shoot up around exam results time. Becoming an engineer in India is almost as tough as becoming a rock star.

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**A population hungry for new skills and new business feeds a cycle of constant development, and it's a cycle that's acknowledged to begin in a lecture theatre.**  
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By contrast, for me back at school in London, it seemed so straightforward. There were dozens of universities and colleges offering engineering courses nearby, and the education and grades I needed to get admitted weren't much of a barrier. I got my engineering degree. But I never really forgot the sound of that child's voice.

Travelling around India last year while writing my first book, *Geek Nation: How Indian Science is Taking Over the World*, I realised just how much we in Britain take our

universities for granted. In India, the government is desperately trying to meet the surging demand for more university places. At the moment, around 600,000 engineering and just below 700,000 science and maths graduates are produced every year, and they're recognised as the linchpins of the country's economic success.

The booming software industry based in the IT parks of Bangalore and Hyderabad – set to be worth more than £7 billion by 2015 – is peppered with graduates of the prestigious Indian Institutes of Technology. The burgeoning design industries of Bombay and Delhi, where much of the world's animation and movie special effects are done, rely on top-notch, creative university graduates as well. New laboratories are opening so fast that universities can't keep up with the demand for fresh researchers. A few years ago saw the opening of the nation's first space institute, dedicated to training up the rocket scientists and astronauts of the future.

These colleges and universities are cauldrons for fresh ideas as well as

talent, and the Indian government has been quick to appreciate their economic value. And with its ambition to become a scientific superpower, these institutions are feeding the growth in research and development that India needs. Industrialised countries generally spend around 2% of their GDP on scientific research and development. India spends only 0.8% now, putting it in the same league as developing nations like South Africa and Brazil. But in the near future it hopes to ramp this up to 1.2%, and in the longer term is determined to reach 2%. Neighbouring China has already reached the 1.5% mark. Meanwhile the UK, which spends around 1.8%, is freezing its science budget in cash terms for the next four years, equating to a fall in real terms. And this means that both India's and China's trajectories could one day see them both beat Britain in research investment.

India's focus on education, science and technology is reflected in its GDP growth rate, which has hovered around eight per cent for the last few years, dipping only slightly when the global recession hit after 2008. Hundreds of thousands of skilled jobs are being created. A population hungry for new skills and new business feeds a cycle of constant development, and

it's a cycle that's acknowledged to begin in a lecture theatre.

India's problem is getting enough students educated fast enough. At the moment, a little more than 12 per cent of eligible students make it to university in India, but the government hopes to raise that to 30 per cent in the next decade. This would mean setting up at least 800 new universities. Funding has already been ramped up to meet this goal – the budget for higher education in India's current five-year plan is nine times higher than in the preceding five years. And across the border in China, it's a similar story.

Demand is so high that foreign universities are setting up campuses in both countries. Lancaster University already has links to a private institute near Delhi, and among universities in the US that have shown an interest in setting up collaborations in India are Georgia Tech, Carnegie Mellon and Brown. On top of this, thousands of Indian and Chinese students go overseas every year to study at universities in the West. According to the Institute of International Education, more than 440,000 Chinese are studying abroad – the largest group, with Indians a close second.

In a science-led economy, universities are critical to producing

fundamental research and technology transfer. This is why the famous Indian Institutes of Technology have begun to encourage more students to stay back to do PhDs, and are linking up with industry so that students can work on solutions to specific design problems.

One example I quoted in my book *Geek Nation* was that of the bread maker, Harvest Gold, which ran a competition asking students to come up with a sturdier and more reliable crate to transport their loaves. Hundreds of young, eager engineers sent in their designs.

"The culture is shifting," one Indian Institute of Technology student told me, after sending in his crate design and being awarded a prestigious third place prize. Unlike the child I'd heard on the radio decades before, he told me that India was now a promising place for young scientists and engineers like him. "It's about what people want. It's not easy but if they really want it, now they can get it," he said.

**Angela Saini is an award-winning British science journalist and the author of *Geek Nation: How Indian Science is Taking Over the World* (Hodder, 2011).**

# Reinvigorating the city through knowledge and talent: Greater Manchester's universities

**Mike Emmerich, Chief Executive, New Economy**

In the wake of the most severe recession in living memory, there is an urgent need to reinvigorate the economy and create the conditions for sustainable economic growth. In Manchester, the role of our world-class higher education institutions will be absolutely vital; with skills, innovation, investment and research-driven entrepreneurialism central to creating a more dynamic, balanced and resilient economy in the long-term.

Greater Manchester's universities – The University of Bolton, The University of Manchester, The University of Salford, Manchester Metropolitan University, Royal Northern College of Music, and University Campus Oldham (part of the University of Huddersfield) – constitute a major economic sector in their own right. The universities directly employ around 20,000 staff, generate a combined income of over £1.4 billion per year and an expenditure of £2.5 billion, and have plans to spend over £1 billion on their campuses and estates over the next three years. In addition, museums, exhibitions and events operated by these universities

attracted over 884,000 attendees in 2009/10, and generated numerous student volunteer and leadership programmes. Perhaps the greatest impact of the universities, however, comes from the talented individuals they attract to Manchester and the knowledge that they develop, refine and spread across the world.

## Attracting and retaining talent

The decline of the industrial city has put a premium on highly-skilled individuals to generate economic growth. Manchester's universities are perhaps the city's greatest asset in attracting fresh talent. Over 125,000 people apply to Manchester's universities each year and the total student population exceeds 100,000. These students have a huge impact on the city, culturally and economically. In terms of direct spend alone they contribute £1 billion to the city each year and they fuel much of the city's cultural offer. More importantly though, coming to study in Manchester is many young people's first experience of the city and it can often lead to a lifelong connection that benefits the city and the individual.

Manchester's student population also helps to provide the city with a truly international feel. Each year, over 11,000 students come to study in Manchester from outside the European Union, making higher education one of Manchester's biggest export sectors (foreign students inject almost £700 million into the region's economy each year). Once they have graduated these gifted individuals directly benefit those companies in Manchester and the UK that need to access high-level skills. They help build a knowledge economy and stimulate the promotion of Greater Manchester as a trading destination through their international connections.

Manchester's universities are also critical in the city's drive to attract professionals from an international elite. To take just two examples, in the early 20th Century, New Zealand-born Ernest Rutherford undertook his most important work in Manchester – splitting the atom for the very first time - having moved here aged 37. More recently, Russian-émigrés Andre Geim and Konstantin Novoselov won the 2010 Nobel prize

in physics for their discovery of the one-atom thick material Graphene, at the University of Manchester.

## Creating and spreading knowledge

Universities are more than just a collection of students and academics; they enable knowledge exchange and innovation across various sectors. Independent research in Greater Manchester has highlighted the important role of its universities that goes beyond the conventional thinking about spinoffs from university research. Research from Volterra Consulting (MIER, 2009) concluded that, beyond spinoffs and the commercialisation of research, the universities play a critical role as important social institutions where ideas can be exchanged freely – with the city's universities “acting as a bridge connecting parts of the [local] community and enhancing the region's capacity to innovate.”

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**The universities directly employ around 20,000 staff, generate a combined income of over £1.4 billion per year and an expenditure of £2.5 billion.**

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In this respect, university research that is carried out locally plays a vitally important role in the development of the human capital that businesses need for success – a process often referred to as “knowledge transfer”. Research-led teaching equips graduates with the personal and professional skills that employers need. Postgraduates in particular provide businesses with a highly-skilled labour force trained in the latest research developments and techniques, able to think creatively and solve complex problems. Furthermore, many businesses directly access the research expertise of universities through working with academics, accessing education and training, or partnering with the universities on major investment projects.

However, the direct role of spinoffs and commercialisation should not be underestimated. In 2009/10, £32 million of collaborative research linking public funding and business was carried out by Greater Manchester universities, whilst a further £58 million of contract research was undertaken with organisations including SMEs and larger businesses.

As at 2010, over 292 active patents were held across the three City universities and 61 graduate start-up companies were recorded in that year. A further 16 spinoff

companies were launched including seven staff start-ups.

## Maximising the universities' impact

Greater Manchester's universities have historically played a vital role in the local and national economy. Going forward, these universities will have an increasingly important role to play in sustaining economic recovery, by attracting the best talent and supporting the development of the city's knowledge-based economy. By working together – through bodies such as Greater Manchester's Local Enterprise Partnership – Manchester's universities, businesses and public authorities can realise mutually-reinforcing economic growth, private sector investment, innovation and entrepreneurialism to ensure the long-term prosperity of the city.

***Mike Emmerich is Chief Executive of New Economy. New Economy's purpose is to create economic growth and prosperity for Greater Manchester and lead on economic development for the Manchester City Region on behalf of the Association of Greater Manchester Authorities.***



# Little to lose and much to gain

**Sam Laidlaw, Chief Executive, Centrica**

The UK's higher education sector is world class. Four of the UK's universities rank in the top ten worldwide and fourteen rank in the top one hundred. Equally significantly, the depth of universities across Britain provides broad regional economic benefits and breadth of teaching and research capabilities that are essential to our economic competitiveness.

This capacity provides two important advantages: firstly, the creation of a highly skilled workforce and secondly, the development of new ideas, products and services from research. To ensure that these economic benefits are realised, it is essential that higher education and research are attuned to societal and business needs. Finding a way of improving collaboration between higher education and business will be fundamental for our collective success. Such collaboration will not only be a key factor in creating a sustainable higher education system but it will also be critical in securing the UK's economic recovery.

Turning first to the role of education

and training, our success in the global economy will increasingly depend on our ability to further develop high value-add sectors such as professional services, engineering and manufacturing. These sectors are reliant on a highly skilled workforce with advanced graduate level skills.

## **Business, therefore, has three key priorities for higher education:**

- raising the number and quality of students with skills in Science, Technology, Engineering and Mathematics (STEM), which are increasingly important to UK businesses
- Raising employability skills of graduates, enabling students to deliver the full potential of their academic learning on entering the business environment
- engaging more actively with universities by offering work experience and internship opportunities and committing time to participate in degree programme advisory boards.

At Centrica, we have invested significantly in raising the number

and competencies of the young people we bring into our business from universities. Our graduate programme has doubled in size to 75 students and to assist graduates in developing the employability skills they need for successful careers, we now run a summer internship programme for up to 75 undergraduates each year. We are also trialing a similar initiative to provide business students with work experience opportunities and sponsoring engineering students as they complete their undergraduate degrees.

## **The world is changing, becoming more complex and interconnected and the frontiers of knowledge are moving ever further from obvious practical application.**

Turning to technology and innovation, university research has long been a source of new ideas,

products and services that have been commercialised by business. But the world is changing, becoming more complex and interconnected and the frontiers of knowledge are moving ever further from obvious practical application. In this environment, there is an increasing need for academia and business to work closely together to ensure that the benefits of the investment in research are optimised. There will, of course, always be a place for pure research, but effective partnership between universities and business will ensure that the UK economy gets the best possible return on the investment in university research.

While big business may in some cases be well positioned to commercialise ideas generated from research, as is the case for example in the pharmaceutical industry, it is often small and medium enterprises (SMEs) who provide the bridge between the prototype and mass market. SMEs also form an important part of regional employment. It is therefore essential to create an environment that makes engagement with academic institutions simpler, particularly for organisations such as SMEs who often find it difficult to tap into the resources universities have to offer; whether this is accessing research and innovation,

delivery of workforce training or accessing students themselves. At Centrica, we continue to seek opportunities to work collaboratively with university research groups. We are currently working with a number of universities on energy research projects ranging from conventional power generation through to smart grid technologies giving Centrica access to the latest thinking and innovations as well as providing post graduate students with real life research challenges.

## **Effective partnership between universities and business will ensure that the UK economy gets the best possible return on the investment in university research.**

There is still much more we could collectively be doing. Business can do more to develop the skills they value by providing opportunities for work experience to students. University services and research can become more accessible to local companies, creating the essential link between SMEs and research labs as well as with big business.

Most crucially, we must recognise that there is little to lose and much to gain from closer ties between business and academia. This will enable both to thrive and for the higher education sector to remain as pivotal to the UK's prosperity in this century as it was in the last.

***Sam Laidlaw is CEO of Centrica, the British natural gas and electricity company. He also chaired the CBI Higher Education Taskforce which published its report in 2009 on business-university collaboration.***

# Empowering the regional economy through technology education

Nick Wilson, Managing Director, Hewlett Packard UK and Ireland

Education in science, technology, engineering, and mathematics (STEM) is crucial to the development of students and economic opportunities in the UK. As a nation, we struggle to keep our young people interested in science, technology and mathematics and these subjects are absolutely vital for growing innovation and economic opportunities in the UK.

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**We believe that universities can use their relationship with local communities and businesses, teamed with the new technologies that they have at their disposal, to lead economic growth.**

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When young people finish their GCSEs, nearly half opt out of studying STEM subjects. This is having a dramatic effect in the employment market as only 5.3% of all working women are employed in STEM occupations, compared to 31.3% of men. In the recent UK

Graduates Career Survey 2011, just 3.9% of final year students applied for IT-related positions.

HP recognises the importance of technology education to businesses. Technology education will help develop students of all ages with the necessary and relevant skills for roles in the IT, science and engineering industries. For many years, HP has worked with the higher education sector to provide the highest quality recruits for its own growth, innovation and business success.

We believe we are in a unique position to provide a balanced view, both as a global business with a strong requirement for good quality graduates and also as a strategic partner to a number of universities.

## Courses – relevant to business needs

Businesses are increasingly looking for highly skilled graduates who can make a real difference and hit the ground running. University courses should be designed so that they are relevant to tomorrow's business needs. This will enable graduates to develop the right skills before

entering the workplace. Too many technology degrees fail both graduates and employers in that employment rates among IT graduates are some of the poorest despite the skills shortages in these areas.

Our partnership with the University of the West of England (UWE) has resulted in the development of a four year enterprise computing degree course that contains course collateral from both UWE and HP. During the course students undertake a one year internship with HP gaining real life business and technology experience. At the end of the degree course, students will gain industry recognised professional qualification, providing them with an excellent career starting point and making them highly sought after by prospective employers.

## Gateway to higher and further education

There are many social groups under-represented within higher education and further education either through low aspiration, lack of opportunity or lack of a 'personal support network'. This is a pool of

great potential talent that could be harnessed for regional businesses to drive economic growth. Universities need to have a widening participation agenda that reaches out to regional communities to encourage members of these groups into the education system.

An example of one recent UWE initiative involved the crew of Space Shuttle Mission STS-133 delivering a presentation to hundreds of school pupils in Bristol. The event was aimed to inspire young secondary school pupils to consider studying STEM subjects, but more importantly to explain there is no limit to what they can achieve.

## Making a difference

Getting involved in local community programmes run by universities in partnership with IT companies can deliver huge benefits to the quality of life for people at a local, national and international level. Interestingly, these social innovation programmes provide other benefits too. University student volunteers gain additional skills and experience, which is often seen as a positive differentiator when applying for employment. Industry partners supplying resources such as staff delivering courses at local universities notice enhanced employee engagement within their own company. HP is one example where staff dedicate their time to

teaching courses at local universities. The success of these social innovation activities enhances the standing and status of the university within the community. Universities together with technology partners have the potential to bring some very compelling local initiatives into these communities and can make a considerable impact, especially in the areas of education and healthcare.

## Supporting regional business

We believe that universities can use their relationships with local communities and businesses, teamed with the new technologies that they have at their disposal, to lead regional economic growth. With this universities and companies with a global presence such as HP can help regional small and medium-sized enterprises (SMEs) to operate in the global market.

Universities are increasingly becoming the cradle of much new business creation as they encourage spin-off businesses through their incubator operations. Technology plays an important part in this process and the latest evolutions of networking, communications and converged infrastructure make it possible for universities to offer their incubators high levels of individual technology

services to get their business off the ground. Regional start-up or pre-start-up business entrepreneurs are not only provided with the latest technology but also office accommodation, hands-on advice and guidance, together with professional mentoring.

Through innovation and collaboration between universities and IT partners, cloud computing solutions can be deployed to regional SMEs providing the type of service and solutions that until recently were only available to larger organisations. This is an initiative that we are currently exploring with UWE by providing enterprise level IT capability to some 350 SMEs in the South West.

We believe that universities can play a leadership role in building new regional economic models that can enable the UK to rebalance its economy and return to a track of sustainable growth. Our aim is to be at the centre of this regeneration and see partnerships with universities as a key part of this strategy.

**Nick Wilson is Managing Director of Hewlett Packard (UK&I) leading the UK and Ireland operations of the world's largest technology company.**



# Attracting inward investment

Universities are international organisations, operating across hundreds of countries and forming partnerships with global business. As one of the UK's major export industries, universities have the capacity to leverage investment for the benefit of the regional economy.



# Universities and the five drivers of productivity

Ed Cox, Director, IPPR North

Universities are a key resource in closing the productivity gap between the North and South of England and facilitating the growth of the Northern regions as they act on each of the five drivers of productivity – investment, innovation, skills, enterprise and competition.

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**IPPR North's Northern Economic Futures Commission is considering ways in which the Northern regions and LEPs can further exploit their university assets to drive productivity.**

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Universities encourage investment by providing the potential for high-value added business activity and the availability of highly skilled workers; evidence published by the OECD suggests that investment in universities is more effective in generating research-intensive foreign direct investment than offering financial incentives to

foreign investors. Numerous examples can be found of firms that cite universities as their reason for investing in the Northern regions, especially where Science Parks are located.

Universities are important innovation assets, as the nature of academic research is to challenge and improve on current ways of thinking and doing. The university environment is one of constant innovation and a resource for local businesses to tap into through formal (e.g. consultancy work) and informal means (e.g. spillover effects). Indeed, the UK government's own research has found that those firms that engage with universities show higher market share, better product quality and a greater product range. For example, universities in the North East are heavily involved in innovation in the region's automotive production industry; Newcastle University is working with private sector partners to develop more efficient electric cars and the University of Sunderland has specialised in working with domestic and foreign firms to

develop hydrogen fuel cell prototypes.

Universities are the main providers of higher level skills training and therefore act to attract and retain skilled workers within local economies, providing the potential for areas to diversify their economic base and facilitate the creation and location of high value added firms. Research has also found that universities tend to increase the demand for highly skilled workers in the local economy beyond the direct effect of those employed by the university. Universities play a crucial role in upskilling the local population and increasing social mobility. An interesting example is the University of Cumbria, which is at the forefront of innovative ways of delivering learning over a wide geographic area via learning centres and online resources, providing easy access for local people to increase their skills.

Universities are becoming increasingly important in the creation of new enterprise through the commercialisation of academic research, the formation of firms exploiting the expertise of

university staff and new graduates getting involved in start-ups. Recognising the potential of students and graduates in driving local business growth, the Liverpool John Moores University's Enterprise fellowship programme provides business support for graduate start-ups in Merseyside. This year Liverpool City Council have launched a sponsorship scheme to fund 30 places on the programme which seeks to create additional businesses in the city, especially in the digital and knowledge-based industries.

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**Firms that engage with universities show higher market share, better product quality and a greater product range.**

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Taking the above together, universities help to lower the costs of production and encourage new entry into markets leading to greater competition between firms.

It is welcome that university representation appears integral to most of the recognised Local Enterprise Partnerships (LEPs). IPPR North's Northern Economic Futures Commission is considering

ways in which the Northern regions and LEPs can further exploit their university assets to drive productivity improvements as part of a wider programme of work into the critical issues facing the economy of the North and new approaches to local and regional economic policy.

Recent research by Imperial College London found that the £3.5 billion annual research council funding resulted in a £45 billion annual increase in the output of UK firms. Given how important private sector growth is to the economic recovery and reducing regional disparities, policymakers would be foolish to ignore the centrality of universities to this objective.

***Ed Cox is Director of IPPR North and Deputy Chair of the recently launched Northern Economic Futures Commission. The Commission is aiming to articulate a 10-year strategy for economic growth across the North of England.***

## Higher Education and economic growth – a Scottish perspective

Dr Lena Wilson, Chief Executive of Scottish Enterprise

It may surprise some to know that Scotland is a world leader in higher education. We have the highest concentration of universities in Europe and the highest ratio of research publications per head of population in the world. Almost 225,000 students are registered with Scottish universities – 15% of whom are from outside the UK.

Our universities employ more than 35,000 people and have a combined turnover of more than £2.5 billion – almost half of which is sourced from the private sector and competitively won sources. Export earnings, alone, are estimated to be worth more than £500 million.

**If we are to accelerate economic recovery, we need more companies operating internationally and we need better leaders who can spot these opportunities and are not afraid to go after them.**

The sheer scale of some of these numbers demonstrates the critical role that universities already play in Scotland's economic performance. But we believe they offer even greater potential and are working together to identify how we can capitalise on the research strengths across all of our universities to create even more value for Scotland's economy.

We've seen some of the biggest medical and scientific breakthroughs occur in our universities. This includes some of the more notorious developments such as Dolly, the first cloned sheep, but also less well known breakthroughs such as penicillin, the cervical cancer vaccine and CT and MRI scanners. However, we recognise that it is not enough to just be a nation that produces outstanding research. We want to be known as a country that exploits that research to generate more wealth, more jobs and more investment.

To do that, we need to get better at growing the companies that emerge from the commercialisation of research and develop greater links between our universities and

businesses that will help fuel growth in Scotland's key industries. That includes promoting the capabilities of our universities internationally so they can act as a magnet for attracting new investment from global companies looking to partner in new research or establish a new R&D base. It also includes creating a culture of entrepreneurship within our universities to help spark more spin out companies while at the same time helping our existing company base to access technology being developed in our universities that will help them develop new products or open up new markets.

In Glasgow, we've announced our ambitions to establish the International Technology and Renewable Energy Zone (ITREZ) – a cluster of activity that draws on both the academic expertise and capabilities at the University of Strathclyde alongside the private sector that will establish Glasgow as a powerhouse of green energy developments. The growth of the renewables sector is a top priority of both the Scottish and UK governments. Our universities have

a fundamental role to play in helping us to achieve those ambitions.

**The greatest flow of knowledge from universities to industry is through the recruitment of graduates.**

ITREZ will transform Glasgow city centre and act as a hub for Scotland's research, development and commercialisation activity in renewables. Scottish, UK and international companies will be able to access cutting edge research and some of the best people working within the sector to develop new products that will shape the renewable energy industry of tomorrow.

We recognise that universities can also help to address challenges that have permeated our business base for a number of years and affected overall productivity levels. Specifically, issues around internationalisation and leadership. Both of these areas are hugely important in the current climate. If we are to accelerate economic recovery, we need more companies operating internationally and we need better leaders who can spot

these opportunities and are not afraid to go after them.

The international reputation of Scotland's education sector means that our universities are pushing at an open door in emerging economies like China and India, which have experienced the fastest growth in recent years and offer some of the biggest opportunities for Scottish companies. We're working with our university base to identify how we can make more of these international networks to enable our company base to internationalise and exploit new opportunities in key sectors and attract new inward investment.

Higher education also has a significant role to play in enhancing the leadership capabilities within our companies. The greatest flow of knowledge from universities to industry is through the recruitment of graduates – Scotland's future business leaders. The increasing focus on enterprise skills across undergraduate courses can only enhance this future supply. But today, too many of our companies are underperforming because their leaders can't see their potential or how to improve the way they do business. We need to encourage our business base to be more ambitious, to raise their aspirations.

A number of our universities, including Glasgow Caledonian University and Napier University, already have real strengths in MBA provision and research. We are also working with other universities to explore how we can compete with global business schools and enhance the provision of strategic business leadership.

While all of these activities – developing better links with industry, commercialisation and knowledge transfer, internationalisation and leadership – can support economic growth, they can also transform the performance of individual universities.

The economic environment across the UK is going to remain pretty tough and the higher education sector has its own challenges to deal with, particularly around the public funding environment. However, there's no doubt that universities can continue to play a leading role in the country's economic recovery and, at the same time, identify exciting new opportunities for themselves.

***Lena Wilson is Chief Executive of Scottish Enterprise, working with businesses across Scotland to stimulate economic growth and improve the business environment.***

## Attracting investment in Northern Ireland

**Professor Tony Gallagher**, Pro Vice-Chancellor, Queen's University Belfast

Northern Ireland's two universities, Queen's and the University of Ulster, play a central role in the social, political, cultural and economic life of society. Both universities draw the majority of their students from the local region and many of the leaders in politics, business, professions and the wider community are graduates. Both have an enduring commitment to a mission of service to the region. Central to this is their economic impact. They attract significant levels of foreign direct investment, directly through research contracts and indirectly through the pipeline of innovative and employable graduates. Both universities lever additional funds, above their direct government grant, to generate significant economic activity. And higher education is recognised as central to the creation of a dynamic, innovative economy, the primary focus of the Northern Ireland Executive Programme for Government.

Both universities lever funds additional to their direct grant, with Queen's leveraging an additional £166, and the University of Ulster an

additional £119, for every £100 of direct grant. Furthermore, both generate additional economic activity beyond their core income: from a combined income of almost £500m, Queen's generates an additional £400m and the University of Ulster an additional £275m in economic activity. The two universities directly employ 6,500 people, but generate at least the same again through the multiplier effect, making higher education a major player in supporting and sustaining employment in the region.

In today's challenging economic climate, regions such as Northern Ireland must identify and build on their strengths if they are to emerge from recession as a strong global player. A clear strength of Northern Ireland lies in its people, so we have a commitment to retain and develop that talent and build on its reputation as a region that values and invests in this most important asset, human capital. Indeed, a number of major inward investment announcements have cited Northern Ireland's talent pool and highly skilled graduates as the main reason for investing in the

region. In explaining CitiGroup's decision to invest in Northern Ireland, their CEO stated that it was the quality of graduates and their loyalty to Northern Ireland, which underpinned such a compelling case for investment.

**A number of major inward investment announcements have cited Northern Ireland's talent pool and highly skilled graduates as the main reason for investing in the region.**

Queen's has a long established strategy of fostering an entrepreneurial culture and promoting the successful transformation of good research into good business through innovation and commercial development. The University's venture spin-out company, QUBIS, has generated companies with an annual turnover in excess of £100m and almost 1,000 high value jobs. Despite the economic downturn, QUBIS has

created five new high-tech companies in the last three years. One of the most successful spin-out companies is Andor Technology plc. Andor was set up in 1989 and now employs over 260 people in 16 offices worldwide distributing its products to 10,000 customers in 55 countries and has now surpassed market capitalisation of £100m.

Small and medium sized enterprises (SMEs) in Northern Ireland have benefited considerably from technology transfer. The Knowledge Transfer Unit was established at Queen's in 1993 to provide a focal point for the promotion and support of knowledge transfer activities, in particular to increase the involvement of SMEs with the University, by developing collaborative projects through Knowledge Transfer Partnerships (KTPs). KTPs allow young graduates to be employed by business, but continue to be supervised by academics from the relevant university department, providing a very useful bridge between academic departments and businesses. This facilitates the transfer of expertise from the universities and colleges to the private sector. There are currently 70 KTP programmes in Northern Ireland: 40 are led by Queen's, 17 by the University of Ulster and 13 by the Further Education Colleges.

**In today's challenging economic climate, regions such as Northern Ireland must identify and build on their strengths if they are to emerge from recession as a strong global player.**

The two universities have also developed strong partnerships with larger companies. Queen's, for example, works in partnership with companies such as Bombardier, Wrightbus, FG Wilson, Randox and Almac, all of whom value the University's research strengths and mention them as a key factor in their continued commitment to investment in the province. The current development of the Northern Ireland Advanced Composites Engineering Centre, a collaboration between Queen's, the University of Ulster and Bombardier is a further example.

Research undertaken by the universities has a critical role to play in inward investment. If Northern Ireland is to be successful in attracting and retaining hi-tech, high-value inward investment, then it is essential that a high priority is given to protecting the existing skills base and ensuring that Northern

Ireland has the internationally recognised research infrastructure it needs. Investment follows excellence and companies at the cutting edge want to be located close to centres of excellence.

All of these achievements are built on foundations of academic excellence and a commitment to inspire participation. Queen's and the University of Ulster encourage the brightest and best amongst our young people to stay in Northern Ireland, while seeking to attract the brightest and best from across the world to study and work here. Realising the full benefits of higher education will only be achieved, however, if Northern Ireland maintains levels of investment in higher education and this, unfortunately, is currently under threat.

***Tony Gallagher is Professor of Education and Pro Vice-Chancellor at Queen's University Belfast. He has acted as a consultant for many government departments, non-governmental public bodies and a range of international organisations.***

# Siemens and the University of Lincoln Engineering Hub

**Professor Andrew Atherton, Deputy Vice-Chancellor (Research, Innovation and Enterprise), University of Lincoln**

When the University of Lincoln campus was founded in 1996 with investment from local businesses and authorities, a primary aim was to set up a school of engineering that would work closely with the energy and power generation engineering companies that cluster in and around Lincoln.

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**The new school of engineering was founded in order to develop local capacity to produce industry-ready graduates, provide new opportunities for staff to undertake personal and professional development and to establish world-class expertise in gas combustion and related technologies.**

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At the heart of this cluster is Siemens Industrial Turbomachinery Limited, which has been manufacturing gas turbines for

industrial and corporate clients world-wide from its base in Lincoln for more than 150 years.

Since that time, the university's partnership with Siemens has grown to the extent that in June 2009 a joint submission to the Strategic Development Fund was submitted to support the creation of a new school of engineering; the first purpose built engineering school to be created for more than 20 years.

The new school of engineering was founded in order to develop local capacity to produce industry-ready graduates, provide new opportunities for staff to undertake personal and professional development and to establish world-class expertise in gas combustion and related technologies.

The UK, in common with many of its European partners, can't get enough engineering graduates from engineering degrees. It is estimated that the power industry sector alone will need up to 34,000 new graduates, and 'green engineering' sectors, including wind power, between 50,000 and 70,000.

This helps explain the rationale behind the new engineering school; it will create the engineers of the future.

As such, an initial stimulus for the partnership was the need to identify and attract bright graduates into engineering at a time when enrolments on degrees in this subject were falling and interest in it as a career was waning.

The University of Lincoln worked with Siemens to develop a framework that would attract students to study engineering at Lincoln and provide a means of selecting the strongest for employment in Siemens. Generous scholarships to cover tuition fees, along with a bursary based on academic excellence, paid work during vacations, and work experience as part of the degree were agreed forming the basis of recruitment of the first full-time cohort of undergraduate students in September 2010. Students performing well academically and demonstrating the ability to apply this in the workplace in Siemens will be offered graduate entry jobs on graduation.

To enhance this, the Siemens' product training team, which is co-located with school of engineering staff in a dedicated on-campus building, provide almost 300 hours a year of training in Siemens product technology to students, offering real experience of engineering products and an introduction to Siemens' production and field engineering services. Co-location of the Siemens' training team and academic staff from the school of engineering is also expected to lead to accreditation of some of Siemens' training, personal development of Siemens staff through enrolment on postgraduate taught and research degrees, and mutual understanding and empathy. Siemens' customers will also attend courses in the building, which is joint-branded.

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Part-time provision has also been developed, in partnership, so that Siemens could shape the curriculum content and mode of delivery to its staff development needs, starting with a part-time undergraduate degree that is delivered alongside the full-time degree. Members of Siemens staff now study part-time with full-time undergraduates over a five-year period to receive their degrees.

A postgraduate masters course, the MSc Energy and Renewables, was developed through internal competition within Siemens, reflecting the increasing investment of the company, and other businesses, in renewable energy and energy management.

Demonstrating the power of this embedded and genuine partnership, a wide portfolio of research projects has also been developed. These range from developmental R&D through to commercial research and commercialisation of intellectual property. Commissioned on a project-by-project basis, the research has to make a clear case for a return to Siemens. In order to enhance academic output, a formal intellectual property agreement has been signed and a process for publishing research results in peer-reviewed academic journals and other outlets agreed.

And the effects are being felt further afield. As well as the close collaboration between the University of Lincoln and Siemens, the school has developed close ties with local engineering businesses – undertaking commissioned research, Knowledge Transfer Partnerships, and access to part-time degrees. This has enhanced Siemens' supplier network locally, and builds greater capacity within the engineering, power and energy cluster of businesses located in and around Lincoln.

All this and the school only opened its doors in 2010. The partnership is firmly established but with so much activity underway we can only glimpse at the potential impact for our regional economy and for future generations of engineering students to study at Lincoln.

**Andrew Atherton is Deputy Vice-Chancellor (Research, Innovation & Enterprise) and Professor of Enterprise & Entrepreneurship at the University of Lincoln. He has responsibility for the University's research, enterprise and employability agendas.**



## Facts and figures

Bournemouth University has **more full-time undergraduate** students on a sandwich course than any other English, Welsh or Scottish Universities.

Around **70%** of the University of Bradford's courses are professionally accredited.

The University of Hertfordshire raised over £10M to develop one of the UK's largest bioscience incubation facilities.

A **£12 million Enterprise and Innovation Centre** at the University of Huddersfield will generate jobs and prosperity for the region.

De Montfort University boosts the East Midlands economy by **£31.9m** each year through Knowledge Transfer Partnerships, business services and **start-up businesses**.

The University of Lincoln's business incubation centre, Sparkhouse, has helped over 100 businesses to establish themselves in the region, creating over **200 new jobs**.

Developed with major blue-chip companies, **"WOW"** (World of Work) is a unique program integrated across the curriculum at Liverpool John Moores University.

Northumbria University has **strong links with industry** – 1,500 students are workplace based and 600 employers sponsor university programmes.

With **43%** of Manchester Metropolitan University students from low income backgrounds, it adds **£147m per year** in social value by contributing to social mobility and **improving the quality of life of thousands**.

Since 2001, The Hive at Nottingham Trent University have helped more than **250 start-up companies**, over 70% are still trading today.

Oxford Brookes University is the **eighth largest employer in Oxfordshire** and over £19m of its annual spend goes to local suppliers.

Three out of four **FTSE 100** companies have sponsored staff on Open University courses.

Plymouth University leads the Growth Acceleration and Innovation Network comprising some **£100 million** pounds of innovation assets across the region.

Every year the University of Portsmouth supports over **300** entrepreneurs from the local economy, helping translate ideas into commercial realities.

University of the West of England is leading 1 of 4 prestigious **Knowledge Exchange Hubs** for the Creative Economy tasked with increasing entrepreneurial capacity and research-based knowledge exchange.

The University of Salford soon join the BBC at **MediaCityUK** in Salford Quays, providing vital training for the North West's **£15.8bn** digital and creative sector.

The University of Glamorgan's **£130m** investment programme includes a hospital simulation suite, hydrogen research centre and aerospace centre complete with a real **airliner**.

Sheffield Hallam University's Enterprise Centre has helped 63 students start up their **own companies** since 2008.

Teesside has launched its own knowledge transfer initiative to help **100** North East SMEs improve their business performance through **innovation**.

Aberystwyth University is leading a £20 million **green technology programme** that could boost the green economy in Wales and significantly contribute to combating climate change.

University of Wales, Newport, in partnership with the city council, have transformed a city centre brown field site by investing **£40M** in a new campus.

The University of Wales Institute, Cardiff has worked with **5,000 companies** and brought over **500 new products** to the marketplace over the past ten years.

Glasgow Caledonian has **excellent training** and R&D partnerships with many leading Scottish organisations including Howden and ClydeUnion.

**University Alliance represents 23 major UK universities who work closely with business to deliver world-class research and a high quality student experience.**

**Alliance universities have innovation and enterprise running through everything they do and deliver - the courses they offer; their leading graduate prospects; the impact of their research; how they work with business, the professions and the community; the leading role they play in building regional economies; right down to the way they are run.**

**They are universities without boundaries: delivering economic and social growth through close links with their research, students and staff and the world around them – locally, nationally and internationally.**

