

Specialist

Institutions

with a
Specialism

Research and Innovation Briefing

Introduction

Research and innovation are the beating heart of higher education. They ensure the generation of new knowledge on which the UK's international reputation for excellence rests. Continuous creation and dissemination of this knowledge, as well as the high-level skills that research engenders in academics, students and public and private sector collaborators, also underpins current – and future – economic growth.

This is the third in a series of briefings highlighting the contribution of a range of institutions that are often not featured in the national spotlight – from the highly specialised subject-specific institutions, to smaller institutions with just a few thousand students to larger institutions with a particular focus, whether delivering part-time courses or celebrating their religious roots.

This briefing focuses on research and innovation in these institutions and the impact this has on society, culture and the economy in the UK and beyond.

1. Environment

The creation of new knowledge that combines excellence with impact is “the life-blood of economic growth and societal progress”¹.

There are centres of excellent research operating within and across all universities and higher education institutions, as shown in both the Research Assessment Exercise (RAE) 2008 and the recent Research Excellence Framework (REF) 2014. The amount of research and subject specialism may vary, but this excellence is important to foster and support, and should be funded wherever it is found.

In 2014, at a time when Government support for the innovation and research potential for business and higher education collaboration was undergoing a substantial recalibration towards a more ‘activist’ or ‘interventionist’ approach, a major GuildHE project² explored and demonstrated the ways in which

small, specialist and locally facing higher education institutions (HEIs) embedded in international research and innovation systems can increase and sustain their contributions to regional and sectorial economic growth.

The project demonstrated how these diverse institutions – working with public and private partners in specialist sectors, including food security, the creative industries, health, and social innovation – possess a unique potential, enabled in part by new technologies, to collaborate with diverse bodies of users: students, graduates, businesses, and providers of public services.

These institutions have been particularly adept at leveraging small pots of funding, innovating both in terms of how they integrate research into the academic, civic and enterprise-informed culture of the university or college.

Distinction and Diversity
in Higher Education

GuildHE

*Celebrating the diversity of
the higher education sector*

Briefing 3: Research and Innovation

*This is a new series of monthly
briefings produced by GuildHE
looking at different aspects of a
diverse higher education sector.*

February 2015

[Briefing 2: World-Class
Infrastructure](#)

[Briefing 1: Student Experience and
Engagement](#)

1. Research Councils UK, <http://www.rcuk.ac.uk/RCUK-prod/assets/documents/RCUKStrategicVision.pdf>
2. [Innovation systems and the role of small and specialist Higher Education institutions](#) published in April 2014 in partnership with the OECD, and **available online** at: www.guildhe.ac.uk/publications

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Case study: The CREST Summer School

In September 2014 CREST and GuildHE played host to PhD candidates and Early Career Researchers from 17 institutions at the first CREST Summer School. Developed by Heads of Research from 22 institutions, the event focused on how – and why – researchers engage with audiences beyond the academy. 27 research students and staff with leadership potential spent the two days learning how to design collaborative projects; discussing research projects with potential collaborators (including the Crafts and Design Councils, UnLtd and the Young Foundation); thinking about how to better disseminate research (with representatives from Taylor & Francis and Routledge); and reflecting on research skills (with Vitae).

Participants also visited the British Library to talk about their current HE initiatives and collections, and spent an afternoon at the Wellcome Trust and Collections learning about their various funding programmes, and designing potential collaborative projects that were then pitched to the Trust's staff. Dr Brian Lobel from the University of Chichester, Wellcome Trust Public Engagement Fellow, spoke at the Summer School dinner, offering advice – both practical and inspirational – on his own research into how performance can be used to communicate complex ideas about the experience of serious illness, and what is possible when you think creatively about the different audiences for research.

“Those two days were full of innovative ideas that made me rethink the way in which I approach my research and understand it. It also opened up new horizons of thinking productively beyond the PhD itself, and more into public engagement, which I personally found a vital issue to consider.”

**Hawra Salman, Phd Student,
University for the Creative Arts and
CREST Summer School participant**



Image: Summer School participants develop collaborative research projects around the theme of public health at the Wellcome Trust, 8th September 2014.

‘Debates about Higher Education reform have often concentrated on teaching quality and incentives to improve it. At other times we have talked about world-class research and how it will drive economic performance and the global reputation of our universities. Ministers regularly talk about teaching institutions and research-intensive universities, but less often about how the two important agendas come together.’

**Professor Chris Gaskell, Principal of
the Royal Agricultural University
and Chair of CREST**

These institutions simultaneously make use of long-standing relationships with industry networks to encourage research, innovation and knowledge exchange partnerships, and to embed these symbiotic networks and the new knowledge they generate in the curriculum.

Research Networks

There are many examples of universities working together to develop strategic research partnerships, with N8, M5, GW4 and Eastern Arc often cited. These networks allow universities to make the most of their important role in the research and innovation ecosystem.

Another good example of a research network is Consortium for Research Excellence, Support and Training (CREST), founded in 2008 by 12 GuildHE institutions; the organisation has since grown to 22 members in 2015. CREST enables the sharing of best practice with respect to, support for and management of research, and means that research students and staff can create new networks built on discrete specialisms and shared expertise.

CREST also allows for joint investments in infrastructure, for example through CREST Collections, the Group's Open Access repository which makes it possible for the public to gain access to emerging 'pure' and translational research, see the case study on the left, for information about the CREST Summer School.



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‘The University of the Arts London is not a traditional university...our 1,200+ teaching staff, as active professional artists, practitioners, designers, critics, and theorists, leads the way on creative and experimental practice. Each College has extensive engagement and relationships with industry partners that promote dense linkages between working and learning.’

**Dani Salvadori, Director of
Innovation, Business and
External Relations, University
of the Arts London.**

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Case Study: University of Chichester Sports science

Dr Steve Myers, Reader in Exercise Physiology and colleagues have undertaken research into the design of High Speed Marine Craft (HSMC), assessing human factors that impact on performance, agility, control and stamina. The research has contributed to improved working conditions and working practices, as well as **equipment design** and procurement for military and civil personal in the UK and overseas.

The initial interdisciplinary research team was funded by the UK Ministry of Defence; the Engineering and Physical Sciences Research Council (EPSRC) awarded additional funding. Theoretical and practical research – including sea-trials – created a new representative data-set that underpinned a series of academic articles reporting the findings. This caught the attention of additional international partners, including the Office of Naval Research Global, the Royal Marines, and the US Navy.

The research also led directly to the creation of two successful commercial spin-outs: STResearch Ltd and FRC International LRC. QinetiQ Ltd, a world-leading defence technology and security company with 9000 employees world-wide, also served as commercial project partners, and have modified landing craft developed for the MoD based on the findings of the Chichester-based team.

The HSMC project team also now deliver educational courses for organisations world-wide, including the Police Service of Northern Ireland, the Canadian Navy and the RNLI.

Their research has also resulted in the creation and revision of international standards and guidance. Made available through Open Access platforms, this has become the default reference document for nations including the UK, Canada, Australia, the United States of America and the Netherlands.

This project contributed to the University of Chichester's strong performance in the REF2014, where the Sport and Exercise Sciences submission received a 53.3% 'world leading' impact rating.

2. Excellence

Excellence in research is not determined by the scale but by achieving an understanding – and ultimately a direct insight – into a difficult question. A diverse range of institutions continue (as highlighted in part by this briefing) to demonstrate their ability to take on some of the most pertinent and challenging questions facing society in the 21st century.

Some smaller and more specialist institutions have shown that they are particularly agile when it comes to matching their expert knowledge, gleaned in the laboratory, the clinic, the studio and/or library to real-world situations with the aim of designing practical solutions for public and private sector partners.

Often they are able to achieve meaningful collaborations because staff and students – from undergraduates to postgraduates – bring their own experience of work and industry to bear on their research. Mature research students and staff brought in from industry possess both passion and perspective, enriching the academic culture both for colleagues and potential partners. Diversity and engagement ensure that researchers understand the context for their research, so can anticipate its potential applications.

It is interesting to note the wide range of institutions, including the highly specialised, that were among the top performers in terms of the impact of their research in REF2014.

Rank 2014	Institution	GPA
1	Institute of Cancer Research	3.87
2	London School of Hygiene and Tropical Medicine	3.74
3	Imperial College London	3.68
4	St George's, University of London	3.64
5	Cardiff University	3.61
6	Liverpool School of Tropical Medicine	3.57
7	University College London	3.54
8	King's College London	3.52
9	University of Oxford	3.51
=10	University of Bristol	3.50
=10	London School of Economics	3.50

Original data from Hefce; GPA calculation by Times Higher Education

Source: Times Higher Education 'Top 10 by impact' 18th December 2014



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'In line with our mission, improving health worldwide, we concentrate our efforts on excellent research that addresses the major health challenges facing the world, and what can be done about them.'

This research may not always attract the attention of the top journals, but our performance on impact demonstrates our success in translating the results of rigorous research into real life benefits.'

**Professor Anne Mills,
Deputy Director and
Provost, London School of
Hygiene and Tropical
Medicine**

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While the excellent research undertaken at these institutions rarely secures national recognition from policy makers, it is clear that such institutions are in high-demand as partners in international projects. Colleagues in emerging economies in South America, Asia and Africa recognise the importance of the research undertaken in specialist institutions. Governments send experienced professionals to study and work as partners on policy and practice-orientated research. Large companies and emerging SMEs send their staff to train with specialist researchers. Established research teams at well-funded research-intensive universities seek out the expert advice of colleagues in these more focused institutions. Research findings, effectively communicated, save and enhance lives in the UK and around the world.

Case Study: University of Worcester Dementia

Building on the successful research centre, the Association of Dementia Studies, the University of Worcester, working in partnership with colleagues at the University of Nottingham, has received funding for a cohort of 6 PhD students, each of whom will undertake projects that contribute to the theme ‘The Arts and Dementia (TAnDEM): Evidence-based ways to live well with dementia through the creative arts’.

This joint Doctoral Training Centre is funded by the Alzheimer’s Society, supporting future **Dementia Research Leaders**. The evidence generated by academics and students working in partnership with the NHS and care homes’ patients and staff will be used to underpin the development of high-quality arts interventions for people with dementia.

‘Knowing first-hand how vital social support is for both carers and people with dementia and in particular the importance of music, this project is to be highly commended and encouraged. It is a challenge in care homes to find new and innovative activities to stimulate and involve residents with dementia. So this research has potentially a positive impact for a range of care and support scenarios. Research into best practice in services delivery is all too rare and, therefore, encouraging to see here.’

The Alzheimer’s Society Research Network: ‘Why we funded this’

Case Study: Harper Adams University

Precision Farming and Food Security

Data integration is key to the success of precision livestock farming. Dr. Mark Rutter (pictured below with the Harper Adams dairy herd) leads precision livestock farming (PLF) research at the University, including the Dairy Animal Sensor Integrate Engineering (DASIE) project – which aims to improve dairy cow health and welfare through the use of sensor technology.

The project focuses on data and farm system integration, as well as the development of dedicated sensor technology which will enable dairy farmers to improve cattle health and welfare through continuous monitoring of animal behavior. It relies on research into new technologies such as Google Glass eyewear and other augmented reality applications, which when applied allow farmers to improve herd management techniques.

DASIE represents one way in which institutions can leverage specialist networks to bring together researchers (Dr Rutter and colleagues) the UK’s innovation agency (Innovate UK) and private manufacturers and business (IceRobotics Ltd., Dairy Crest and Kingshay) to address one of the UK’s – and the EU’s – key grand challenges: **food security**.



HAU are now in the process of establishing sector specific meetings to discuss the issues raised in more detail with the various stakeholders. Dr Rutter said: “We also hope to begin to change the public’s perception of PLF, as there is a current mistrust of intensification and automation. But what is important to remember is that PLF is not necessarily about making intensive farms more intensive, it is about monitoring individual animals so that farmers can better cater for their individual needs.”



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‘The REF results show how specialist and regional universities can leverage excellent research to achieve significant impact in broader cultural and economic terms. GuildHE/CREST institutions and their researchers have built up an impressive body of collaborators and beneficiaries, as evidenced by theirs and HEFCE’s work at gathering information on the ‘impact’ of research. Key beneficiaries and partners include local businesses, charities, museums, cultural organisations and policy makers, in particular those working in the areas of religion, agriculture, education, social welfare and public health.’

Dr. Andy Dixon, Director of Research at the University of Cichester and Director of [CREST](#)

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3. Impact

Research centres in smaller and specialist institutions tend towards applied, close-to-market research. The translational nature of this research fills a much needed gap between blue-skies academic research and action on the ground.

They provide a particularly important role in UK's interconnected local, regional, national and global innovation ecosystems with respect to forging meaningful relationships with microbusinesses and SMEs. These are the companies developing the products and services on which the short, medium and long term wealth of UK economy and society depends.

These institutions were particularly pleased that the most recent REF allowed institutions to articulate their various pathways to impact with respect to HE-derived research, and to benchmark their activity with colleagues across the sector. Their success in leveraging embedded relationships with businesses and the third sector in key sectors – from public health and education to the creative industries – was confirmed by their impact ratings.

The inclusion of a measure of research and innovation impact in the exercise allows the sector, institutions and individuals to operate within a joined-up system and makes possible the constant exchange of new knowledge between HE and existing and emerging industry. Many would welcome an increase in the percentage impact contributes to their overall score in future REFs; this important funding stream allows them to support direct interactions between, and collaborations that benefit, businesses, students and ultimately the UK as a competitive global innovation player.

4. Why does this matter?

This briefing has demonstrated how a diverse range of institutions leverage relatively low levels of funding to generate research that benefits users locally, regionally, nationally and internationally. Although broader trends towards concentrating research funding hamper these institutions' ability to fulfil their full potential as integral links in the chain between 'blue skies' and 'translational' research, their achievements to date are significant. It is important that future policy encourages this valuable work, and that policy makers understand the impact of diversity, specialism and collaboration to the knowledge economy.

Case Study: The University for the Creative Arts

Sustainable Business Design

In the South East, the University for the Creative Arts (UCA) has made use of its unique nature as a multi-campus specialist creative arts institution to reach a wide variety of creative businesses in a key region for high growth businesses. Through the services of the Centre for Sustainable Design (CfSD – established in 1995) UCA has targeted the sustainability agenda, and Eco-design specifically, assisting and training large and small businesses in the local area and internationally – in Europe, North America and Asia – to change their practices and address **sustainable innovation and product sustainability** issues throughout their business models. Key initiatives have included:

- Towards Zero Waste in Industrial Networks (ZEROWIN)
- Sustainable Supply Chains through Innovation (SUSCIN)
- Environmental Market and Innovation Development (ECOMIND)
- Sustainable Research Consumption Exchanges (SCORE)
- Asia Eco-Design Electronics (AEDE)

These projects have achieved significant funding from the European Commission as well as through a variety of private sector and international partnerships.

As well as using their knowledge and skills to help external stakeholders the Centre also draws upon its partners to help deliver expert lectures and workshops to the student population at UCA. Hence the CfSD is fully embedded in university life.

The success of the CfSD and other innovative research initiatives contributed to UCA receiving a 90% world-leading and internationally excellent impact rating in REF2014.



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