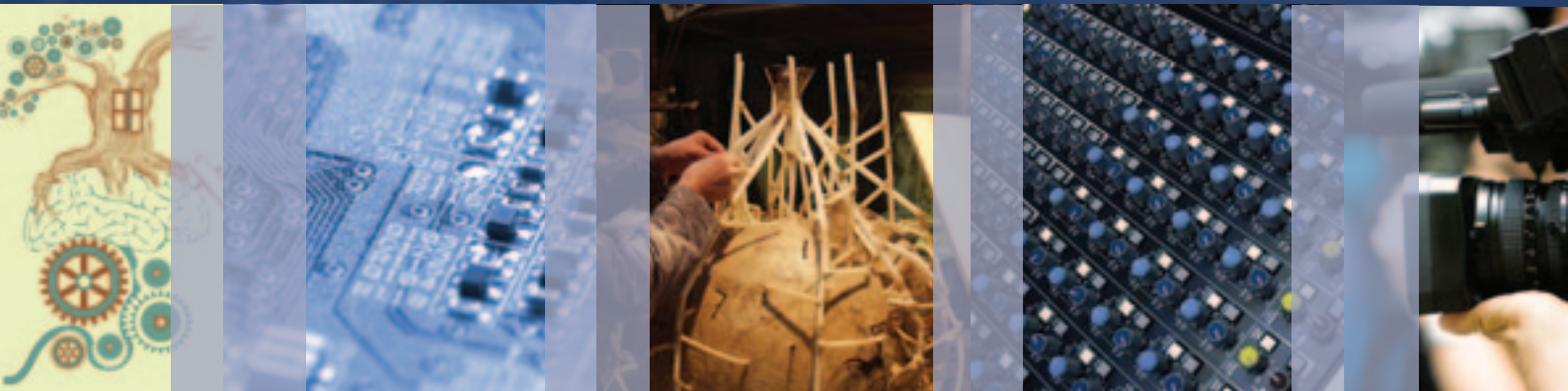


# Hidden Connections

Knowledge exchange between the arts and humanities and the private, public and third sectors



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Arts & Humanities  
Research Council



## Acknowledgements

This report is based on the analysis of data generated in the course of a research project carried out in the Centre for Business Research (CBR) at the University of Cambridge. The project entitled University Industry Knowledge Exchange: Demand Pull, Supply Push and the Public Space Role of Higher Education Institutions in the UK Regions (RES-171-25-0018) is part of the Impact of HEIs on the Regional Economies Initiative supported by the Economic and Social Research Council (ESRC) in partnership with the Scottish Funding Council (SFC), Department for Employment and Learning (DEL) in Northern Ireland, the Higher Education Funding Council for England (HEFCE) and the Higher Education Funding Council for Wales (HEFCW).

This Report uses data from:

Cambridge Centre for Business Research Survey of Knowledge Exchange Activity by United Kingdom Businesses (Hughes, A., Kitson, M., Abreu, M., Grinevich, V., Bullock, A. and Milner, I.) UK Data Archive Study Number 6464.

Cambridge Centre for Business Research Survey of Knowledge Exchange Activities by UK Academics (Hughes, A., Kitson, M., Abreu, M., Grinevich, V., Bullock, A. and Milner, I.) UK Data Archive Study Number 6462.

We would like to thank Alexia Hereford, Christopher Walker and others from the Project Steering Group at the AHRC who provided comments on interim reports and earlier drafts of this report. We would also like to acknowledge the support of the many academics and businesses who gave up their time to complete our surveys or be interviewed for our case studies. This report would not have been possible without them. The usual disclaimers apply.

This report forms a major output of a commissioned research project funded by the Arts and Humanities Research Council (AHRC)

The views expressed in this report are those solely of the authors and do not necessarily reflect those of the AHRC.

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Published: May 2011

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# Executive Summary: Overview and Selected Key Findings

## Overview

Academics from the Arts and Humanities in the UK are engaged in a wide range of interactions with a wide range of partners. In general, this does not take the form of technology transfer through patents, licences and spin-outs. Distinctions between the Arts and Humanities and other disciplines based on this narrow perspective are, however, deeply misleading.

Once we move beyond that narrow perspective on the role of impact to include mechanisms which include people-based, problem-solving and community orientated activities, the Arts and Humanities display as rich and diverse a set of connections as other disciplines and a particularly rich set of third sector and community interactions.

The patent, licensing and spin-out approach also diminishes the wider role played by academics in other disciplines and masks the similarities between them and the Arts and Humanities.

Even within the narrow perspective a disaggregation of Arts and Humanities to distinguish Creative Arts and Media from other Humanities reveals that the former displays connection characteristics as rich as other disciplines and with considerable private sector and commercial interactions.

Academics from the Arts and Humanities are highly connected within the UK economy and society in a process that supports scholarship and a two-way complementary interaction with external organisations.

There are number of important dimensions of the Arts and Humanities knowledge exchange process that should be emphasised.

First, there is significant diversity within the Arts and Humanities group – with those in the Creative Arts and Media tending to be the most highly connected to external organisations and involved in private sector commercial transactions.

Second, the simple distinction between research that has economic impact and that which is concerned with the pursuit of knowledge is inappropriate – research may be in pursuit of both goals.

Third, the notion that knowledge exchange is an activity driven by commercial and pecuniary interests is mis-founded – for most academics in the Arts and Humanities, the main impact of connecting with others is to support their research and their teaching.

Fourth, businesses interact with academics for a variety of reasons: these are not restricted to technology development but also include many other dimensions of business and organisational performance.

Fifth, and related to the above, businesses tend to use multiple sources of knowledge – and when they connect with academia, they often connect with academics from many different disciplines including Arts and Humanities.

Sixth, connections are most frequently initiated by individuals associated with the external organisations that academics partner with - indicating that the development of mutual understanding and managing expectations is crucial if knowledge exchange is to be effective and provide benefits to all partners.

Seventh, the major constraints that academics perceive as hindering their interactions with other organisations are a lack of time and difficulties caused by internal bureaucracy - in general, the conventional wisdom that cultural difference or disagreement over intellectual property are not perceived as problems.

Finally it should be noted that many academics from the Arts and Humanities (and those from other disciplines) do not connect with external organisations because it is not necessary for their research or teaching. Where there are areas where improved connectivity would both support academic pursuits and wider social and economic objectives, such connectivity can be improved by better flows of information and mechanisms that can support the development and management of relationships.

## **Selected Key Findings**

### **Academics Pursuing Research with Impact**

#### **Arts and Humanities Academics: Reaching Out to the Rest of Society**

- Academics from the Arts and Humanities are: more likely to engage in teaching compared to academics from other disciplinary groups; more likely to be involved in administrative activities than other disciplinary groups; and are more likely to be involved in outreach than other disciplinary groups.

#### **Research: basic, applied, user-inspired or all three?**

- Academics from the Arts and Humanities are much more likely to describe their research as basic; less likely to describe their research as user-inspired; least likely of all disciplinary groups to report their research as applied.
- Within the Arts and Humanities, Creative Arts and Media are the least likely to describe their research as basic; the most likely to put their research in the user-inspired category; and most likely to put their research in the applied category.
- The case studies reveal an important interplay in research activity between considerations of use and the pursuit of fundamental understanding.

## **Academics Engaging with Society through Multiple Mechanisms**

### **Moving from Technology Transfer to Knowledge Exchange**

#### **Relevance of research**

- Academics from the Arts and Humanities are much more likely than those in other disciplines to report that their research is of no relevance for external organisations; are less likely to have had their research applied in a commercial context; but are more involved in research with relevance for non-commercial external organisations.
- Languages academics are the most likely and Creative Arts and Media the least likely to report that their research is of no relevance to external organisations.
- Academics in the Creative Arts and Media are the most likely to have had their research applied in a commercial context and are much more likely to believe that their research is in a general area of commercial interest.

### **Commercialisation activities**

- Academics from the Arts and Humanities are less likely to have taken out a patent, licensed research outputs, formed a business or formed a spin-out or consultancy than other disciplinary groups.
- Within the Arts and Humanities there are relatively high levels of commercialisation activity within the Creative Arts and Media group.

### **Arts and Humanities Academics Engaged in Widespread Knowledge Exchange**

- When the knowledge exchange process is broadened beyond the narrow confines of technology transfer, a richer and more varied range of modes of engagement and interaction are apparent.
- There is a high level of varied connections involving people-based, problem-solving and community-based activities linking academics in the Arts and Humanities with external organisations.
- This broad pattern of connections is similar to that of all academics – although academics from the Arts and Humanities are proportionately more likely to have community-based connections compared to other disciplines.

### **The Highly Connected Academic**

- In general there are proportionately fewer highly connected (ie with many multiple connections) academics from the Arts and Humanities compared to other disciplines. However, for community-based interactions a much higher proportion of highly connected academics exists in the Arts and Humanities compared to the other disciplines.
- Compared to other Arts and Humanities, the Creative Arts and Media has the highest proportion of highly connected people-based, problem-solving academics and community-based interacting academics.
- The likelihood to being a highly connected Arts and Humanities academic is increased by being a professor, older and male.

### **Wider Collaboration: Academic Interactions with the Private, Public and Third Sectors**

#### **A Range of Partners**

- Nearly a third of academics from the Arts and Humanities are engaged with private sector businesses and nearly a half of academics from Creative Arts and Media engaged with the private sector.
- In terms of public sector engagement, around two fifths of Arts and Humanities academics have connections with the highest proportion in Creative Arts and Media.
- Academics from the Arts and Humanities are more likely than other academics to interact with the third sector. Nearly a half of all Arts and Humanities academics have such connections, rising to over a half in the case of the Creative Arts and Media.
- Within Arts and Humanities Creative Arts and Media has the highest proportion of academics engaging with the private, public and third sectors.

## The Determinants of Interactions with Private, Public and Third Sector Organisations

- Creative Arts and Media academics have a higher probability of being involved in an interaction.
- Being a professor raises the probability of having an interaction with the public sector as does being an academic in the Creative Arts and Media.
- Being a Creative Arts and Media academic increases the likelihood of being engaged with the third sector.
- Being a professor has a strong positive effect on involvement with third sector organisations.

## The Characteristics of Businesses Connecting with the Arts and Humanities

### People-based Activities

- Businesses with an Arts and Humanities interaction engage in a high level of people-based knowledge exchange activity which is, nonetheless, slightly lower compared to businesses that interact with disciplines other than Arts and Humanities.
- Businesses with an Arts and Humanities people-based interaction have similar levels of local or regional engagement; lower level of national engagement; but a higher level of international engagement compared to businesses that interact with disciplines other than Arts and Humanities.

### Problem-solving Activities

- Businesses with an Arts and Humanities interaction are more likely to engage in problem-solving knowledge exchange activity compared to businesses that interact with disciplines other than Arts and Humanities.
- Businesses with an Arts and Humanities interaction have a higher level of local or regional engagement; a lower level of national (rest of UK) engagement; and a lower level of international engagement compared to businesses that interact with disciplines other than Arts and Humanities.

### Community-based Activities

- More than two thirds of businesses with an Arts and Humanities interaction engage in community-based knowledge exchange activity compared to less than half of businesses that interact with disciplines other than Arts and Humanities.
- The highest level of community-based business engagement is local and regional.
- Businesses with an Arts and Humanities interaction have the same level of local or regional engagement; a higher level of national (rest of the UK) engagement; and a lower level of international engagement compared to businesses interacting with other disciplines.

### Connections and Innovation

- Nearly three quarters of businesses with an Arts and Humanities interaction are engaged in innovation activities compared to less than two thirds of businesses that interact with disciplines other than Arts and Humanities.
- Businesses with an Arts and Humanities interaction are more likely to have made major changes to their business structure and activities compared to businesses that interact with disciplines other than Arts and Humanities.

- Businesses with an Arts and Humanities interaction are more likely to use sources of knowledge from within the group and from conferences and trade fairs compared to businesses that interact with disciplines other than Arts and Humanities. They are less likely to use sources of knowledge from commercial labs, higher education institutions, public research institutions, technical standards or standard setting bodies and professional and industry networks.

### Does Geography Matter for Business Connection?

- Overall proximity to skilled labour is important for all businesses – although this is considered to be less important for businesses with an Arts and Humanities interaction compared to businesses that interact with disciplines other than Arts and Humanities.
- Proximity to HEIs is considered to be important for around a fifth of businesses with an Arts and Humanities interaction as well as for those who do not.

## How Partnerships Develop: Academic and Business Perspectives

### The Role of the Technology Transfer Office (TTO)

- Around a third of academics from the Arts and Humanities reported some contact with their TTO compared to around a half of academics from other disciplines.
- Academics from the Arts and Humanities are more likely to be unaware of TTO services compared to those academics from other disciplines.
- Within the Arts and Humanities, academics from Creative Arts and Media have the highest level of contact with and awareness of their TTO. The lack of awareness was highest in Languages and lowest in Creative Arts and Media.

### How Connections Are Made

- The most frequent initiators of connections identified by academics were individuals associated with the external organisations (with around 4 out of 5 academics in both Arts and Humanities and other disciplines reporting this to be the case).
- Two thirds of academics from the Arts and Humanities also reported connections initiated by their own action in approaching external organisations directly.

### The Perspective of Businesses

- Over half of businesses with an Arts and Humanities connection reported that they were made on their own initiative compared to less than half of other businesses.
- As was the case with academics, the least frequently used mechanism cited by businesses with and without an Arts and Humanities connection is the TTO.

### Connectivity: the Importance of People

- Relationships are most frequently initiated by individuals - most frequently associated with the organisations that academics partner with.
- The capacity to connect is an important factor in the knowledge exchange process. Personal 'boundary spanning' between academia and external organisations is important.

## The Motivations and Impact of Knowledge Exchange

### Academics Connect to Strengthen Their Research

- For both Arts and Humanities and other academics the highest rated motivation for connecting is to gain insights into their research area.
- The creation of student project and job placement opportunities is scored relatively highly as a motivation in Arts and Humanities.
- The motivation to secure personal income is rated least by academics from all disciplines.

### Impacts on Research and Teaching

- More than two thirds of academics from the Arts and Humanities who engage with external organisations believe that it has given them new insights into their research work. This is similar to other academics.
- Over three quarters of academics from the Creative Arts and Media who engage with external organisations believe that it has given them new insights into their research work.
- Over half of academics from the Arts and Humanities who engage with external organisations believe it has had a positive impact on their teaching through the way they present their material.
- In terms of the employability of students, just under a third of academics from the Arts and Humanities who engage with external organisations believe it has had a positive impact.
- These proportions are very similar to those reported by non-Arts & Humanities academics.
- Creative Arts and Media academics are more likely to report positive impacts from other Arts and Humanities disciplines.
- The evidence from the survey of academics shows that engagement with external organisations strengthens the two core missions of academics – research and teaching.

## Why do Businesses Connect? Motivations and Impacts of Knowledge Exchange

### Businesses Connecting to Support a Range of Functions

- The most frequently cited motivation by businesses to interact with universities was a concern with marketing, sales and support services – cited by two thirds of Arts and Humanities connected businesses and just less than half of other businesses.
- Other important motivations concern human resource management, innovation, logistics, procurement and operations.
- Overall, a third of businesses with an Arts and Humanities interaction believe that the interaction had a significant impact on the firm's activities compared to just over a quarter of businesses that interact with disciplines other than Arts and Humanities.

## **What Constrains Interactions with External Organisations?**

### **Constraints: the Perspective of Academics**

- Overall, the most frequently cited constraints are a lack of time and bureaucracy and these are common to both Arts and Humanities and other academics.
- Being in the Creative Arts and Media group increases the probability of reporting a constraint arising from lack of time to fulfill all university roles, and within that group younger academics and those below professorial status are the most likely to report such constraints.

### **Constraints: the Perspective of Businesses**

- The most frequently cited constraint by businesses with an Arts and Humanities interaction and other businesses was a lack of resources in the firm to manage the interaction.
- Cultural differences and concerns about the intellectual property are infrequently cited by both Arts and Humanities connected businesses and other businesses.

### **Why Businesses do not Engage with Academia**

- The most frequently cited reason why businesses with and without an Arts and Humanities interaction did not interact was that they did not consider it relevant to their business. This is important as it should be recognised that connecting to academia is not necessary for the competitiveness of many businesses.
- Other frequently cited factors for not engaging include: no information on the benefits of interactions and no information on how to interact.

# 1. Introduction

In the UK there has been a recent reassessment of the role of universities in society. In addition to the core missions of teaching and research, there has been increasing emphasis on ensuring that research has 'impact' and on the role that universities can play in contributing to innovation, economic growth and wealth creation (Sainsbury, 2007; Abreu et al, 2008, 2009; BIS, 2009). Much of the analysis and policy discourse has concentrated on promoting 'technology transfer' concentrating on the commercialisation of science through such mechanisms as patents, licences and spin outs.

For some, the focus on the contribution of universities to the knowledge economy is a threat to the Arts and Humanities. According to Bate (2011), the Arts and Humanities are considered as a 'superficial ornament' (p. 12) and according to Nussbaum (2010), there is a 'silent crisis' as the Arts and Humanities are:

*'Seen by policy-makers as useless frills, at a time when nations must cut away all useless things in order to stay competitive in the global market, they are rapidly losing their place in curricula..... nations prefer to pursue short-term profit by the cultivation of the useful and highly applied skills suited to profit making.'* (p.2)

And according to Bullen et al (2004) there is a:

*'consistent tension in policy discourse which makes claims about the value of the arts and humanities, but resiles from the apparent incompatibility of these disciplines with the commercial and entrepreneurial orientation of the innovation system.'* (p.11)

What is implicit in such critiques is the notion that the Arts and Humanities are largely disconnected from the economy and other institutions in society.

Several other studies, however, have shown that the Arts and Humanities have an impact: on society (Levitt et al, 2010; British Academy, 2010); on innovation (Bakhshi et al, 2008) and on public policy making (British Academy, 2008) and that there are strong commercial links in the Creative Arts (CIHE 2010, UUK 2010). It has also been persuasively argued that the similarities in knowledge exchange in the Arts and Humanities and STEM (Science, Technology, Engineering and Mathematics) disciplines can be seen once a narrow utilitarian focus on technology based on licensing and patenting is abandoned (Crossick, 2009).

This study contributes to this debate by using systematic quantitative and qualitative evidence to show the high degree of connectivity between academics from the Arts and Humanities and the rest of society. This report covers a large sample of over 3,500 academics in the Arts and Humanities supplemented by in-depth case studies and a large scale survey of businesses. It shows that many academics from the Arts and Humanities are engaged in the knowledge exchange process – and the knowledge exchange mechanisms they use are wide and varied. The focus on technology transfer through the codified transfer of science (such as patents, licences and spin-outs) ignores the more widespread mechanisms that include many people-based, problem-solving and community driven activities. There has also been a narrow concentration on how academia connects with business but many academics from the Arts and Humanities are interacting with the public and third sectors – and, in general, their level of interaction is higher with these sectors than with the private sector.

## Research Methods and Sources

This research analyses the pattern, scope and impact of interactions between academics in the Arts & Humanities with external organisations in the private, public and third sectors. The research uses new datasets to provide a detailed and comprehensive picture of such interactions in the UK and evaluates them in a comparative context with other disciplines.

The analysis is based on a detailed analysis of three unique and contemporary databases: first is the CBR survey of over 22,000 academics (CBR 2011a); second, the CBR survey of over 2,500 business enterprises in all sectors of the UK economy (CBR 2011b); third, a series of case studies of interactions between academics from the Arts and Humanities with other organisations. An annex setting out full details of these sources is available upon request from the authors.

### The Business Survey

A size, sector and region stratified sampling frame was drawn from the Dun and Bradstreet Marketing Database, supplemented by the FAME financial accounts database for the largest firms. A total of 25,015 firms were drawn to be surveyed. The response rate was 11% with a total number of responses of 2,530 businesses covering all UK sectors excluding Mining, Quarrying and Utilities.

To gross up the survey responses to give population representative data we used a rim weighting procedure based on the number of firms in the business population in each size class, sector and region.

Around a quarter of the sample have a turnover of £500,000 or less with a median turnover of £1.1m. At the other extreme 15.6% have a turnover of £10m or more with a median turnover of £97m. The sample therefore covers a very wide range of turnover and employment experience in the UK economy.

The sample provides a very good cross section of ages of business. The median age of the businesses was 22 years in 2008. However, 21.8% of the sample started trading before 1970, whilst 14.4% started trading in the year 2000 or later. Micro and small firms are youngest whilst the median age of medium firms was 27 years and of large firms 37 years.

The sample on which we have based this report therefore covers a full range of industrial sectors and age and size categories. It also includes a significant number of innovating firms and a large number of businesses who have transformed their business structures as well as being engaged with multiple sources of knowledge for their innovative activities including interaction with higher education institutions.

### The Academic Survey

The sampling frame was all academics active in teaching and/or research in the sample period in all disciplines in all UK higher education institutions in 2008-9.

Of the total surveyed sample of 125,900, we achieved 22,170 returns for an overall response rate of 17.6%. The sample is broadly representative of the UK academic population in terms of discipline, age, gender and professional seniority, and covers responses from 3,650 Arts and Humanities academics.

## The Case Studies

The AHRC secured the agreement to participate in case study interviews of 35 academics, selected from their database of grant awards, whose activity appeared to include some form of collaborative work. In addition, and as background material, the AHRC provided details of a recent research award for each academic as a starting point for each interview. In total, 33 academics accepted our approach for interview (a response rate of 94%). The 33 academics were asked to facilitate contact with the external partners.

In total, 39 partner interviews were conducted. Of these, 11 were from the private sector, 15 were from the public sector, 10 were from the third sector, and three were individuals (private sector freelancers or artists).

To investigate further the nature of interactions between firms and Arts and Humanities academics, we selected a small sample of respondents from the business survey which had reported connections with relevant Faculties. We approached 7 firms. Of these, 4 firms participated in an interview. Academics did not necessarily engage exclusively with private or public or third sector partners on any given project. Where multiple partners from multiple sectors were involved, we tried to interview partners from two different sectors (in practice, one from the private sector plus one other).

Our total sample therefore comprised 33 academic case studies based on 72 interviews (33 academics plus 39 partners) and 4 business case studies/interviews. The academic disciplines covered by the case studies include: Archaeology, Architecture, Art History, Arts and Engineering, Communications Studies, Creative Design, Creative Industries, Creative Technologies, Drama, English, History, Information Studies, Law, Media Studies, Modern Languages, Museum Studies, Music, Religious Studies, Visual Arts.

The variety of research projects studied is very wide, including by duration of the project (3 months to 4 years), the nature of the project (varying from Research Leave for the writing of a monograph via Knowledge Transfer Fellowships to Research Networks), and by progress through the project (from under halfway through to completed three years ago).

Our case studies therefore provide an important and diverse range of experience covering a wide range of disciplines and interactions.

## Data Presentation

The data from the academic survey are presented in two ways. First, the analysis compares the results for academics from the Arts and Humanities with the results for academics from all other disciplines. Second, the results for the Arts and Humanities are further sub-divided into three broad disciplinary groupings: Creative Arts and Media, Languages and Other Humanities. The data from the business survey focuses on over 500 businesses which reported an interaction with a university. The report primarily compares those businesses that had an interaction with the Arts and Humanities with those businesses that had an interaction with academia but not with the Arts and Humanities. The analysis of the case studies informs all of the analysis but the main details are presented in boxes throughout the report.

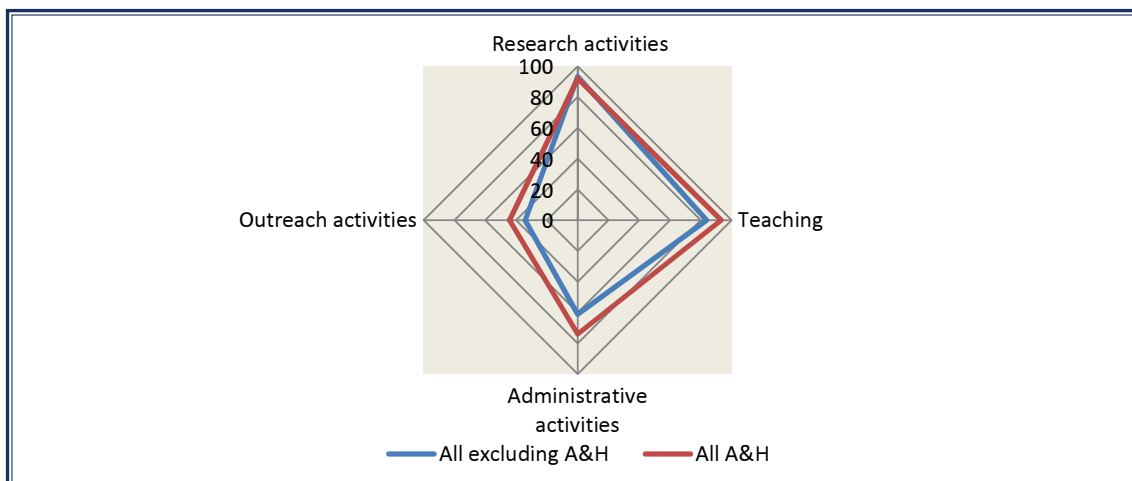
## 2. Academics Pursuing Research with Impact

There are increasing demands on the modern academic. The primary roles perceived by the public are that an academic is a teacher and a researcher. But in addition to these primary roles there has been the more recent emphasis on outreach and engagement – as well as increasing administrative responsibilities. This section considers the activities undertaken by the academics from the Arts and Humanities – and considers their research activities in greater depth.

### Arts and Humanities Academics: Reaching Out to the Rest of Society

The evidence in Exhibit 2.1 shows the proportion of academics engaging in a range of functions, and compares those from the Arts and Humanities with all other academics. It shows that the proportion of all academics reporting that they are research active is very similar, and is in excess of 90% for both groupings. Academics from the Arts and Humanities are, however, more likely to be engaged in the other aspects of academic life. Academics from the Arts and Humanities are: more likely to engage in teaching compared to academics from the other group (93% compared with 84% for other academics as a whole); more likely to be involved in administrative activities than all other disciplines (74% compared with 61% for all other academics); and are more likely to be involved in outreach than all other disciplines (44% compared with 34% for all other academics).

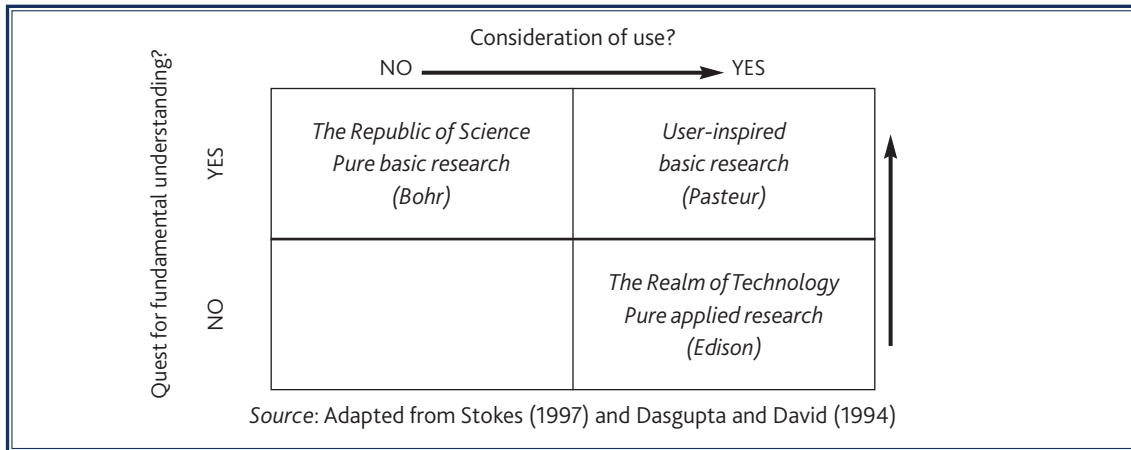
#### Exhibit 2.1 Activities of Academics



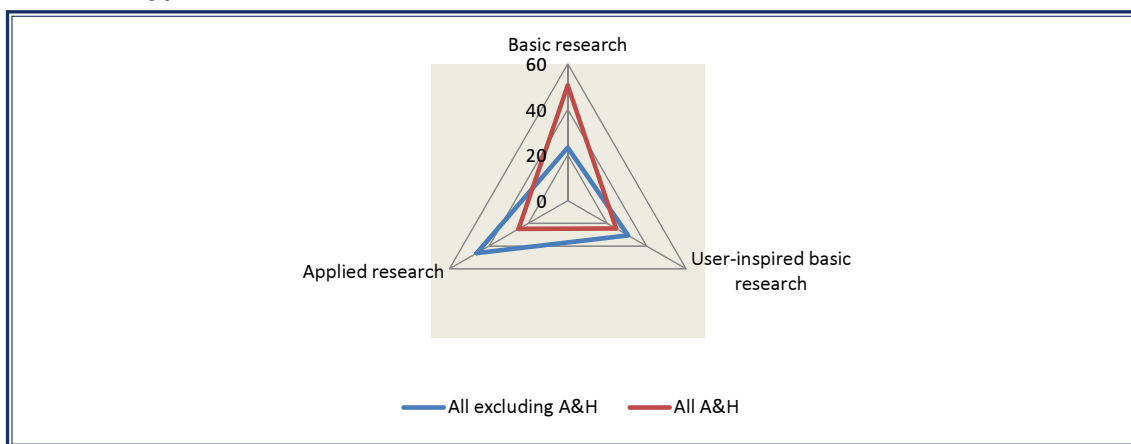
### Research: with impact or concerned with fundamental understanding – or both?

There has been increasing focus on the impact of research on economic and social outcomes. A common theme is the distinction between pure and applied research – often combined with an argument that funding should be concentrated in applied areas, particularly in science and technical disciplines, where economic impact is most likely to occur. The distinction between basic and applied research is, however, highly simplistic and it ignores the dynamic interactions in research activity between considerations of use and the pursuit of fundamental understanding. To shed light on these interactions, and to characterise the research activities of the academics in our study, we use the framework of analysis developed by Stokes (1997). As shown in Exhibit 2.2, Stokes distinguished between research which is not interested in considerations of use at all and is solely concerned with the pursuit of fundamental understanding (represented by the Bohr quadrant) with research concerned solely with considerations of use (represented by the Edison quadrant). The quadrant that combines both considerations of use and fundamental understanding is Pasteur's, in which useful and important reflexive interactions between applications and fundamental understanding take place.

### Exhibit 2.2 Pasteur's Quadrant

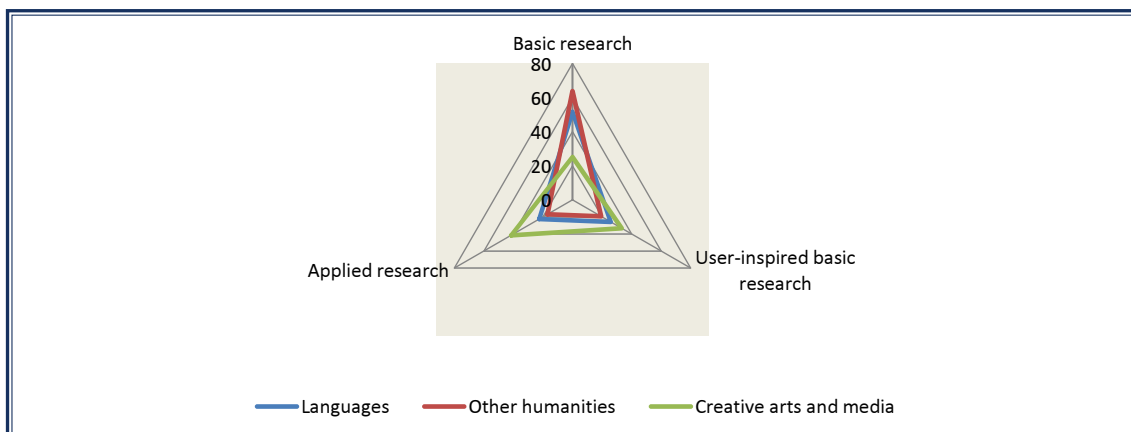


### Exhibit 2.3 Types of research



In the survey of academics, we asked our respondents how they would characterise the nature of their research activity using the Stokes framework and using definitions based on the Frascati Manual (OECD, 2002 and 2005). As shown in Exhibit 2.3, academics from the Arts and Humanities are much more likely to describe their research as basic (50%) compared to other academics (27%). Also, Arts and Humanities academics (25%) are less likely to describe their research as user-inspired compared to other academics (31%) (except those in Health). Furthermore, academics from the Arts and Humanities are the least likely of all disciplines to report their research as applied (25%) compared to other academics (46%).

### Exhibit 2.4 Types of research by Arts and Humanities discipline



There are important differences in the classification of research activities within the Arts and Humanities as shown in Exhibit 2.4. Whereas 60% of academics from the Other Humanities group consider their research as basic only 25% of academics from the Creative Arts and Media would put their research into this category. Academics from the Other Humanities (19%) are least likely to report their research as user-inspired whereas academics from the Creative Arts and Media (33%) are the most likely to put their research in this category. In terms of applied research, academics from Creative Arts and Media academics (41%) are most likely to put their research in this category, and academics in Other Humanities (17%) the least likely to.

By considering the different types of research together a clear picture emerges of the different focus between the broad disciplines within the Arts and Humanities. First, academics from the Other Humanities are the least likely to be involved in user-inspired basic or applied research and are the most involved in basic research. Second, academics from the Creative Arts and Media are the most likely to be concerned with user-inspired basic and applied research and the least likely to have academics concerned with basic research.

Although the Stokes quadrant framework is a useful heuristic device, it should be stressed that there is a continual interplay in research activity between considerations of use and the pursuit of fundamental understanding. And basic research can lead, often with a long time lag, to a range of important uses. This interplay is illustrated in the case study of the work undertaken by Professor Stephen Hoskins at the University of the West of England (Box 1), where basic research in the visual arts led to applied research and subsequently to industrial applications.

#### **Box 1: Arts and Humanities Research Moving Between Quadrants**

Professor Stephen Hoskins heads a visual arts research centre at the University of the West of England that explores the relationship in arts and crafts between technology, ideas and making. The Centre for Fine Print Research investigates the development of quality fine print from the nineteenth century through to the digital age primarily from a fine art perspective, but its focus on novel materials and processes to push forward innovation in 2D and 3D printing also attracts industrial partners. Around one third of the Centre's revenue derives from industrial projects but Hoskins is clear that, despite their success in working with industry, the industrial share should remain below half because they want to stay within the University's arts faculty.

A recent piece of research encapsulates the interest of Hoskins' work for both artists and industrial partners. Building on prior research at the Centre into bas reliefs his team investigated rapid prototyping for the creative arts, i.e. the possibility for artists to print ceramic objects directly in three dimensions, allowing them to produce unique works without incurring modelling and tooling costs. A major exhibition of art works produced in 2D and 3D was staged at the end of the research period, which "was very well received". As the project progressed industrial firms became increasingly interested, both from the production angle and in terms of developing the equipment required to produce bespoke items. "*The industrial work often starts from pure research – and the pure research here was developing this ceramic material – and then moves through to a slightly more applied stage and that often leads to industry. So we often set the pure research agenda and then that leads out. And once we are going along a line, when industry comes they become industry focused projects because that's where the money comes from.*" Six companies are "knocking at the door" because of the ceramic material developed during this project. Hoskins has identified other exciting potential outcomes of the research, for example investigating printing ceramic bone replacements for surgical use.

The money these firms pay for further development could be in the form of equipment, for example to examine the possible applications of a using particular type of printer on different media to create different effects. Alternatively to experiment with a wider range of materials to create new opportunities for 3D output. "*It's not fundamental research, it's applied research that needs to happen to get us to the situation where it can be proved [a technique] is viable commercially, based on design knowledge and some of the work we have done previously.*" The firms themselves may also learn a lot from how artists and researchers interact with the technology, in ways that could be very different to their concept of how people would use it. And there is interest also in understanding how to use insights gained from a creative arts approach to printing to improve the tactile qualities of the output from high technology industrial machinery: "*putting creative input into hard industry through an understanding of print*", by striking a middle path between industrial design and the visual arts. "*Without that visual arts background we would never be able to do it, and without having this background of industrial knowledge based on our previous collaborations we wouldn't be able to do it. It's that sort of disciplinary mix.*"

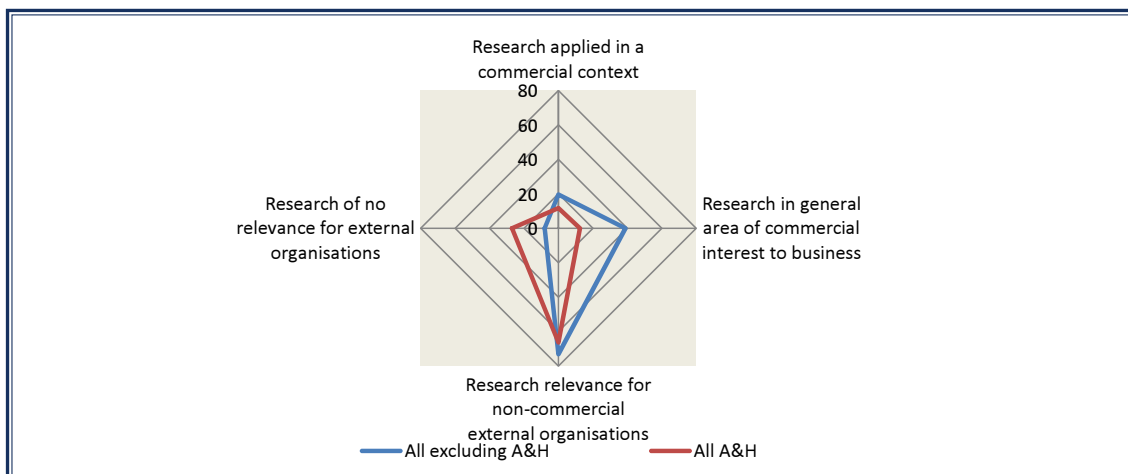
### 3. Academics Engaging with Society through Multiple Mechanisms

The knowledge exchange process is much broader than the narrow focus on commercialisation and technology transfer. There is now recognition that the modes of interaction between academia and external organisations are multiple, varied and sometimes complex - and that interactions involve academics from a wide range of disciplines. This section considers the wide range of mechanisms through which academics from the Arts and Humanities engage with the private, public and third sectors.

#### Moving from Technology Transfer to Knowledge Exchange

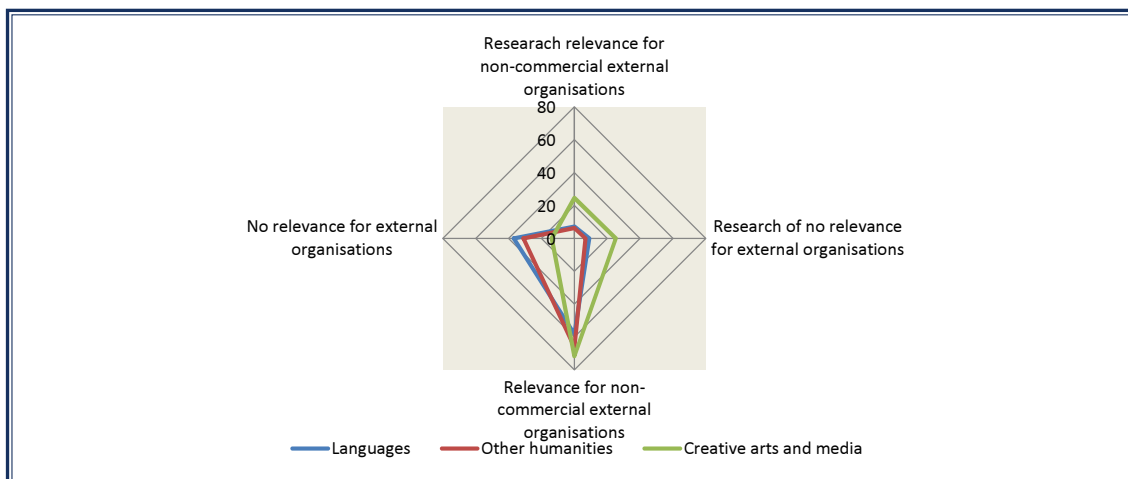
One of the main focuses of university-business interactions concentrates on how technology can be transferred from the science base – often through such mechanisms as patents, licences and spin-outs. As argued throughout this report, this view is too narrow and it is incomplete but below we consider the commercialisation activities of academics in the Arts and Humanities.

**Exhibit 3.1 Relevance of research**



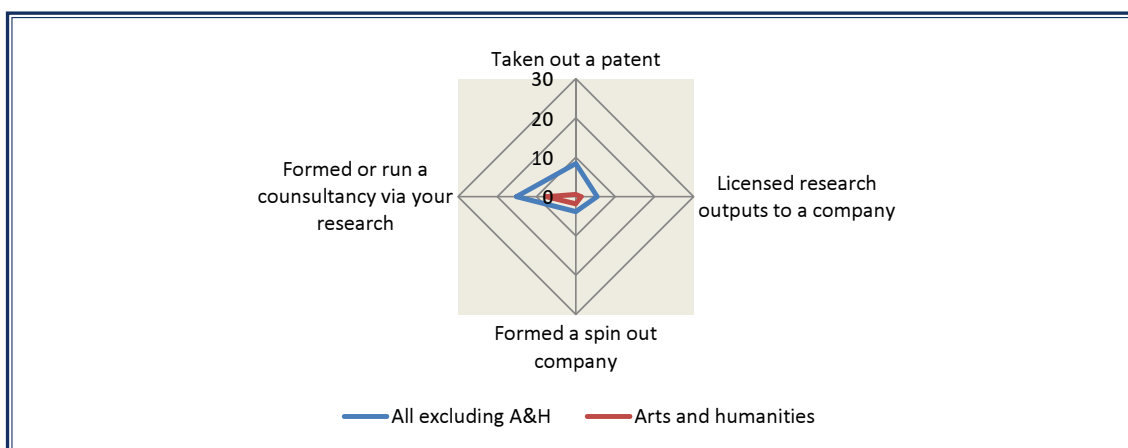
We asked the respondents from our survey of academics to indicate if they were undertaking research whether: it had been applied in a commercial context; was in a general area of commercial interest to business and/or industry; had relevance for non-commercial external organisations, including the public sector; or whether, in their view, it had no relevance for external organisations. As shown in Exhibit 3.1, academics from the Arts and Humanities (27%) are much more likely to report that their research is of no relevance for external organisations compared to other academics (11%). And academics from the Arts and Humanities (12%) are less likely to have had their research applied in a commercial context compared to academics from other disciplines (20%). The same broad pattern is true for carrying out research in a general area of commercial interest. A majority of academics, however, from the Arts and Humanities (66%) are involved in research with relevance for non-commercial external organisations.

### Exhibit 3.2 Relevance of research by Arts and Humanities discipline



There are important differences in the relevance of research between the different disciplinary groupings within the Arts and Humanities. Languages academics (37%) are the most likely and Creative Arts and Media (14%) the least likely to report that their research is of no relevance to external organisations. Academics in the Creative Arts and Media (25%) are the most likely to have had their research applied in a commercial context and academics from the Other Humanities (6%) are the least likely have their research applied in this way. Furthermore, academics from the Creative Arts and Media are much more likely to believe that their research is in a general area of commercial interest. Within the Arts and Humanities there is a clear gradient with academics from the Creative Arts and Media (72%) being the most likely to be involved in research of non-commercial relevance to academics in Languages (58%) being the least involved. Overall, a clear pattern emerges from the data with academics from the Creative Arts and Media being much more likely than the other two sub-disciplines to have research which has been applied or is commercially relevant to external organisations.

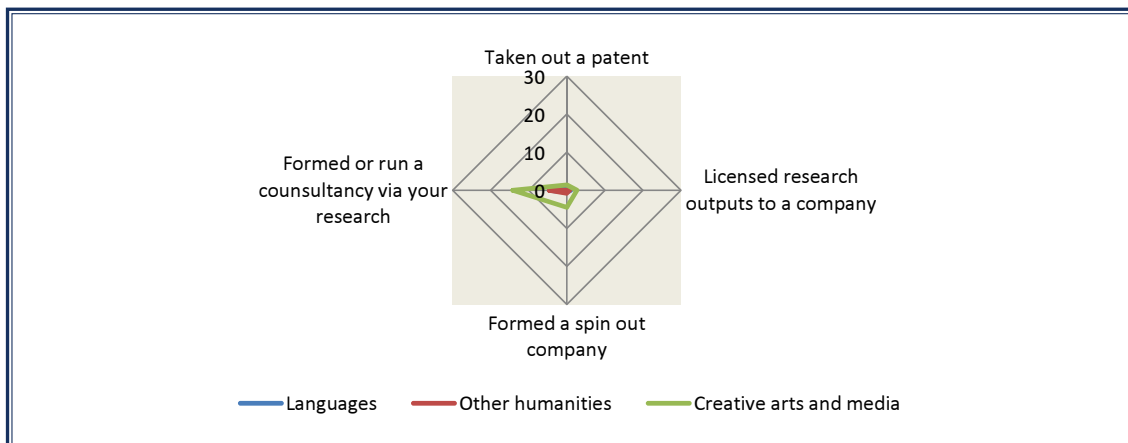
### Exhibit 3.3 Commercialisation activities



There are four major forms of direct commercialisation activity: patenting; licensing; formation of a spin-out company; and the formation of a consultancy. As shown in Exhibit 3.3, academics from the Arts and Humanities (0.6%) are less likely to have taken out a patent in the last 3 years compared to all other academics (8.4%), although it should be stressed that amongst the other academic group patenting tends to be concentrated amongst a few disciplines such as Engineering. Similarly, academics from the Arts and Humanities (1.4%) are less likely to have licensed research outputs compared to the average for other academics (5.4%). A similar pattern applies to spin-out companies where Arts and

Humanities academics (1.8%) are less likely than all other academics (3.8%) to have formed such a business. Approximately 7% of Arts and Humanities academics have formed a consultancy, and although this is lower than for other academics (15%) the gap is not as wide as with other forms of commercialisation.

### Exhibit 3.4 Commercialisation activities by Arts and Humanities discipline



As shown in Exhibit 3.4, academics from the Creative Arts and Media are more likely to engage in commercialisation activity compared to other academics from the Arts and Humanities. They are more likely to have patented (1.8%), licensed their work (2.7%), formed spin-outs (4.5%), and established consultancies (14%).

Overall, there is a relatively low level of commercialisation by academics in the Arts and Humanities compared to that undertaken by other academics – but this evidence should be interpreted carefully. First, the absolute (as opposed to the relative) level of commercialisation by academics in the Arts and Humanities is important – and relative comparisons must take into account the skewed distribution of commercialisation which tends to be very high in Engineering and its cognate disciplines. Second, within the Arts and Humanities there are relatively high levels of commercialisation within the Creative Arts and Media group and this is illustrated in a number of case studies (see Box 2). Third, commercialisation is only one narrow aspect of the knowledge exchange process – as discussed below.

#### Box 2: Commercialising Arts & Humanities Research

As expected we found very few examples of patenting, but some optimism among a number of academics that commercialisation of aspects of their research could take place in future:

The Centre for Fine Print Research at the University of the West of England, led by Professor Stephen Hoskins, has filed 3 successful patents in the past 10 years: the first produces a commercial return; the second – for a printing substrate registration process – has attracted little interest until recently but is being looked at carefully by one of the Centre’s industrial partners; and the third, for a ceramic material arising from Centre’s work on 3D rapid prototyping, is expected to be the source of substantial future revenues as it lies at the base of a large amount of planned industrial work.

Dan Pinchbeck, a Reader in Computer Games at the University of Portsmouth, has been negotiating for some months with commercial media studios about a partnership to commercialise a niche market product that emerged from his interest in creating an innovative form of narrative computer game. Any licensing deal that comes out of their talks will include marketing promotion via the company’s online distribution platform. The credibility he has gained having reached this stage is immense: *“there has always been a difficulty with academics trying to talk to industry. Industry doesn’t really respect academia because they haven’t really done anything [...] that deserves respect. I know that if I’m talking to people I can say ‘I have done this with producers, we’ve sent it to market’ and they immediately go ‘then you understand what it’s like, you’re operating in our world and you understand our world.’”*

*continued overleaf*

Box 2: continued

An industrial partner has suggested to Colin O’Dubhghaill, a silversmith and researcher at Sheffield Hallam, that he should develop an educational package aimed at the amateur crafts or small business jewellery market. It would comprise a parcel of precious metal alloy samples with instructions on how to work them into jewellery. The hobby market for these particular alloys exists already in the US but has not been developed in Europe. The industrial firm is interested in increasing the stock turnover of these precious metals. He is currently conducting tests to try out the alloys and patination techniques with novice users.

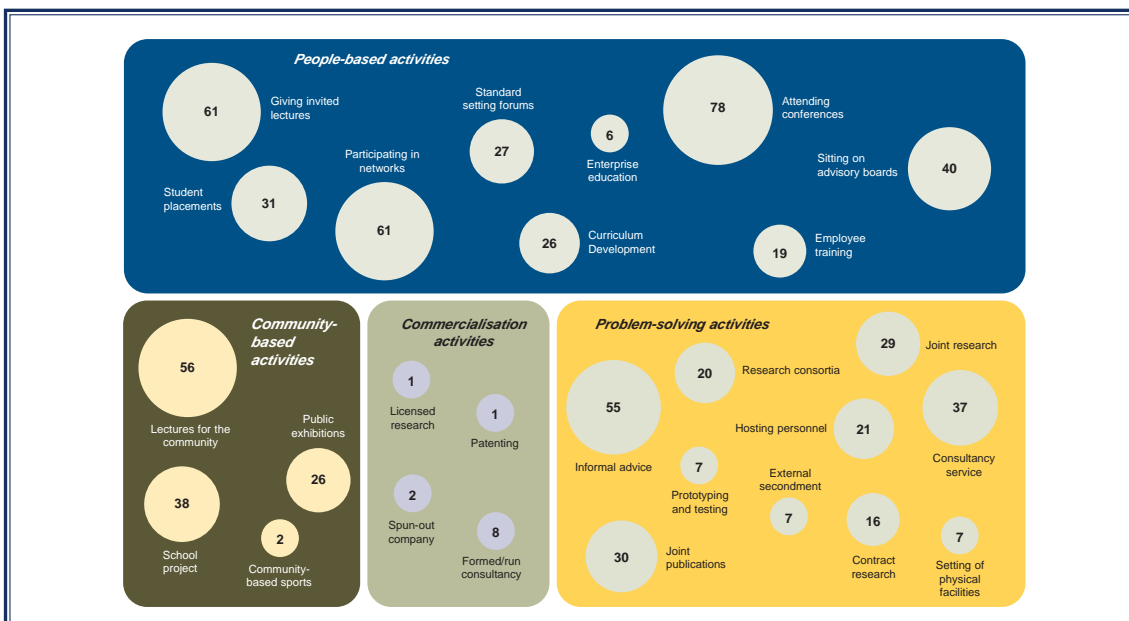
Dr Kristina Niedderer, who is based in the School of Art & Design at the University of Wolverhampton, is also a creative arts practitioner. She regrets the sensitivities that can emerge when commercial organisations engage with the academic world: *“It’s one of those things I think that keeps academics and commercial research apart. We in Design would like to see much more integration between design companies and academic design research.”* Both she and a specialised machinery manufacturer have hopes of commercial potential arising from her research on a particular metalworking technique for her silversmithing work, but further funding must be raised if she is to experiment further.

### Arts and Humanities Academics Engaged in Widespread Knowledge Exchange

When the knowledge exchange process is broadened beyond the narrow confines of technology transfer, then a richer and more varied range of modes of engagement and interaction are apparent. In addition to the commercialisation modes we have to identify an additional 23 modes which can be grouped into three broad categories: people-based, problem-solving and community-based.

Exhibit 3.5 shows the percentage of respondents from the Arts and Humanities reporting each type of interaction; the larger the bubble, the higher the percentage of respondents reporting that interaction. It is clearly apparent that commercialisation activities are amongst the least common forms of external knowledge exchange activity when taken alongside the much wider and more frequently reported people-based, problem-solving and community-based interactions. Overall there is a high level of varied interactions between academics in the Arts and Humanities with other organisations – ranging from participating in networks (61%), to providing informal advice (55%) and consultancy services (37%). Overall, the broad pattern of interactions is similar to that of all academics – although academics from the Arts and Humanities are proportionately more likely to be involved in community-based activities compared to other disciplines, and somewhat less likely to be involved in problem-solving interactions.

Exhibit 3.5 Modes of interaction: Arts and Humanities



Within the Arts and Humanities, academics from the Creative Arts and Media display an overall profile which is similar to that for all non-Arts and Humanities disciplines taken together, with relatively high levels of problem-solving interactions. Furthermore, academics from the Creative Arts and Media are also more likely to be involved in community-based interaction compared to academics from other Arts and Humanities disciplines.

### The Highly Connected Academic

The picture above shows the wide extent of engagement by academics from the Arts and Humanities. But there will, of course, be different levels of engagement – with some academics having a low level of engagement and others being more intensively connected with outside organizations, as illustrated by the engagement activities of Professor Paul Heritage (see Box 3). To examine the characteristics of the highly connected academics patterns we analysed the extent to which individual academics are involved in many different types of knowledge exchange activities within each of our categories. We define a highly connected academic in the people-based domain as one who is involved in six or more out of a possible nine modes of interaction. A highly connected academic in the problem-solving domain is involved in six or more out of a possible ten modes of interaction. And a high connected academic in the community-based domain is involved in two or more out of the possible four modes of interaction. We also consider an overall highly connected academic as being one who interacts in twelve or more out of the total twenty-three possible modes of interaction.

**Exhibit 3.6 Highly Connected Academics**

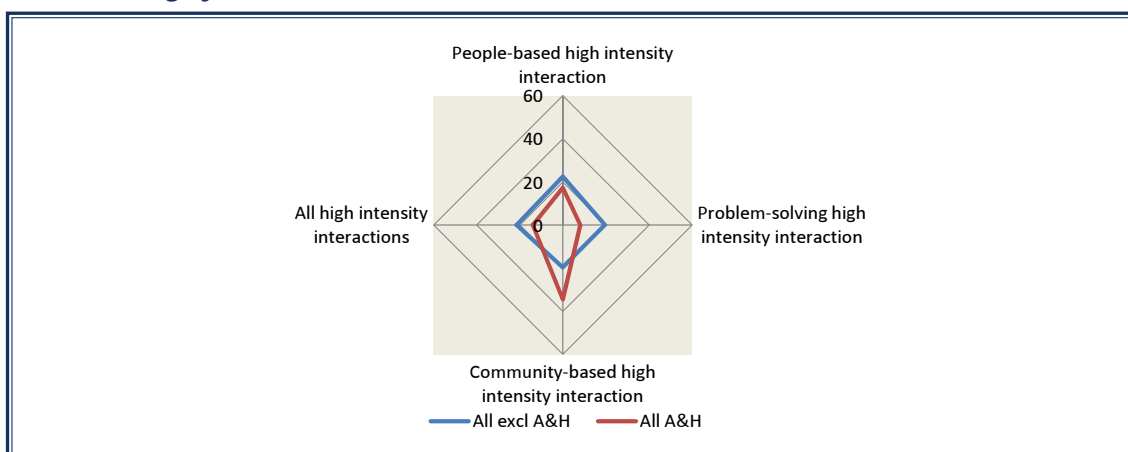
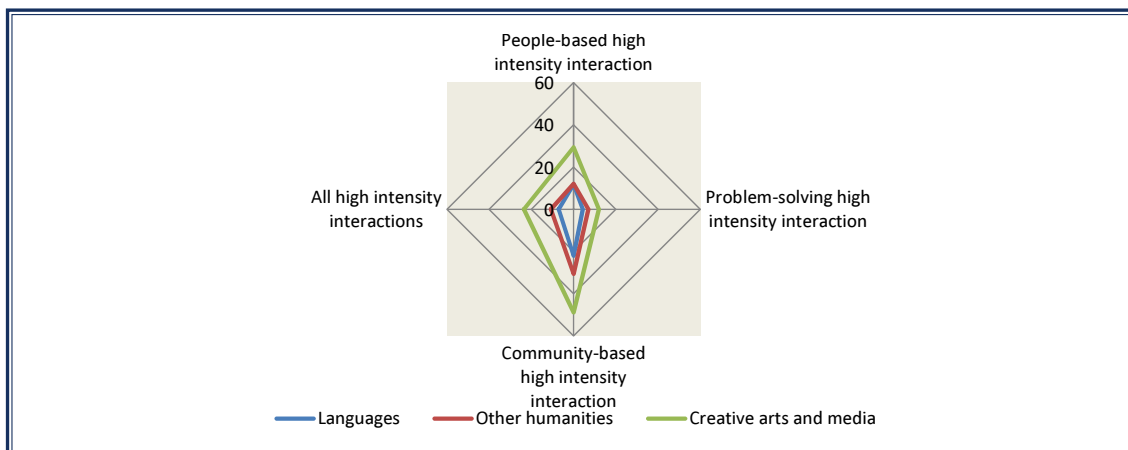


Exhibit 3.6 shows the proportions of academics that fit our definition of being highly connected. Overall, there are proportionately fewer highly connected academics from the Arts and Humanities (14%) compared to the group of other academics (22%). In terms of people-based activities, Arts and Humanities (17.3%) has relatively fewer highly connected academics than the other group of academics (23%), although it should be stressed that there are important differences between disciplines: Arts and Humanities has relatively more highly connected people-based academics than Biology, Chemistry and Veterinary Science (15%) and Physics and Mathematics (13%) but fewer than Education (34%), Engineering Materials Sciences and Health (26%) and Social Sciences (24%). In terms of problem-based activities, 8% of academics in the Arts and Humanities are highly connected compared to 20% for the other group of academics. With community-based interactions there is a much higher proportion of highly connected academics in the Arts and Humanities (35%) compared to the other group of academics (20%).

### Exhibit 3.7 Highly Connected Academics by Arts and Humanities discipline



The proportion of highly connected academics is much higher in the Creative Arts and Media compared to other parts of the Arts and Humanities – the Creative Arts and Media has over twice as high a proportion of highly connected academics (24%) than either of the other two sub-disciplines. Furthermore, the Creative Arts and Media has the highest proportion of highly connected people-based academics (29%); the highest proportion of highly connected problem-solving academics (12%); and the highest proportion of highly connected community-based academics (49%). Overall, within the Arts and Humanities, and taking each type of interaction together, a clear picture emerges of a gradient in which Languages academics are the least likely to connect with other organisations and Creative Arts and Media the most likely to connect.

#### Box 3: Intensive Interactions in the Creative Arts

Professor Paul Heritage of Queen Mary, University of London is a drama academic who has been developing boundary-spanning initiatives for over two decades through his research and practice in social justice and cultural intervention. He has had a particular focus in the last 15 years on international work. People's Palace Projects (PPP) is a separate entity with its own charitable status (although it is still part of the university) that he has established to facilitate interactions with external organisations, "not just for funding reasons, although there are funding advantages to being a charity, but also in terms of clarity of message". He and his team at PPP raise money from the AHRC, the British Academy and other academic funding sources for their research work, but also from arts bodies such as Arts Council England, the Lottery Fund, various trust funds and foundations including the Paul Hamlyn Foundation and the Clore-Duffield Foundation, and even the Brazilian Ministry of Justice to support their practice-led work. These funding streams support PPP's arts-based human rights projects with people in prisons, with communities afflicted by gun and gang crime, and with young people in conflict with the law.

Since 1998, Heritage has been working with Grupo Cultural AfroReggae, a pioneering Brazilian organisation created in a Rio shantytown (favela) in 1993 that offers young people positive alternatives to the drug/gang culture. In 2006 Heritage set up a 7-year programme of research and knowledge transfer called Favela to the World to look at why and how AfroReggae is effective and whether its model could be transferable to a UK context. "AfroReggae has an inspirational way of taking young and emerging artists onto another level of aspiration and believing in what they can do. And all our evaluations around this look at questions about what the arts can give young people in terms of authenticity, in terms of confidence, in terms of connectivity with the world?" Heritage's Favela programme has many different projects within it, with different partners and different funders (with different goals) for each – which requires complex financial management.

The main project partner in the first three years was the Barbican Centre, which was interested in attracting a more diverse audience and developing a creative learning programme for young people around that experience. It paid to bring AfroReggae musicians to the UK, while Heritage raised other funding for a 3-week programme of knowledge transfer around their performances, for example from Amnesty International UK – which wanted to find out how to reach out beyond its traditional middle class supporters to make contact with young people in the UK who face similar issues of gang and gun-related violence to those it tries to help overseas. Professor Heritage also brought in other partners such as The Learning Trust, which works with Hackney schools and wanted to learn about the sorts of arts provision that could help pupils deal with similar issues. Other more recent major partners include Manchester-based Contact Theatre and Sage Gateshead in the North East. Heritage has also led a British group of government policymakers, directors of Foundations and artists to Brazil, to stimulate new international dialogues about the role of art and civic society.

*continued overleaf*

Box 3: continued

Professor Heritage comments, "Our job is to broker relationships that raise skills and knowledge in the arts. One thing that's interesting is a lot of the talk around external partners seems to discuss everything from the academic's point of view. In fact I think the academic can quite often set up a hub but not necessarily remain at the centre of it. The academic partner sets up a spider's web around an idea or a project or an arts partner. For example on the Favela project we place AfroReggae at the centre, rather than ourselves, but we were brokering all the relationships, the knowledge and resources that are being shared. [...] We each have different things we want to know, but we can collaborate together from that common point of AfroReggae's experience and expertise."

## Understanding the Patterns of Interaction

So far we have considered patterns of interaction for academics as a whole. It is, however, interesting to enquire as to the extent to which interaction is affected by a number of key variables: the seniority of the academic in terms of the position they hold; their age; gender; and discipline. An analysis by seniority and age considered together helps us to distinguish between the effects of seniority (which might reflect distinction) and experience as an academic. Similarly by considering gender and discipline in a multivariate context, we can examine the effect of each of those holding the effects of seniority and age constant. Considering these variables in a multivariate context is important, since looking at them one at a time may conceal the impact of them taken separately. Thus for instance any examination of seniority alone may be picking up the effects of age and vice versa. Similarly, since we know that in the distribution of academics women are less likely to hold senior appointments compared to men, it is important to hold the effect of seniority constant whilst analysing the effect of gender. Finally, since we know from our comparison of disciplines within Arts and Humanities that there are significant variations, it is important to hold discipline constant whilst considering each of the other variables.

A brief overview of how the variables affect the intensity of interaction is provided in Exhibits 3.8a-3.8c. These exhibits are based on a multivariate analysis that predicts the probability of being a highly connected academic conditional on being in one of two seniority groups, one of two age groups, either male or female, and being in the Creative Arts and Media discipline compared to the others.<sup>1</sup> We divide academics into two seniority groups, professors compared to others, and we compare those aged under 50 to those aged 50 and over. We present an analysis for all Arts and Humanities academics taken together and then for those academics within the Languages, Other Humanities and the Creative Arts and Media disciplines separately. The easiest way to interpret the coefficients shown in the Exhibits is to regard them as the increase in the probability of being included in a highly connected group when account is taken of: age (being in the high age group and not the low age group); seniority (being in the more senior group and not the lower group); gender (being male); or being in Creative Arts and Media (and not in another Arts and Humanities discipline). So, for example, if we take the first column of Exhibit 3.8a, the results show that the probability of being highly connected in terms of people-based interactions is 4.5% higher for professors than other academics. In relation to age, being in the older age category compared to the younger age category increases the probability of highly connected in terms of people-based interactions by 5.5%. Being male rather than female, all things being equal, increases the probability of being in the highly connected people-based interaction group by 2.5%. Finally, the effect of being in the Creative Arts and Media group compared to other disciplines raises the probability of being highly connected in terms of people-based interactions by 17.8%. All these effects are statistically as well as quantitatively significant.

The remaining numbers in the columns reflect the overall statistical significance of the goodness of fit of the equation (Wald Chi-Square Test) and the percentage of academics who would be correctly

<sup>1</sup> These exhibits show the marginal effects derived from a multivariate probit regression analysis.

classified to their high intensity people-based interaction group on the basis of their seniority, age, gender and disciplinary characteristics. In this case the equation would correctly classify nearly 83% of academics. The interpretation of all the other columns in this table and the two subsequent multivariate probit regression analyses presented in later sections is the same.

The results of the multivariate regression can be straightforwardly interpreted. If first of all we focus on all Arts and Humanities academics together, it appears that high intensity people-based interaction is significantly enhanced by being in the Creative Arts and Media group, holding all other effects constant. The same is true, although at a less significantly quantitative level, for age and for gender, and for seniority.

### Exhibit 3.8a Highly connected people-based interaction

	All			Languages		Other humanities		Creative arts and media	
Professor	0.045	**		Professor	0.071	**	0.049	**	0.022
Age 50 +	0.055	**		Age 50 +	0.078	**	0.035	**	0.071
Gender	0.025	**		Gender	-0.028		0.036	**	0.040
Creative Art and Media	0.178	**					1783		
N	3561			N	690				1088
Wald Chi <sup>2</sup> (4)	195.33	**		Wald Chi <sup>2</sup> (3)	17.25	**	23.94	**	10.81
Percent correctly classified	82.76			Percent correctly classified	88.12		88.11		70.59

### Exhibit 3.8b Highly connected problem-solving interactions

	All			Languages		Other humanities		Creative arts and media	
Professor	0.078	**		Professor	0.030	*	0.073	**	0.108
Age 50 +	0.007			Age 50 +	0.042	**	0.009		-0.018
Gender	0.027	**		Gender	-0.028	*	0.021	*	0.029
Creative Art and Media	0.063	**							
N	3500			N	676		1755		1069
Wald Chi <sup>2</sup> (4)	99.29	**		Wald Chi <sup>2</sup> (3)	23.79	**	35.76	**	15.49
Percent correctly classified	92.00			Percent correctly classified	95.56		93.05		88.03

In the case of community-based interactions, a similar pattern emerges. Discipline has a major impact with the presence of an academic in the Creative Arts and Media grouping implying a 21.2% higher probability of being highly connected in terms of community-based interactions. It is worth noting here, however, that the overall ability of seniority, age, gender and discipline to correctly classify highly connected community-based interactions is relatively low. Only around a 66% success rate in the classification is achieved which suggests that these factors taken together are a modest predictor of whether or not highly connected community-based interactions will occur.

If we turn to the results by discipline, in the Creative Arts and Media group age has a positive impact on people-based actions, and seniority has a positive effect on problem-solving and community interactions. There is a significant effect for gender on the probability of being involved in people-

based interactions, problem-solving interactions or community-based interactions at a highly connected level.

In the case of Languages, seniority and age have a significant effect on the probability of being highly connected in terms of people interactions and problem-solving interactions. In the latter case, being male also increases the likelihood of being highly connected. Community-based interaction within the Languages group is significantly enhanced by seniority and age. Senior individuals in the Languages academic disciplines are 16.5% more likely to be involved than younger members. In each case the percentage of correctly classified academics is reasonably high in the Languages group.

In the Other Humanities grouping seniority, age and gender increase the probability of being highly connected in terms of people-based interactions and in relation to problem-solving where seniority and gender count. In the case of community-based interactions, once again, seniority and gender matter, but age does not.

### Exhibit 3.8c Highly connected community-based interactions

	All			Languages		Other humanities		Creative arts and media		
Professor	0.102	**		Professor	0.165	**	0.075	**	0.086	*
Age 50 +	-0.025			Age 50 +	-0.096	**	-0.001		-0.009	
Gender	0.042	**		Gender	0.041	*	0.044	*	0.010	
Creative Art and Media	0.212	**								
N	3487			N	674		1756		1057	
Wald Chi <sup>2</sup> (4)	162.49	**		Wald Chi <sup>2</sup> (3)	16.70	**	14.56	**	3.82	
Percent correctly classified	65.96			Percent correctly classified	78.04		69.31		52.98	

### Arts and Humanities: A Spectrum of Engagement

When analysis moves beyond the narrow confines of commercialisation, there is substantial evidence of widespread knowledge exchange between academics from the Arts and Humanities and other parts of the economy and society. But it should also be emphasised that there are variations between disciplines with a high level of interactions being prevalent amongst the Creative Arts and Media group. The multivariate analysis of the survey data reveals that academic seniority and age is, in general, associated with higher levels of interaction. This may suggest that experience and the accumulation of contacts and networks helps the knowledge exchange process. Furthermore, the evidence suggests that males tend to interact more than females even when other variables are taken into account. This is an area that requires further investigation – but it may reflect issues relating to the importance of time to initiate and manage relationships and gender differences in work-home commitments.

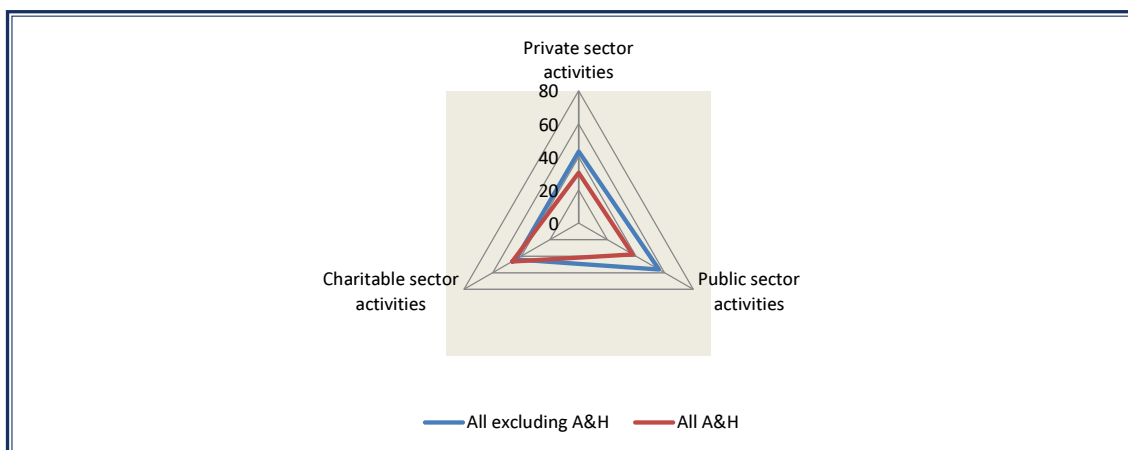
## 4. Wider Collaboration: Academic Interactions with the Private, Public and Third Sectors

The discussion on the impact of academic research and engagement has tended to focus on how it can influence business performance with a particular emphasis on innovation and technology. But it is important to recognise that academics engage with other parts of the economy and society including the public and third sectors. This section analyses the evidence which reveals extensive engagement by academics from the Arts and Humanities with a range of partners.

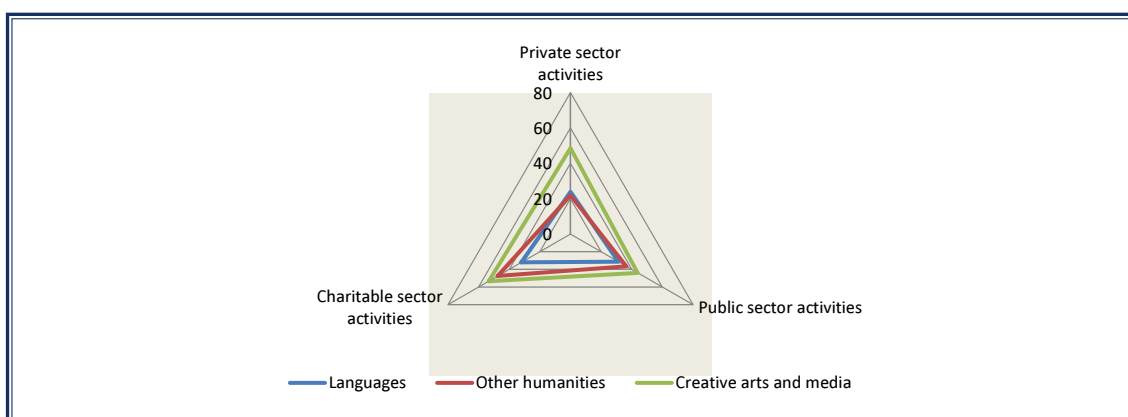
### A Range of Partners

As shown in Exhibit 4.1, overall 30% of academics from the Arts and Humanities are engaged with the private sector – this compares with 43% for all other academics. In terms of engagement with the public sector, 38% of academics from the Arts and Humanities report engagement compared to 56% of all other academics. With the third sector, interactions by academics from the Arts and Humanities are slightly higher (46%) than the level of engagement by academics from other disciplines (44%).

**Exhibit 4.1 Partners: who academics connect with**



**Exhibit 4.2 Partners: who academics connect with - by Arts and Humanities discipline**



Within the Arts and Humanities, Creative Arts and Media has the highest proportion of academics engaging with the private, public and third sectors. Nearly half (49%) of academics from Creative Arts and Media are engaged with the private sector, compared to 24% of those from Languages and 22% from the Other Humanities. In terms of engagement with the public sector, 44% of those from

Creative Arts and Media are engaged compared to 36% of those in Other Humanities and 31% in Languages. And in terms of engagement with the third sector, 53% of those from Creative Arts and Media are engaged with the third sector compared to 48% of those in Other Humanities and 37% in Languages.

#### **Box 4: Community Engagement: Connecting with a Troubled Inner City Youth Organisation**

Professor Eve Rosenhaft is a historian in the School of Cultures, Languages and Area Studies at the University of Liverpool. She has been involved since early 2010 with the Tackling Racism Group (TRG), a secondary schools-based group in Liverpool that aims to raise students' consciousness of issues around racism, diversity and identity. TRG, which has the support of the TUC, Youth Point (which does so-called 'detached' youth work) and Liverpool City Council, among others, finds the funding from a wide range of sources.

Rosenhaft's research into Africans under National Socialism in Germany had resulted in her sponsoring a travelling exhibition of German concentration camp biographies that came to a local Jewish community centre. There she was approached by John McCarthy, the facilitator for TRG, who had brought some students to see the exhibition as part of their preparation for a visit to Auschwitz and asked her for help with their further preparations. She ran two workshops for the youngsters, the first focusing on the victims, taking in particular examples of young people who suffered in various ways – *"one of my objectives is to downplay the Jewish victims and put in the foreground the victims who were very much like the kids I am talking to, so ethnic minority, poor, having problems at school"*. The second session was on the perpetrators, where her aim was to get them to *"put themselves in the position of perpetrators and see how those crimes arise out of everyday life, when people are under stress"*. For her, this activity *"is an extension of my research in the sense that my approach, my understanding of the Holocaust is based on biographical research, on individual people in different ethnic groups"*. Her engagement with TRG deepened when she took some teachers – of history, English, art, and even of sciences – from the school where the initiative started on a separate visit to Auschwitz, as a result of which three returned home thinking about ways to incorporate the experience and what they had learned about the Holocaust into their teaching *"and they have asked me to talk to them about that"*. She has also, at the suggestion of McCarthy, involved some of her undergraduates in the student workshops as live examples of what young people can achieve. There is benefit for the undergraduates, too, in that a couple of them aspire to be teachers. In the medium term Rosenhaft wants to develop undergraduate participation in this and possibly similar community activities into accredited modules, which is something that exists as a model at Liverpool University but not in her Department.

Regarding her engagement with the community, Rosenhaft comments: *"I have always thought it was a good thing to be engaged with the community, but it's only recently I think that the situation has been such that I could bring those two things together and feel that I wasn't stepping outside my academic role in my community engagement. And that's partly because my collaborators have invited me to engage, precisely because of my academic expertise"*. As for her colleagues, *"I am in what is basically a school of modern languages where as you can imagine some are better placed than others to have something to offer a non academic audience. A number of my younger colleagues are doing really interesting things. They understand the political need for it but also I think they see the value of talking to people who aren't just in the next room."*

### **The Pattern of Interactions with Private, Public and Third Sector Organisations<sup>2</sup>**

So far we have considered the effect of disciplinary grouping without enquiring about the way in which interactions with private, public and third sector organisations may vary in terms of seniority, age, gender or discipline of the academic concerned. We therefore carried out an analysis similar to our previous analysis of the intensity of interactions. In this case our multivariate analysis helps to predict the likelihood of being involved with private, public and third sector organisations respectively, conditional on the seniority, age, gender and disciplinary groupings which we described earlier.

In terms of Arts and Humanities interactions with private sector organisations, the analysis shown in Exhibit 4.3a indicates that for all academics being in the Creative Arts and Media group raises the probability of being involved in an interaction by over 26% and this result is both quantitatively and statistically significant. There are no other significant effects except in the case of Creative Arts and Media, where the likelihood of being involved with private sector organisations varies with gender and is more likely to be undertaken by men.

<sup>2</sup>The results shown are marginal effects derived from a probit regression of the independent variable against seniority, age and gender as dichotomous dummy variables and a discipline variable which takes the value 1 for Creative Arts and Media and 0 otherwise.

### Exhibit 4.3a Patterns of engagement with private sector organisations

	All			Languages		Other humanities		Creative arts and media		
Professor	0.012			Professor	0.040		0.032		0.016	
Age 50 +	0.025			Age 50 +	0.014		-0.011		0.049	
Gender	0.018	**		Gender	-0.044		0.025		0.054	*
Creative Art and Media	0.264	**								
N	3558			N	692		1782		1084	
Wald Chi <sup>2</sup> (4)	242.1	**		Wald Chi <sup>2</sup> (3)	2.95		5.41		3.87	*
Percent correctly classified	70.32			Percent correctly classified	75.87		78.17		53.41	

In the analysis of public sector organisations, shown in Exhibit 4.3b, a somewhat different picture emerges. Being a professor raises the probability of having an interaction with the public sector by 14.8%, and being an academic in the Creative Arts and Media has a 10.1% impact. Being in the older age group raises the probability of being involved with public sector organisations by 8.5%. Age and seniority have similar effects in all sub-disciplines, but gender has no impact either in the group as a whole or in any of the separate disciplines identified.

### Exhibit 4.3b Patterns of engagement with public sector organisations

	All			Languages		Other humanities		Creative arts and media		
Professor	0.148	**		Professor	0.092	*	0.116	**	0.252	**
Age 50 +	0.085	**		Age 50 +	0.106	**	0.086	**	0.076	**
Gender	-0.003			Gender	-0.037		0.020		-0.031	
Creative Art and Media	0.101	**								
N	3526			N	688		1776		1062	
Wald Chi <sup>2</sup> (4)	124.2	**		Wald Chi <sup>2</sup> (3)	15.33	**	46.20	**	44.26	**
Percent correctly classified	63.47			Percent correctly classified	68.75		68.85		61.02	

The results of the analysis of interactions with the third sector are shown in Exhibit 4.3c. Being a Creative Arts and Media academic increases the positive impact on the likelihood of being engaged with the third sector by 10.8%. Being a professor has a strong positive effect on involvement with third sector organisations, principally because of strong effects in Languages and Creative Arts and Media.

**Exhibit 4.3c Patterns of engagement with Patterns of engagement with third sector organisations**

	All			Languages		Other humanities		Creative arts and media	
Professor	0.065	**		Professor	0.145	**	-0.003	0.122	**
Age 50 +	0.064			Age 50 +	0.054	*	0.106	0.025	**
Gender	0.007	**		Gender	-0.064		0.020	-0.012	*
Creative Art and Media	0.108	**							
N	3521			N	689		1767	1065	
Wald Chi <sup>2</sup> (4)	63.78	**		Wald Chi <sup>2</sup> (3)	14.39	**	20.08	9.38	**
Percent correctly classified	55.50			Percent correctly classified	67.2		55.69	53.43	

**Connecting with Multiple Partners**

The survey evidence shows that nearly a third of academics from the Arts and Humanities are engaged with private sector businesses. But there are important differences between disciplines with nearly a half of academics from Creative Arts and Media engaged with the private sector. In terms of public sector engagement, 38% of academics have connections, rising to 44% of academics from Creative Arts and Media. The group with which academics from the Arts and Humanities are most likely to interact with is the third sector – 46% of academics have connections, rising to 53% of academics from the Creative Arts and Media. The multivariate analysis indicates that older academics in senior positions are, in general, more likely to connect with the public and third sectors but interestingly there are no apparent relationships between seniority and age with connectivity with the private sector.

## 5. The Characteristics of Businesses Connecting with the Arts and Humanities

Although it is important to stress that academics connect with a range of partners, in this section we analyse engagement with businesses in more detail. In particular we look at connections from the perspective of businesses - focusing on those businesses in our survey who reported having one or more interactions with academia in the three years prior to the survey: approximately 550 firms had such interactions many of which involved interactions with more than one discipline. In this section we compare those firms who report an interaction with an Arts and Humanities discipline (approximately 10% of interacting firms) with those who report no interaction with Arts and Humanities.

### Arts and Humanities: Connecting With a Range of Businesses

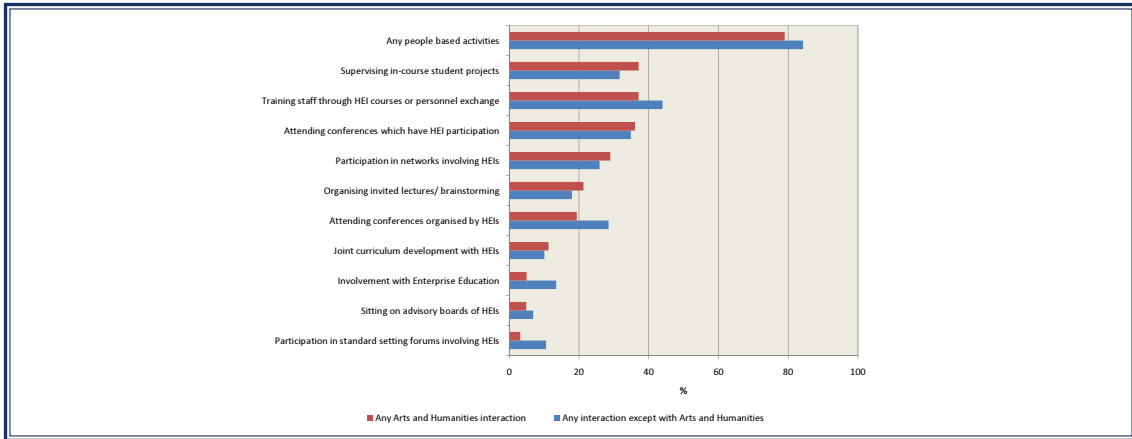
Overall, businesses with an Arts and Humanities interaction tend to be of a broadly similar size (in terms of median turnover) to businesses that interact with disciplines other than Arts and Humanities. In terms of the size distribution of businesses, however, connections with the Arts and Humanities tends to be more prevalent with smaller firms and less prevalent with larger firms (in terms of turnover) compared to interactions with disciplines other than with the Arts and Humanities. There is an increasing emphasis on the importance of exports for generating and sustaining economic growth, and businesses with an Arts and Humanities interaction tend to be more export oriented compared to businesses that interact with disciplines other than Arts and Humanities. A comparison by discipline suggests that businesses with an Arts and Humanities interaction have a similar level of export orientation to firms with interactions with the science base, whereas businesses that interact with the Social Sciences and Education tend to be less export oriented compared to other disciplines.

There has been an increasing focus on support for research and development (R&D) as a method for increasing innovation. Although businesses with an Arts and Humanities interaction tend to undertake R&D they are less likely to spend high levels of R&D compared to firms interacting with other disciplines. Businesses interacting with the Arts and Humanities have, on average, a lower median R&D expenditure per employee compared to businesses that interact with disciplines other than Arts and Humanities. A comparison by discipline suggests that businesses with an Arts and Humanities interaction have the lowest level of median R&D expenditure per firm and per worker, whereas businesses that interact with Health Sciences have the highest level of median R&D expenditure (per worker and per firm). It is important to note, however, that R&D expenditure is a poor proxy for innovation expenditure – and in particular it is not a good indicator of innovation expenditure in services.

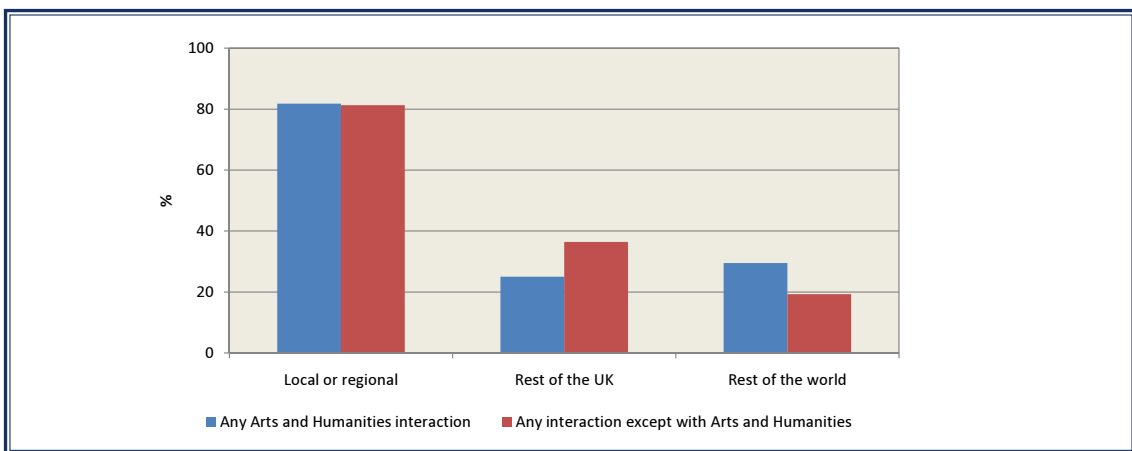
### The Varied Patterns of Engagement

The evidence presented in section 3 shows the variety of interactions from the perspective of academics; here we show the interactions from the perspective of businesses. It should be emphasised, however, that although we are evaluating individual modes of engagement, many business use multiple channels. For instance, the case study in Box 5 shows engagement ranging from informal advice to student placements. The evidence presented in Exhibit 5.1 shows the perspective of businesses in terms of people-based activities: although businesses with an Arts and Humanities interaction engage in a high level of people-based knowledge exchange activity (79%), this is slightly lower compared to businesses that interact with disciplines other than Arts and Humanities (84%). The relatively lower level of engagement by businesses with an Arts and Humanities interaction is most important (in terms of statistical significance) with respect to participation in standard setting forums and involvement in enterprise education.

**Exhibit 5.1 Business: Engagement in people-based activities by discipline (%)**

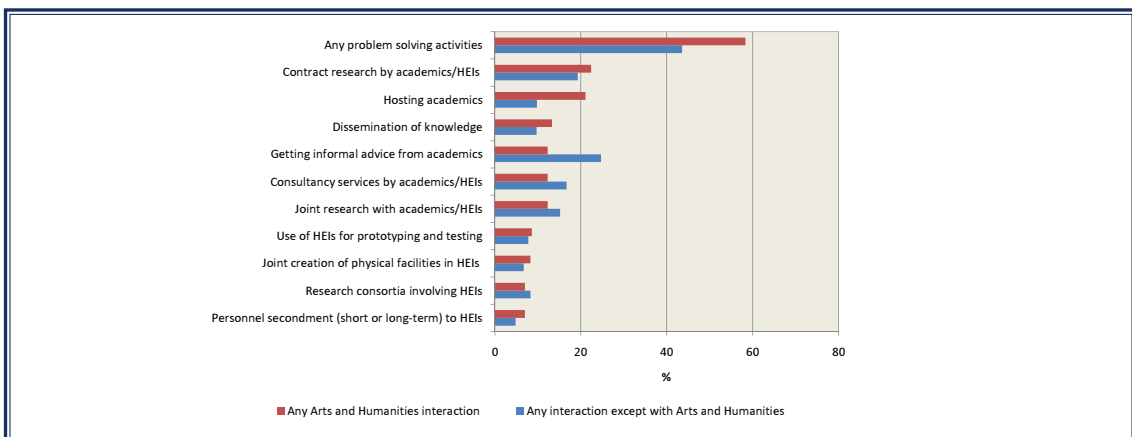


**Exhibit 5.2 Business: Engagement in any people-based activities by location and discipline (%)**



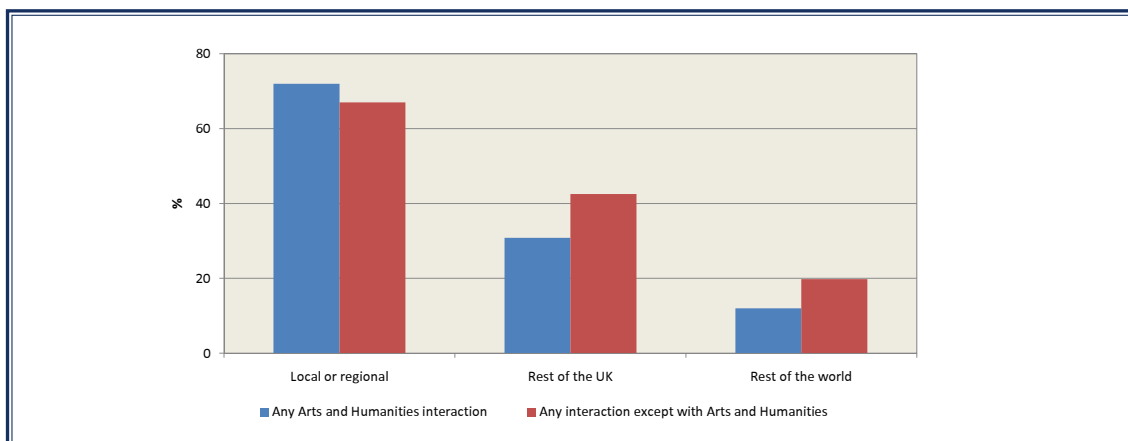
Business interactions with academia vary across different geographies. As shown in Exhibit 5.2, the highest level of people-based engagement is locally and regionally. Businesses with an Arts and Humanities interaction have similar levels of local or regional engagement (82%) compared to businesses that interact with disciplines other than Arts and Humanities (81%). Businesses with an Arts and Humanities interaction have a lower level of national (rest of the UK) engagement (25%) compared to businesses that interact with disciplines other than Arts and Humanities (36%). But businesses with an Arts and Humanities interaction have a higher level of international engagement (30%) compared to businesses that interact with disciplines other than Arts and Humanities (19%).

**Exhibit 5.3 Business: Engagement in problem-solving activities by discipline (%)**



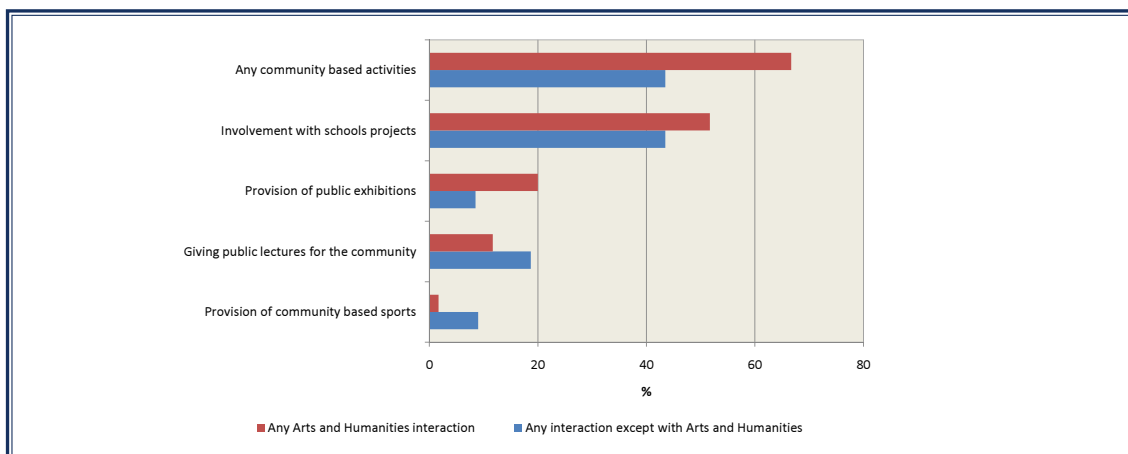
The evidence from businesses on problem-solving interactions is shown in Exhibit 5.3. Overall, 58% of businesses with an Arts and Humanities interaction engage in problem-solving knowledge exchange activity compared to 44% of businesses that interact with disciplines other than Arts and Humanities. The relatively higher level of engagement by businesses with an Arts and Humanities interaction is most important (in terms of statistical significance) for hosting academics on a short or long-term basis and in contract research by academics. Informal advice is one engagement mechanism which is much lower for businesses with an Arts and Humanities interaction compared to businesses that interact with disciplines other than Arts and Humanities.

**Exhibit 5.4 Business: Firms engagement in any problem-solving activities by location by discipline (%)**



The geography of problem-solving engagements is shown in Exhibit 5.4. The highest level of problem-solving engagement is locally and regionally. Businesses with an Arts and Humanities interaction have a higher level of local or regional engagement (72%) compared to businesses that interact with disciplines other than Arts and Humanities (67%). Businesses with an Arts and Humanities interaction have a lower level of national (rest of the UK) engagement (31%) compared to businesses that interact with disciplines other than Arts and Humanities (43%). Businesses with an Arts and Humanities interaction also have a lower level of international engagement (12%) compared to businesses that interact with disciplines other than Arts and Humanities (20%).

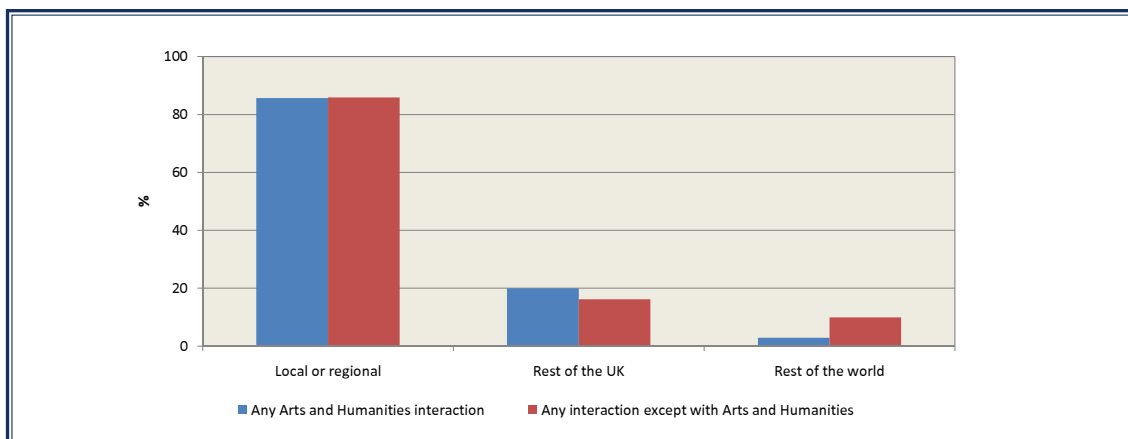
**Exhibit 5.5 Business: Engagement in community-based activities by discipline (%)**



The evidence from businesses regarding engagement in community-based activities is shown in Exhibit 5.5. Overall, 67% of businesses with an Arts and Humanities interaction engage in community-based knowledge exchange activity compared to 44% of businesses that interact with disciplines

other than Arts and Humanities. The relatively higher level of engagement by businesses with an Arts and Humanities interaction is most important (in terms of statistical significance) in providing public exhibitions. Involvement with school projects is also higher by businesses with an Arts and Humanities interaction – but this is not statistically significant.

**Exhibit 5.6 Business: Firms engagement in any community-based activities by location by discipline (%)**

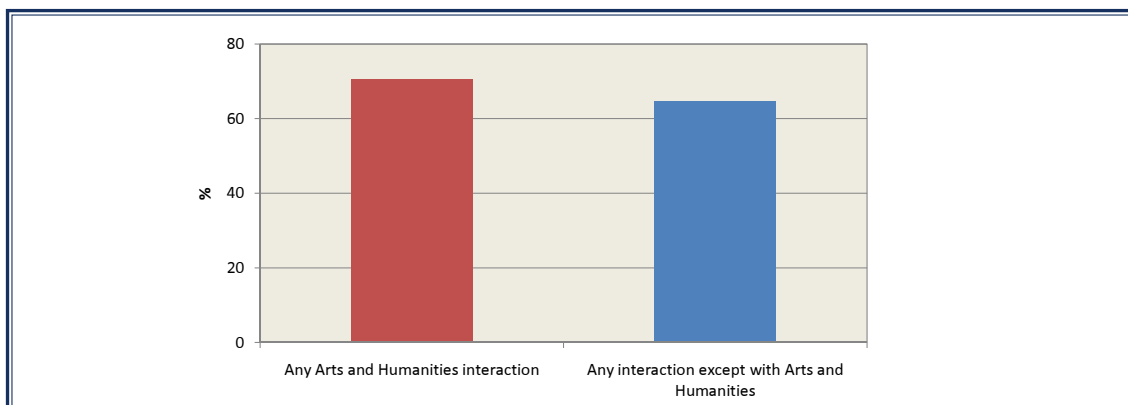


In terms of geography, as shown in Exhibit 5.6 the highest level of community-based engagement is local and regional. Businesses with an Arts and Humanities interaction have the same level of local or regional engagement compared to businesses that interact with disciplines other than Arts and Humanities (both 86%). Businesses with an Arts and Humanities interaction have a higher level of national (rest of the UK) engagement (20%) compared to businesses that interact with disciplines other than Arts and Humanities (16%). Businesses with an Arts and Humanities interaction have a lower level of international engagement (3%) compared to compared to businesses that interact with disciplines other than Arts and Humanities (10%).

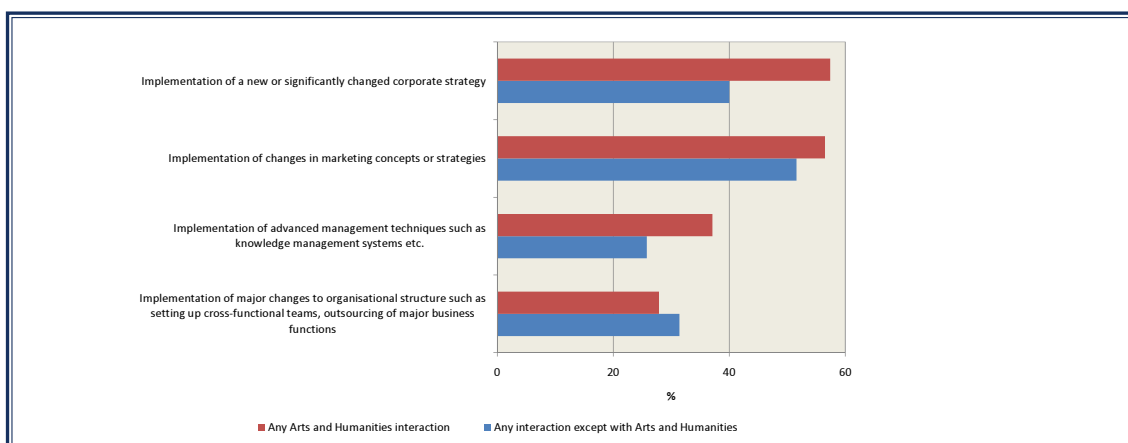
### Connections and Innovation

The survey of business identified those businesses that are innovation-active and those that are not. As shown in Exhibit 5.7, overall, 71% of businesses with an Arts and Humanities interaction are engaged in innovation activities compared to 65% of businesses that interact with disciplines other than Arts and Humanities. A comparison across disciplines indicates that businesses that have an interaction with the science base (Biology, Chemistry, Veterinary Science, Engineering, Materials, and Health Sciences) are more likely to be engaged in innovation activities compared to businesses that have interactions with other disciplines.

**Exhibit 5.7 Business: Engagement in innovation activities by discipline (%)**

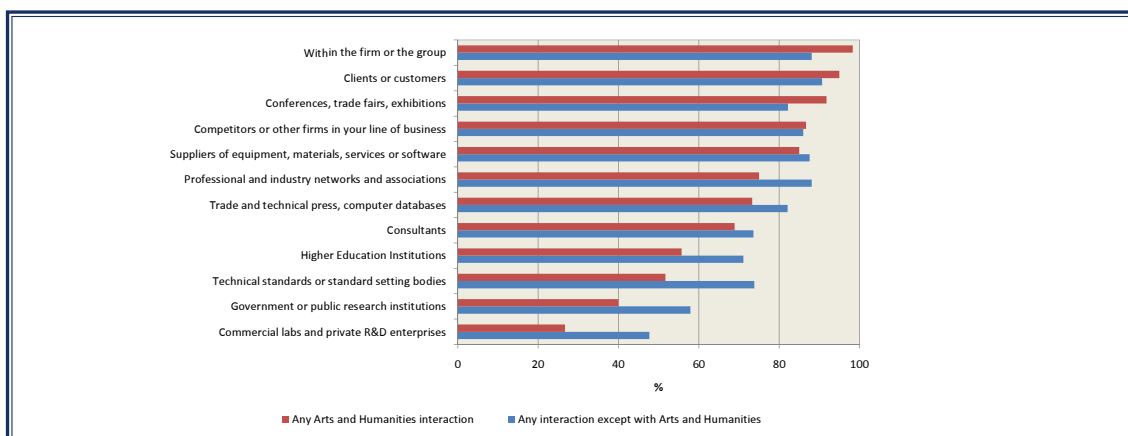


**Exhibit 5.8 Business: Whether the firm has made any major changes in business structure and activities in the last 3 years by discipline (%)**



Wider notions of innovation include the introduction of new forms of business structures. As shown in Exhibit 5.8, businesses with an Arts and Humanities interaction are more likely to have made major changes to its business structure and its activities in the last 3 years compared to businesses that interact with disciplines other than Arts and Humanities. The most frequently cited change was the implementation of a new or significantly changed corporate strategy – cited by 57% of businesses with an Arts and Humanities interaction compared to 40% of businesses that interact with disciplines other than Arts and Humanities. Other important changes include the implementation of advanced management techniques – cited by 37% of businesses with an Arts and Humanities interaction compared to 26% of businesses that interact with disciplines other than Arts and Humanities.

**Exhibit 5.9 Business: Use of sources of knowledge or information in innovation activities by discipline (% using source)**

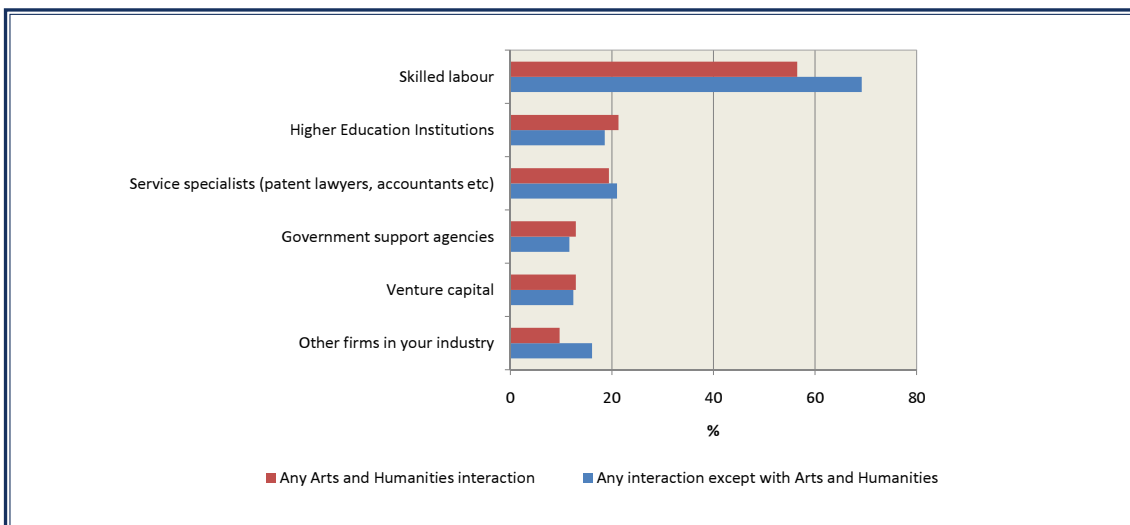


As captured in the notion of 'open innovation', there is an increasing emphasis on using multiple sources of information to improve innovative performance and competitiveness. As shown in Exhibit 5.9, businesses use a range of sources of knowledge or information to support their innovation activities. Overall, businesses with an Arts and Humanities interaction are more likely to use sources of knowledge from within the group and from conferences and trade fairs compared to businesses that interact with disciplines other than Arts and Humanities. Businesses with an Arts and Humanities interaction are less likely to use sources of knowledge from commercial labs, higher education institutions, public research institutions, technical standards or standard setting bodies and professional and industry networks compared to businesses that interact with disciplines other than Arts and Humanities.

## Does Geography Matter for Business Connection?

The focus on 'clusters' has illustrated the increasing emphasis on agglomeration and proximity to other economic actors as a source of competitive advantage for businesses. Exhibit 5.10 shows how businesses rate the importance of proximity to a range of resources. Overall proximity to skilled labour is important for all businesses – although this is considered to be less important for businesses with an Arts and Humanities interaction (57%) compared to businesses that interact with disciplines other than Arts and Humanities (69%). Proximity to skilled labour is most important for businesses that interact with Engineering, Materials Science and the Health Sciences. Proximity to HEIs is considered to be important for 21% of businesses with an Arts and Humanities interaction compared to 19% of businesses that interact with disciplines other than Arts and Humanities.

**Exhibit 5.10 Business: Importance of geographic proximity to certain resources by discipline (% rating as important or highly important)**



### Box 5: People-oriented Business Interactions with the Creative Arts

Martin Earle founded a Kent-based company in 1994 to produce models primarily for the residential development and architectural design markets, but has diversified into making models for product development and displays for themed attractions, galleries and museums. He had studied interior design at his local university and then went to study model-making at an arts college in Hertfordshire. He retains a strong affinity to creative arts HEIs: *"I saw how it benefited me [...] in terms of the creativity [...]. I appreciated there is a learning curve, that in college there is a lot you learn about techniques just by watching people do it wrong sitting next to you, and equally I think you don't stop learning. Particularly in model-making you definitely don't stop learning once you leave college, so I feel there are still elements I can draw from that. And it's paying it back in really, putting it back into the system for what I benefited, that's the reason why I still have a connection."*

He 'pays back in' in several ways: the firm has a laser-cutting facility which he allows students from the local university to use at a basic hourly rate – *"they can come down, I can try and untangle all their messy drawings and I can produce it for them"*. Fewer come now that the University of the Creative Arts (UCA) has its own facility, but sometimes they prefer *"a more professional edge"* to their presentation. Some of the lecturers he knows on the model-making, product design and set design programmes will sometimes phone for advice, or will come for a day to tap into his experience and borrow bench space. The third avenue is occasionally to take students for the industrial release portion of their degree, but *"it doesn't always coincide with when I need people. I am a small business, so I can't suddenly produce work for an additional model-maker who probably needs to be watched over."* He also attends the graduates' shows and offers them interviews, although more often to help him keep in touch with the model-making industry's many freelancers than to offer employment – *"geographically it's handy to be able to draw on a skill base that's locally based rather than find people from Essex or London"*. A student may have different skills that he needs on a temporary basis for a specific project – for example in glass fibre production – so he can offer a few weeks of work experience, even if their architectural skills do not fit his requirements. From time to time lecturers ask him to run projects with the second year students,

*continued overleaf*

Box 5: continued

*"I was invited in to UCA during 2009 to run a project that required students to ... produce elevation architectural models over a four week period, with a lecture on what architectural model-making encapsulates. [...] Bringing in an external lecturer can add a slightly different approach, and it brings a lot more credence to the project if you have got someone coming in from the industry."*

He does not see the university as the main source of knowledge for his own work – *"usually university is playing catch up with the industry"*. On the other hand, he has been on a number of courses that the university has run on topics such as entrepreneurship, marketing, basic web design and creative software use. The 10-week course on marketing was particularly useful: *"it changed my outlook as to what marketing was and how I could use it"*.

## Hidden Connections with Business

When evaluating the ways that universities interact with business there is tendency to focus on how academia in the realms of science and technology can improve the innovation performance of firms. But this is an incomplete picture: businesses engage with academics from a range of disciplines often for reasons that are not primarily concerned with the acquisition of technology. And many businesses interact with academics from the Arts and Humanities – particularly businesses that are export oriented and those that have made major changes in their organisational structure. There are multiple modes of knowledge exchange, with a relatively high propensity to engage in problem-solving activities and community-based activities. Furthermore, these activities are most likely to take place at a local or a regional level. What should be stressed is that businesses tend to use multiple sources of knowledge – and when they connect with academia, they often connect with academics from many different disciplines. This connectivity with academics from the Arts and Humanities is often combined with collaborations with academics from other disciplines including science and engineering.

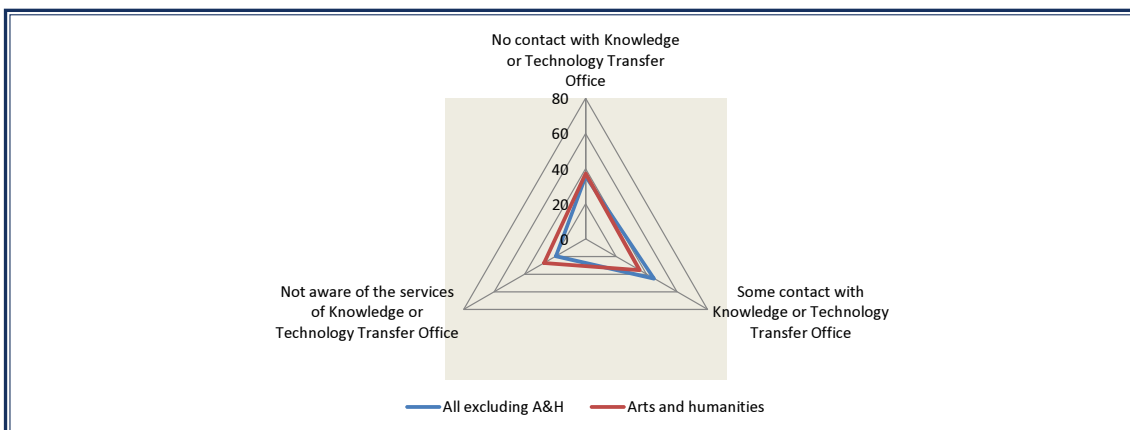
## 6. How Partnerships Develop: Academic and Business Perspectives

The evidence on partnerships shows that knowledge exchange operates through multiple mechanisms and involves a range of disciplines and types of knowledge. Moreover, knowledge is 'exchanged' rather than 'transferred' and this requires the development of partnerships which ensure effective contractual and relational interactions. There are number of mechanisms through which partnerships between academics and other organisations are initiated and developed.

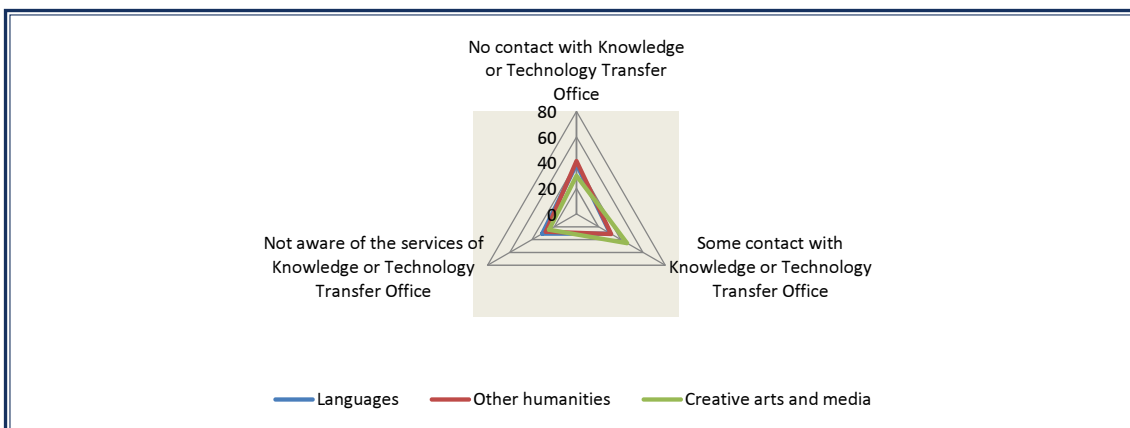
### The Role of the Technology Transfer Office

The focus on technology transfer has seen the development and expansion of technology transfer offices (TTOs) in universities to initiate and manage the transfer process. As shown in Exhibit 6.1, 36% of academics from the Arts and Humanities had contact with their TTO – slightly less than the 45% of academics from other disciplines who has some contact. The figure from the Arts and Humanities could be considered to be surprisingly high given that most of such academics do not produce 'technology'. In terms of awareness of the services of the TTO, 27% of academics from the Arts and Humanities were not aware of this service compared to 20% of academics from other disciplines.

**Exhibit 6.1 Academic: Contact with Knowledge or Technology Transfer Office**



**Exhibit 6.2 Academic: Contact with Knowledge or Technology Transfer Office by Arts and Humanities discipline**

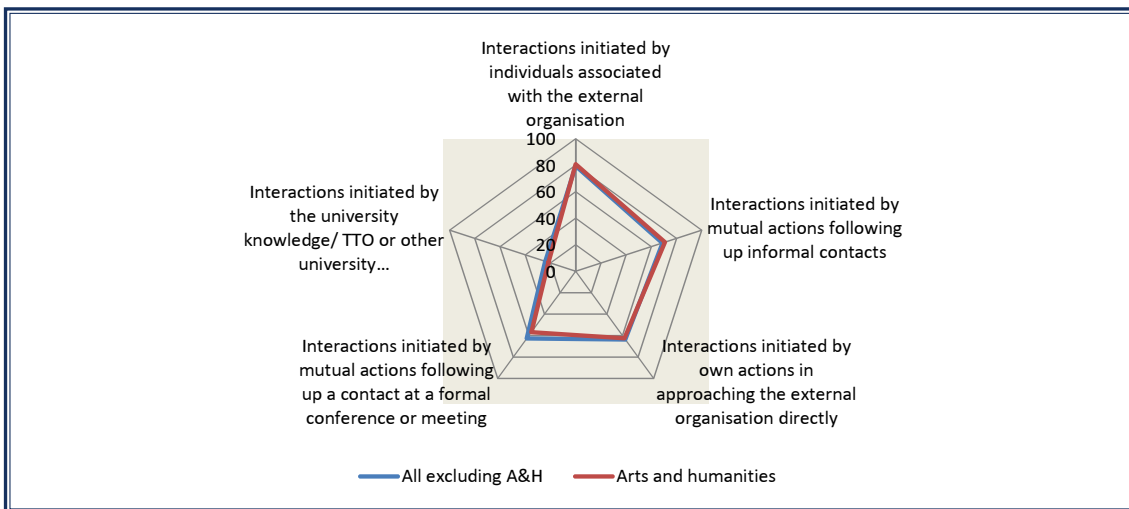


As shown in Exhibit 6.2, within the Arts and Humanities, academics from Creative Arts and Media have the highest level of contact with their TTO (46%). The lack of awareness was highest in Languages (31%) and lowest in Creative Arts and Media (25%). Overall, Creative Arts and Media is the discipline that is more likely to have contact with, or be aware of, the services of technology transfer offices.

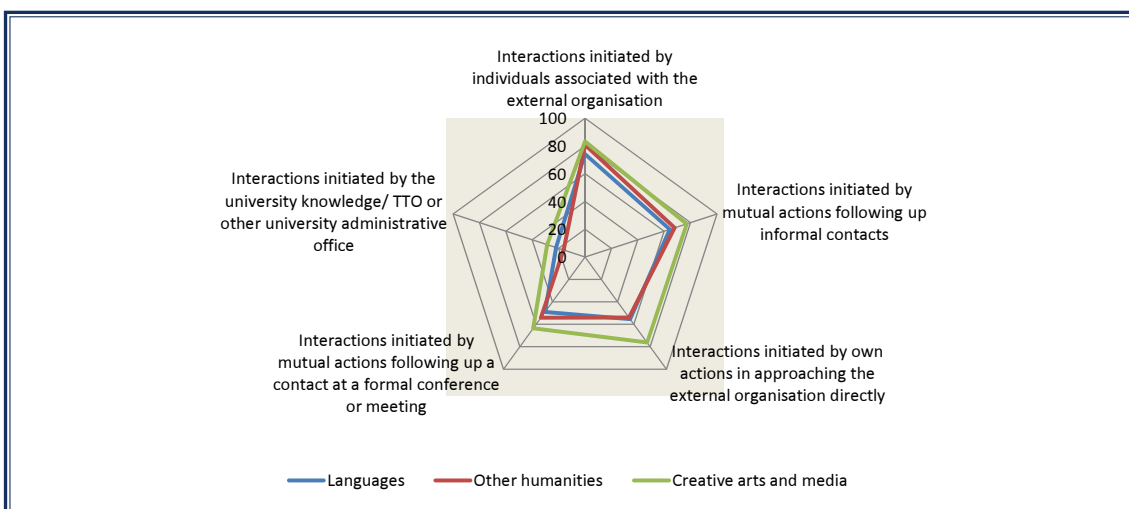
### How Connections Are Made

As shown in Exhibit 6.3, the ways that partnerships are initiated are very similar for academics from the Arts and Humanities and for academics from other disciplines. Overall, the most frequently cited initiator were individuals associated with the external organisations – with 81% of academics from the Arts and Humanities citing this channel compared to 80% of academics from other disciplines. Other important mechanisms include interactions initiated by mutual actions following up informal contacts – reported by 71% of academics those from the Arts and Humanities. And 63% of academics from the Arts and Humanities reported that interaction was initiated by their own action in approaching the external organisation directly.

**Exhibit 6.3 Initiation of interactions – the perspective of academics**



**Exhibit 6.4 Initiation of interactions by Arts and Humanities disciplines - the perspective of academics**



As shown in Exhibit 6.4, academics from Creative Arts and Media are more likely to use all forms of interaction initiation compared to academics from Languages and Other Humanities. A high proportion of interactions initiated by individuals from external organisations is reported by all the sub disciplines within Arts and Humanities – with the highest level in Creative Arts and Media (83%). Interactions initiated by mutual actions following up informal contacts are particularly frequently cited by academics from Creative Arts and Media (77%), as are initiating contacts by their own actions (76%).

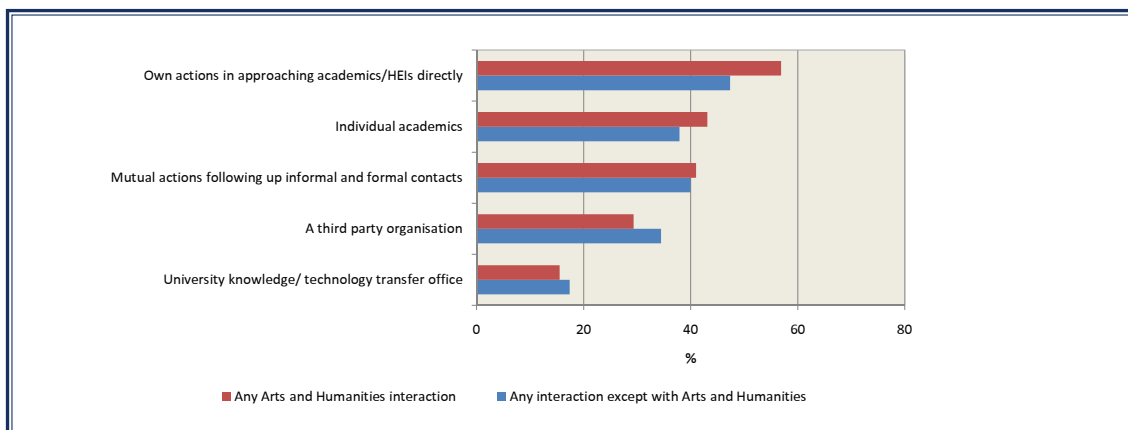
### Box 6: Academics Initiating Relationships

As a researcher in Cultural Studies at Goldsmiths, University of London, Professor John Hutnyk has been engaged in collaborative projects for many years. A book he wrote some years ago about music and politics inspired a group of Scandinavian musicians to set up what has become an annual music festival and, when the opportunity arose for a research network grant to look at 'border crossings', Hutnyk invited them to participate. He also drew into this network personal but dormant connections with, among others, a London-based visual arts group and a theatre group in India: *"without the impetus to put together a network of people that I knew would be interested but I was not in touch with, and with no other way to really animate this network, none of this would have happened. It has led to all sorts of creative spin offs"*. The original partners drew in new connections and expanded the network, including a now well-known poet who co-wrote and co-produced a play they workshoped, a group of artists who staged a related exhibition of various experimental art works on the theme, and several groups of activists working in the same area as the network theme.

Frances Holliss, who qualified as an architect before joining the School of Architecture in London Metropolitan University, initiated partnerships – three formal and one informal – in a variety of ways for her Knowledge Transfer Fellowship on the topic of work-homes. Of the formal partners the first, an architectural practice, had been a subject of her earlier research and readily agreed to participate again; the second, a regeneration consultancy, she met at a conference where they found common ground in antipathy to the approach under discussion; and the third, a German housing firm, was known to her co-investigator (and, as it happened, by her second partner). The fourth partner, whom she also met at a conference, was a director of a global construction and property consultancy company, a much larger firm than the other three – and for that reason the partners preferred to keep the relationship with him on an informal basis; timing was also an issue, since Holliss did not meet him until several months after the other relationships had been formalised. Nevertheless, she saw him as a potentially important collaborator in the future, particularly if she and one of the other partners were successful with their submission to an architectural competition.

Sarah Taylor, an experimental textiles designer at Heriot-Watt University, incorporates optical fibre technology and light-emitting diodes (LEDs) into her craft pieces. She works with electronics and lighting companies to create the effects she needs. Her first experience with external partners came when she participated in an exhibition for sensory-impaired people, producing a work to stimulate the tactile, aural and visual senses. The exhibition organisers provided contacts with a couple of university spin-out companies, whom she worked with for the following 4-5 years. In search of partners for her more recent work incorporating colour and light into textiles she attended a trade fair in London, where she met a company that introduced her subsequently to several other potential partners, one of whom had just the skills she needed and *"had a really good approach"*. The Technology Strategy Board's Materials Knowledge Transfer Network – which she joined by attending various events and helping students applying for grants for materials – has also showcased her work as an example of how 'smart' materials can find new markets and opportunities.

### Exhibit 6.5 Initiation of interactions – the perspective of businesses



Evidence on the perspectives of businesses on how interactions are initiated is shown in Exhibit 6.5. The most frequently cited mechanism through which interactions with HEIs are initiated is the firm's own actions. Overall, 57% of businesses with an Arts and Humanities interaction use this mechanism compared to 47% of businesses that interact with disciplines other than Arts and Humanities. Other frequently cited mechanisms include the actions of individual academics: overall, 43% of businesses with an Arts and Humanities interaction use this mechanism compared to 38% of businesses that interact with disciplines other than Arts and Humanities; and mutual actions, where, overall, 41% of businesses with an Arts and Humanities interaction use this mechanism compared to 40% of businesses that interact with disciplines other than Arts and Humanities. The least frequently cited mechanism is use of the university technology transfer office – broadly consistent with the evidence from the academics discussed earlier in this chapter.

### Box 7: Partner-initiated Relationships

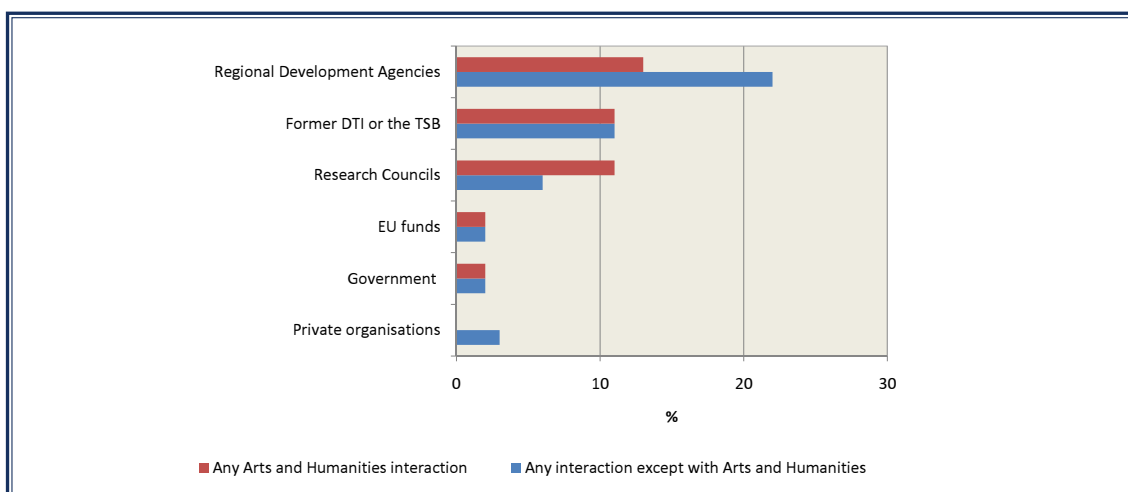
Commercial confidentiality agreements restrict disclosure of the details of many business partner-initiated projects at Professor Stephen Hoskins' research centre. One example is of a tableware producer, who, attracted by the Centre's expertise in 3D ceramic printing, is collaborating on some research work on how to print concept versions of cups and plates which can be glazed and fired before being shown to potential clients – replacing the plaster models the firm currently uses, which cannot be fired. Having developed the ceramic printing process one of the current research issues for Hoskins and his team to solve is how the firing can be done without warping. A second example involves a specialised printer manufacturing company which had first met Hoskins some four years ago. For three years the relationship did not particularly develop, until the company launched a new printer that combined the ability to do wide format printing with 3D printing on a wide range of media. It gave the Centre one of these printers with an open brief to explore potential applications that could open up new opportunities or new markets for the company. According to this business partner, "*direction is what we want to get out of it. It's very rare that you ever find a massive commercial potential in one single idea. At the moment we don't know what we don't know, and the relationship with an academic partner can at least give us an insight into the possible*".

On the strength of his reputation as a historian of technology and in particular of communications technology Dr Jon Agar of University College London (UCL) was approached by a curator of a museum. She was seeking advice on the interpretation for the public of objects in the museum's collection. This was for a new gallery on the making of modern communications due to open in 2014. The curator had also worked previously with a firm that designs internet- and mobile-based interfaces, particularly for educational purposes, on the development of an interactive website for the museum. When she saw an AHRC call for pilot research network proposals in that broad area, it seemed an ideal opportunity not only to investigate how to create an experience of the new gallery beyond the museum's four walls using digital technology, but also to bring in outside perspectives on how this might be done. Since the museum was not at the time recognised by the AHRC as an Independent Research Organisation, the curator encouraged Agar to submit a bid for funding to develop a prototype of a location-based mobile phone application for histories of technology. From their different perspectives the partners sought to explore how an audience's relationship with the history of technology might change if the person were standing in the location where the development took place. For Agar the collaboration was significant: "*the designing of something that is almost like a physical artefact, something that you can actually show people and use [...] was the highlight for me. [...] I don't think I could have gone to [the private company] and said 'I want to do this', I don't have the knowhow. The museum for example is a body that is used to commissioning and working with technical service providers [...]. I know now that working with an organisation like the museum can actually get something like this to happen, so I would like to do that again.*"

### Support for Connections

With the increasing emphasis on the role of universities in national and regional development, there has been increased funding to support interactions between businesses and universities. As shown in Exhibit 6.6, businesses with an Arts and Humanities interaction are less likely to have benefited from Regional Development Agencies (RDAs) funding (13%) compared to businesses that interact with disciplines other than Arts and Humanities (22%). In this area it should of course be noted that the RDAs are being wound up and will stop operating this year. Conversely, businesses with an Arts and Humanities interaction are more likely to have benefited from Research Council funding (11%) compared to businesses that interact with disciplines other than Arts and Humanities (6%), although it should be noted that a comparison by individual discipline (not reported here) suggests that businesses with a Biology, Chemistry or Veterinary Science interaction are most likely to have benefited from Research Council funding (16%).

**Exhibit 6.6 Business: Which of the following public funding bodies have provided support for the firm's HEI interactions in the last three years by discipline (%)**



### Connectivity: the Importance of People

The development of mutual understanding and expectations is crucial if knowledge exchange is to be effective and provide benefits to all partners. The evidence shows that relationships are most frequently initiated by individuals - often associated with the organisations that academics partner with. The importance of individuals initiating interactions is illustrated in many of the case studies - for instance, Professor John Hutnyk (Goldsmiths) has developed wide network of contacts that have helped his engagement activities (see Box 6) and businesses have initiated connections with Professor Stephen's Hoskins's Centre for Fine Print Research (University of the West of England) because of its established reputation (see Box 7). This suggests that the capacity to connect is an important factor in the knowledge exchange process. This evidence suggests that 'boundary spanning' between academia and external organisations is important. The relative minor importance of TTOs – particularly for academics from the Arts and Humanities – probably reflects the fact that many knowledge exchange mechanisms do not require contractual and transactional inputs from a TTO.

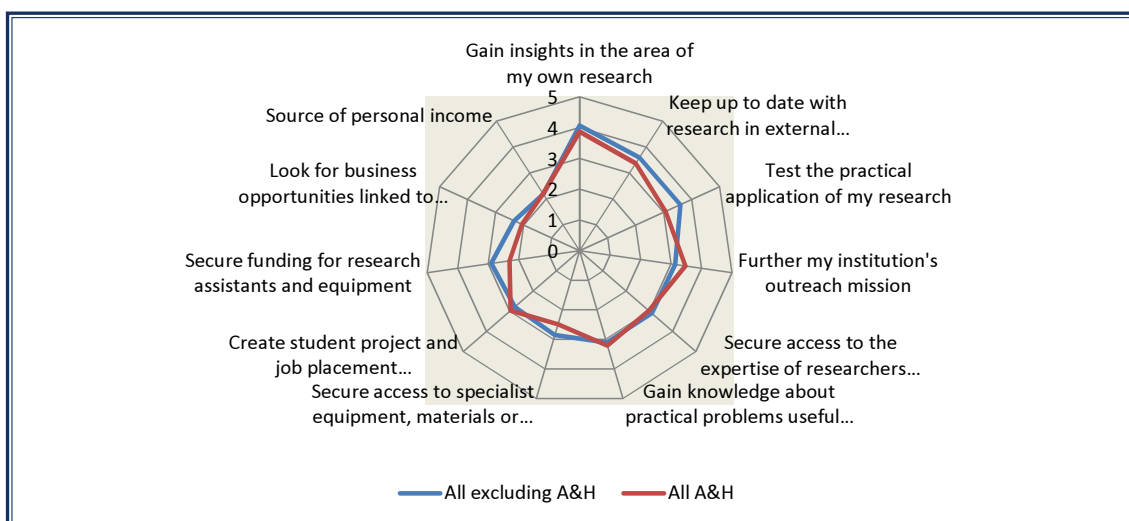
## 7. Why do Academics Connect? The Motivations and Impact of Knowledge Exchange

If knowledge exchange is to be developed and promoted it is important to evaluate the motivations of both academics and businesses. In this section we evaluate why academics engage and interact with external organisations. To do this we asked them to score a range of motives on a scale from 1 to 5, where 5 is very important and 1 is unimportant (the scores reported below refer to the mean score for the relevant group).

### Academics Connect to Strengthen Their Research

The main motivations to engage with external organisations were concerned with developing the research activities of academics. As shown in the case study of Helen Kennedy's research into new media, external engagement with others was a crucial motivation to help her work on developing a virtual learning environment for people with cognitive disabilities (see Box 8). When we look at the overall picture revealed by the survey evidence, the highest scoring motivation is to gain insights in the area of the academic's research area – this scored 3.9 by academics from the Arts and Humanities; and 4.0 by academics from other disciplines (see Exhibit 7.1). To test the practical application of their research was scored 3.1 by academics from the Arts and Humanities, which was the lowest score of all the broad disciplinary groupings (although it was scored at 3.5 by academics from Creative Arts and Media). To further the institution's outreach mission was scored at 3.5 by academics from the Arts and Humanities, compared to 3.1 for academics from other disciplines. The importance of securing access to specialist equipment, materials or data is relatively unimportant for the Arts and Humanities – scoring 2.5 – compared to 2.9 for academics from other disciplines (3.3 for those from Engineering). The creation of student project and job placement opportunities is relatively high in Arts and Humanities (it is ranked second for the broad disciplinary groupings) – it scores 3.0 for all academics from the Arts and Humanities rising to 3.6 for academics from Creative Arts and Media. The motivation to secure funding for research assistants and equipment is relatively lowly ranked, scoring 2.3 for academics from the Arts and Humanities but 2.9 for other academics. The motivation to secure business opportunities was in general scored low by all academics – 2.1 for academics from Arts and Humanities and 2.3 for academics from other disciplines. The motivation to secure personal income is scored low by academics from all disciplines.

Exhibit 7.1 Motivations for interactions



## Exhibit 7.2 Motivations for interaction by Arts and Humanities discipline

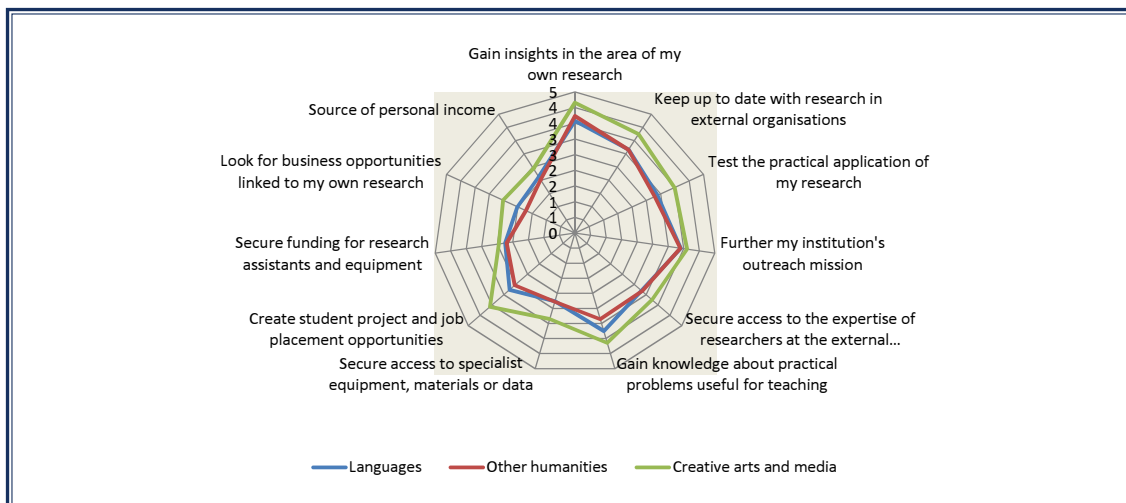
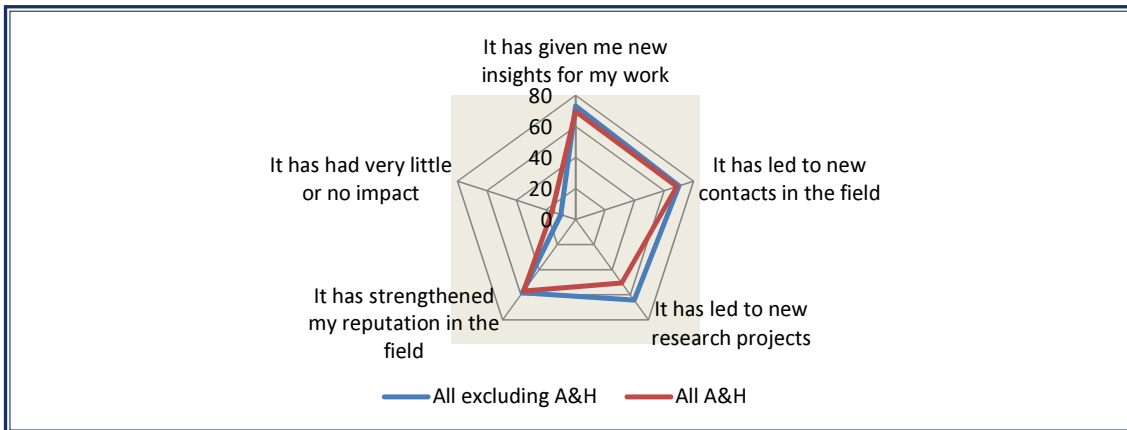


Exhibit 7.2 shows that within Arts and Humanities, gaining insights in the area of the academic's research was highest in Creative Arts and Media (4.2) and lowest in Languages (3.6). Overall, to keep up to date with research in external organisations was important for all academics (scoring 3.6) but was slightly less important for academics from Arts and Humanities (scoring 3.4), although those from Creative Arts and Media scored it at 3.7. To gain knowledge about practical problems useful for teaching was scored at 3.1 for all academics and at 3.2 for academics from Arts and Humanities (and 3.6 by academics from Creative Arts and Media).

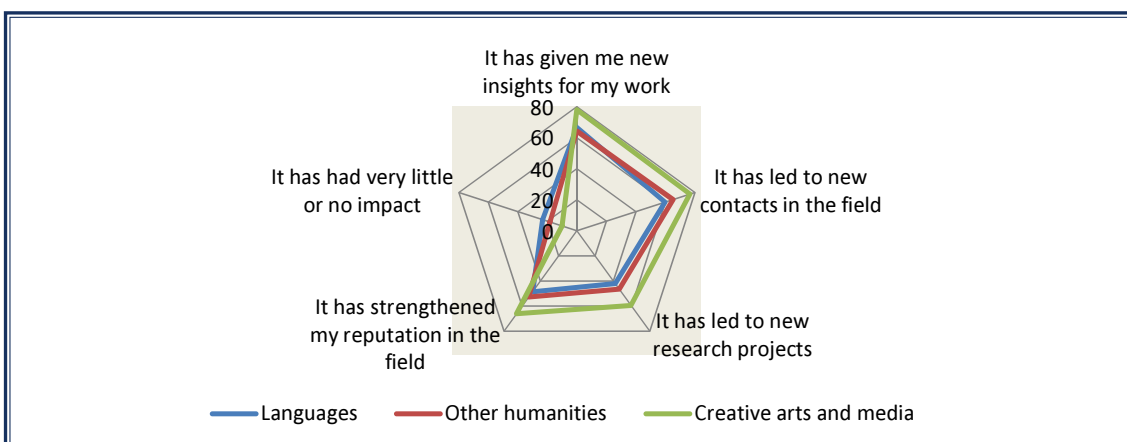
## Impacts on Research and Teaching

In addition to asking about motivations we also asked about impacts (where applicable). The results are consistent with the evidence on motivations – academics are primarily motivated to engage with others to help their research and their interactions did help their research. As shown in Exhibit 7.3, 70% of academics from the Arts and Humanities who engage with external organisations believe that it has given them new insights into their research work – for academics from other disciplines it is 73%. Exhibit 7.4 shows that 78% of academics from the Creative Arts and Media who engage with external organisations believe that it has given them new insights into their research work. Overall, 69% of academics from the Arts and Humanities who engage with external organisations believe that it has led to new contacts in the field – compared to 70% for academics from other disciplines; and 77% for those from Creative Arts and Media. In terms of the development of new projects, 51% of academics from the Arts and Humanities who engage with external organisations believe that it has led to new research projects – compared to 62% for academics from other disciplines; and 59% for those from Creative Arts and Media. As far as reputation is concerned, 57% of academics from the Arts and Humanities who engage with external organisations believe that it has strengthened their reputation – for academics from other disciplines it is 58%; and 66% for those from Creative Arts and Media. Overall, 16% of academics from the Arts and Humanities who engage with external organisations believe it has had very little or no impact on their research – for academics from other disciplines it is 16%; and 10% for those from Creative Arts and Media.

### Exhibit 7.3 Interactions: the impact on research



### Exhibit 7.4 Interactions: the impact on research by Arts and Humanities discipline



### Box 8: Collaborative work stimulates new research as well as learning opportunities for external partners

Based at the University of Leeds, Dr Helen Kennedy's field is New Media and a simple description of her research would be 'about people who make the web', particularly in terms of questions around equality, inequality, inclusion and exclusion. In one research project on the development of a virtual learning environment for people with cognitive disabilities she investigated the impact of contexts of consumption on the success of the product; and the processes of production and how they impacted on the final product and subsequently on the success of the product. Although the research project was seen as successful, Kennedy felt "we need to know more about the embeddedness of accessibility in the work practices of web designers and developers if we want to make accessibility happen" for people with cognitive disabilities. A new project used action research to enhance web designers' understanding of the accessibility needs of people with intellectual disabilities, and hence to encourage change in web design practices. The expectation was that web designers would build a product and test it with people with intellectual disabilities, during a series of workshops.

Recruitment of web designers and developers to the project was through existing networks; via a website; by Kennedy standing up in a session at a major web design conference and challenging people to become more creative in their approach to accessibility; and by contacting field leaders in the UK web design industry. Included in four of the workshops were people with intellectual disabilities (recruited through an intermediary organisation), who acted as experts in their accessibility needs rather than as research subjects and were paid for their time. According to a freelance web designer participant, "the highlight was we actually got to work with user groups, [...] to try our individual practical projects out on the real users". As a part-time Further Education teacher of web design this participant was acutely aware of the gap between IT teaching and practical workplace skills, so she was actively transferring what she learned in the workshops to her students, raising their awareness of intellectual disability in web design.

Dr Kennedy and her colleagues staged an additional meeting 6 months after the workshops because of the level of enthusiasm and commitment they found among the participants. In her words, "the feedback on the workshops was positive and people were  
continued overleaf

Box 8: continued

Dr Kennedy and her colleagues staged an additional meeting 6 months after the workshops because of the level of enthusiasm and commitment they found among the participants. In her words, *"the feedback on the workshops was positive and people were grateful for the opportunity that we have given them to learn and participate. I would also say there were unexpected outcomes. It wasn't our intention that these people would leave our project wanting to work on projects that were specifically for people with intellectual disabilities; it was much more about them adapting their existing practice. But quite a few of our participants went on and did paid work for the Rix Centre [a learning disability and innovation centre at the University of East London], which hires in freelance designers and developers. And a significant number did free work for me on the web site redesign. I am finishing writing a book at the moment and one of the things I write about is this willing volunteering of labour which comes from a kind of ethical commitment to accessibility as a cause."*

Something else that emerged through the process of the project is a bid with another academic and three participants for funding to research how to create an entirely visual social networking application for people at the profound end of the intellectual disability range, who cannot read, write or speak. Rather than simply focusing on the best methods for producing this application, the research will concentrate to a greater extent on its potential social impact.

Exhibit 7.5 Interactions: the impact on teaching

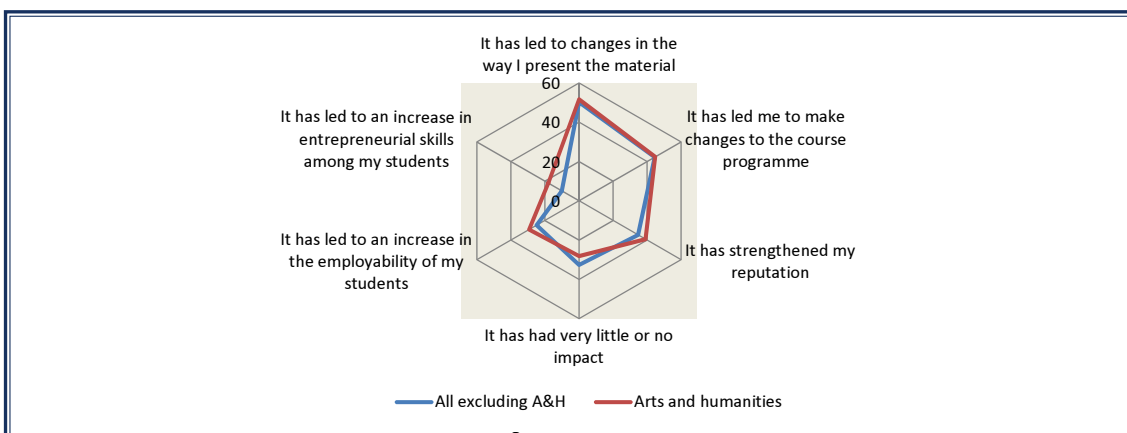
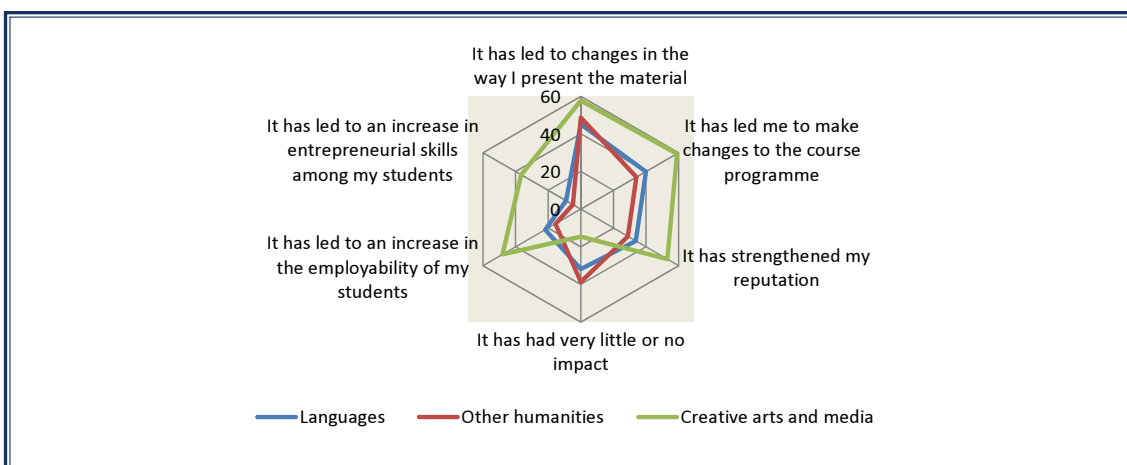


Exhibit 7.6 Interactions: the impact on teaching by Arts and Humanities discipline



Exhibits 7.5 and 7.6 show the impacts on teaching of engaging with external organisations. Overall, 52% of academics from the Arts and Humanities who engage with external organisations believe it has had an impact on their teaching through the way they present their material – for academics from other disciplines it is 50%; and 58% for those from Creative Arts and Media. In terms of the impact on changes to course programmes, 45% of academics from the Arts and Humanities who engage with external organisations believe it has had an impact – for academics from other disciplines it is 45%;

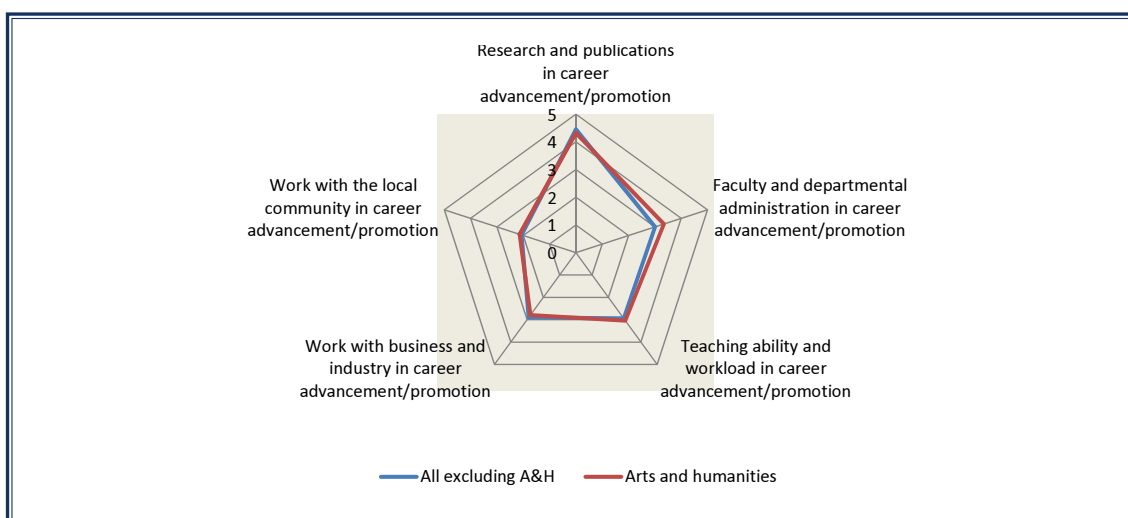
and 59% for those from Creative Arts and Media. Regarding strengthening reputation, 39% of academics from the Arts and Humanities who engage with external organisations believe it has had an impact – for academics from other disciplines it is 35%; and 53% for those from Creative Arts and Media. In terms of the employability of students, 29% of academics from the Arts and Humanities who engage with external organisations believe it has had an impact – for academics from other disciplines it is 25%; and 48% for those from Creative Arts and Media. Regarding the development of entrepreneurial skills, 10% of academics from the Arts and Humanities who engage with external organisations believe it had an impact – for academics from other disciplines it is 18%; and 37% for those from Creative Arts and Media. Overall, only 28% of academics from the Arts and Humanities who engage with external organisations believe it has had little or no impact on their teaching – for academics from other disciplines it is 32%; and 15% for those from Creative Arts and Media.

The evidence from the survey of academics shows that engagement with external organisations strengthens the two core missions of academics – research and teaching. Another important aspect to evaluate is how external engagement is evaluated in the promotion process. The academics in the survey were asked which factors were important in their institution with regard to career advancement and promotion (a scoring system was used with a scale from 1 to 5, where 5 is very important and 1 is unimportant – the scores reported below refer to the mean score for the relevant group).

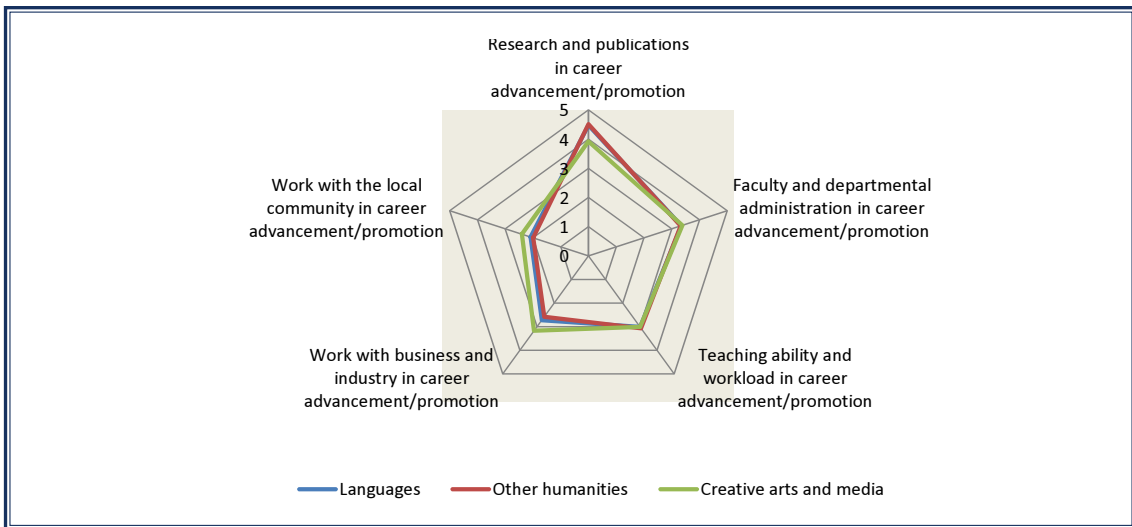
### Connecting and Career Advancement

As shown in Exhibits 7.7 and 7.8, research and publications, not surprisingly, are considered the most important factors in terms of promotion – and this is consistent across disciplines. Administrative duties are also an important factor, and this was particularly considered to be important by academics from the Arts and Humanities. Teaching ability and workload was also ranked as important and this is consistent across disciplines. Engagement with business tended to be considered to have a low impact on promotion – although this tends to be relatively highly scored by academics from Creative Arts and Media compared to academics from most other disciplines. In general, engagement with the local community also considered to have a low impact on promotion.

**Exhibit 7.7 Weight given to various factors in career advancement/promotion**



### Exhibit 7.8 Weight given to various factors in career advancement/promotion by Arts and Humanities discipline



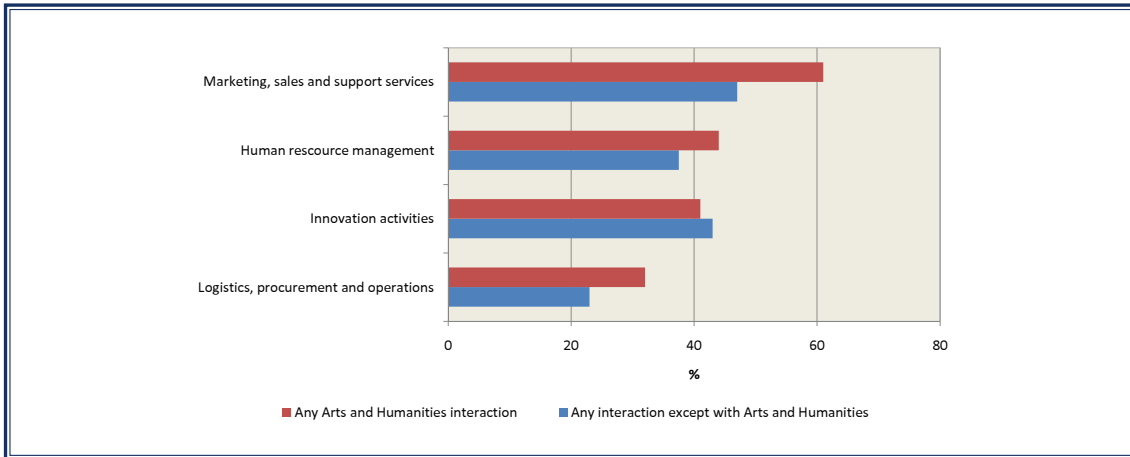
### Connectivity Supports the Core Missions of Academia

Academics engage with external organisations to support their research and teaching activities – within the Arts and Humanities these motivations are particularly important for those in Creative Arts and Media. The main motivations for academics from the Arts and Humanities are: gaining insights in the area of the academic’s research; furthering the institution’s outreach mission; and keeping up to date with research in external organisations. Overall, the evidence would suggest that research, and to a lesser extent teaching, are the main factors that drive the promotion process. External engagement is, in general, considered to have lower impact – but an important caveat should be emphasised: as discussed above, external engagement supports and strengthens research and teaching and it may be through these mechanisms that it helps career advancement.

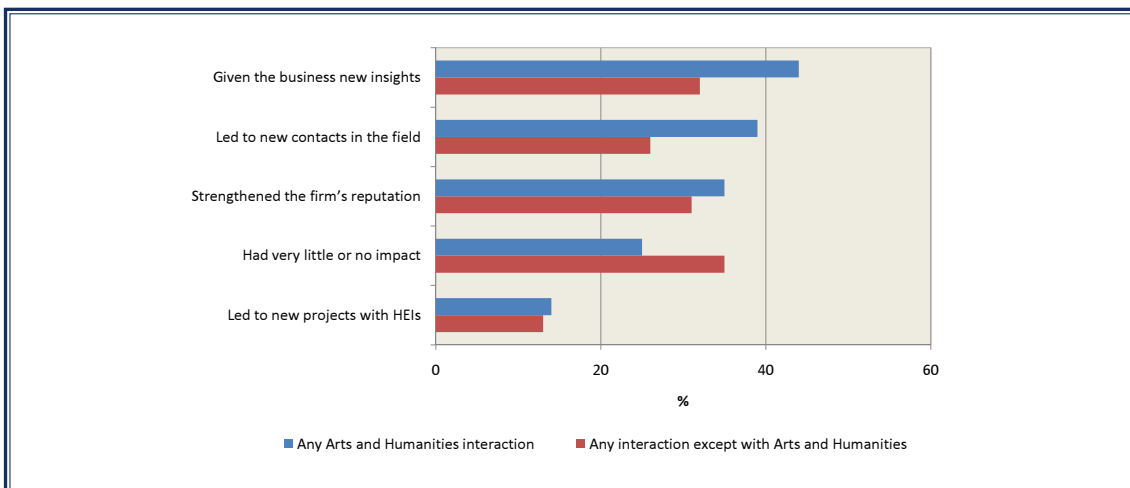
## 8. Why do Businesses Connect? The Motivations and Impacts of Knowledge Exchange

This section considers the motivation and impact of interactions with academics from the perspective of businesses. There has been an emphasis on the importance of the transfer of technology to improve the technology and innovative performance of firms. This section suggests that businesses interact with a range of academics and they are not simply motivated by the desire to acquire technology.

**Exhibit 8.1 Business motivation to interact with Universities – which activities it is concerned with (%)**

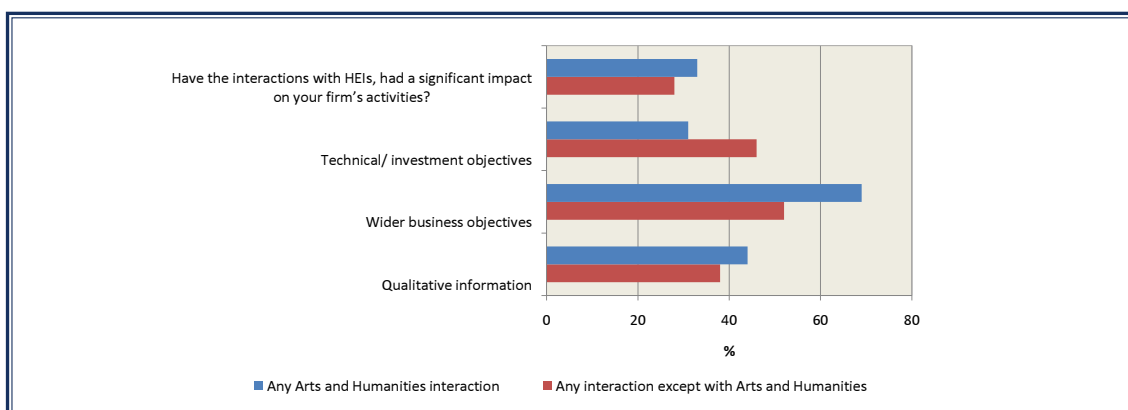


**Exhibit 8.2 Impact on business performance of knowledge exchange activities with Universities (%)**



The impact of knowledge exchange activities on business activities is shown in Exhibit 8.2. The most frequently cited impact by businesses with an Arts and Humanities interaction was providing more insights – cited by 44% of businesses compared to 32% of businesses that interact with disciplines other than Arts and Humanities. Also frequently cited was the development of new contacts in the field – cited by 39% of businesses with an Arts and Humanities interaction compared to 26% of businesses that interact with disciplines other than Arts and Humanities. Whereas 35% of businesses that interact with disciplines other than Arts and Humanities believe that the interaction had very little or no impact, this falls to 25% for businesses with an Arts and Humanities interaction.

### Exhibit 8.3 Businesses: overall impact of knowledge exchange with Universities and measures to assess impact (%)



The evidence presented in Exhibit 8.3 shows that, overall, 33% of businesses with an Arts and Humanities interaction believe that the interaction had a significant impact on the firm's activities compared to 28% of businesses that interact with disciplines other than Arts and Humanities. Businesses use a variety of methods to assess the impact of their knowledge exchange activities. The most frequently used method is: consideration of wider business objectives; followed by qualitative information; and then technical or investment objectives.

#### Box 9: Connecting with Business: New Insights in the Music Industry

Jeff Thompson runs Fat Northerner Records, a small independent music label in Manchester. His colleague contacted Birmingham City University (BCU) after hearing Dr Andrew Dubber, one of its academics, speak at a music industry conference in the US. They quickly arranged to meet Dr Dubber and Professor Tim Wall, who leads the Interactive Cultures team in the Centre for Media & Cultural Heritage, to discuss how internet technology is changing the ways that people interact with music.

The Centre for Media & Cultural Heritage comprises both academically-focused media researchers and people with production/media industry backgrounds, and many industry contacts, and has a vocational orientation to teach students planning to join the media and cultural industries. The instant rapport between Thompson and the Interactive Cultures team led to Fat Northerner becoming one of over 20 partners in a knowledge transfer fellowship project around new strategies for the radio and music industry. Thompson and his colleagues contributed ideas about useful outcomes for the industry in various brainstorming workshops. The original plan within the project was for the Interactive Cultures team to work with Fat Northerner to create a new organisational strategy, including an online presence, for the record label – at that stage “we were a record label, we were just trying to make records and put bands out”.

What happened was that a much broader relationship developed with the Interactive Cultures team. Thompson had started an informal ‘conversation’ in mid-2008 with other Manchester-based independent record labels to talk about where the industry was going “from a real world perspective [...] because we never did that before”. Early on he got Dubber and another music industry-oriented member of the team involved in the discussions, which then expanded to include people from bigger music labels in London. In October 2008 that ‘conversation’ turned into a conference in Salford, which was “basically about grass roots and DIY and small labels who didn’t have the resources to do stuff themselves, getting together and creating their own thing peer to peer. [...] And that’s been the crux, really, of our work with BCU since.”

Since that first conference Un-Convention, as it is called, has become a not-for-profit grassroots music event and community that has met in 17 ‘unconventional’ locations in the UK, India, Colombia, Brazil, Argentina, the Netherlands, Germany, and Australia. It has spread so rapidly partly because “Dr Dubber has got such broad contacts around the world [and has conversations with people about these things] but also just because of the internet. He came [to the first event] and wrote about it in his blogs, and within 2-3 months there was another one...” At least one BCU academic has been involved in every event and “they’re using that to feed back into their academic work”, while two are members of Un-Convention’s Board alongside Thompson.

“None of the conference side of it is what you’d think of as a formal relationship between us and them. It’s just that they’ve very much driven a lot of how it’s developed and grown”, says Thompson. “I think we’ve learnt an awful lot, and it’s not even just the knowledge, it’s the contacts we’ve made from doing this. We’ve met so many inspirational people. [...] [The BCU people are] invaluable to what we do and where we’ve come. We would have been doing something, with or without them, but [...] I would suspect that [...] a lot of the outcomes we’re getting, in terms of where things are happening and how are they coming around, are through our relationship with BCU.”

## **Businesses Connect to Strengthen a Range of Business Functions**

Businesses interact with academics – including those from the Arts and Humanities – for a variety of reasons: these are not restricted to technology development but also include service development, human resource management, training and marketing. This is illustrated by the case of Fat Northerner Records that initially connected with Tim Dubber (Reader in Music Industries Innovation at Birmingham City University) to help create a new organisational strategy – which subsequently led to a much deeper relationship (see Box 9). Much of the analysis and policy concerned with the links between businesses and universities has too narrowly focused on the role that academia plays in the technological, science and engineering aspects of the innovation system. But many of the motivations of business to interact with academics are not primarily concerned with such narrow aspects of innovation but instead are concerned with other aspects of management and business performance.

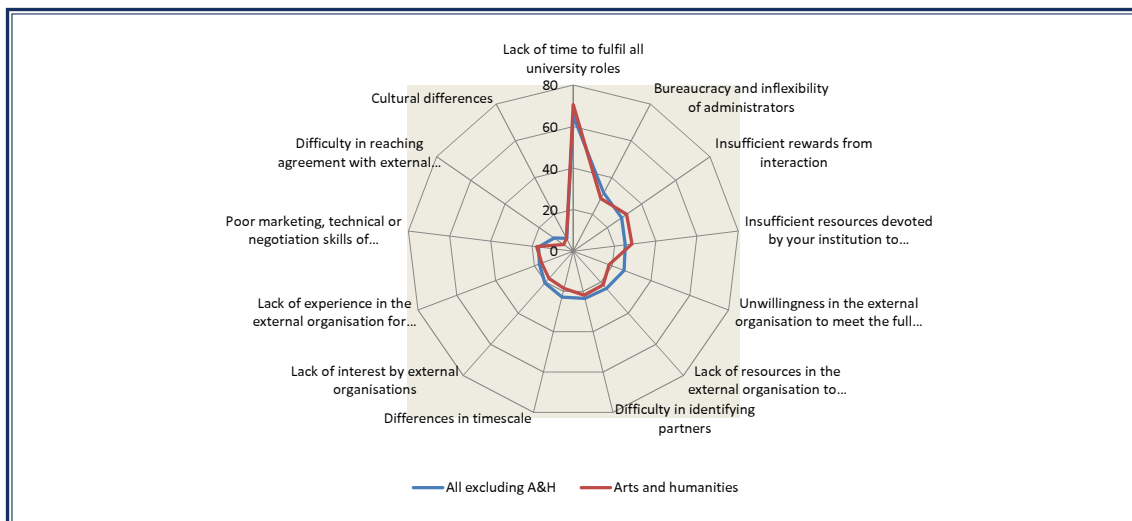
## 9. What Constrains Interactions with External Organisations? Academic and Business Perspectives

The evidence in this report shows a high degree of interaction between academics – including those from the Arts and Humanities – and the private, public and third sectors. It is also important, however, to consider what factors may constrain or hinder such interactions. For instance, it has often been argued that cultural difference and concerns about intellectual property are major constraints (Lambert, 2003) despite a lack of systematic evidence on the extent of these constraints. This chapter provides systematic evidence on the prevalence of constraints on interactions as identified by both academics and businesses.

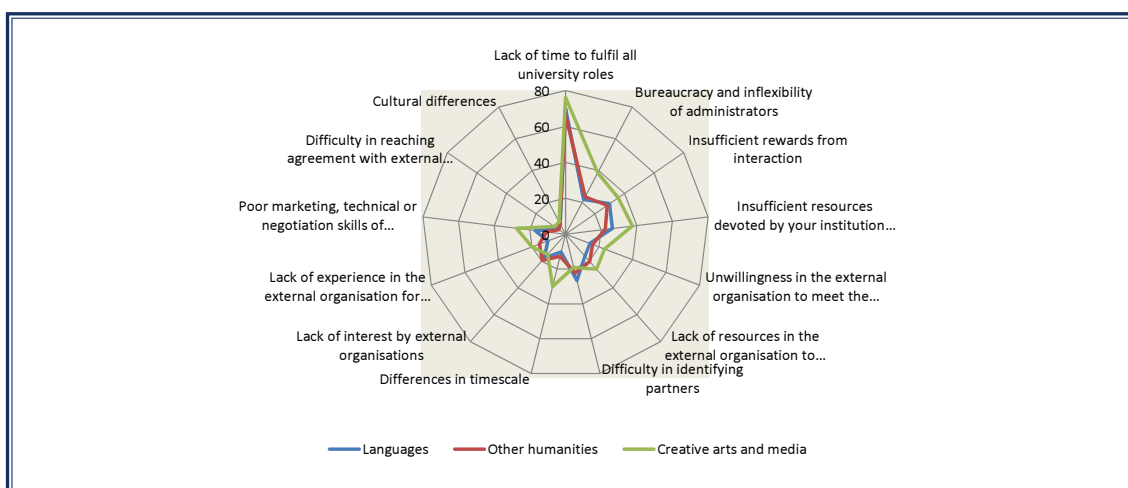
### Constraints: the Perspective of Academics

Exhibits 9.1 and 9.2 show the constraints on interactions as identified by the academics in the survey. Overall, the most frequently cited constraints are a lack of time and bureaucracy. In terms of lack of time, this is reported by 71% of academics in the Arts and Humanities (including 76% of academics from the Creative Arts and Media); compared to 65% of academics from all disciplines. In terms of bureaucracy, this is reported by 29% of academics from the Arts and Humanities (including 39% of academics from the Creative Arts and Media); compared to 31% of academics from other disciplines. These constraints are illustrated in a number of the case studies – with many academics feeling that they are increasingly having to deal with competing demands on their time (see Box 10). In the Arts and Humanities, other constraints that were frequently cited in the survey include: insufficient rewards from interaction (31%); and insufficient resources devoted by the institution to support interactions (29%). In the Arts and Humanities, constraints that are relatively low include: concerns over IP (6%); cultural difference (7%); lack of external interest (18%) and differences in timescales (19%).

**Exhibit 9.1 Constraints on Interactions: the Perspective of Academics**



## Exhibit 9.2 Constraints on Interactions: the Perspective of Academics by Arts and Humanities discipline



### Box 10: Constraints on interactions – perspectives of academics

A fine arts historian finds his research programme has increasingly led to engagement outside academia, through the staging of exhibitions at public art galleries in Europe. He noticed, at a conference of museum curators and academics, a discernable rise in interest among the academics “*who want to be involved with exhibition work, allowing their research to go beyond three or four readers of a highly specialised journal*”. At the same time, his HEI imposes an upper limit on the amount of time an academic can spend on research so that everyone will spend some time on teaching and administration as well, “*but if I was successful enough in making enough research income to buy out a hundred percent of my time, and then just go off and research full time, the rewards to them as a school would be substantial. Why would you not want that?*” – particularly since the outcome of his research work is always an exhibition accompanied by a scholarly catalogue that is available to the general public. (Anon)

Another historian felt that knowledge transfer activities like hers were encouraged by her institution, “*but there are so many pressures on people’s time and resources that it’s hard to say they are particularly prioritised among all the other things we have to do*”. She was also aware in the interactions with her educational sector partners of their problems of time constraints and uncertainty: “*They are busy and they are given a lot of new material in terms of curriculum changes, administrative requirements and so on, so there is little mental space for absorbing new research. And I think on top of that there is possibly a sense of feeling a bit anxious and insecure because they don’t often get the opportunity to meet researchers, or possibly it’s something to do with the status of teachers, that it’s not taken seriously enough as a profession. These are just guesses on my part. But I would say that the characteristic that was most powerful is lack of confidence.*” (Anon)

Misconception within the broader external institution – but not with the immediate project partner – about the purpose of their joint work concerned one media and cultural studies researcher in the early stages of collaboration with a museum. “*It was a very new venture ... to set out on a much more speculative, open route of trying to answer some of these questions about their core audience and why in effect they couldn’t shift, why all their policies and programming were not actually attracting either a younger or more ethnically diverse audience.*” But in fact, part of the museum “*defined what we were doing as a cultural diversity project, so they essentially turned the research in their minds into an educational outreach project and of course assumed that our intention was to convert these [...] non art lovers into art lovers. But that was the furthest from our intention! We just wanted to study what they thought. [...] We were saying look, we will give you a series of qualitative narratives from the people that you are trying to attract so that you will better understand. [...] we were trying to provide the museum with a richer, deeper understanding of these barriers [to access] as perceived or experienced by our participants.*” But as the academic recognised, all this was taking place against a specific political background which meant that museums “*were directed in their education and outreach programmes towards targeting those who were seen to be excluded from culture*” in order to fulfil government policy directives. The problem – which was also recognised by their immediate collaborator – was resolved satisfactorily and by the end the entire team felt that the key people in the museum recognised the value of understanding how people interpret and give meaning to the objects in the collection. (Anon)

## Understanding the Patterns of Constraints<sup>3</sup>

So far we have considered constraints for academics within Arts and Humanities as a whole and each of the three disciplines within the group. As in previous sections, we carried out a multivariate analysis to identify the impact of seniority, age, gender and discipline. We focus on lack of time, the most important constraint identified for Arts and Humanities academics as a whole and for each of the separate disciplines within that group. The most striking result which emerges is that being in the Creative Arts and Media group increases by 8.8% the probability of reporting a constraint arising from lack of time to fulfill all university roles. This is consistent with our earlier multivariate findings that this group is also the most likely to be involved in a range of people-related, problem-solving and community-based activities – as well as involvement with private and public sector external organisations. The probability of reporting time constraints is 4.7% lower for older academics. In general, professorships, age and gender have no effect on the probability of reporting a time constraints (although there is a weak tendency for gender to have an effect in other humanities). The most striking findings are for Creative Arts and Media. We have seen that this group has a higher level of connections with external organisations and membership of it also increases the probability of reporting time constraints. The probit analysis shows that the probability of reporting time constraints within this group is 8.1% less for professors and 5.5% less for older academics which suggests that younger, more junior academics are under the most time pressure.

### Exhibit 9.3 Constrained by lack of time to fulfill all university roles

	All			Languages		Other humanities		Creative arts and media	
Professor	0.004			Professor	0.025	0.044		-0.081	**
Age 50 +	-0.047	**		Age 50 +	-0.064	-0.038		-0.055	*
Gender	0.019			Gender	-0.009	0.048	*	-0.003	
Discipline	0.088	**		Discipline					
N	2413			N	393	1163		857	
Wald Chi <sup>2</sup> (4)	27.9	**		Wald Chi <sup>2</sup> (3)	1.87	5.63		9.78	**
Pseudo-R <sup>2</sup>	0.010			Pseudo-R <sup>2</sup>	0.004	0.004		0.011	
Percent correctly classified	70.37			Percent correctly classified	69.47	66.47		76.08	

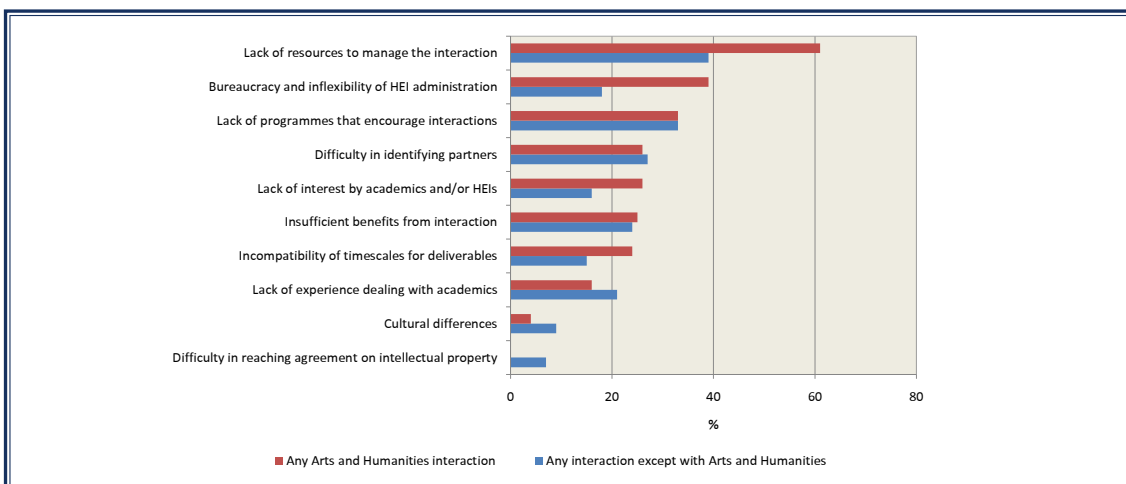
### Constraints: the Perspective of Businesses

The perspective of business on the prevalence of constraints that hinder interactions with universities is shown in Exhibit 9.4. The most frequently cited factor by businesses with an Arts and Humanities interaction was a lack of resources in the firm to manage the interaction – cited by 61% of businesses compared to 39% of businesses that interact with disciplines other than Arts and Humanities. This indicates the importance of the ‘boundary spanning’ function – the ability to initiate, facilitate and manage connections and relationships. It is important to note that this problem also affects relationships with public sector organisations which we covered in our case studies. Potentially productive relationships were often harmed by a lack of skills, experience or resources (see Boxes 11 and 12). Other frequently cited constraints from the survey included the bureaucracy and inflexibility of HEI administration – cited by 39% of businesses with an Arts and Humanities interaction compared

<sup>3</sup>The results shown are marginal effects derived from a probit regression of the independent variable against seniority, age and gender as dichotomous dummy variables and a discipline variable which takes the value 1 for Creative Arts and Media and 0 otherwise.

to 18% of businesses that interact with disciplines other than Arts and Humanities. As with the evidence from the academics, cultural differences are infrequently cited – only 4% of businesses with an Arts and Humanities interaction considered this to be a constraint compared to 9% of businesses that interact with disciplines other than Arts and Humanities. What was revealing from the case studies, however, was that whatever the constraints that were identified they could generate dissatisfaction and frustration amongst the partners (see Boxes 11 and 12).

**Exhibit 9.4 Business: Have the following factors constrained your interactions with HEIs in the last three years by discipline (%)**



**Box 11: Perceived problems in working with HEIs – private sector perspectives**

While private sector partners praised the opportunities that networking projects provided to make new connections – both with academics and with other external participants – there was sometimes frustration, verging on cynicism, about the lack of funding available for follow-on activities: *“What was very good in the project is there was a certain element of art involved, there were artists involved in this. So the area I think is very interesting, between engineering and science and art [...]. I think the strong thing coming out of this project is the establishment of a network of people that carry on speaking to each other. [...] [On the other hand] we are not necessarily looking at profit making, we are looking at innovation and interesting projects and making sure the costs are covered, and the publicity coming out of this, and that would have been great. But that didn’t happen. [...] We did an application to do more, coming out of this, but that was not funded. [...] [Through all my years of participating in these networks] I have never seen a proposal coming through”* (Anon) private sector

Timescales were different, but this is not so important when the private sector partner is limited to delivering what it is asked to deliver: *“To be frank it’s a fairly slow project from our perspective and so I guess what that means is we either really knuckle down and get it done as quickly as possible or in this case we really let the two other institutions drive the project and we turned up and did stuff when they were ready.”* In fact, the unhurried nature of the project was a bonus for this firm: *“I must admit we played around with it just almost like a little bit of R&D of our own. So I think the reality is we could have [done the work within the budgeted time] but we did a bit of extra stuff, mainly because it was an opportunity actually to bring one of our developers up to speed in this area. So it was almost like a training opportunity, an internal training opportunity. We didn’t use a developer who knew exactly what they were doing and could bang it out in a couple of days, we took it as a training opportunity for a developer who hadn’t worked in this area before.”* (Anon) private sector

The same firm also drew attention to another difference in the way of working: *“We’re very project driven and we’re very focused on users and what clients want, and I guess that’s where the boundaries are because academics and curators are much more, if you like, either object focused or much more interested in the history behind the object and the experience. There was a lot of thinking about different ways we could do it, different ways we could structure it, but we ended up pretty much with what we started off thinking about to be honest.”* In particular, he found that working with public sector clients (including HEIs) was all about process rather than delivering a good outcome: *“as long as you show how you got there it doesn’t really matter if what you’ve delivered in the end from our perspective doesn’t look very good. It drives us mental, but so often we deliver something that just could be better.”* (ibid.)

Another issue raised concerned research for research’s sake and the inability of the private sector partner to influence the course of a project towards more practical outcomes: *“Overall the project from our perception was heavily weighted towards the academic*  
*continued overleaf*

Box 11: continued

*institutions in terms of what they wanted to do [and] it has academically interesting outputs but it's not necessarily... If the project had been led the other way, led by practice with support from the institutions, I think it would have gone in a slightly different way [...] with more emphasis perhaps on outputs that could be positively taken up to change practice in the field." (Anon) private sector*

Another private sector partner sums up all these points at once: "I felt there was a huge discrepancy between what academia does and what we do outside in industry, in terms of speed, how we turn around projects in industry, and how much closer we are to reality and to actual needs, whereas in the universities it's all very theoretical and there seems to be a fear of actually going outside the institution to approach people to get a better picture. Obviously this is the purpose of knowledge transfer as well, to get people from the outside into the university to advise, so in that sense the collaboration has worked fine, probably, for the university. For us as the industry partners I am not sure what we will gain from it, there is a bit of a PR exercise in doing a research project like that. But the project that has been set up, we don't really know in future where it will lead to. Is it something that will just finish up and the project will come to an end at the end of the month, or is it something that can be actually taken forward? – because it's all depending on funding as well. So it is a bit difficult to see what the advantage would be for an industry partner, apart from gaining an insight into university life and what academia does and building up some relationship with people in that field." (Anon) private sector.

**Box 12: Perceived problems in working with HEIs – public sector perspectives**

A knowledge transfer project between an HEI and a museum ran into difficulties because of a lack of resources within the museum: the academic had understood the museum would be providing someone on a part-time basis (and this turned out not to be the case), while the museum director believed they had not applied for the 'right' type of funding (i.e. which would pay for museum staff time). This problem arose against the backdrop of looming public sector funding cuts and restructuring. (Anon) public sector

Occasionally the necessary skills or experience on the academic side seem to be lacking, which has implications both for the speed at which the collaborative activity progresses and for the amount of time the external partner has to devote to guiding the activity: "I think there is a certain naivety; there is a lack of experience of about how to engage the public and we are having to push the quality up at that end of things. There is a lack of knowledge and expertise there which we've found a bit frustrating [...] in terms of how the sector works and what the realities are on the ground for practitioners. [...] Staff here have had a lot of [unanticipated] input and it's usually well received and listened to. [...] [The work] is still very much in its research academic phase I would say. [...] We are going to have to do a lot to that product to make it user friendly for the general public when it's handed over to us." All the same, the partnership has not been a disaster: "it's definitely better having the project than not at all. It's been a good partnership on many levels. We have never had issues at the strategic senior level; it's been more the operational side and perhaps better ways we could have done things. But as I say they had to change the methodology pretty quickly into the project. I think we could have perhaps done more to help, if we had known at certain points. It's just been missing the opportunities, I think, through lack of communication. [...] We certainly wouldn't have had the resources or the capacity to do what's been achieved through the project." (Anon) public sector

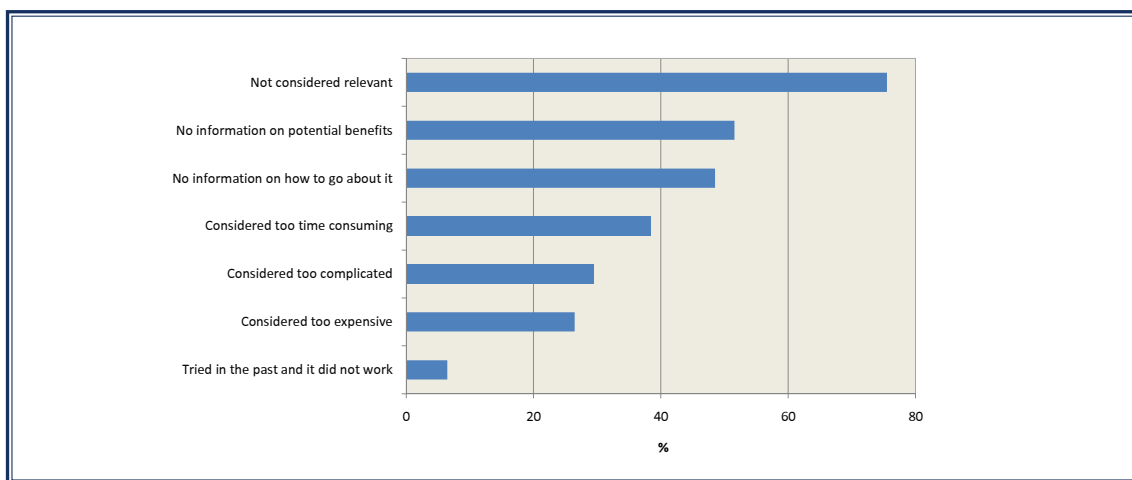
Sometimes, attitudes were perceived as problematic: public sector bodies participating in knowledge exchange or knowledge transfer programmes felt that they were being 'talked down' to, that the knowledge was moving only in one direction, from academic to external partner. This could be revealed as reluctance by the academic side to accept critiques of the materials they were transferring – "one of the key things that I hoped the KTP was all about was that maybe academics learned how to explain things to the masses" (Anon) public partner.

A contrasting view was given by a museum, where the relationship had changed to a more equal partnership 7-8 years ago: "I suppose in our very first rather tentative areas [of collaborative working] we were being used in some ways by academic institutions as a kind of great research resource, so they would send doctoral students along who would look at our collections and write their thesis about them. And that was great because it meant that they were doing research that we couldn't possibly manage to do ourselves, but it was effectively an agenda that was being led by the universities' research interests rather than necessarily things that we wanted to see happen. That has changed now, and I think there is a much more equal based discussion of projects, of what we want out of them, of how we will all benefit from them. [...] If you make it clear that a collaboration actually is a partnership of equals, and you establish your priorities and your partner's priorities, and find shared routes to delivering those, that I would say has been our damascene moment really. That has led, actually, to a series of really successful collaborations." (Anon) public sector

## The Reluctant and Discouraged Connectors: Why Businesses do not Engage with Academia

The majority of businesses do not interact with academics from any discipline and the main reasons for this are shown in Exhibit 9.5. The most frequently cited reason why businesses did not interact was that they did not consider it relevant to their business. This is important as it should be recognised that connecting to academia is not necessary for the competitiveness of many businesses – and that knowledge exchange from universities is not a ‘silver bullet’ that will ensure widespread innovation and a major shift in economic growth. But other frequently cited factors include: no information on the benefits of interactions, cited by 52% of non-interacting businesses; and no information on how to interact, cited by 49% of non-interacting businesses. This evidence suggests the prevalence of important information failures which may be preventing fruitful and beneficial interactions.

**Exhibit 9.5 Business: Reasons why the firm has not engaged with Universities in the last three years by discipline (%)**



### Constraints: Questioning the Conventional Wisdom

The major constraints that academics perceive as hindering their interactions with other organisations are a lack of time and difficulties caused by internal bureaucracy - in contrast to the conventional wisdom that highlights cultural difference and problems about intellectual property. And when other variables are held constant, the time constraint is more likely to be cited by senior academics. Businesses are more likely to identify insufficient internal resources as a constraint – reflecting the problem of making ‘demand pull’ knowledge exchange effective. It should also be noted that a majority of business do not engage with academia from any discipline – and approximately 75% of those who do not engage do not consider that such interactions are relevant for the business. But it should also be noted that other frequently cited reasons for not interacting concerns informational problems – including a lack of information on the possible benefits and a lack of information on how to engage with academia.

## 10. Concluding Remarks

Academics from the Arts and Humanities in the UK are engaged in a wide range of interactions with a wide range of partners. In general, this does not take the form of technology transfer through patents, licences and spin-outs. Distinctions between the Arts and Humanities and other disciplines based on this narrow perspective are, however, deeply misleading.

Once we move beyond that narrow perspective on the role of impact to include mechanisms which include people-based, problem-solving and community orientated activities, the Arts and Humanities display as rich and diverse a set of connections as other disciplines and a particularly rich set of third sector and community interactions.

The patent licensing and spin-out approach diminishes the wider role played by academics in other disciplines and masks the similarities between them and the Arts and Humanities.

Even within the narrow perspective a disaggregation of Arts and Humanities to distinguish Creative Arts and Media from other Humanities reveals that the former displays connection characteristics as rich as other disciplines and with considerable private sector and commercial interactions.

Academics from the Arts and Humanities are highly connected within the UK economy and society in a process that supports scholarship and a two-way complementary interaction with external organisations.

There are number of important dimensions of the Arts and Humanities knowledge exchange process that should be emphasised.

First, there is significant diversity within the Arts and Humanities group – with those in the Creative Arts and Media tending to be the most highly connected to external organisations and involved in private sector commercial transactions.

Second, the simple distinction between research that has economic impact and that which is concerned with the pursuit of knowledge is inappropriate – research may be in pursuit of both goals.

Third, the notion that knowledge exchange is an activity driven by commercial and pecuniary interests is mis-founded – for most academics in the Arts and Humanities, the main impact of connecting with others is to support their research and their teaching.

Fourth, businesses interact with academics for a variety of reasons: these are not restricted to technology development but also include many other dimensions of business and organisational performance.

Fifth, and related to the above, businesses tend to use multiple sources of knowledge – and when they connect with academia, they often connect with academics from many different disciplines including Arts and Humanities.

Sixth, connections are most frequently initiated by individuals associated with the external organisations that academics partner with - indicating that the development of mutual understanding and managing expectations is crucial if knowledge exchange is to be effective and provide benefits to all partners.

Seventh, the major constraints that academics perceive as hindering their interactions with other organisations are a lack of time and difficulties caused by internal bureaucracy - in general, the conventional wisdom that cultural difference or disagreement over intellectual property are not perceived as problems.

Finally, it should be noted, that many academics from the Arts and Humanities (and those from other disciplines) do not connect with external organisations because it is not necessary for their research or teaching. Where there are areas where improved connectivity would both support academic pursuits and wider social and economic objectives, such connectivity can be improved by better flows of information and mechanisms that can support the development and management of relationships.

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May 2011

Produced by RCUK's internal service provider