Research report

# International research collaboration: opportunities for the UK higher education sector

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1918–2008

This series of Research Reports published by Universities UK will present the results of research we have commissioned in support of our policy development function. The series aims to disseminate project results in an accessible form and there will normally be a discussion of policy options arising from the work.

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international unit

## About the UK HE International Unit

The UK Higher Education International Unit has been established to coordinate, promote and undertake activities designed to support UK universities in a globally competitive world. The International Unit is funded by the Higher Education Funding Council for England, the Scottish Funding Council, the Higher Education Funding Council for Wales, the Department for Employment and Learning (Northern Ireland), GuildHE and Universities UK.

TECHNOPOLIS

Technopolis Limited has been delivering policy studies and strategic advice to decision-makers in the research and innovation policy arena for almost 20 years, founded in 1989 as a spin-off from SPRU at the University of Sussex. The UK practice employs 14 people presently, and has an annual turnover of around £1.25 million. It sits at the centre of the Technopolis Group, which comprises Technopolis Limited and six wholly owned subsidiaries in five other European member states, which together employ more than 50 policy analysts.

Our principal business is conducting contract research using the full spectrum of social scientific research methods in a range of policy domains, but especially (i) Science and public-sector research, (ii) Higher education and skills, (iii) SME and business support, and (iv) Innovation and competitiveness policy.

Our work falls into five broad categories, which encompass the policy lifecycle:

- International comparative analyses to model and benchmark good practice in the design and implementation of government policies and programmes;
- Prospective analyses (foresight, road-mapping) and formulation of strategic advice to inform policymakers on policy and programme design;
- Design and piloting of new programmes, including the development of monitoring and evaluation systems to permit budget holders to measure progress against agreed targets;
- Evaluation and economic impact assessment of government policies and programmes;
- Design and delivery of approved training courses in programme design and evaluation methodology for policymakers and project managers.

Our work is carried out on behalf of national and regional public bodies across the UK and internationally, including government departments, public agencies such as the EPSRC and ESRC and non-governmental bodies such as the Council of Science and Technology, the Design Council and Universities UK.

## Contents

# Foreword

Universities are international organisations with a diverse staff and student body. They have links, partnership and collaborations with universities, business and other organisations around the world. This international dimension is essential to their ability to prosper and remain competitive, and drive economic growth. Our universities have a strong international research record and the UK is second only to the United States across a number of key output indicators. Because of this strength the UK is seen as the location of choice for researchers, or a key partner of choice. For example, UK scientists are engaged in 50 per cent more international collaborations than they were ten years ago.

This is not, however, to deny that international competition is significant. While the UK collaborates more with China than any other European country, Chinese researchers have more than doubled their international research collaborations and tripled their share of world publications over the same ten year period. In the face of growing global competition it is crucial that the UK can continue to exploit its reputation for high research quality, improve its attraction for inward investors and potential partners, and capitalise on international collaborations.

Collaboration has of course always been a natural part of academic life, but within the context of an increasingly globalised research environment the ability to link into or build international collaborations becomes all the more important. Strengthening research collaboration is also important in order to meet the big global challenges confronting science, such as climate change and infectious disease; as well as attracting and retaining links with the best scientific talent to ensure that the UK stays at the centre of global innovation networks.

Enhancing the UK's research performance is a national priority that is strongly endorsed by Universities UK and in order to support this aspect of the work of member institutions we commissioned Technopolis to undertake a study of international research collaboration. Its report reviews trends, examines competitor countries' policies and UK universities' management of this function. It confirms that there is an almost universal commitment across the UK higher education sector to expand the level of international research collaborative activity. However, Technopolis reports that only a minority of our universities currently has an international research collaborative strategy although the great majority believe that more strategic management of this activity is needed. The report provides examples of how this can be done. It also points to the additional support that national agencies could provide to ensure that our collaborative activity is strengthened and our research performance is enhanced as a result.

**Professor Eric Thomas**

Chair, Research Policy Committee

**Professor Paul Wellings**

Chair, International and Europe Policy Committee

Universities UK

# 1 Summary

This report presents the findings arising from a study of international research collaboration, exploring trends, competitor countries' policies and UK universities' management of this function.

The literature reports that there has been strong growth in international research collaboration in the recent past and there is an expectation that this trend will continue into the future.

Bibliometric data suggest that the volume of international research activity has increased its share of total UK research outputs from 30 per cent in the 1990s to around 40 per cent in 2005. The data suggest that the UK's most prolific international partnerships are with researchers in the United States, Germany and France. The UK's fastest growing international partnerships are with researchers in China, where there has been a doubling in the output of international research papers between the 1990s and 2005. The data also suggest that larger, well-established research countries, including the UK, have seen their share of global international research output eroded, and most commentators expect that this relative decline will continue.

We estimate that the monetary scale of the UK's international research collaboration activity is equivalent to 10-20 per cent of the total UK science budget (which includes the social sciences and humanities). This estimate includes the spectrum of international research activity, from national subscriptions to international scientific organisations such as CERN, to the ad hoc support for the international elements of projects financed through the mainstream programmes of the research councils. Dedicated international research schemes run by the research councils, learned societies, non-governmental organisations and others account for about one per cent of the UK science budget, and while numerous, they are used in the main to seed relationships rather than to fund more permanent interaction.

UK expenditure on international scientific organisations appears to be flat, while spending on European collaborations is increasing, and there is also real growth in the UK's funding of dedicated international schemes. We found no good data on the trend in expenditure through mainstream research programmes, but we assume that it will be increasing as this funding largely follows trends in demand.

In terms of benefits, it seems that the world's politicians and policymakers are broadly in agreement, with most international research strategies citing the same quartet of motives: the competitiveness and sustainability of the domestic research system; domestic economic growth; a commitment to work together on common problems, from climate change to poverty; and a commitment to internationalisation and a global citizenry more generally.

Higher education institutions foresee benefits in a variety of guises but perhaps the most crucial are those of international standing deriving from very visible and successful research collaborations, a good supply of researchers of the right calibre, and improving its recruitment advantages for prospective research students. In terms of researcher benefits, people note the excitement and stimulation of working with people and groups that have somewhat different histories and viewpoints to one's own.

The UK position appears to be broadly in line with its main competitor countries, in terms of its strategic support for international research collaboration. Policymakers elsewhere (for example Australia, Germany, France, Japan, Sweden, the United States) do not believe that they are ahead of the game. Most agree that there is a great deal to be done at a policy level and that there is a genuine sense of a risk of being left behind.

Many 'competitor' countries have a published strategy on international research collaboration (internationalisation of research), with most prioritising the same broad set of motives and/objectives: supporting national research excellence, underpinning national competitiveness ambitions and tackling global issues (of national interest) more effectively. Wider policy objectives are evident in many cases, whether that is foreign policy, trade or international development.

We found no systematic overview of the nature and extent of the measures being used by competitor countries to support the development and expansion of international research collaboration. However, individual accounts suggest that most employ a combination of routine monitoring and feedback on developments and opportunities in target countries, some form of in-country promotion and support, as well as high-level endorsement, with politicians signing open collaborative agreements.

UK higher education institutions share an almost universal commitment across the sector to expand the level of international research collaborative activity. Almost all institutions confirm that it is currently an active policy objective to develop such collaboration. Universities point to an important distinction between two classes of international research collaboration, with most distinguishing the much smaller number of institution-level strategic research partnerships from the much more extensive international collaboration between individual researchers. Senior management takes a more formative role in the former and a more facilitative role in the latter.

At present only a minority of UK universities has an international research collaboration strategy, although a significant majority has plans to develop such a strategy in the near future by extending either their existing international or research strategies. The vast majority believe that their university would benefit from managing international research collaboration in a more strategic fashion.

Although no single organisational model is evident, there is something of a standard approach beginning to emerge, with a member of the senior management team having overall responsibility for policy and strategy and a director and small team coordinating the execution of the strategy, usually in concert with departmental teams and senior researchers. In many cases, there is an international committee consisting of external members to provide advice and challenges to the internal team.

Only a very few higher education institutions have a dedicated budget to (i) support their research teams in undertaking international research collaboration, or (ii) develop their internal management capabilities. However, funds are generally available when needed, but are drawn from any one of several internal university budgets and occasionally from external bodies with a remit to sponsor universities or research.

A small majority of universities is aware of at least some forms of external support that are available to help institutions develop their management capabilities and strategic research partnerships, but less than a quarter were actually receiving such funding at the time of replying to our questionnaire survey. Subsequent interviews revealed that the forms of support are many and various, with a majority being targeted on researchers rather than institutions in the first instance, typically dedicated international programmes providing small grants to cover the cost of short visits and fellowships.

Universities are broadly content with the current situation and are not clamouring for more support from government or its agencies, although all agreed that additional funding would be worthwhile. In discussing the challenges, interviewees did offer several specific suggestions:

- more and better in-country promotion of the research capabilities of UK universities;
- more measures to support cross-institutional (within the UK) networking and learning;
- a scheme to support the 'bundling' of UK institutions with particular strategic interests; and
- a co-financed fund, to help universities develop strategic partnerships that have emerged from seed funds or researcher-level initiatives.

## 2
## The study

This study of international research collaboration has involved a mixture of desk research, survey and interviews in order to arrive at an overview of:

- the trends and benefits of international research collaboration;
- the national policies and support for international research collaboration in selected UK competitor countries, with a particular focus on support for universities;

  and
- UK universities' management and organisation of international research collaboration.

# 3 Trends and benefits of international research collaboration

## 3.1 Extent of collaboration

There is a small but growing body of statistical and empirical material that tackles the question of UK university involvement in international research collaboration, in terms of its nature, extent and trends. The report by Evidence Limited, is arguably the most comprehensive recent analysis[1]. There is a much larger body of work that debates the motives and benefits of international research collaboration, available at both the national and supra-national levels[2].

The literature reports strong growth in international research collaboration and the expectation that this will continue into the future and might very well strengthen. Most reports point to supporting trends in one or more of the principal indicators, which include the number of

- international research outputs;
- international patents;
- international research awards (and their value); and
- non-national researchers and research students

The first of these indicators – using bibliometric data – has proved to be perhaps the most fruitful in helping to map the development of international relationships in a systematic manner, capturing important aggregate exchanges among the research communities of different countries and tracking the ebb and flow of this international endeavour[3].

Bibliometric statistics suggest that the number of UK international journal articles is growing at perhaps 5 per cent a year, as compared with total research output, which is growing at 2–3 per cent a year. The same data show that this class of research papers has seen its share of total UK research outputs rise from around 30 per cent in the 1990s to around 40 per cent (in 2005), a trend that is replicated broadly speaking for France and Germany and far outstrips Japan and the United States.

Table 1 presents three related tables showing recently compiled figures for the numbers of international research articles published in each of the last two, five-year periods[4]. The first two tables present the basic counts for each period. The third table presents growth across the two periods. The first two tables show the counts for the UK and a series of eight partner countries and a residual figure for papers written with authors based at addresses somewhere in the rest of the world (ROW), which together add up to the total number of international papers recorded by the Thomson ISI web of science database. For comparison, the first two tables present the counts of international research outputs for each UK partner country in turn, along with the distribution of output across the other partner countries (and the UK)[5].

**Table 1**
**International collaborative research output by country and partner country, 1996-2000 and 2001-2005 (articles) and for growth across the two periods (percentage)**

| 1996-2000 | Total | UK | USA | CAN | FRA | GER | JAP | AUS | CHINA | INDIA | ROW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **UK** | **97,592** | | **30,874** | **6,138** | **11,114** | **13,490** | **4,988** | **6,039** | **2,838** | **1,369** | **20,742** |
| **USA** | 244,911 | **30,874** | | 28,754 | 20,744 | 32,095 | 23,711 | 10,679 | 9,226 | 4,555 | 84,273 |
| **CANADA** | 55,429 | **6,138** | 28,754 | | 4,791 | 4,136 | 3,069 | 2,433 | 1,801 | 627 | 3,680 |
| **FRANCE** | 82,076 | **11,114** | 20,744 | 4,791 | | 11,863 | 3,119 | 1,772 | 1,351 | 1,036 | 26,286 |
| **GERMANY** | 106,821 | **13,490** | 32,095 | 4,136 | 11,863 | | 5,485 | 2,729 | 2,754 | 1,713 | 32,556 |
| **JAPAN** | 54,346 | **4,988** | 23,711 | 3,069 | 3,119 | 5,485 | | 1,986 | 3,915 | 1,076 | 6,997 |
| **AUSTRALIA** | 30,743 | **6,039** | 10,679 | 2,433 | 1,772 | 2,729 | 1,986 | | 1,463 | 391 | 3,251 |
| **CHINA** | 25,836 | **2,838** | 9,226 | 1,801 | 1,351 | 2,754 | 3,915 | 1,463 | | 404 | 2,084 |

| 2001-2005 | Total | UK | USA | CAN | FRA | GER | JAP | AUS | CHINA | INDIA | ROW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **UK** | **144,457** | | **43,337** | **9,248** | **15,502** | **20,235** | **6,658** | **9,573** | **5,505** | **2,253** | **32,146** |
| **USA** | 334,662 | **43,337** | | 38,913 | 27,135 | 43,921 | 31,148 | 15,999 | 20,542 | 7,021 | 106,646 |
| **CANADA** | 75,659 | **9,248** | 38,913 | | 6,423 | 6,464 | 3,933 | 3,672 | 3,688 | 981 | 2,337 |
| **FRANCE** | 107,729 | **15,502** | 27,135 | 6,423 | | 16,609 | 4,646 | 2,753 | 2,774 | 1,530 | 30,357 |
| **GERMANY** | 146,615 | **20,235** | 43,921 | 6,464 | 16,609 | | 7,464 | 4,388 | 5,401 | 3,101 | 39,032 |
| **JAPAN** | 77,197 | **6,658** | 31,148 | 3,933 | 4,646 | 7,464 | | 2,964 | 8,631 | 2,262 | 9,491 |
| **AUSTRALIA** | 46,502 | **9,573** | 15,999 | 3,672 | 2,753 | 4,388 | 2,964 | | 3,663 | 776 | 2,714 |
| **CHINA** | 54,529 | **5,505** | 20,542 | 3,688 | 2,774 | 5,401 | 8,631 | 3,663 | | 1,127 | 3,198 |

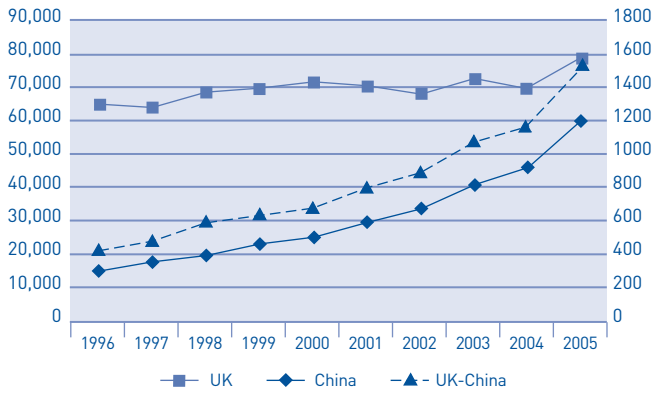
| Growth | Average | UK | USA | CAN | FRA | GER | JAP | AUS | CHINA | INDIA | ROW |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **UK** | **154%** | | **140%** | **151%** | **139%** | **150%** | **133%** | **159%** | **194%** | **165%** | **155%** |
| **USA** | 148% | | | 135% | 131% | 137% | 131% | 150% | 223% | 154% | 127% |
| **CANADA** | 142% | | | | 134% | 156% | 128% | 151% | 205% | 156% | 64% |
| **FRANCE** | 146% | | | | | 140% | 149% | 155% | 205% | 148% | 115% |
| **GERMANY** | 153% | | | | | | 136% | 161% | 196% | 181% | 120% |
| **JAPAN** | 155% | | | | | | | 149% | 220% | 210% | 136% |
| **AUSTRALIA** | 162% | | | | | | | | 250% | 198% | 83% |
| **CHINA** | 214% | | | | | | | | | 279% | 153% |

*Source: Adams (2007), based on Thomson ISI publications data*

The data suggest that the UK's most prolific international partnerships are with researchers in the United States, Germany and France, which together account for around 55 per cent of its total international research output as captured by the Thomson ISI database. These same data suggest that the UK's fastest growing international partnerships are with researchers in China, where there has been a doubling in the output of international papers between the 1990s and 2005. Collaborations with researchers in India, Australia, Canada and Germany have all seen strong growth of between 50 per cent (Germany) and 65 per cent (India) during the same period.

Chart 1 takes the same data for each of the ten years since 1996 and presents them in a line graph, better to illustrate the trend in UK-China research collaboration, which has grown more than threefold, rising from 400 to 1,600 co-publications a year, and the rate of growth is accelerating. The chart also presents the ISI database counts for all UK articles and for all China articles, the latter of which show a fourfold increase, albeit from a low base, as compared with an increase of about 20 per cent for the UK. The very similar growth trend for China articles and UK-China articles suggests that the rapid growth in international research collaboration with China is being driven, or facilitated at least, by an expansion in the capacity and output of the Chinese research system more generally. There are other indicators which might support this notion: China has seen an increase in its share of world scientific publications, from 2 per cent to 6.5 per cent over ten years (1995–2004); and its spending on research and development has increased by more than 20 per cent a year since 1999. It stood at 1.3 per cent of GDP in 2005[6].

**Chart 1**
**Growth of research collaboration between the UK and China**




*Source: Table 1 of Research in China: patterns of international collaboration, FCO, Beijing, January 2007, based on Thomson ISI publications data*

UK-China research collaboration has become much more significant in the past decade and is strengthening. However, some degree of caution is necessary when drawing conclusions from this bilateral analysis: more detailed data show that most of our partner countries have seen an increase of more than 50 per cent in their international collaborative output, and a doubling at least of links with China. Australia, the United States and Japan have seen the strongest growth in output, while the UK and Germany have seen the least growth.

## UK research collaboration with China

Innovation China-UK (ICUK) is a multi-million pound research partnership between the UK and China, co-funded by the UK and Chinese governments in a bid to bring the latest joint research to the marketplace. In May 2006, the project was awarded funding of £5 million from the UK's Higher Education Innovation Fund (HEIF3), which is to be matched by the Chinese (the first time a research initiative on this scale has been *jointly* funded by the UK and China). Queen Mary's University of London is taking the lead, working with four other UK universities (University of Nottingham, King's College London, Royal Veterinary College, University of Southampton) in cooperation with around 20 Chinese institutions[7].

The Supergen group was awarded £202,258 through the Engineering and Physical Sciences Research Council (EPSRC) INTERACT scheme (4th Call) to link its funded projects with similar activities in China. The aim is to extend the international influence of this flagship sustainable energy programme to China, and to promote or augment individual members' overseas research links. The two-year project includes group visits, workshops, exchange visits and the establishment of a forum. The Interact Supergen Group involves collaboration between seven UK and seven Chinese higher education institutions[8].

The University of Leeds is involved in an initiative supported by a Biotechnology and Biological Sciences Research Council (BBSRC) China Partnering Award and a grant from the university's own international fund. The project involves collaboration between plant scientists at the University of Leeds and applied agricultural specialists from the Chinese Academy of Sciences, working on joint projects looking at the role of genes within crop plants, particularly rice. The project will also see the creation of a 'virtual laboratory', where researchers can share information and research data. A memorandum of understanding between the two countries was signed in late 2006 and the partnership is expected to lead to long-term projects and future joint appointments[9].

Although China may be grabbing the headlines, the absolute dominance of the UK's collaborative output with the United States, Germany and France remains significant. While a good proportion of the growth in UK international output may focus on China and India, the nature of relationships underpinning these statistics makes it hard to imagine that our ties with established partners are going to decline in absolute terms, at least in the medium term.

The data also suggest that larger, well-established research countries, including the UK, have seen their share of global international research output eroded by several countries that have witnessed much stronger than average growth in their international research output (for example China), and most commentators expect this relative decline to continue.

Trends in the data for the UK's key partner countries and research competitors suggest that the historical notion of research excellence as the primary driver may be somewhat overstated, and that other factors including access to international labour markets (students and researchers) and to overseas markets are also important.

The importance of research excellence as a 'driver' is most apparent at a discipline level, with the distribution of total outputs being biased towards those country pairings where there is a mutual interest in a particular disciplinary sub-field, and where the citation data suggest that the quality gain is strongest. The geography of the disciplinary hot spots (pairs) tends to be more variable and more widely dispersed than the aggregate country-level data, which suggests that where advancement of knowledge is the primary objective, large physical and cultural differences are less significant barriers than one might imagine.

At the country-level, bibliometric data show regional alliances winning out over more distant pairings, so that rates of growth in bilateral collaborations are stronger than average for those pairings in Asia, for example, as they are for some pairings in greater Europe.

With the bibliometric data really only covering science and technology (STEM) subjects, it is not at all clear how much international research collaboration occurs within the social sciences or arts and humanities. There is no readily available source of systematic data of relevance here. Notwithstanding this absence of robust, time series data, it is clear from our bilateral discussions and from analysis of data on for example EU-China collaborations within the EU Framework Programme 6 for research and technological development (or UK-Japan collaborations more generally) that there is a good deal of social science being undertaken within the context of international research collaborations.

Several commentators observed that there are likely to be greater limits as to the relevance or value of international collaboration in the social sciences and arts and humanities, when compared with the natural and physical sciences, as a significant proportion of this research is concerned to understand and analyse issues that are highly particular or even unique to a given social system. Equally, there can be strong epistemic and ideological differences, which can be a barrier to collaboration, although in some instances such tensions can be a source of creativity and intellectual advance. On the other hand, the particularities of many socio-economic systems can in itself provide a reason to collaborate with researchers in the host countries, whether that is health researchers exploring suicide in Japan or infectious diseases in China.

We were told by several contributors that internationally-framed studies can provide researchers with access to unique populations or data sets, which can assist greatly with the controlled study of a given phenomenon, with the non-national population providing a critical control group.

One can see further evidence of the level of interest in the social sciences where the principal national source of research grants, the Economic and Social Research Council (ESRC), has maintained an international unit almost from the outset when it was launched in the early 1980s, and has longstanding ties with research councils and leading academies around the world. Professor Ian Diamond, Chief Executive of the ESRC, commented:

> "The ESRC has international bilateral agreements with thirteen countries around the world, which together produce 400–500 international (bilateral and multilateral) bids each year, all of which are carefully peer-reviewed using an agreed standard procedure, endorsed by all of the national funding bodies and research councils, all of whom are content to fund their domestic research groups' share of any approved projects" [10].

In preparing its international research strategy[11] Research Councils UK (RCUK) carried out some background analysis together with its individual member councils and arrived at a series of estimates to indicate the extent of the UK's international research engagement. In 2007, data and estimates from the research councils and the Higher Education Statistics Agency (HESA) reveal that:

- 40 per cent of research council grants have an international component;
- 50 per cent of UK PhD students are non-nationals; and
- 40 per cent of UK research staff are non-nationals.

Although there are data on the extent of international research engagement, the bibliometrics provide the best view of the changing volume of collaboration. A small number of universities have stated that they have run their own internal surveys in order better to understand the nature and extent of international research collaboration, although these data are not often public and have never been aggregated.

The following extract from the international strategy of the Institute of Education at the University of London is an example of such institution-level data:

> "A preliminary analysis of research projects undertaken from 1 November 1998 to April 2004 that were international either in their focus of enquiry or their funding source suggests that at least 8.5 per cent of current research activity is international. The level of research income from EU and other overseas sources has increased markedly over the past five years"[12].

## 3.2 Expenditure levels

We estimate that the monetary value of the UK's international research collaboration is equivalent to 10-20 per cent of the total UK science budget. This estimate includes the full spectrum of international research collaboration activity from the national subscriptions and associated research tied to international scientific organisations such as CERN, the value of participations in the EU framework programme and the ad hoc support for the international elements of predominantly national projects financed through the mainstream programmes of the research councils.

Dedicated international research schemes run by the research councils, learned societies, non-governmental organisations and others account for about 1 per cent of the UK science budget and while they are numerous, running into the many tens of schemes, they are quite small in financial terms, as they are used in the main to seed relationships through the international movement of people (short visits, exchanges, individual fellowships).

UK spending on international scientific organisations appears to be flat, while spending on European collaboration is increasing, through the framework programme itself as well as several of its offspring, notably the European Research Council (ERC) and ERA-NET (the networking of national and regional research programmes within the European Research Area). There is also real growth in the UK's funding of dedicated international schemes, with the addition of schemes such as the EPSRC's Interact, the BBSRC's strategic partnering awards and the British Council's UK India Education and Research Initiative. We have no good data on expenditure trends through mainstream research programmes, however the British Embassy in Beijing did say that its exchanges with the various research councils had produced an estimate of £53 million for current financial commitments in China. We assume that it will be increasing too as this mode of funding largely follows trends in demand.

## 3.3 Motives and benefits

The desk research and surveys make clear the fact that the benefits of and motives behind international research collaboration look somewhat different depending upon one's perspective, and level within the research system: national, institutional or researcher.

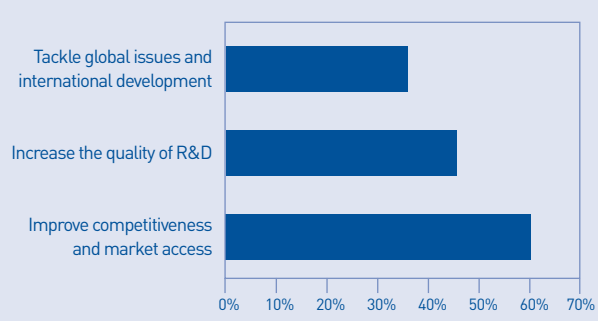
The world's politicians and policymakers are broadly in agreement with one another about national policy ambitions, with most international research strategies citing the same quartet of motives, which are:

- maintaining and enhancing the competitiveness and sustainability of the domestic research system facilitated by research institutions becoming more international. This includes establishing new strategic partnerships to boost research quality and reputation, improving access to international labour markets (researchers and research students) and achieving the economies that can result from sharing the cost of overheads;
- improving the competitiveness of the domestic economy, secured through research-led access to overseas markets and by the attraction of high-value added inward investment;
- a commitment to expand the global assault on the most pressing, shared problems, such as climate change, poverty and security; and
- a commitment to the internationalisation of people and politics, with research collaborations and researcher mobility seen as being a powerful and cost-effective contribution to a more harmonious and safer world (global citizens).

Selection criteria for partner countries and thematic priorities are closely related to these objectives. They encompass scientific, political and economic considerations and are increasingly applied based on systematic information gathering on science and technology research activity in other countries.

A survey of EU member states' senior science and technology officials (carried out on behalf of the CREST working group on internationalisation of research and development) confirmed these priority objectives. It underlined the extent to which domestic wealth creation is the strongest of three major objectives: 60 per cent of respondents stated that gaining access to emerging markets was a primary motive. Interestingly, at this national or strategic level, increasing the quality of research was reported to be a primary focus for just under half of all respondents, an outcome that underlines the importance of research to wider economic ambitions and international relations more generally.

**Exhibit 1**
**Major objectives of internationalisation of science and technology in EU member states (n = 20)**




*Source: Survey of EU member states' senior science and technology officials carried out on behalf of the CREST working group on internationalisation of research and development, July 2007*

These national-level drivers echo the motives of UK universities to some extent, with most expressing concern about the long-term sustainability of their institution in what is seen to be an increasingly global market place, especially for the provision of postgraduate education and the recruitment of students and staff.

> "By 2015, our distinctive ability to integrate world-class research, scholarship and education will have secured us a place among the top 50 universities in the world." Vision statement from the University of Leeds current strategy.[13]

Institutions foresee benefits in a variety of guises, but perhaps most prominent are: their international standing derived from very visible and successful research collaborations (for example, with leading researchers, businesses and institutions; and the influence it can confer within international forums and political debates); a good supply of top-flight research staff, and a plentiful supply of good research students. Most also see that they have a public duty, as part of their institutional mission, to support knowledge transfer through international collaboration as a route to enhanced social equity and economic development.

Exhibit 2 presents a well-developed list of 'drivers', which include many of the forces for change cited by senior officers interviewed during the course of this study, although in this case, the list was specified in a presentation by the University of Leeds.

**Exhibit 2**
**Drivers of international research collaboration (University of Leeds)** [14]

**Drivers of the 'internationalisation' of research**

- World-class research is inherently international and important for the sustainability of a research-led university;
- Undergraduates, research students and postdoctoral researchers increasingly request international experience as part of their 'standard' education;
- Major corporate funders are changing their purchasing styles (value for money, stimulation of developing economies, new forms of partnership) favouring international collaborations;
- Collaborative research publications gain 2.5 to 5 times the citation impact of the field average for 'single-country' authored papers;
- EU programmes facilitate direct involvement of many countries;
- Several major non-UK funders (for example the National Institutes of Health in the United States) are increasing the scope of their calls for proposals, with very significant income being secured by UK universities;
- UK research funders' emerging commitment to prioritise research investment around global challenges (for example, the research councils);
- Regional economic development agencies across the UK are encouraging local universities to work with them to strengthen their ability to secure international objectives for the region, around exports, foreign direct investment and productivity.

*Source: Presentation by Richard Williams, Pro-vice-chancellor for Enterprise, Knowledge Transfer and International Strategy at the University of Leeds, to a Universities UK seminar, London, 20 November 2007*

Exhibit 3 presents a similar although perhaps rather sharper set of drivers from a Canadian university, underlining the quite generic nature of universities' goals in the international arena.

**Exhibit 3**
**Drivers of international research collaboration (University of British Columbia, Canada)**

**Why we pursue international research collaborations**

- Different perspectives promote knowledge
- Capacity-building without cost
- Research funding
- To develop solutions that resonate around the world
- Graduate student recruitment
- Reputation

*Source: Presentation by Craig Klafter, Associate Vice President International, University of British Columbia, to a Universities UK seminar, London, 20 November 2007*

As with the national agenda, research excellence is just one of several objectives for universities, although, once again, as with most aims, it is the means rather than the end. Global visibility and institutional reach appear to be more typical of the high-level ambitions of UK universities, and this is being driven by expectations of students and staff, global competition and gathering forces of institutions, cities, regions and governments – all pressing universities to engage with an international agenda and to develop more operational clarity around this.

Two of the drivers mentioned by institutions are less commonly reported in national policy discussions, and yet they are clearly of significance to researchers themselves. The first relates to the insights that can result from collaboration between academics with different epistemic perspectives, wherein attempts to resolve tensions and apparent contradictions can precipitate the emergence of new 'truths' and prompt advances in understanding more generally[15].

The second novel institutional driver relates to the occasional need to deliver capacity quickly and at low or no cost to the university, which can be achieved through project-specific collaboration among established partners. These kinds of temporary alliances are commonplace in many areas of the private sector, and are expected to be an important focus for organisational development in the future.

For example, leading civil engineers, such as Arup, make extensive use of partnerships and coalitions to achieve the flexibility they need to cope with a somewhat unpredictable market. In the case of universities and civil engineers, a proportion of those partners will be non-nationals. Several contributors mentioned that it was easier in some instances to collaborate with non-national partners, as the funding system in the UK tended to reinforce inter-institutional rivalry and impede cooperation.

There is also an issue of cost-effectiveness and productivity, with several interviewees mentioning the specific benefit of higher staff output and lower labour costs. In India for example, a research dollar buys more research hours than it would in the UK, and perhaps more importantly, there is a potential intellectual boost in that typically, Indian institutes are in a position to deploy several post-doctoral researchers to wrestle with a theoretical or conceptual issue, where the team in the UK might be forced to move forward with a single researcher and he or she might well have more than one project in hand. This expansion in effective capacity is amplified by the intensity of work rates in India, where we are told that the atmosphere inside a typical research institute is closer to that of a busy press office with endless deadlines and concerns over time, as compared with the more congenial and self-determined environment evident in the UK.

In terms of research benefits, bibliometric data suggest that on average international research outputs are of substantially higher quality and higher impact, with typical average impact ratings being two or three times the average rating for all domestic papers in the same sub-field. Despite the structural boost multiple authors can give to any paper's citations, the differential appears to be so significant as to suggest that there is a real quality 'gain' from international research collaboration.

For the individual researcher there is the excitement and stimulation of working with people and groups that have somewhat different histories and viewpoints, the career and reputational gain of being seen to have been associated with leading overseas groups and the increased opportunities for interaction, debate and learning that derive from pursuing individual interests in a global community of hundreds (rather than tens of peers, at home) of deep specialists.

## 4
## Comparative analysis of support for international research collaboration

There is a growing sense that several of the UK's scientific competitors are devoting rather more effort to strengthening their international research links than the UK is. There is a belief that these presumed differences in activity might lead to a relative decline in the quality and international standing of UK science in the medium to long term, as we find ourselves passed over as preferred partners by the best research groups and most exciting research projects.

Technopolis' research on international cooperation, carried out for the former Office of Science and Innovation (OSI) and the Global Science and Innovation Forum did produce anecdotal evidence suggesting that Australia and Germany in particular, but Canada and Sweden too, were devoting substantial energy to strengthening ties with China and India, which was reflected in the numbers of high-level delegations, new memoranda of understanding and investment in new joint centres and institutions[16].

This apparent difference in strategy and investment might not be quite so pronounced in reality of course, and there are some contra-indicators. The recently published paper on *Patterns of international collaboration for the UK and leading partners* suggests that the UK is performing as well if not better than France and Germany in terms of the numbers of links its researchers have with their peers in the emerging scientific nations of China and India[17].

Nor is the policy position static, with the UK having recently launched several new initiatives, such as the UK India Education and Research Initiative, the UK China Partners in Science programme, and the Global Science and Innovation Forum strategy for international engagement.

Our research suggests that this sense of falling behind is probably overstated and that the UK position appears to be broadly in line with its main competitor countries, in terms of its strategic support for international research collaboration.

Policymakers elsewhere (for example, officials in Australia, Germany, France, Japan, Sweden and the United States) do not believe that they are ahead of the game. Most were of the opinion that there was a great deal to be done at a policy level and that there was a genuine sense of a risk of being left behind. Most stated that they are just beginning to marshal their communities, seeking to develop strategies and associated actions that will help them to be more successful in the international realm in the future and to derive more value from it, whether that is in respect to domestic research excellence, labour supply or the exploitation of knowledge produced in other countries.

A good number of UK competitor countries (Austria, Belgium, Finland, France, Norway, Sweden) have a published strategy on international research collaboration (internationalisation of research), with most prioritising the same broad set of motives and objectives: supporting national research excellence, underpinning national competitiveness ambitions and tackling global issues (of national interest) more effectively. Wider policy issues are evident in many cases, whether that is foreign policy, trade or international development.

Although there are strategies aplenty, we found no cases where these high-level documents are accompanied by implementation plans, with specific objectives, budgets and activities to deliver those strategies. That said, most of these high-level documents do make some commitments to specific actions to drive forward strategies, in the shape of new funds to expand researcher mobility, for example, as well as commitments to a broad approach (for example, extensive partnerships involving the wider scientific community, working with non-governmental organisations in order to benefit from their wealth of knowledge in-country and the need to ensure mutually beneficial partnerships where all partners contribute significantly to the venture).

We found just one attempt at a systematic view of the measures being used to support international research collaboration, however the exercise was essentially European; it was based on a survey of EU member state senior officials and the question posed was only sufficient to reveal the existence of a form of support. There is no indication as to the extent of such support, the frequency with which it is used or the relative importance of one measure as compared with any other.

Exhibit 4 presents the results of this survey, with the measures sorted in descending order using the number of citations, which reveals a pattern closely matching the kind of assistance in use here in the UK. Researcher mobility schemes and in-country support by embassies are pretty well universal, and support with partner search, technical advice and in-country promotional campaigns are also pretty widespread.

The ranking reveals two measures where the UK might be argued to be somewhat out of step with the majority, which are:

- The share (60 per cent) of countries that responded to the survey, stating that they maintain dedicated promotional agencies in-country, in selected strategic partner countries. The UK is beginning to match this with its recently opened Research Councils UK (RCUK) offices in China, India and the United States.
- The share (50 per cent) of countries that responded to the survey, stating that national research schemes are able to pay the costs of non-national partners involved with 'national' research projects. The Scandinavian countries appear to have been particularly forward-looking in this respect, having been encouraging international projects within their national schemes for at least ten years, and being increasingly prepared to consider extending the geographical application of their financial investment (through national institutions) to secure engagement with strategic partners.

Our own discussions confirm that most countries' embassies are involved actively in monitoring and reporting on important science and technology developments, brokering and hosting inbound missions and the organisation of ad hoc bilateral conferences/events. Embassy support for business appears to be more developed than support for universities, on the assumption that the university sector has its own liaison offices. There is also activity at the level of the research institutes, with some universities and institutes having decided that it makes strategic sense for them to create affiliates of national universities and research institutes in another country. We heard from our interviews in China that American universities were particularly active in this regard.

**Exhibit 4**
**International research collaboration measures across EU member states (n = 20)**

| Measure | Number of countries | percentage of countries |
|---|---|---|
| Small grants for overseas visits | 19 | 95% |
| Promotion in country by embassies | 18 | 90% |
| Support with partner search | 17 | 85% |
| Unfunded foreign partners in national projects | 16 | 80% |
| Technical advice to individual collaborators | 16 | 80% |
| Nationally coordinated international marketing campaigns | 15 | 75% |
| Dedicated sponsorship agencies in country | 12 | 60% |
| Joint funding of running costs | 12 | 60% |
| Joint funding of infrastructure | 11 | 55% |
| Local funds for foreign partners in national projects | 10 | 50% |
| Other funding measures | 10 | 50% |
| Foreign branches of research institutions | 10 | 50% |
| Other promotion measures | 7 | 35% |
| Other measures | 5 | 25% |
| Fiscal incentives | 4 | 20% |

*Source: Survey of EU member states' senior science and technology officials carried out on behalf of the CREST working group on internationalisation of research and development, July 2007*

## 5 UK universities' management and organisation of international research collaboration

### 5.1 Survey and interviews

We ran an online survey directed to the vice-chancellors and principals of 150 universities and higher education colleges, and obtained 86 responses. We carried out follow-up interviews with twenty pro-vice-chancellors and research directors at a wide range of institutions to deepen our understanding.

While pro-vice-chancellors were content to respond to our survey, confirming the timeliness and importance of the topic, we found that respondents were rather more diffident when it came to representing their institution as any kind of exemplar. For most, this was an important journey that they have only recently embarked upon.

### 5.2 Policy and strategy

The survey suggests that there is an almost universal commitment across UK higher education institutions to expanding their international research collaboration, with almost all respondents (94 per cent) confirming that it is currently an active aim of their institution to develop such collaboration.

Almost all (94 per cent) are actively trying to increase the volume of research collaboration, with around two-thirds targeting institution-level collaboration on specific disciplines and countries, which in practice means thematic partnerships with one or more institutions in a given country.

Follow-up interviews revealed an important distinction between two classes of international research collaboration, with most people distinguishing institution-level strategic partnerships from researcher-level collaboration. The latter is reported to account for the great majority of total activity and is driven by individuals' own research interests and ambitions, where international engagement is an integral part of being a research professional. Respondents see their duty here as being facilitative, for the most part simply providing generic support and ad hoc advice to individuals and research groups. For most, this bottom-up approach increasingly coexists with a more strategic, institutional perspective. It seems that many UK universities already have a small number of strategic research partnerships, institution-to-institution, with overseas universities or research groups, motivated by the desire to sustain or improve the institution's research capability and international standing or reputation. As the University of Birmingham's international strategy comments:

> "Internationalisation in itself isn't 'new,' but what is new is the way in which institutions, and now towns, cities and government, are engaging with the international agenda more strategically and with more operational clarity."[18]

It is also clear that most of these institution-level relationships began with educational programmes, ranging from double masters degrees to international summer schools and major recruitment campaigns. However, there is clearly a growing interest in research collaboration, more narrowly:

> "Launched in April 2005, the strategy of the University of Edinburgh's China Office is to enhance the University's profile through the development of research and educational links with high-ranking Chinese institutions. Through these links and public awareness of the university's reputation, Edinburgh has developed a good relationship with various fellow prestigious universities and academic institutions, such as Peking University, Tsinghua University, Fudan University, Beihang University, Beijing Film Academy, Xiamen University, Nankai University, China Agriculture University, in fields as diverse as e-science, engineering, life and medical sciences, arts and culture"[19].

> "Columbia University and the London School of Economics (LSE) have a formal collaboration at the institutional level, and our two anthropology departments already have an ongoing program for collaboration and exchange. At both the institutional and departmental levels, Columbia and the LSE share a number of areas of expertise and interest. For example, our anthropology departments have substantial shared regional expertise in South Asia and East Asia, as well as expertise on the themes of globalisation, nationalism, and gender. And yet there are also significant differences between the departments and institutions – in approaches to anthropology, in undergraduate and postgraduate teaching programs, in administrative framework, and so forth. We consider these to be areas that provide scope for a genuine collaboration between partners, as well as an opportunity to evaluate the effectiveness of these educational tools in two distinct and yet closely related learning environments"[20].

"Forging scientific links with other synchrotrons across the world has been an important element of Diamond's work this year. During 2006 Diamond Light Source has signed a number of memoranda of understanding with international facilities. On 20 February 2006, during the China-UK N+N Workshop on Synchrotron Science in Shanghai, Diamond signed a memorandum of understanding with the Shanghai Synchrotron Radiation Facility/Shanghai Institute of Applied Physics, Chinese Academy of Sciences"[21].

"India is a huge focus for Leeds Metropolitan University and our Northern Film School, and we have strived to establish strong links to the Indian Film Academy (IIFA) and Bollywood. Our motive is a blend of enterprise (3rd stream), education and practice-led research and consulting. Research collaboration is not a big part of what we do, however it is an increasingly important part of the mix; we are just about to establish two academic chairs, the IIFA Chair for Global Cinema, and an India 60 Chair celebrating 60 years of Indian independence. The infrastructure, relationships and insight gained through the work with India and the IIFA has been used as a platform for ongoing efforts to develop a strategic collaboration with Sri Lanka (Colombo, High Commission, British Council) around 'responsible tourism"[22].

There is widespread commitment to becoming more strategic, which is not to say that institutions are seeking to switch modes from bottom-up to top-down, but rather to do a better job of operating a hybrid model. The survey found that only a few universities presently have an international research collaboration strategy (13 per cent), although it revealed that a significant majority has plans to develop such a strategy in the near future (65 per cent). An even greater proportion (91 per cent) stated that they believed their university would benefit from managing international research collaboration in a more strategic fashion. Follow-up interviews revealed that many of these strategies are international strategies and not international research collaboration strategies per se, and deal with the internationalisation of the entire spectrum of higher education activities, including research. In many cases, international research is addressed as both means and ends: research of international significance used as a means by which to compete with other UK and overseas higher education institutions for the best researchers and research students; international collaboration as a means by which to secure and sustain research capability of international standing.

**Exhibit 6**
**Institute of Education's internationalisation strategy (2005-2008)**

**Strategic objectives for the Institute's international work**

The overall aim of the strategy is to secure the Institute's position as a global leader in the field of education and related areas of social science and professional practice.

Its objectives are as follows:

- The generation and dissemination of knowledge that recognises a diversity of contexts and is informed by the Institute's commitment to truth and justice;
- The promotion of international, intercultural and comparative approaches to Institute activity;
- The achievement of market leadership in terms of attracting students from outside the UK to study education and related areas;
- The achievement of a significant increase in the income generated through research and third stream work with an international orientation.

*Source: Extract from the International Strategy of the Institute of Education at the University of London (2005)*

A minority said that their international research collaboration strategy was being developed as part of the institution's wider research strategy. The documents encompass a number of facets, including the institution's international research standing (and monitoring thereof), its recruitment of talented researchers, support for short overseas visits for younger researchers, and the pursuit of international research collaborations in areas of particular importance to the institution.

The survey and interviews suggest that overall institutions no longer feel that it is quite enough to leave things to individual researchers and that the realisation of their more general institutional objectives is more likely if some conscious decisions are made centrally about the creation of international partnerships in particular fields, and even with specific institutions.

Some interviewees expressed minor reservations as to the ultimate feasibility of managing research collaboration centrally, because of its critical dependence upon bringing together individuals with complementary interests and ambitions, where deep specialisation and interpersonal chemistry can rather get in the way. These same interviewees stated that while senior management might readily divine one or two of the more obvious strategic partnerships, they are not in a position to look more widely. To help to overcome this particular challenge, several of the respondents had created internal seed funds, which invite research groups to come forward with proposals for international projects or networks, which if successful will be granted £10–20,000 to facilitate relationship-building and ideally a joint funding application.

We heard one of two arguments against the need for increased central management and coordination of international research collaboration, including one individual who expressed concern at the growing pressure evident in policy circles for universities to be doing more, which he suggested was something akin to a problem looking for a solution. Several of the more research-intensive universities argued that the bottom-up approach really was the best way to organise things.

> "I am not a great fan of institutional strategies for, or central management and coordination of, international research collaborations. Universities need hungry individuals that want to collaborate with overseas partners, coupled to administrations that support them in their ambitions and do what they can to support them. I don't see much need for 'strategy' that goes beyond this"[23].

## 5.3 Benefits

Interviewees told us that there are several benefits to a university of being strategic, in some degree at least, about the management of its international research collaboration:

> "Intangibles: it increases the reputation and brand value of the university at home and internationally; it underwrites the cosmopolitan feel of the university; and it makes us (students and staff) more aware of global issues and means we are likely to be better global citizens.
>
> Tangibles: the potential to secure increased levels of research and consulting income overall as compared with a bottom-up model; it has the potential to strengthen one's technical capabilities through concentration and specialisation on the one hand and the pooling of complementary (and otherwise absent) competences, methodologies and data sets on the other; the potential to increase the numbers and quality of non-nationals (fee paying) applying to study first and higher degrees, including research degrees".

Interviewees suggested that this more strategic mode of behaviour falls naturally to the university's central functions or the faculties and departments because an individual researcher cannot easily be 'strategic'. It is equally unlikely that such behaviour would emerge automatically as an aggregate effect of many researchers' individual decisions. They commented:

> "The institution is better equipped to create significant and wide-ranging collaborations, as compared with individual researchers. Moreover, individual researchers often struggle to sustain long-distance relationships, as their respective careers progress and their research interests evolve. Individual relationships may wither for personal reasons, even when there is still a great deal of potential value to be derived".
>
> "The NSF Materials International Institute for Complex Adaptive Matter, a subsidiary of the Institute for Complex Adaptive Matter (ICAM) at the University of California, is a multilateral international research partnership involving the Max Planck Institute and Cambridge University, among others, a collaborated that is reported to have helped the University of California leapfrog from 'ordinary' to 'world class' in this materials field in little more than two years".
>
> "The university has the authority, reputation and resources to establish friendships and mutual understandings among a much broader group of interested and influential parties (eg in-country universities and ministries, the local British Council, Foreign Office, etc) as compared with individual researchers or research groups. Similarly, the institution has the financial wherewithal to establish a significant presence in-country, to build relationships and engage local staff, and generally embed the institution and its joint venture".

## 5.4 Organisation

While there is no single organisational model, the survey and interviews suggest that there is something of a standard approach beginning to emerge, with a member of the senior management team having overall responsibility for policy and strategy and a director and small team coordinating the execution of the strategy, but usually in concert with departmental teams and senior researchers. Often there is an international committee comprising external people to provide advice and challenges to the internal team.

Our survey established that for the great majority (76 per cent), international research collaboration is the specific responsibility of one of the university's senior officers, typically a pro-vice-chancellor. However, only around a quarter (27 per cent) of higher education institutions have personnel in central units who spend at least half of their time supporting international research collaboration activities, and just less than a quarter (22 per cent) have people performing such roles at the department-level.

The interviews refined this view somewhat, and suggest that, in most cases, the pro-vice-chancellor is supported by a small team of international research collaboration staffers. It seems that most have a senior member of the university staff, at director level, with responsibility for the delivery of international research collaboration, whether that is the development of strategic research partnerships, or the provision of support on demand to individual research collaborators. However, in most cases, he or she also has responsibility for several other important outward-facing functions, such as international student recruitment or external relationships more generally. Central support teams are similarly quite likely to have a broader corporate remit, so a team of 5-10 people might very well amount to rather less than one full-time equivalent member of staff dedicated to international research collaboration.

"In terms of our strategic approach the University of Bath's attitude is that we should blend a top down and bottom-up approach. We should encourage collaborations to develop bottom-up and do what we can to support these, but this should be supplemented by a more concerted 'top-down' effort in areas that have been identified as ripe for further development. The research support units in the university help researchers to find suitable partners if necessary, and provide the usual range of other 'Research Office' activities, such as assistance with funding opportunities, grant applications, etc"[24].

"At the University of Bristol, the pro-vice-chancellor for research (Malcolm Anderson) has overall responsibility. He is heading up the operational unit that provides internal support. The university is also a member of the Worldwide Universities Network (WUN) – Vice-Chancellor Eric Thomas is the chair – and this is a key mechanism through which it develops and thinks about international research collaboration at a more strategic level. They have an international development manager who leads for them in this area from an operational participation perspective"[25].

"Bi-lateral relationships are quite common but multiple partner arrangements are rare. With an increased desire to develop strategic international links to address global issues there is an opportunity to increase the likelihood of success by using established international university networks. Some of these networks have already established trusting relationships between their member institutes and the discipline based research clusters within them. Some can already demonstrate a track record of research outcomes. For example, the World University Network (www.wun.ac.uk) with its emerging programme of research to address global challenges is a clear opportunity for UK research councils to connect with, especially where the challenge programmes align strongly with the thematic signposts in the recent Treasury delivery plans. For example, in the case of EPSRC (they relate) to health and medical technology, energy, nanotechnology etc. Use of such networks will speed the rate of progress and seems an obvious first point of call for research councils seeking to explore effective multi-partner collaborations"[26].

Most interviewees were quick to point out that specific strategic initiatives are tackled jointly with a given department or school, with a department's senior academics and support staff typically playing a major role in the development of the relationships, the framing of its objectives and activities, and often finding the seed funds for travel and negotiations from within their departmental budgets. In some cases, interviewees stated that their university has created dedicated management and supervisory structures for each strategic partnership, with academic working groups leading on content and academic/administrative groups providing a supervisory and evaluative function.

Interviews with selected universities suggest that greater attention is being afforded to international research collaboration in its own right, and in many cases, it is beginning to be coordinated and managed separately from student recruitment. This is not to suggest that the two aspects of the university mission have been divorced from one another, indeed, it is clear to most that there is strong synergy between the two.

There appears to be a trend wherein responsibility for international research collaboration is increasingly being assigned to research directors or pro-vice-chancellors for research, with fewer and fewer cases where it remains within the domain of pro-vice-chancellors for international affairs.

## 5.5 International research budgets

Hardly any higher education institutions have a dedicated budget for (i) supporting their research teams in undertaking international research collaboration, or (ii) developing their internal capabilities in this area. However, the interviews refined this view, suggesting that funds are generally available when needed, but drawn from any one of several budgets (not specifically earmarked for international research collaboration); the budgets for the recruitment of international students are quite substantial. Equally, many institutions have sufficient reserves or discretionary funds to invest six-figure sums in the exploration of international partnerships, and there are also numerous places where one can make ad hoc applications to small funds operated by learned societies or in several cases local and regional government.

## 5.6 Keeping records

The survey found that a small majority (58 per cent) do maintain some kind of central record of their international research collaboration activities. Follow-up interviews confirmed, however, that in many cases the information is incorporated in more general files on for example research grants (i.e. contracted income and expenditure; parties to the grant or contract) and the reportable data is usually limited to identification of projects that include an external collaboration and (if so) with which institution(s).

Accordingly, several of the respondents stated that the information is not recorded for the purpose of understanding international research collaboration, and that it would take them some time to organise their data in such a way as to reveal for example trends in the volume of overseas collaboration, or changes to the profile of partner countries over time.

> "The only records we keep [at the University of Abertay, Dundee] are a list of grant applications – this would include international collaborators on the application, so some kind of partnership listing could be generated, however there is nothing ready to be used, or shared"[27].

Several interviewees said that it would be of great benefit to them to have access to rather better data about their institution's overseas research linkages. However, one or two others indicated that they have sought to develop such a record in the past and that the data had been little used, so the databases had fallen into disrepair. On balance, there appears to be a demand within the institutions for better management of information in relation to international research collaboration, such that trends and patterns can be understood and existing relationships developed.

> "Bournemouth University's international collaboration activity is extensive and we periodically try to work out what is going on and document it. However, the information we collect through these exercises tends not to be used to any great extent, after some preliminary review, it just sits on the shelves, and so there is currently no routine record keeping on international activities"[28].

> "The University of St Andrews runs internal exercises periodically to document what is going on, but there is no formalised management information system that would permit us to generate/review reports on our international activities"[29].

"Leeds Metropolitan University's International Faculty works very hard to keep track of the institution's international collaborations. We work with the individual faculties to keep a record of all proposals submitted and current jobs, as well as encouraging visitors – inbound and outbound – to prepare a standard report on their trip, a 'database' of experiences and contacts which is available for others to refer to and learn from. We also try to keep a record of students, income and publications. As well as trying to capture information on individual activities and transactions, each faculty prepares an annual report covering all of its many and various international activities, which is then synthesised and reviewed by the senior management team"[30].

## 5.7 Critical success factors

Just as there is no single reason for or type of international research collaboration, so it would be hard to imagine a single, right way of managing international collaboration. Indeed, none of our contributors proffered a guide to collaboration.

Notwithstanding this diversity, contributors did point to a small number of what one might call rules of thumb which they believe are critical to successful research collaboration:

- To be successful, strategic research partnerships need to align with an institution's wider research and education strategy, in order to be sure of senior management's full engagement and its ability to invest real time in the relationship.
- Most institutions seek to maintain just a few of these strategic relationships, five rather than fifty, whereas the international partnerships of their individual researchers will run into the hundreds.
- There has to be value evident in the collaboration for all parties, as creating new strategic partnerships requires a lot of senior management time and energy as well as substantial investment. The best collaborations are non-competitive spaces, where everyone gets something positive out of the relationship and mutuality and reciprocity are strong ideas.
- Strategic partnerships seem to work best where there is a good fit in terms of institutional goals, competences and philosophies.
- Really successful collaboration tends to unfold over time, and to follow on from earlier relationships and success.
- Supporting success where it emerges from the bottom. This includes providing an institutional-level commitment, extending the collaboration through different types of interaction and even investment so as to reduce the risk of a partnership waning as a result of individual researchers' career movements.
- Research collaboration is rather different to educational partnerships. It depends critically on the commitment, chemistry and benefits derived by a small group, which requires different sorts of support people to those one finds in some international units; people who are a little more proactive and creative, people who will think about the best way to tackle an issue, and not be limited by existing instruments or bureaucratic procedures.
- Where language and cultural differences are particularly pronounced, it can be a great help to include one or more post-doctoral fellows, originally from the partner country, in the team, working closely with the senior academics.
- In terms of institutional support, it seems that it makes good sense to appoint a senior university officer with explicit responsibility for international research cooperation and ideally having a collaboration strategy, team and budget to pursue those duties.
- Even within established strategic research partnerships, central management teams facilitate rather than prescribe and must work in conjunction with senior academics. The researchers have to want the partnership to bear fruit.
- Several universities report great success arising from the institution having created a small international fund, for academics/staff to bid into competitively, which encourages people to come forward with ideas for collaboration that might ultimately be of strategic interest to the university. The open nature of the competitions has generated widespread interest and is proving to be quite a powerful seed fund for future projects and partnerships.

- Several interviewees stated that they try to main a central archive of reference material, from listings of country contacts, to checklists for travellers and even presentations and visit reports, submitted by previous travellers. In addition, some universities maintain a list of named individuals with a lot of experience of collaboration with a given country, and whom they can refer people on to in order to obtain a more personal and in-depth introduction to the whys and wherefores of collaboration, from etiquette to funding systems.

Beyond this, interviewees tell us that success still has a somewhat random quality:

> "Success is part chance, part hard work, part good communication between institution-level management teams and academics, a commitment to experiment and learn, and a willingness to recognise and respond to the aspirations and circumstances of one's partners".

## 5.8 Use of external support

A further set of questions explored the extent to which higher education institutions are currently (i) aware of, and (ii) receiving external forms of support for the development of capability in international research collaboration. A small majority are aware of at least some forms of external support, but less than a quarter were actually receiving such funding at the time of making a reply.

Subsequent interviews revealed that the forms of support are many and various, but that most are dedicated international programmes providing small grants to cover the cost of short visits or longer-term exchanges or fellowships. Sources include the research councils, learned societies and charities. Several people mentioned the EU framework programme as providing a range of measures to support cross-border networks, and that these can include membership of researchers from third (non-partner) countries, such as Canada or China[31].

In the main, the support given had been to help individual researchers develop new relationships with parties in other countries, and had not been designed to support institution-to-institution partnerships or indeed institution-level capability building in the manner of the Higher Education Innovation Fund (HEIF) in the area of knowledge transfer or the initiative, Beacons for Public Engagement, that was announced in 2007.

It is also fair to characterise this support as pump-priming or seed funding, intended to trigger new relationships rather than to fund more extensive collaboration or indeed to sustain these long-distance relationships in the longer term. This emphasis on a single impetus is borne out by the lists of grantholders, where few if any individuals can expect to benefit from more than one grant from the same scheme. There is a presumption that significant collaboration has to be financed through the research councils.

## 5.9 Ideas for support

Almost all respondents agreed that additional support to help higher education institutions develop their international research collaboration capabilities would be a good use of public resources (88 per cent), and we used the follow-up interviews to explore people's ideas about useful additions to the current portfolio of schemes.

Most interviewees were broadly content with the current situation and were not clamouring for more support from government or its agencies, although all agreed that additional support would be worthwhile[32].

Several people commented that most UK universities are not well known overseas, and particularly not in China, where American institutions dominate perceptions and only the biggest UK institutions tend to have any profile at all. This works the other way round too, with UK university officers reportedly knowing very little about the capabilities of most of the Chinese institutions not in the top flight. This asymmetry in awareness can cause problems on the ground, with frictions, delays and missed opportunities. There was a general anticipation that the new RCUK offices might be able to run the kinds of information campaigns and marketing initiatives necessary to create brand awareness and a 'feel-good' factor around UK universities, as well as attracting the attentions of national and regional policymakers and planners.

Interviews with senior officials and professors in China, all of whom had been involved with framework programme projects and networks, provide a slightly different picture to the one that emerges from the UK looking out. The impression given by the dozen or so interviews is that:

- The United States and Japan are the dominant science and technology partners, and, in Europe, Germany is the best known.

- UK universities and research capabilities, and those of Europe in general, are not well known.
- American universities are the most visible and most ambitious.
- Strategic contact is often institution, rather than government led, even though overseas missions might be (heavily) supported and financed by state government.
- Links are built on the pre-existing relationships maintained by a majority of professors, which has studied or done post-doctoral work in the United States.
- Investments focus on joint laboratories and facilities, rather than people or salaries.
- Investment commitments might be measured in millions not thousands.

The importance of awareness and perceptions in the target country was also underlined in a recent study Technopolis carried out for the British embassy in Tokyo, where we found a marked difference in perceptions of research excellence and willingness to collaborate, between those who had worked with British scientists and engineers and those who had not.

> "The academic survey in Japan suggests that the UK is generally seen as a strong scientific performer, with over 30 per cent (400) of respondents ranking UK research partners second only to the United States on scientific excellence. On this analysis, UK research performance is better than either Germany or France. The picture is not all good, however. For those researchers *without* experience of collaboration with the UK, the impression of UK research was lower than for those that do, sufficiently so to detract from the idea of collaboration"[33].

In discussing the challenges, the contributors to this study did offer several specific suggestions, however most remarked on their very partial knowledge of what was available already and the attendant risk that any ideas they have might already exist. The following list is the sum of the suggestions made:

- More and better overseas promotion of the research capabilities of leading UK universities (or clusters of universities) in a given field by the relevant research councils, and the new RCUK overseas offices is needed.
- It would be useful to have schemes to support cross-institutional (within the UK) networking among the senior managers and academics involved in institution-level research collaboration, to facilitate information exchange and learning, and reduce the costs/waste associated with every institution having to the learn the same lessons and make the same mistakes.
- We need information portals, to publish information on international research support (for example, what is available, to whom, to what end, on what terms, etc), lessons and experiences in support material (for example, checklists, case studies, role models) that could be made available to all universities – and indeed, researchers – to help people to learn more quickly and make fewer mistakes along the way.
- Schemes to support the 'bundling' of UK institutions with particular strategic interests, such as common and complementary interests in a field such as climate change, as the basis for strengthening the attractiveness of the 'offer' to potential partners would be useful. One aspect of this would be the potential to build much stronger, multilateral networks and partnerships.
- A high-profile challenge fund, available on a competitive basis, would be productive. It would help the most committed institutions develop and experiment with new strategic partnerships that have emerged from seed funds or researcher-level initiatives, with grants in the high tens and hundreds of thousands, provided on a matched funding basis (with universities having to invest/risk their own central reserves as a means by which to get the right incentives and also as a quid pro quo for a rather open and non-prescriptive approach).

## 6
## Conclusion

In conclusion, there is an almost universal commitment across the UK higher education sector to expand the level of international research collaboration, both institution-level strategic partnerships and the more typical, researcher-level international collaboration.

At present only a few UK universities have an international research collaboration strategy, although most believe that their university would benefit from managing international research collaboration in a more strategic fashion.

*Where universities have a strong commitment to expanding international research cooperation, they might consider the value of creating an explicit international research collaboration strategy, tied to the institution's overarching mission and strategy, setting out the rationale, objectives and means by which the strategy will be delivered*

Although no single organisational model is evident, there is something of a standard approach beginning to emerge, with a member of the senior management team having overall responsibility for policy and strategy and a director and small team coordinating the execution of the strategy, usually in concert with departmental teams and senior researchers. There is often an international committee, consisting of external members, to provide advice and challenges to the internal team.

*Where universities have a strong commitment to expanding international research cooperation, they should consider the value of appointing someone at pro-vice-chancellor or director level to lead the institution's endeavours in this area*

*There would appear to be value also in the creation of a small, dedicated support team with the confidence and skills necessary to work on a global scale and the determination and creativity to find solutions to the challenges that will inevitably reveal themselves*

Hardly any higher education institutions have a dedicated budget to (i) support their research teams in undertaking international research collaboration, or (ii) to develop their internal management capabilities. However, funds are generally available when needed, but are drawn from any one of several internal university budgets and occasionally from external bodies with a remit to sponsor universities or research.

*There would appear to be value in the creation of a small, dedicated development fund, which might be used in any one of several ways: strategy fund for consolidation/extension of promising new partnerships; training and education fund to support would-be collaborators through creation of course; creation of guidance material and archives and participation in university networks; and seedcorn fund for academics to explore researcher-level international collaboration*

A majority of external support is targeted on researchers rather than institutions, typically dedicated international programmes providing small grants to cover the cost of short visits and fellowships. Universities are broadly content with the current situation and are not clamouring for more support from government or its agencies, although all agree that additional funding would be worthwhile for both researchers and institutions.

*There would appear to be value in universities joining one of several existing networks, such as the new Internationalisation Forum, set up by the University of Birmingham with sixteen other UK universities, to support cross-institutional (within the UK) networking and learning*

## Appendix A: Interviewees

| | | |
|---|---|---|
| Professor C J Backhouse | Loughborough University | Director of Internationalisation Strategy |
| Professor Dianne Berry | University of Reading | Pro-Vice Chancellor Research |
| Mr Dave Coombe | University of Kent | Director of Research Office |
| Professor Barry Evans | University of Surrey | Pro-Vice-Chancellor Research and Enterprise |
| Professor George Griffin | St George's, University of London | Vice-Principal Research |
| Dr Edward Halpin | Leeds Metropolitan University | Associate Dean, Research, Partnerships and Consultancy, International Faculty |
| Professor H.T. Hassan | University of Paisley | Vice-Principal, Research & Commercialisation |
| Professor Brigid R Heywood | The Open University | Pro-Vice-Chancellor Research and Staff |
| Dr David Langley | University of Bristol | Director of Research and Enterprise Development |
| Professor Trevor McMillan | University of Lancaster | Pro-Vice-Chancellor Research |
| Professor Jane Millar | University of Bath | Pro-Vice-Chancellor Strategic Development |
| Professor Alan Miller | University of St Andrews | Vice-Principal Research |
| Professor Nick Petford | Bournemouth University | Pro-Vice-Chancellor Research and Enterprise |
| Dr Clive Randall | University of Abertay Dundee | Research Development Manager |
| Mr Nigel Relph | Queen Mary, University of London | Director of Corporate Affairs |
| Professor Jon Saunders | University of Liverpool | Pro-Vice-Chancellor Research |
| Mr Angus Stewart | London School of Economics | Director Research and Project Development |
| Dr Mary Stiasny | Institute of Education, University of London | Assistant Director, Learning and Teaching |
| Heather Sugden | University of Sheffield | Research Development Manager |
| Dr Helen Thorne | RCUK | Director, RCUK office, Washington |
| Dr Antony Weir | Heriot-Watt University | Head of Research and Legal Services |
| Professor Richard Williams | University of Leeds | Pro-Vice-Chancellor Research and Enterprise |
| Professor Barry Winn | University of Hull | Pro-Vice-Chancellor Research and Enterprise |

## Appendix B:
## International research offices outside the UK

### B.1 Basic functions of an international research office

Based on the examples of international research offices given below, the following is a representative list of functions undertaken and roles played by such offices.

#### Strategic

- Create a university-wide strategy (to replace existing individual and department level development).
- Bring together staff from several departments who deal with international activities (including those relating to international students).

#### Liaison

- Expand existing partnerships and develop mutually beneficial relations.
- Maintain active liaison with sponsoring agencies and research organisations.
- Maintain active liaison with international offices at other institutions.
- Establish, maintain and hold international agreements with foreign institutions.

#### Exchanges

- Facilitate the establishment and review of international exchange programs and academic linkages.
- Facilitate exchanges.
- Provide protocol support for outgoing delegations visiting other countries.
- Host delegations from foreign institutions and provide support services for visiting researchers and scholars.

#### Promotion

- Promote international research activities.
- Monitor, provide information and promote the institutions current activities.

#### Funding

- Identify and publicise funding opportunities and diversify the pool of donors supporting international activity.
- Give advice and assistance in the preparation and submission of proposals, ensuring full compliance and helping to increase success rates.
- Oversee contracts and grant agreements relating to international research.
- Lead contract negotiation with sponsors and project partners, ensuring the best use of financial resources, clarifying respective roles, responsibilities and mutual interest, reducing the risks associated with working internationally.
- Oversee project implementation.
- Coordinate the institution's participation in major programmes for research cooperation with institutions abroad.

#### Training

- Foster an understanding of history, cultures and values.
- Increase mutual interest and understanding.
- Give guidance and advice to researchers on cooperation with foreign universities.

## B.2 Case studies of university international offices

### International Unit, University of Waterloo, Ontario, Canada.

In May 2007, the University of Waterloo, Ontario, announced a new Waterloo International Unit (with its own office and meeting space) to support the university's increased international focus. The unit brings together staff from several departments who deal with the university's international activities (including the international student office, the international programs office, and the recently appointed alumni officer for international programs), headed by the associate vice-president (international).

The university's Sixth Decade Plan (Going Global) set out ambitious goals for internationalisation at the university. It stated that in the next decade Waterloo plans to establish at least two international campuses abroad and expand partnerships, collaborative academic programs and joint research centres with other prominent international institutions.

The Office of International Programs (which will be folded into the new international unit), provides information and assistance, working in close cooperation with academic and administrative units across campus and promotes research and international activities.

International Programs provides information and assistance to the university community for a wide variety of research and training related activities including all non-industry research and international programs. Working in close cooperation with academic and administrative units across campus, the office:

- promotes research and international activities;
- facilitates visitor protocols;
- monitors and provides information on the university's current activities in these areas;
- identifies and publicises funding opportunities;
- gives advice and assistance to faculty in the preparation and submission of proposals;
- Maintains active liaison with sponsoring agencies, research and international education organisations, and international offices at other universities; and
- facilitates the establishment and review of international exchange programs and academic linkages.

### Office of International Agriculture, University of Auburn, Alabama, United States

The Office of International Agriculture fosters and supports faculty, staff, and student travel, study abroad, research, and outreach, as well as international visitors and exchanges. It holds ten international academic interchange agreements with institutions in other countries, including England, China and various countries in South America.

The university's College of Agriculture also runs China Programs, which build bridges between the United States and China, drawing on the strengths of various departments in the college and other colleges at the university, and partner with public and private organizations in Alabama and the United States. It promotes relations with China by:

- facilitating educational exchange including exchanges of faculty, staff, and students;
- promoting collaborative research and research activities;
- facilitating activities related to teaching and training;
- fostering an understanding of history, cultures, and values;
- serving as a catalyst and resource for the promotion of economic, governmental, and civic pursuits; and
- increasing mutual interest and understanding.

### International Research Office, Oslo University, Norway

In 1997, the Senate of the University of Oslo adopted the strategy plan for the university's international activity: *the university in the global community*. The strategy document consisted of two parts: one which described the higher-level strategy for international activities, and a second which described the necessary measures to implement this strategy. In the years following the adoption of the international strategy, a large number of the proposed measures were taken.

The International Research Office coordinates the University of Oslo's participation in major programmes for research cooperation with universities and research institutions abroad. The main focus areas of the office are the EU framework programmes and programmes for cooperation in research and higher education with Africa, Asia and Latin America. In addition, the office is involved in policy processes and gives guidance and advice to the university's researchers for cooperation with institutions in Central and Eastern Europe as well as in industrialised countries outside Europe (the United States, Canada, China, Japan and Australia).

### International Research Office, University of Saskatchewan, Saskatchewan, Canada

The International Research Office spearheads the coordination, facilitation and implementation of programs, partnerships and policies at the University of Saskatchewan, to support an expanding research and training portfolio. Office staff work with the university research community and their national and international collaborators, to develop mutually beneficial relations that advance the goals articulated in the University of Saskatchewan foundational documents. Responsibilities of the office include:

- providing guidance to faculty and administration on all aspects of the project cycle relating to international research, advisory services and training contracts;
- liaising with international agencies, Canadian government departments, universities and the non-governmental organisation sector to promote faculty involvement and accountability of externally funded research;
- overseeing all contracts and grant agreements relating to international research; and
- supporting the work of the tri-council research facilitators to expand international opportunities available in those programs.

### International Research and Development Office, University of Toronto, Ontario, Canada

The International Research and Development Office assists the University of Toronto central administration and academic communities in the development of international collaborative agreements and research partnerships. It hosts incoming delegations from foreign institutions and provides protocol support for outgoing University of Toronto delegations visiting other countries.

The Office of International Research and Development:

- researches and nurtures opportunities for developing collaborative agreements between the university and foreign institutions, research entities, and governments;
- hosts visiting delegations from foreign institutions interested in developing collaborative agreements;
- enhances strategic international relations and agreements in support of divisional and institutional goals.

## International Centres

### Berlin Centre

Founded in 2001 by the University of Toronto and the Université de Québec à Montréal, the Canadian Universities' Centre in Berlin serves as a vehicle to strengthen academic cooperation between the member Canadian universities and universities, scholars, and scientific institutions in Europe. The Canadian Universities Centre assists with a large summer university programme for Canadian and other international students in Berlin, provides information and advice to European scholars on opportunities for study and research in Canada, and promotes outstanding Canadian scholarship in Germany and Europe by organising and co-organising conferences, speaker series and study visits in Berlin. http://www.cuc-berlin.org/

### The Asia-Pacific Advancement Office (Hong Kong)

The Asia-Pacific Advancement Office, the university's office in Hong Kong, is operated by the Division of University Advancement and serves as a platform for development initiatives, alumni affairs, public affairs in the Asia-Pacific Region. This office serves as the administrative centre for the University of Toronto (Hong Kong) Foundation Ltd., the University of Toronto Alumni Association (Hong Kong), and the University of Toronto Club of Singapore, and works together with alumni volunteers in China, Japan, Korea, Taiwan, Malaysia, Macau and Australia. The office also provides advice and administrative support for visits by the university's senior administration to the region. http://www.utoronto.com.hk

### International Agreements

The University of Toronto is currently engaged in a wide range of agreements with academic, research and scientific institutions and government bodies around the world. It is currently operating with a total of 130 agreements in 41 countries, excluding non-international agreements within Canada.

| Region | Number of Agreements |
|---|---|
| Western Europe | 62 |
| Asia | 34 |
| Africa and the Middle East | 7 |
| Central & Eastern Europe | 10 |
| Australia / New Zealand | 9 |
| Central & South America | 3 |
| Caribbean | 1 |
| North America | 4 |

### The Office of International Research, McGill University, Quebec, Canada

The Office of International Research facilitates, coordinates and promotes international research and development activities at McGill University, Montreal, Quebec. It plays a strategic role in assisting and enhancing international projects and outreach and supports faculty members across campus in all their international activities, including fundamental research collaborations.

The office provides guidance on proposal preparation, then leads contract negotiation with sponsors and finally oversees project implementation. Its mandate can be divided into four broad and interconnected areas of responsibility:

1. A liaison and advocacy role with foreign government agencies and private sector companies and foundations, which disseminates information about opportunities and challenges.
2. Early involvement in the development of proposals, ensures full technical and budgetary compliance, helping to increase success rates in competitive calls. The Office also identifies new and non-traditional sources of funding and diversifies the pool of donors supporting international activities.
3. It acts as the authorised representative of the university and takes the lead role in negotiating contractual terms and conditions with project partners and sponsors. Thus ensuring the best use of financial resources at hand, clarifying respective roles and responsibilities and mutual expectations, and contributing to reducing the risks associated with working internationally.
4. It promotes the application of the highest standards of business practices in the operational and financial management of McGill's international projects, allowing project teams to dedicate themselves entirely to the academic aspects of their international project.

### Shastri Indo-Canadian Institute

The Shastri Indo-Canadian Institute promotes collaboration between India and Canada through scholarly activities, academic and cultural exchange, and applied research. It is a collaborative effort of 22 member institutions in Canada, the Governments of Canada and India and the community at large. The Institute is working towards increasing the participation and membership of universities in India. The Shastri Indo-Canadian Institute builds knowledge in Canada and India by sponsoring academic activities. The Canadian studies programme offers fellowships for Indian scholars and visiting lectureships in India for Canadian academics. Under the Institute's India studies programme, fellowships are provided to Canadian scholars, librarians and artists and Indian imprints are supplied to Canadian universities, the purpose being to promote understanding of India in Canada.

### Office of International Research, University of Ottawa, Ontario, Canada

The Office of International Research is the administrative centre responsible for promoting and coordinating the growth of international research and development at the University of Ottawa. It was established in 2005 and works closely with faculties, research facilitators and top-notch researchers at the university to build effective international collaborative projects. It is dedicated to enhancing the internationalisation of the university, to:

- develop and promote international R&D projects;
- advocate for faculty and researchers with international interests;
- discover grant opportunities for research, collaboration, and travel by faculty and researchers;
- create and administer international networks to facilitate collaboration and exchange programs;
- promote the university's numerous institutional affiliations and linkages abroad;
- provide support services for visiting researchers and scholars;
- maintain relations with international organisations and donor agencies;
- enhance the university's capacity for participation in technical and development assistance project;
- act as the university's principal liaison for outreach activities to science-based departments and agencies and regional organisations with international concerns in the Ottawa region.

In the lead-up to the articulation of a full international research strategic plan, an interim strategic plan has identified eight key actions for the Office of International Research to pursue:

1. create an administrative foundation;
2. develop and sustain a comprehensive network of contacts;
3. identify international opportunities;
4. align opportunities with policy priorities;
5. integrate opportunities with academic priorities;
6. devise appropriate policies and programs;
7. facilitate the emergence of incentives, services and products;
8. provide tools and administrative support.

### Office of International Research Promotion, Waseda University, Tokyo, Japan

The mandate of the International Research Protection Office includes the establishment of an international research development methodology for cultivating international calibre researchers and the creation of a university-wide strategy for and focus on the development of international research, to replace existing individual and department level development. Its work is as follows:

1. Formulate guidelines to promote the international research
- utilise existing overseas outposts centred in Asia
- cooperate with overseas institutions
- construction of networks with overseas researchers
- coordinate international research cooperation

2. Establish a database for international exchange
- full use of international exchange data in the development of international strategy.

3. Hold a workshop for young researchers to develop writing skill in English

4. Support international research development
- provide translation service for researchers who plan to apply for international conference or journals.

5. Hold international research symposium, etc.
- disseminate Waseda's research products and research activities internationally through those opportunities

# Notes

1 Jonathan Adams et al (2007) *Patterns of international collaboration for the UK and leading partners*. Evidence Limited, Leeds.

2 For example, the Global Science and Innovation Forum (GSIF) Strategy for International Research and Engagement (www.berr.gov.uk/dius/science/int/gsif); or *Policy approaches towards science and technology cooperation with third countries*, Brussels, September 2007, prepared on behalf of the CREST Working Group on Internationalisation of R&D by Jan Nill, Klaus Schuch, Sylvia Schwaag Serger, Jörn Sonnenburg, Peter Teirlinck, Arie van der Zwan.

3 As with any indicator, bibliometrics have their limitations and in this context their most important shortcoming is the exclusion of social science, arts and humanities, fields where we know there is wide-ranging and long-standing international research collaborations. These broad fields tend to publish their most important work in monographs and book chapters rather than journal articles and as such bibliometric statistics will tend to omit a major part of their oeuvre. So, throughout this paper, the bibliometric data relate to science, technology, engineering and mathematics (STEM) subjects and not social science or the arts and humanities.

4 Derived from data presented in Table 2 'changing volumes of international collaboration,' of the report, Adams (2007) *Patterns of international collaboration for the UK and leading partners*.

5 The exception is India, which was not included in the basic database constructed by Evidence Limited in order to prepare its report by Adams (2007), op.cit.

6 DEMOS (2007) *The Atlas of ideas: How Asian innovation can benefit us all*. London: DEMOS,

7 Ms Manyi Cristofoli, senior technology transfer officer, Queen Mary University London. See: www.kegoodpractice.org/downloads/Queen%20Mary%20-%20ICUK_20032007.ppt

8 Dr Haifeng Wang, Visiting Fellow, Department of Economics and International Development, University of Bath. See: http://www.bath.ac.uk/elec-eng/news/chinasupergen.html

9 Professor Phil Gilmartin, Pro-Dean for Research, Faculty of Biological Sciences and Professor Brendan Davies, Director, Centre for Plant Sciences with Dr Bing Liu, Director of China Liaison, Faculty of Biological Sciences. See: http://reporter.leeds.ac.uk/press_releases/current/china_collaboration.htm

10 Professor Diamond, chair of Research Councils UK, speaking on international research cooperation at a breakfast seminar held at the House of Commons on 27 November 2007, and hosted by the UK Higher Education International Unit.

11 www.rcuk.ac.uk/cmsweb/downloads/rcuk/publications/international.pdf

12 International Strategy of the Institute of Education (IOE), University of London, 2005.

13 This would be a significant improvement on Leeds' current position and within a fast-moving environment in under 10 years: the 2007 THES World Ranking places the University of Leeds at equal 80th

14 Compiled from a presentation made by Richard Williams, Pro-Vice-Chancellor for Enterprise, Knowledge Transfer and International Strategy at the University of Leeds, to a Universities UK seminar, London, 20 November 2007

15 As noted earlier, these epistemic differences are thought to be more widespread – and valuable – within the social sciences, as compared with the natural and physical sciences.

16 The Technopolis report is available to download from the GSIF web site, at www.berr.gov.uk/dius/science/int/gsif/evidence/page40353.html

17 Jonathan Adams (2007), op.cit.

18 Extract from 'an introduction to Birmingham's international strategy,' by Dr Judith M Lamie, Director of International Strategy at the University of Birmingham.

19 Dr Nini Yang, The China Office, University of Edinburgh

20 Research Director, London School of Economics

21 STFC Diamond Newsletter

22 Associate Dean Research, Leeds Metropolitan University

23 Vice-Principal Research at St George's, University of London

24 Pro-Vice-Chancellor Strategic Development at University of Bath

25 Director of Research and Enterprise Development at University of Bristol

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

27 Research Development Manager University of Abertay, Dundee

28 Pro-Vice-Chancellor (Research & Enterprise), Bournemouth University

29 Vice-Principal Research, University of St Andrews

30 Associate Dean Research, Leeds Metropolitan University

31 Conversations with university officers in Canada and China offer a slightly different perspective, where the attraction of working with scientists and engineers in Europe is tempered by the small amounts of money on offer and the significant levels of bureaucracy

32 This result resonates with the findings from the 2005 'drivers' report for GSIF (Drivers, Barriers, Benefits and Government support of UK international engagement in science and innovation, Technopolis Ltd., 2005) in which contributors to a UK-wide survey, this time senior researchers, put forward very few suggestions as regards new or different schemes missing from the UK policy landscape. The two issues that did materialise were (i) a general sense of there being too many very small schemes with highly particular rules on who and what might be supported and (ii) an absence of agencies actively promoting UK research capabilities in-country, preparing the ground so to speak.

33 Extract from the Main report of the mapping project on UK-Japan science and innovation carried out by Technopolis and the University of Tokyo, for the British Embassy in Tokyo.

## About Universities UK

This publication has been produced by Universities UK, which is the representative body for the executive heads of UK universities and is recognised as the umbrella group for the university sector. It works to advance the interests of universities and to spread good practice throughout the higher education sector.

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