

## DEBATE SUMMARY

### The Dowling Review of Business-University Research Collaborations

Held at The Royal Society on 7<sup>th</sup> October, 2015.

The Foundation is grateful to BP, the Michael John Trust, the Lloyd's Register Group and Rolls-Royce for supporting this debate.

The hashtag for this debate is #fstdowling .

Audio files of the speeches are on [www.foundation.org.uk](http://www.foundation.org.uk) .

- Chair:** **The Earl of Selborne GBE FRS**  
Chairman, The Foundation for Science and Technology
- Speakers:** **Professor Dame Ann Dowling DBE FREng FRS**  
Chair of the Review and President, Royal Academy of Engineering  
**Professor Sir Peter Gregson FREng**  
Vice-Chancellor and Chief Executive, Cranfield University  
**Eric Hawthorn**  
Managing Director, Radio Design Ltd
- Panellist:** **Professor Jeremy Watson CBE FREng FIET**  
Professor of Engineering Systems, University College London
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PROFESSOR DOWLING said that from her first-hand experience of the value of university business collaboration she was convinced that it was essential to scale up collaborations for the benefit of the UK economy. The report<sup>1</sup> had been written under a tight time-scale but had been able to take into account 200 written submissions, and input from 200 individuals who participated in regional meetings. She outlined the conclusions and recommendations of the report under six headings:

1. *Complexity* - A graph on page 25 of the review showed the bewildering number of organizations involved and their links involved in co-ordinating public support for collaboration. Few SMEs could navigate their way through the system, and many did not know where to get started. The processes of support need to be simplified (which did not mean a cut of funding) and it is necessary where possible to "hide the wiring".

2. *People* - It must be made clear to academic leaders that industry related research is not less prestigious than pure research and that work with businesses is a benefit for an academic career, not a hindrance. The emphasis given to impact in the Research Excellence Framework (REF) was valua-

ble. There should be a good flow of exchanges between academic departments and businesses in both directions. Ideally all researchers should spend some of their early career working in business.

3. *Brokerage* - There should be an easy mechanism to enable businesses to find out who to approach in any university to find out who to speak to about research opportunities, and for academic researchers to find out which businesses could benefit from their research. There were good links already between major corporations and research groups, but for SMEs academia could appear forbidding and difficult to find out if they could be helped; similarly academics did not know enough about individual SMEs to see if there were opportunities for their research to be utilised. Personal networking was the most valuable means of linking, and should be encouraged. An on line portal, manned by knowledgeable staff would be of value.

4. *Pump priming* - There was a gap in the market for developing research/business collaboration in areas where there was the possibility of creating a critical mass of research, which could spark a major economic opportunity in national or international trade. Such investments could bring large public sector rewards. Removal of VAT on collaborative spaces would greatly help.

5. *Prioritizing knowledge exchange* - A problem was that some research institutions had looked to make short term gains through IP protection and

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<sup>1</sup> The Dowling Review of Business-University Research Collaborations

[www.raeng.org.uk/publications/reports/the-dowling-review-of-business-university-research](http://www.raeng.org.uk/publications/reports/the-dowling-review-of-business-university-research)

other means rather than seeking the longer term benefits of seeing their institutions research utilised in the wider economy. Their Technology Transfer Offices (TTOs) should always prioritize the latter. But more work needed to be done on standardizing and clarifying IP model agreements.

6. *Government strategy* - It should be made clear that the government had a strategy for collaboration and would support it through the tax system and by using the abilities of every Local Enterprise Partnerships (LEP) to support it - at present their support was not always clear. Innovate UK also plays an important role. The government could provide a template for how collaborations could be set up and operated. Above all there was a need for consistency in approach, institutional arrangements and funding.

The report had been welcomed by business, bodies such as RCUK and HEFCE (the Higher Education Funding Council for England) and academia. She hoped the review would be followed by action and not need to be followed by another review in a few years' time. Its publication was timely as the Prime Minister was making industrial success based on innovation and research a clear theme of his government.

SIR PETER GREGSON welcomed the inclusive nature of the report which added 32 recommendations to the 297 from the 9 most recent reviews but Dame Anne has succinctly grouped them all into her six key messages. University-business collaboration in the UK was already effective, and it was important not to impede it, but he warned that universities had a dual function - to educate as well as research, and we must not neglect either. Innovation was a complex subject, and businesses and universities do not always mean the same thing when they discuss either 'innovation', or the term 'impact'. Businesses see both innovation and impact as something that drives forward their profitability and commercial success, while universities see the term to mean development in knowledge and public understanding. Research uses pounds to generate knowledge; knowledge leads to innovation and innovation brings in pounds.

Simplification of the processes of government support was desirable but innovation was a chaotic process - successful ideas emerged serendipitously. Simplification could mean that a particular route to innovation was closed. He stressed the message in the report about the need for consistency in both structures and funding.

There was a culture of trust between many researchers and large businesses which ensured compatibility of aims and working methods. But we should not overlook the 1,000 start-ups from universities which were now maturing, and the 10,000 graduate start-ups developing within the low barriers to entry that universities offer. But if the economy was to flourish we had to find a better way of engaging with the growing small to medium sized businesses. However, there were

five million SMEs and 10,000 academics and we need to understand better the key characteristics of business need as well as what universities can offer. Signposting local, regional, national and international opportunities for business and research collaboration was vital both for businesses and universities.

We must also overcome the current skills deficit in engineering and science subjects. We need to double the number of graduates and post graduate students in STEM areas. We need the students to be more diverse (more women) and we need the skilled immigrants. There should not be constrictions on the ability of skilled immigrants to work in the UK.

UK universities and business had worked together very effectively in leveraging government funding - in engineering, £2bn in government funding brought in £9bn of business investment: £1.3bn was secured from charities, largely from small donations. He supported the emphasis on prioritizing knowledge exchange in Technology Transfer Offices, but warned that the gap between a research idea and eventual development to a commercial scale was very large. We must not over manage research and collaboration; provided there is consistency in government approach, there are many paths to success.

MR HAWTHORN outlined the nature of his business, Radio Design Ltd. It had been founded in 2007 with 11 people, and now had over 300 staff with operations in UK, India and China. So it was no longer an SME in the conventional sense but a growing business with a technological base which thrived on using research. The company had developed a close relationship with the University of Leeds, where it sponsored a Royal Academy of Engineering research Chair. Seven PhD research students currently work in the Centre for Microwave Signal Processing supported by the company's R&D team. From the start of the collaboration it was agreed that IP would be vested in the company and not in the university. This beneficial arrangement had come about because of a personal contact in the University who had approached him. Without this contact he would not have known how to collaborate with the university. This demonstrated the dangers of complexity and the need to make the access of business to academia easier. The collaboration worked because he and Professor Hunter met regularly and both shared the same understanding of 'impact' of research. They had a clear programme of research with objectives. This had led to new product designs within twelve months, leading to £1m of sales.

He was chair of the Leeds LEP Business Innovation and Growth Panel, but was concerned that they did not have sufficient resources. LEPs needed guidance and support to drive innovation and promote growth. He strongly supported the conclusions of the Review, but emphasized that brokerage must be proactive. Any scheme must work positively to bring businesses and researchers to-

gether so that there is mutual support in finding opportunities. He would not have known himself how to find funding or gain research support. He understood the problems for universities - REF ranking was crucial for them, and had traditionally been based on published papers; that was why it was important that 'impact' measures were a strong factor in REF scores. We now needed to see an implementation plan for the Report's recommendations.

PROFESSOR WATSON opened the discussion. He looked at the problem through three lenses - as a university professor, government (former Chief Scientific Adviser at the Department for Communities and Local Government), and as a former Director of Research for a consulting engineering firm, Arup. He noted that the report did not discuss the role of local authorities and their relationship with local universities. Localism was important, and links between local authorities and their local universities (and their LEPs) could be significant. Authorities could help with capital and helping SMEs draw on the design capabilities of academics. It was also important for SMEs and businesses to be aware of the function of Catapult centres and their innovative technological processes which could be of wider use.

Among the points raised in discussion were: -

1. Apprentices, (not in the remit of the review) and the division between higher and further education. Apprenticeships were a crucial interface where students could be trained to understand both research and the priorities of business. This could be a source for training people to understand the mechanisms for knowledge transfer, but the institutions needed to work together.

2. The report had underplayed the motivation of researchers doing cutting edge research using a very high level of technology. Their work inspired them, and measurable impact or collaboration with business would not weigh heavily against publication of research in peer reviewed journals. But, while this might be true of some researchers, there was evidence of growing interest among the research community for industry related research and a willingness to collaborate. But the key was to acclimatise researchers at an early age to the importance of collaboration and the opportunities, both personal and nationally, it offered. The position in Scotland was better; there was a closer engagement between business, universities and local authorities than elsewhere. Perhaps devolved regions such as Scotland, Wales and Northern Ireland understood the link between local industry and international business more closely than in England. In Northern Ireland there was a particular link with the US, and a culture of collaboration.

3. Professor Gregson's doubts about simplification were justified. Simplification could mean removing some arrangements which worked. But perhaps more tools were needed to enable SMEs and start-ups to attract venture capital investment.

Without investment long term growth and sustainability were threatened. Others disagreed. Venture capitalists were not interested in the long term or sustainability, and should be treated with caution. Better use could be made of LEPs.

4. The brokerage model for collaboration, which saw researchers and businesses as separate and needing connection, was over simplified. More satisfactory would be to look at the overlapping spheres, so that both would feature in an overlap on a Venn diagram. This was not incompatible with the model. The crucial aspect was training, the learning process. If this were in place the overlap would occur. An incentive might be for universities to suggest business projects for businesses to bid for.

5. Why there had been so many past reports and why had their recommendations not been implemented? Progress had resulted from these reports, such as the significant shift in academic motivation, and the greater understanding amongst businesses of the value of university research. But one must accept the reality of political changes and funding crises, which lead to institutional change (such as RDAs and LEPs) and cuts in government grants.

6. There was an urgent need to increase STEM graduates and post graduates. The problem lay in schools, where the advantages in career and intellectual opportunities in STEM subjects were not stressed. There was a communication problem which universities and government needed to address. The government also needed to understand the importance for universities and the economy of immigration. Why did more women not take up STEM subjects? There was no discrimination in industry against employing them. The trouble was there were not enough women coming forward to study STEM subjects.

7. There were problems for SMEs with public procurement. The NHS preferred to procure goods and services from large companies with an established track record with them, and so do many government departments. The result for life sciences is that many researchers and companies prefer to take their research and innovative products elsewhere.

8. Professor Watson was right in stressing the importance of local contacts and institutions, such as local authorities. Trust was built through personal contact and geographical contiguity.

Speakers welcomed the report but stressed in particular four points: (a) the importance of continuity in the government's approach, its funding and institutions; (b) the weakness of the STEM supply chain, and the need to integrate Further and Higher Education; (c) simplification must not cut across existing relationships which work well; and (d) businesses, universities and funding bodies should think holistically about local, regional, national and international opportunities.

Sir Geoffrey Chipperfield KCB

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[www.gov.uk/government/organisations/department-for-business-innovation-skills](http://www.gov.uk/government/organisations/department-for-business-innovation-skills)

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Rolls-Royce  
[www.rolls-royce.com](http://www.rolls-royce.com)

The Royal Academy of Engineering  
The Universe of Engineering – a call for action. A report chaired by Dame Sue Ion DBE FREng.  
[www.raeng.org.uk/publications/reports/the-universe-of-engineering](http://www.raeng.org.uk/publications/reports/the-universe-of-engineering)

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