

OPINION

TURBULENT POLITICS PUT A PREMIUM ON RESEARCH IMPACT

The political landscape in the UK, and the rest of the world, is changing, and with it, so do policies relating to education and research. Professor Graeme Reid, Chair of Science and Research Policy at UCL, argues that this is a time for great opportunities in engineering research.



Professor Graeme Reid

The political context for engineering and science changes almost daily. New legislation on higher education and research; profound changes in the US leadership; devolution debates at both national and city levels; stock markets rising against expectations; an economic backdrop that is ever more difficult to understand; and, of course, Brexit.

I was worried that science and engineering would be squeezed to the margins of politics by more pressing concerns. However, it is clear that science and research are one of the government's priorities. By demonstrating the impact of research, we can keep it that way.

Theresa May placed heavy emphasis on science and innovation in her vision for our future. In her 23 January speech on exiting the EU, and a few days later about industrial strategy, she made clear her intention to attract talented people from around the world, protect research funding, maintain strong international collaborations (not least with EU member states), and to make science and innovation one of the cornerstones of the UK economy. This builds

on the surprise announcement in last year's autumn statement of a £4.7 billion increase in science and innovation spending.

The Research Excellence Framework (REF), carried out in 2014, showed how university researchers have been demonstrating more clearly than ever the impact of their work on the economy and society ('Research with impact', *Ingenia* 69). The impact case studies submitted to REF2014 provide an unprecedented archive. The national academies, the Campaign for Science and Engineering, and others can now combine these case studies with economic analysis to demonstrate to government and a wider audience the value of science and innovation.

REF is a valuable catalyst, encouraging academic researchers to more clearly explain the impact of their research. However, it did not set out to capture the full impact of research and higher education. Let us take two examples of impact beyond REF.

About two-thirds of the UK's research investment comes from businesses, and about half of that comes from firms with headquarters overseas, much more

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than other major economies. The UK's outstanding academic research is a magnet to overseas firms who come here to collaborate with, and recruit from, our universities. The government sometimes bemoans the low level of business R&D in this country – imagine what the level would be like without the inward investment from global corporations, attracted to the UK by our strong academic base?

University teaching brings students into contact with the frontiers of knowledge, and the researchers who are stretching those frontiers. An interwoven fabric of teaching and research allows universities to make indispensable contributions to the development of the next generation of professionals. These highly skilled people are a vital part of our knowledge economy. University teaching is under scrutiny like never before, and may well be subject to appraisal under new arrangements going through Parliament. Changes that are introduced must not reduce the impact of university graduates on our businesses, public services and cultural institutions.

Relationships between universities and business – the subject of an influential review by the Royal Academy of Engineering's President Professor Dame Anne Dowling OM DBE FREng FRS – are good, but they need to keep improving.

The new industrial strategy promises even more emphasis on commercialising research. The National Centre for Universities and Business is developing software tools to match supply and demand for research collaborations and student placements. We need more innovations like that.

For decades, this country has failed to generate enough people with strong technical skills. The government now promises further investment in that area, but that is only part of the picture. It is easy to think of innovation as something that depends on PhD graduates in businesses and universities. In reality, many firms innovate successfully without doctoral research expertise, using talented people who have qualified through apprenticeships or first degrees to develop improvements in sales, marketing, finance, employment and other key features of a successful business. We need to integrate further education, apprenticeships and first degree skills into the innovation agenda but engage further education colleges more extensively and expand the coverage of innovation initiatives beyond technology into other areas of business management. Wales and Scotland are already making moves in that direction with the closer integration of further and higher education.

Postdoctoral research must also break down barriers between academic disciplines.

Many universities, including my own, have made a vigorous start by supporting research in unconventional, cross-disciplinary domains such as bioengineering, sustainable cities and food technology. But we have yet to realise the full potential of collaboration between, for example, engineering and the humanities. The creation of UK Research and Innovation offers much potential to take this further.

Political turbulence brings opportunities as well as threats. As the House of Lords Science and Technology Committee said in a recent report, "an uncertain era is a time for boldness, not timidity". The powerful impact of our research base gives this country something to be bold about.

BIOGRAPHY

Professor Graeme Reid is Chair of Science and Research Policy at UCL. He was specialist advisor to the House of Lords Science and Technology Committee for its work on science and the EU, before and after the 2016 referendum on UK membership of the EU. Professor Reid is also Chairman of the Campaign for Science and Engineering, a Trustee of the Association of Medical Research Charities and Strategic Advisor to the National Centre for Universities and Business.