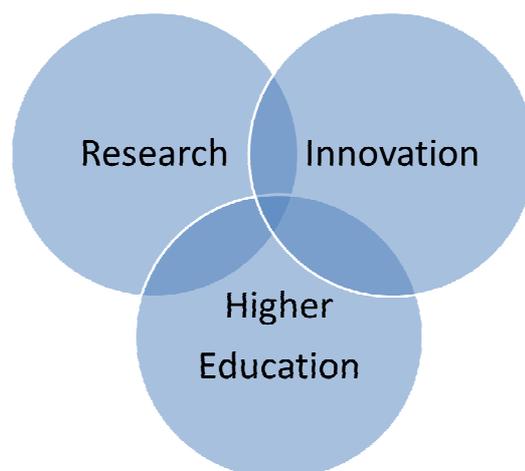


# How do we drive innovation and maximise the impact of research and expertise in UK Higher Education and help drive the economy?

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## Overview



- Estimated that only around 16% of UK businesses use information from higher education to help with innovation. (Lambert Review 2003)



## University/Business engagement

### *Findings of the Lambert Review 2003*

- Poor R & D investment in UK from business and Government compared to other G7 countries.
- UK businesses perform less than half R & D per worker of the US, Japan and Germany.
- Importance of human interaction in building linkages, particularly in knowledge transfer.
- Significant cultural change in HEIs with respect to interaction with business and supporting national and local economies

But

- Much more remains to be done



## Barriers - Business

- 50% of companies reported deficiencies in customer service as the biggest problem in dealing with universities
- Difficulty in finding who does what. Navigation of complex institution to the academic they need. Building relationships with individual academics.
- Too aggressive in valuation of, and negotiations over intellectual property. However, Universities reported that business had become accustomed to receiving IP for free in the past.
- Academics were encouraged to publish academic research for RAE more than undertake joint research with industry. Multi-disciplinary research to meet business needs is not aligned to funding streams.



## Barriers - Universities

- Industry unwilling to pay full costs of research projects
- Significant costs and difficulties in out-reach activities
- Lengthy and complex negotiation over IP ownership & issues
- Partnerships affected by changing business strategies and dependent on consistent management [& staffing]



## Cultural Differences

- key driver for universities = knowledge; key driver for industry = profit
- “language” differences
- Timescales- university long-term; business – shorter term
- Building mutual respect and trust
- Discipline versus solutions
- university bias towards pure science/openness
- industry bias towards practical results/control of ideas
- long-term nature of knowledge-based research vs shorter term focus of industry
- mutual lack of understanding on expectations and ways of working



## Internal University 'Issues'



- 'Blue sky research' VS • Focussed problem solving
- Discipline silos VS • Interdisciplinary teams
- Lack of understanding of business needs?
- IP (over)protection?
- Pipeline of staff of the right mind-set?
- Development of entrepreneurial students?

## University driven change...

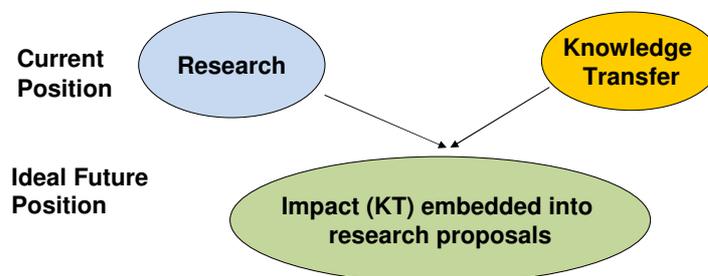
- HEIF (2001) has been successful: £1 invested yields £6 gross additional income
- Improved partnerships with business investing in universities
- Steady improvement of relationships with large companies.
- Less success with SMEs and small business

## Higher Education Policy Landscape

- Advent of the Technology Strategy Board
- 'Impact' agenda
- Catapult Centres
- HEFCE UKRPIF and Catalyst Initiatives
- Open access and open data

### ***Excellence with Impact agenda is a way of embedding KT into research programmes***

- Universities need to embed Impact & Knowledge/Technology Transfer into research programmes at the outset, not at the end (or not at all)
- People movement, networks, training, and other aspects of KT are vital.
- Academic culture change essential



## Possible University improvements...

Witty review highlights a number of ways to improve

- Better cooperation with LEPs and similar bodies
- Better sources of information within and between universities for business
  - especially SMEs who find it difficult to interact with universities



## Possible University improvements...

- Industry to get involved with the totality of the University's agenda (and vice versa!).
  - co-design and joint delivery programmes,
  - taking students on work placements,
  - getting involved in inspirational talks and professional development at universities.

Thereby

- influencing the 'product' (=graduates)
- forming links and connections that can bear fruit in closer collaboration.



## Industry engagement

**EPSRC**

Engineering and Physical Sciences  
Research Council



 **Constellium**



**Brunel**  
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## National Structural Integrity Research Centre

- Partnership between TWI and Brunel – focus on oil, gas, power, engineering sector
- Postgraduate and Research Centre alongside TWI, Cambridge
- Investment 
  - £15M Government grant to Brunel
  - £22M Regional Growth Fund grant to TWI
  - £45M from industrial partners for research over 10 years
    - 40 MSc students per year
    - 60 PhD students per year
    - 25 secondments to industrial partners per year

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## Advanced Metal Casting Centre Professor Fan

- £3.7M from the EPSRC to set up an Advanced Metal Casting Centre, a unique national scale-up facility for light metal casting.
  - The centre will benefit from £3M in cash and £2.25M in-kind contributions from industrial partners Jaguar LandRover and Constellium.



## Brunel Experimental Techniques Centre (ETC)

- Established in 1982 to provide materials characterisation services for University researchers and groups and for local industry.
- strategic collaborative relationships with over 300 SMEs established in the engineering and technology sectors.
- ETC has provided these firms with varied support (short courses and training, consultancy, materials characterisation services) to collaborative and contract research and research student training.
- ETC also support the development of collaborations between the SMEs and other researchers at Brunel, acting as a facilitator for the development of mutually beneficial research and development programmes driven by industry. Thus
- ETC plays a key role in the strategic drive to ensure that Brunel research is of high quality and meets the needs of industry, as well as leveraging in public funds to support the research programmes.
- University investment in facilities has enabled the success



What more can we do?

## Industry Ready Students

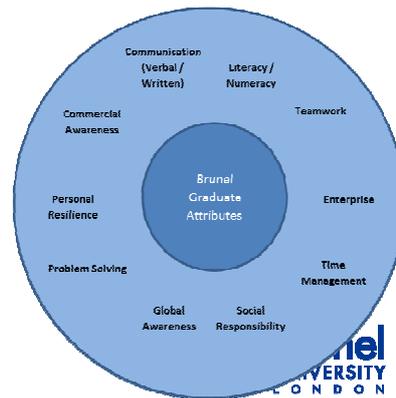
- Drive to produce “industry ready students”
- Long-term view of universities – jobs for 10 years time not just for directly post-graduation
- What will the industry of the future be?



- Equip graduates with transferable skills

## School of Professional Development

- To enhance the employment prospects of students and early career researchers :
  - activities designed to develop 'soft transferable skills' sought by employers.
  - engaging with employers and Colleges to increase placement/internship and career opportunities for students
  - offering students the opportunity to develop their entrepreneurial talents
  - develop an innovation hub



## Maximising the impact of Research

- Organise into three Institutes
  - Energy Futures
  - Materials and Manufacturing
  - Environment, Health and Societies
- Work with two industrial strategic partners in each of these areas
- Work with SMEs through intermediaries
  - Whole supply chain, RTOs, corporate partners or RDAs/LEPs

