

# Engineering for Tomorrow

Developments in  
engineering education,  
research and knowledge  
transfer for the process  
sectors

David Brown

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# Education



- Education as a continuing process, not just to age 21
- Professional recognition and CPD
- Greater mobility across the sciences and engineering
  - Revised definition of ‘What is an engineer?’?

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# Competent, multiskilled engineers



- The engineer as specialist - a continued need for engineering graduates who are technical experts of world-class standing.
- The engineer as integrator - operating and managing across boundaries, technical or organisational, in a complex business environment.
- The engineer as change agent - a critical role in providing the creativity, innovation, and leadership to guide the industry to a successful future.

*N Spinks, N Silburn & D Birchall, study by Henley Management College for the Royal Academy of Engineering, 2006*

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## Education

- The #1 challenge: attracting young people into STEM
  - It can be done – success of **whynotchemeng**
  - Need to work together from primary school upwards
- And when we've sold the youngsters on engineering – ensure world class
  - .... learning outcomes
  - .... university experience
  - .... IPD and CPD opportunities
  - .... Rewards
- This, among other things, means teaching must no longer take 2<sup>nd</sup> place to research



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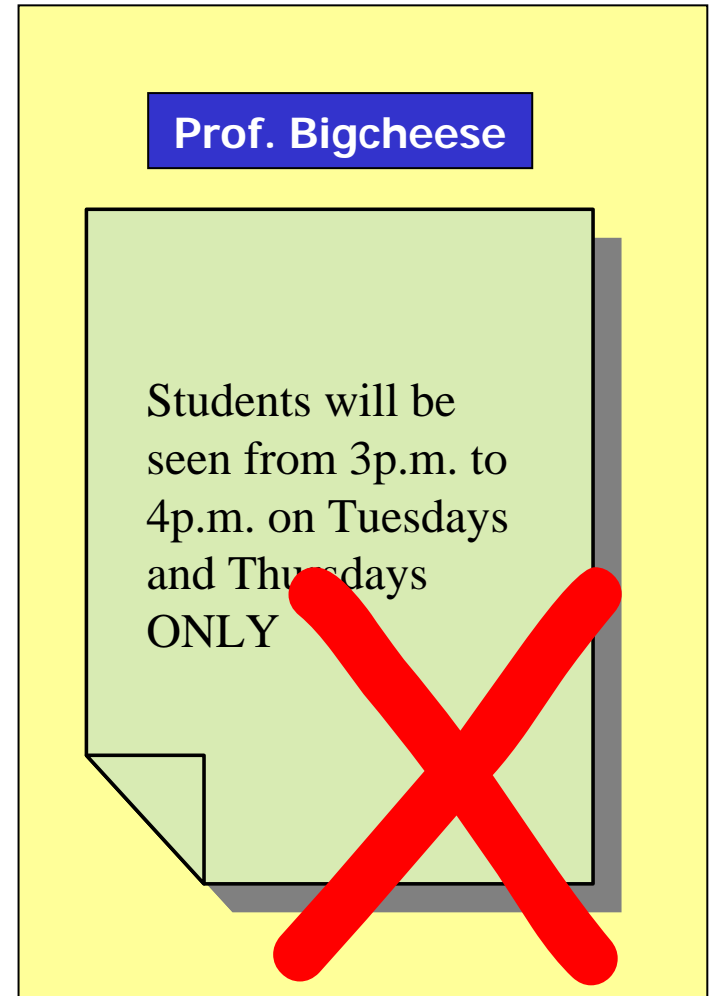
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# Education



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## Education continues....

- Continuing professional development and progress to Chartership
- Independently benchmarked competence levels across companies
- Assurance to regulators and the public
- Developing 'softer' skills
  - Communication
  - Management of innovation
  - Leadership

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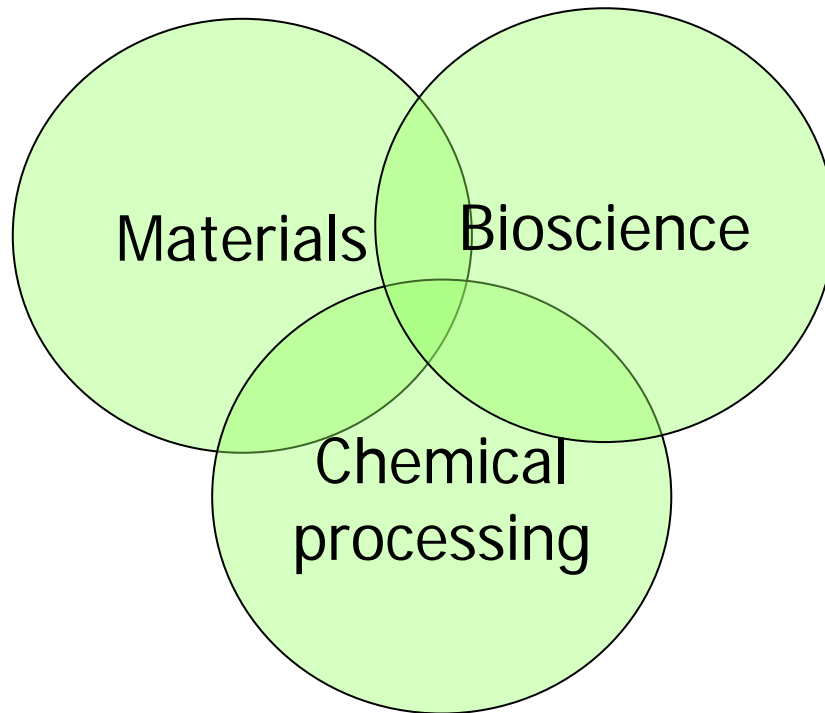
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# Research

- Process sector research wider than ever before



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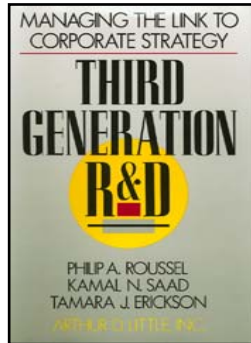
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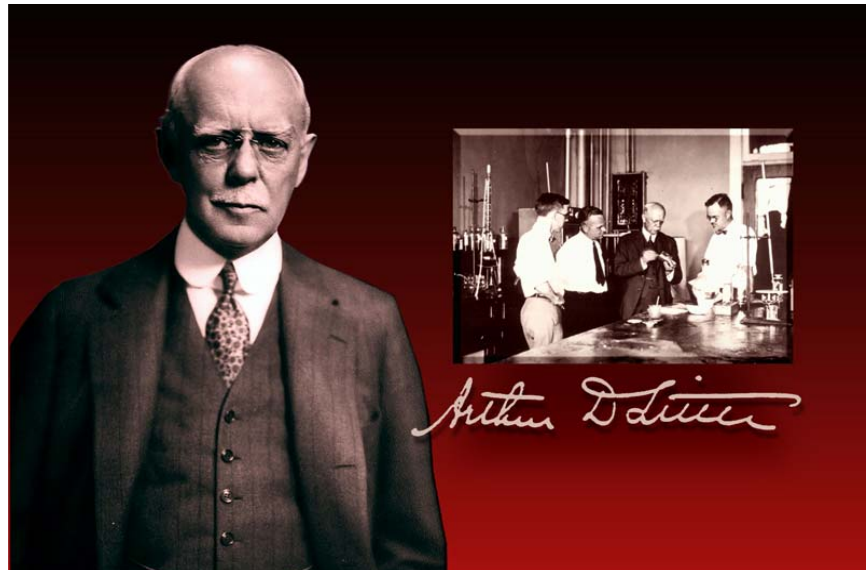
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# Knowledge transfer



- The process sectors pioneered business-relevant R&D management
  - Third generation R&D
- They also pioneered effective university – industry links
  - Lead companies – ICI, pharma sector



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# Knowledge transfer – what next



- Knowledge transfer at risk
  - Fragmentation of formerly-expert firms
  - Unbalanced incentive for universities
  - Poor infrastructure of knowledge providers outside the universities
- Contributors to a solution
  - National and EU programmes
  - Regional initiatives (clusters)
  - Professional organizations
  - Passionate people

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# The whole package



- Knowledge base – research, education, knowledge transfer infrastructure - as a magnet for inward investment
- Main value through training **people** – not research outputs alone
- Stress the **economic** case for investment

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## A united voice



- “You engineers are hopeless at lobbying”

Why?

- Fragmentation
- The science – engineering “divide”
- Inarticulate engineers?

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