



The Royal Academy
of Engineering

Higher Education and Industry

A Presentation for HE STEM Stakeholder Groups
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Science, Technology, Engineering and Mathematics (STEM) are strategically important national educational priorities.

Due to falling numbers of STEM graduates, these subjects are now considered vulnerable and a concerted programme of action needed to turn them around

There are concerns over the number of 1st year students dropping out

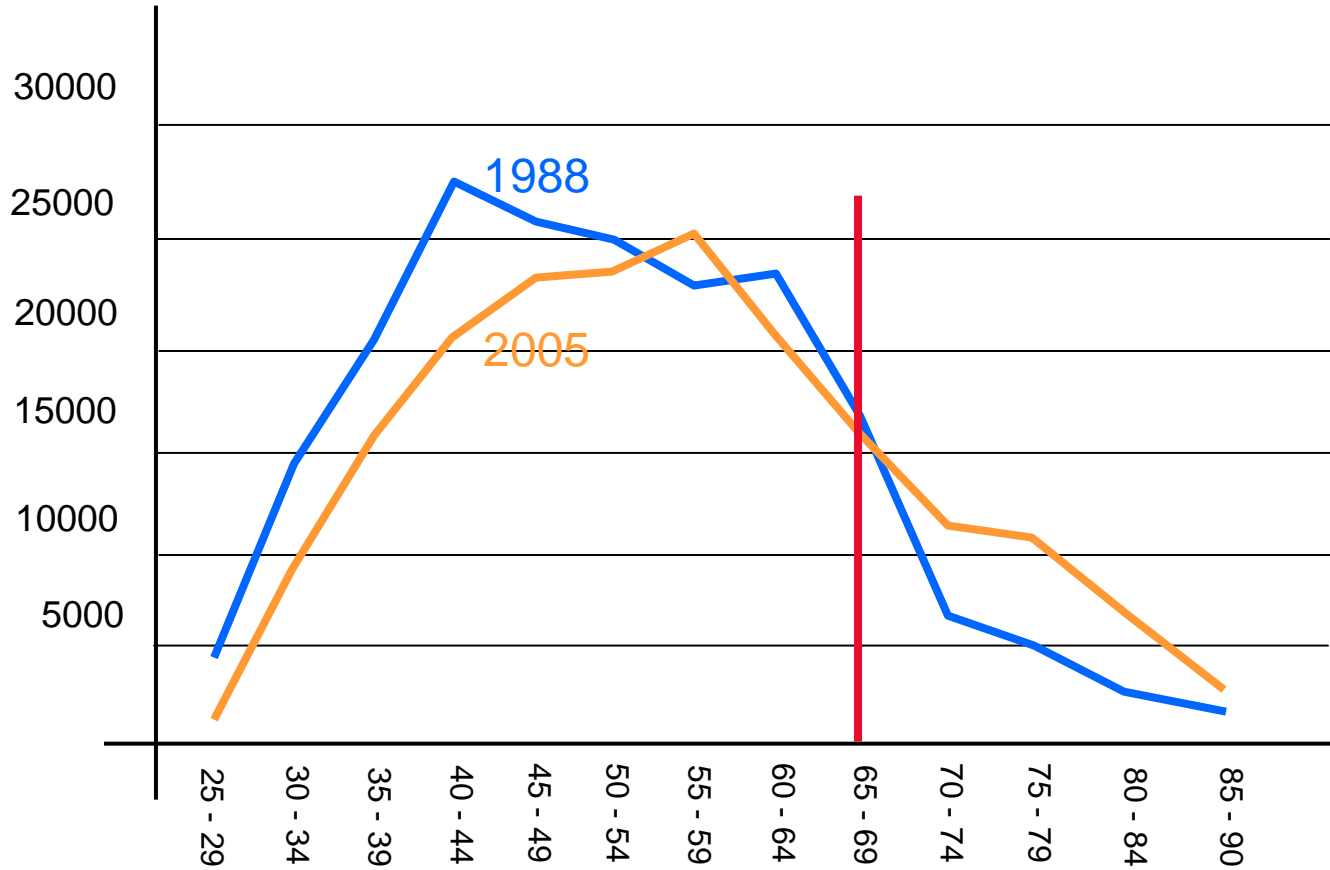
Many STEM students lack relevant industrial experiential learning in their degree programmes

The number of academic staff with experience in industry has declined, particularly in research-led universities.

There is a recognised need for graduate engineering programmes to have 'greater involvement' with industry

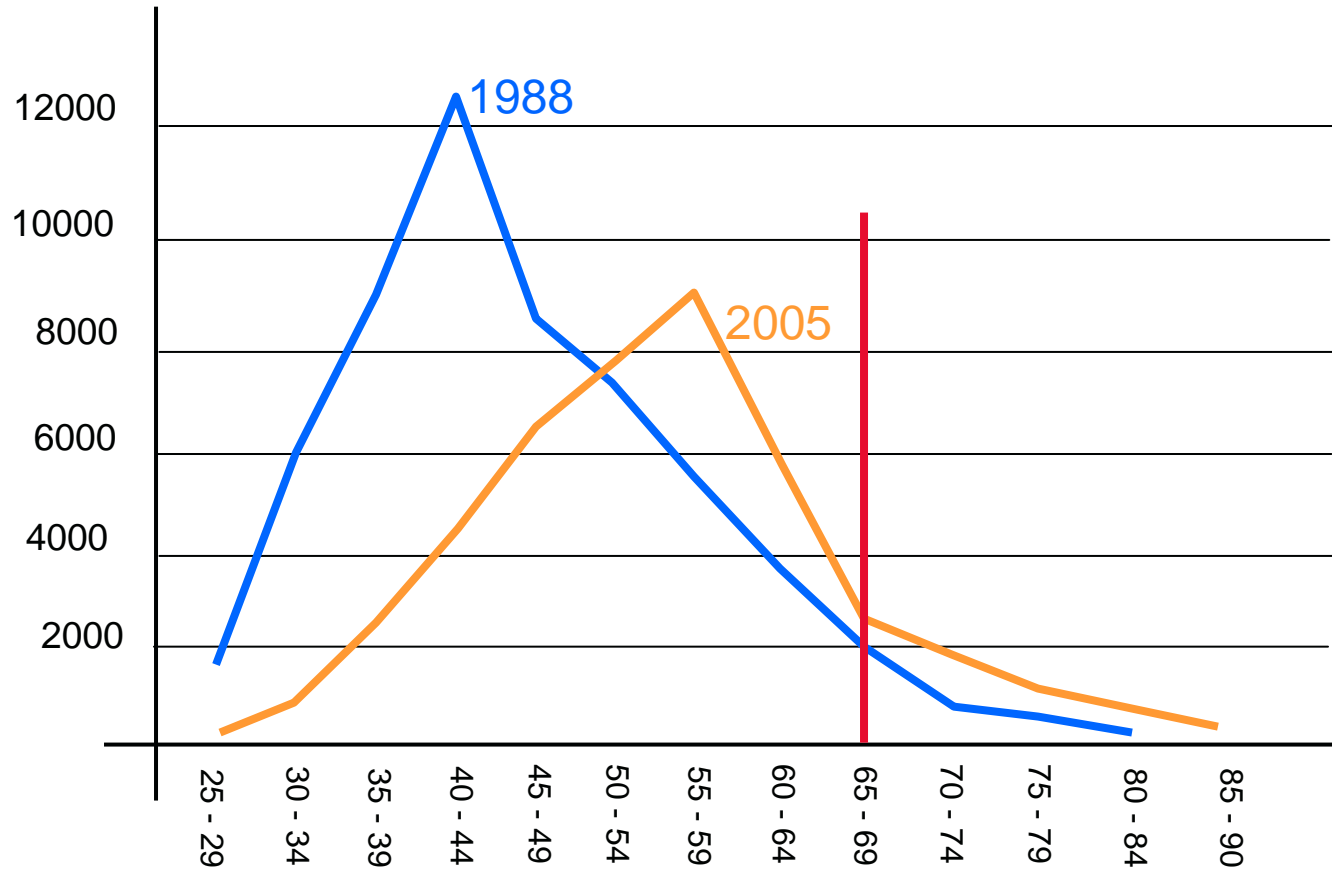


Chartered Engineers





Incorporated Engineers



Engineering Graduates for Industry

HEI engineering departments seek to produce graduates with a particular mix of skills, knowledge and experience for the graduate jobs market.

Students with industrial experience are more likely to seek and find employment in engineering and technology related jobs on graduation;

Students are more highly motivated and generally achieve a higher degree classification

Industrially relevant course content helps students to link theory to practice, enhancing student engagement and improving retention

Commitment is needed from both industry and the universities to champion enhancements to experience-led engineering degrees

The ability to change is heavily dependent on having senior management support



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Recommendation 1

‘Experience counts and relevance motivates. Experience-led components must be embedded into every engineering degree, using the effective practice outlined in these case studies as inspiration. Experience-led engineering degrees benefit students and industry alike, supporting economic recovery and future prosperity’.

Outcome: Enhancement of the student experience

Mechanism: Increase opportunities for academics and their students to gain experience of industry



Recommendation 2

‘Preferential ring-fenced investment in experience-led HE engineering is required to deliver the higher skills needed. Innovative mechanisms are needed to focus and prioritise the investment required, in the context of a difficult fiscal period and an existing shortfall in the funding of engineering degree programmes necessary for financial sustainability’.

Outcome: Greater efficiencies, less reliance on public funding, greater industrial involvement.

Mechanism: Increase financial and in-kind support to universities and students, inspired by the report exemplars



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Recommendation 3

‘Significant time and energy should be directed towards building, enhancing and sustaining university/industry partnerships. Effective partnerships are a key feature of the most successful exemplars’.*

Outcome: Increased industrial input into degree programmes and more work opportunities for students (including high quality industry placements)

Mechanism: Increase engagement with universities, using staff at all levels as appropriate and existing national schemes where available

* *Engineering Graduates for Industry*



The National HE STEM Programme

Funded by the Higher education Councils for England and Wales. £21M over a 3 year period (2009 – 2012)

Lead university (Hub) – Birmingham University

Regional lead universities (Spokes):

Bath, Birmingham, Bradford, Manchester Metropolitan, Southampton, Swansea

Professional Bodies:

Royal Academy of Engineering, Institute of Mathematics & Applications, Institute of Physics, Royal Society of Chemistry



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Funding the Programme

HEFCE and HEFCW through Birmingham University has distributed £12M to programme partners for delivery and holds £9M to fund HEI activities

The Royal Academy will provide £720K of funding for projects in the following work streams.

- HE Innovation – includes engagement with employers
- Engineering in Society
- Education research
- HE focussed STEM activities



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Overview of Programme Activity

Encouraging young people to opt in to STEM undergraduate programmes and careers (best practice from the London Engineering Project)

1. Supporting STEM Outreach activity in schools and colleges
2. STEM clubs, events, workshops, industrial visits
3. STEMNET Ambassadors
4. Industry role models to encourage widening participation and diversity
5. Building capacity and capability in universities to carry out these functions effectively

Overview of Programme Activity

Higher Education curriculum developments/enhancements focusing upon course delivery and design, student support, and knowledge and skills

1. Visiting professors/lecturers taking real industrial cases into the classroom
2. Employers working with HEIs on industrial contextualisation, curriculum enhancement
3. Providing experience of industry for students and lecturers – WE and projects
4. Developing industrial liaison fora for sustainable dialogue

Overview of Programme activity

Workforce development, encouraging those within the workforce without a university-level qualification to re-engage with further study

1. Developing flexible mechanisms for engagement to enable those in work to access education and training
2. Universities developing modules and courses for updating and up-skilling of existing workforce



The Royal Academy of Engineering is a key partner in the implementation of the HE STEM Programme and seeks to build successful and sustainable collaboration between HEIs and Industry.

The STEM community would welcome your involvement in helping Higher Education make a real difference to the future prosperity of your industries.

Contact

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