Is the science education system supplying the skills that the UK wants?

John Holman

Director, National Science Learning Centre

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How the world's best-performing school systems come out on top

McKinsey, September 2007

'Above all, the top performing systems demonstrate that the quality of an education system depends ultimately on the quality of its teachers'

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The National Science Learning Centre, York

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Project ENTHUSE

- A partnership project to enable science teachers from maintained schools across the UK to come to the National Science Learning Centre for professional development
- Partners: Wellcome Trust, Government and seven major science-based industries

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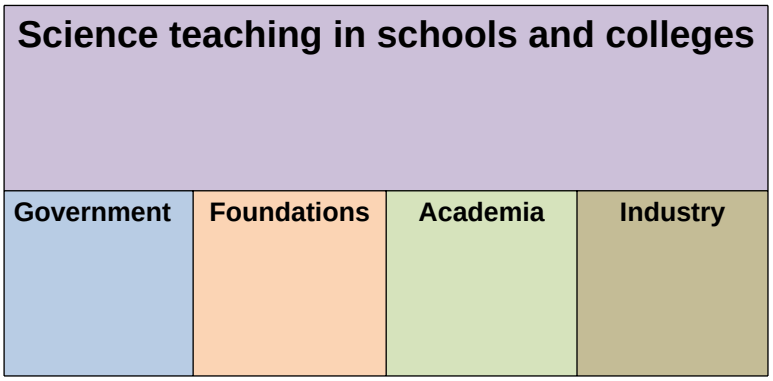
Science teaching has many supporters



Science skills are not just about secondary schools and universities

- Science needs to be considered alongside Technology, Engineering and Mathematics - STEM
- Primary science is very important
- Graduates alone are not enough

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Science

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Employers' preference for degree subjects

No specific preference	**42%**
Science, technology, engineering, maths	**40%**
Business	**13%**
Social sciences	**3%**
Humanities	**1%**

CBI Education and Skills Survey 2009

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S T E M

inside the classroom

National Science Learning Centre

sTEM

outside the classroom

National Science Learning Centre

S T E M

inside the classroom

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Science
Technology
Engineering
Mathematics

National Science Learning Centre

Technology Engineering Mathematics

National Science Learning Centre

Engineering Mathematics

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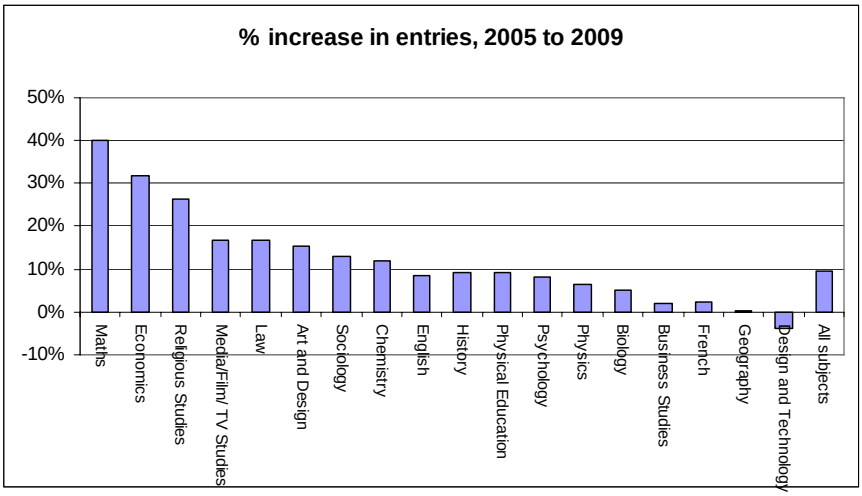
Mathematics

Science LEARNING CENTRES

Increases in A level maths entries are higher than for any other A level subject



DCSF, 2010

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Most important factors when considering recruiting graduates

Employability skills (eg team working, problem solving etc)	**78%**
Positive attitude	**72%**
Relevant work experience	**54%**
Degree subject	**41%**
Degree result	**28%**
University attended	**8%**
Foreign language capability	**2%**

CBI Education and Skills Survey 2009

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Get them young

A survey of 1141 scientists and engineers found that 63% of them first began thinking about working in STEM by the age of 14.

Taking a Leading Role, Royal Society, 2004

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Attitudes to science are formed in primary schools

- Children's early experiences are critical to shaping future attitudes to science careers
- Several recent studies suggest that children's attitudes to science are declining in later primary years (*e.g. Murphy and Begg, School Science Review 2003).*

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Influences on primary science

- Teachers' knowledge and confidence
- Science is a core subject in the primary curriculum, but ……
- …. no longer tested externally

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Supply and demand in the process industries by 2022

Employee Group	Forecast Demand		
Higher Level Workers (Manager and professionals)	55,000		
Core Workers (Technicians and operators)	72,000		

Cogent, 2008

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Supply and demand in the process industries by 2022

Employee Group	Forecast Demand	Forecast Supply	
Higher Level Workers (Manager and professionals)	55,000	68,000	Over supply +13,000
Core Workers (Technicians and operators)	72,000	31,600	Short fall -40,400

Cogent, 2008

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Skills for jobs: today and tomorrow

High priority skills for immediate action:
One of the most striking themes to emerge from the Audit is the growing importance of technicians, especially in specialist STEM areas.

UK Commission for Employment and skills, 2010

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Skills supply and demand in Europe to 2020

... a considerable shift in labour demand towards skilled workers, implying that future jobs will become more knowledge and skills intensive .

Technicians and associate professionals ….. have the highest potential for job creation in the next decade (around 4.5 million)

European Centre for the Development of Vocational Training, 2010

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Engineering Qualifications

- 350,000 learners began an engineering qualification in further education in September 2009 (compare with 26,000 in HE)
- The 350,000 learners are signed up for one of 605 engineering qualifications. A further 601 qualifications exist which currently have no learners!

Royal Academy of Engineering, 2010

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Don’t talk to aliens, warns Stephen Hawking

From The Sunday Times
April 25, 2010

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Will we ever know the truth?

We continue from era to era of growing understanding, always with uncertainty at the leading edge. Maybe we shall eventually reach a point where the scientific approach can take us no further, though that time is a long way off.

Sir John Sulston, Times Higher Education Supplement, 10 June 2005

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