WHY SUPPORTING AND PROMOTING ENGINEERS IS VITAL FOR THE WORLD'S FUTURE

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Engineers solve problems. As the UK grapples with its deficit, and the world tackles climate change, a population unable to feed itself and dwindling fossil fuel supplies, we need them more than ever.

In the UK we have a serious challenge. We need to recruit 13,000 mechanical, automotive and aerospace engineers every year just for our engineering industries to stand still. Add 20% to ensure a balanced, growing economy means we need at least 15,600 every year. Figures for 2009/2010 show that just 2,395 UK students completed courses in mechanical, automotive and aerospace engineering. The UK is falling behind: currently just 6% of UK students are studying engineering and technology subjects, compared with 20% in India and 40% in China and Singapore. Either we choose to become a second rate nation, or we act now to ensure our future place in the world.

WHY ARE WE IN THIS SITUATION?

Unlike the past when the likes of George Stephenson and Isambard Kingdom Brunel meant engineering was hailed as a profession for heroic pioneers, engineering in 2011 is rarely fêted, and not enough youngsters dream of pursuing a career in engineering.

This is despite the fact that there are currently thousands of engineers around the world doing work just as critical and just as exciting as the work of the early pioneers.

Engineers drive vital technological change. They are in the front-line in moving the UK from a society dependent on high carbon, low security energy to the vital mix of wind, wave, nuclear, solar and carbon capture energy sources we desperately need.

Engineers are working on programmes to improve the UK transport infrastructure, including projects on the UK High Speed Rail network, charging infrastructure for electric cars and the development of low carbon vehicles.

Engineers are also working on technologies which will revolutionise the way we live. Technologies like sub-orbital aeroplane flights, which could cut travel times by more than half, and ever more sophisticated surgical robots to complete medical procedures more accurately than a human surgeon can. Engineers are developing air-capture machines which capture gases which cause global warming from the atmosphere for storage in used oil and gas fields, as well as designing the cities of the future – where buildings will be built to cope with the inevitable and severe consequences of the change in weather behaviour caused by climate change.

We want engineering to be celebrated, not just by engineers but by society as a whole, for the exciting and vital role it plays in all our lives and those of future generations.

The need to stimulate enthusiasm about engineering in young people is urgent. We need to ensure we motivate schoolchildren and students to pursue careers in engineering, so that they can become problem solvers for tomorrow. If we don't solve the impending skills shortage we will have no chance of creating a low carbon economy or finding solutions to man's greatest challenges.

The Big Bang Fair, the UK's biggest single celebration of science and engineering for young people, is a project which is helping to inspire the next generation of engineers and scientists. Led by EngineeringUK and involving over 150 organisations, including the Institution of Mechanical Engineers, and from across the private, public and voluntary sectors, it reaches out to schools and over 30,000 students across the country. The Big Bang is an example of the UK's science and engineering communities working together.

Activities such as these are important in stimulating children's interest in engineering and in showing the key relationship between science, engineering and design.

But we have a problem. The school curriculum hardly even recognises engineering.

Schoolchildren wanting to pursue careers in design and engineering often have to make a choice of either pursuing art and humanities subjects or science and maths. Schoolchildren should be given the opportunity of linking interests in subjects like art, design, physics and mathematics – which together are the ideal building blocks for careers in design engineering.

The proportion of females entering engineering in the UK is also the lowest in the western world.

Despite the considerable work done by the engineering community, more needs to be done by Government to encourage schoolchildren and students to pursue engineering careers.

First, the Government needs to ensure that the planned all-age careers service provides informed, industry-led careers advice in schools. This would benefit not just pupils, and engineering, but also other professions currently facing a skills shortage like nursing, science, medicine and dentistry.

According to a YouGov poll earlier this year just 13% of students thought that their careers advice was of any use and there is the real danger that the problem will get worse. The Education Bill now going through Parliament places a duty on schools to provide access to impartial and independent careers advice, yet it has removed careers education from the curriculum. Thousands of pupils could start school next year with little or no access to professional careers advice.

The Government's announcement of support for 250,000 apprenticeships is an important step but will be meaningless if there are not enough young school-leavers qualified and willing to take them on.

For those wishing to pursue a degree in engineering, there is also the huge stumbling block of tuition fees. We already know that in response to cuts in university tuition funds, many universities plan to charge the full £9,000 tuition fee for their courses. At the moment universities appear likely to levy those fees uniformly across all subjects – including subjects deemed strategically important and vulnerable, such as engineering.

Interestingly, in a recent survey by the Institution carried out by ICM, 80% of the 1,000 members of the public surveyed showed strong support for Government subsidies for costly university courses like engineering. The Government needs to consider whether it is necessary to provide subsidies for courses in subjects vital to society and the economy like engineering and medicine.

It is clear that the UK and the world need engineers – it's so obvious as to be almost a cliché. It is the responsibility of Government in partnership with employers to help ensure we have enough people wanting to pursue engineering careers. It is only with this support that we will find the George Stephensons and Isambard Brunels vital to our future.

KEY ACTIVITIES BY THE INSTITUTION OF MECHANICAL ENGINEERS

Formula Student

Run by the Institution of Mechanical Engineers, Formula Student challenges universities from across the world to design, build and race a single-seater racing car in one year. The teams are tested on their design, costing and business presentation skills before their cars compete in terms of acceleration, braking, speed and endurance. Formula Student builds in an exciting practical and business element to University courses and courses that have involvement in Formula Student are always oversubscribed. Formula Student 2011 will feature a record 125 teams from 34 different countries.

Bloodhound Super Sonic Car

The Institution is one of the sponsors of the Bloodhound Super Sonic Car (SSC), which aims to inspire the next generation of scientists and engineers, by building a jet and rocket powered car capable of travelling at over 1,000 miles per hour and breaking the world land speed record.

The Bloodhound SSC project is unique as it has a philosophy of open access to all aspects of the research, design build and test of the car. So far more than 4,300 schools, colleges and universities have signed up to Bloodhound, gaining access to a range of learning materials, as well as regular updates on the project. Many of these schools and colleges want enthusiastic engineers, many of which are members of the Institution, to go into the classroom and use Bloodhound to reach out to and inspire these young scientists and engineers.

Primary Engineer

The Institution also partners Primary Engineer, which helps primary teachers with design and technology by demonstrating the practical application of science, mathematics, literacy and information and communication technology.

Manufacturing Excellence

Developed in conjunction with the Warwick Manufacturing Group, Manufacturing Excellence is the most successful and long established manufacturing awards programme in the UK, and the only one that provides such a detailed benchmarking and assessment process to help improve your business.

Manufacturing Excellence works with all manufacturing businesses, whatever their size, age, sector or area of expertise to help improve their processes and showcase their excellence. It is also completely free to enter.