HAS GOVERNMENT FORGOTTEN THE "E" AND "T" OF STEM EDUCATION?

Dr Tony Whitehead
Director of Policy at the Institution of Engineering and Technology

When the new Government was formed a year ago, they put "re-balancing the economy" at the heart of their agenda. They recognised that an important element of achieving this would mean increasing the numbers of young people becoming engineers and technicians. Inevitably there is always more than one agenda in politics, and reassuring rhetoric about the importance of engineering and technology needs to be complemented by effective action. So, one year in, how is engineering education faring under the Coalition?

For schools, the change of Government has seen a renewed focus on traditional subjects, not least Maths and Science. As Maths and Science are "gateway" subjects that provide the underpinning knowledge for many students who go on to study engineering (and indeed other subjects) at a later stage, the focus on these subjects is very welcome. However, this focus should not come at the expense of other subjects that underpin development and appreciation of engineering skills, such as Design & Technology (D&T). The introduction of D&T in the mid 1980's enabled young people to have first-hand experience of practical work that translates science and innovation into the products that people use in their daily lives. Universities clearly recognise the value of D&T, an A-Level which is listed as essential or useful for entry to most engineering degrees.

For the Coalition to now sideline D&T by excluding it from the English Baccalaureate and through future changes to the National Curriculum would be a huge mistake. Moreover, it would put the UK out of step with international trends. The UK's introduction of D&T as a separate subject has been copied in leading economies across the world, including parts of the USA, Australia, New Zealand, Finland, Sweden, the Netherlands, Taiwan, Germany and South Africa.

Across all levels of education, we need to do more to sell engineering careers to girls and women

Whilst practical technology subjects risk being sidelined in many schools, the Government has recognised their importance through support for University Technical Colleges (UTCs). UTCs are a new type of school in which students between 14 and 19 years of age will receive teaching in specialist subjects like engineering. Crucially, each UTC is linked to a university, as a means of ensuring the provision of a high quality, academically challenging education, which will ensure that students are well equipped when the time comes for them to make the transition from school to university. Given the unfortunate British tendency to underestimate the value of practical education, unlike many other leading economies, maintaining this reputation for high quality will be vital to UTCs' success – and, encouragingly, the early signs are very good indeed.

The Coalition deserves credit for not decimating the Further Education budget and instead facing the bad press resulting from cuts to university funding. Nonetheless, colleges have to deal with significant reductions, and these will impair their ability to train the next generation of technicians – who are so critical to science and engineering enterprises. As the severest engineering skills shortages are at technician level, this poses a significant challenge and continuing threat to our economic recovery. Against the backdrop of overall reductions in Further Education funding, the Budget included £180 million of extra money for 50,000 new apprenticeships. Whilst this is welcome, reading the small print in the Budget makes clear that the main purpose of this funding is addressing the NEET problem – those who are not in education, employment or training – and the majority of these new apprenticeships will not be at the level required for roles as engineering technicians.

The Wolf Review included many welcome proposals for reform, but the remit of the review was limited to 14-19 year olds. With the rise in university tuition fees, young people may be open to alternatives to university, including engineering apprenticeships. However, for alternative routes to be attractive they need truly to be a route to future employment and not seen as second best or even a dead end. Most large companies make career progression following an apprenticeship possible, for example by offering sponsored HNDs, HNCs or Foundation Degrees for those that wish to pursue further qualifications. However, the same is not always the case in SMEs, who find it more difficult to support the overhead costs of training. The current and continuing financial pressure on employers increases the onus on the Government to support and streamline training between technician and graduate levels – a point which the Coalition has not yet taken on board.

Since the election, much of the fiercest debate about education has focused on universities. Engineering departments, many of which take on high numbers of foreign students, will be badly hit by changes to the immigration system. At this stage, it is less clear how engineering departments will be affected by rising tuition fees. From the point of view of students, who will increasingly want to get value and better employment prospects from the investment degree, engineering may seem a more attractive option than it has been in the past – reflecting, for example, recent research which shows the significantly higher lifetime

Whilst practical technology subjects risk being sidelined in many schools, the Government has recognised their importance through support for University Technical Colleges

earnings of engineering graduates compared to graduates with other qualifications. Four of the top ten graduate salaries are in engineering subjects. From the point of view of universities, it seems likely that, for the next year at least, Vice Chancellors will favour subjects which still bring in a teaching grant, which includes engineering. In the longer term, though, and especially if the teaching grant sees further cuts, it may be that expensive subjects like engineering become burdensome. In this case, universities will either cut engineering or they will try to recoup the money by charging higher fees for engineering than for subjects which are cheaper to deliver.

The IET's most recent survey of engineering and technology companies found that 5% of professional engineers and 4% of engineering technicians currently working in industry are female. These are disturbingly low figures. Across all levels of education, we need to do more to sell engineering careers to girls and women. The IET's Young Women Engineer Award forms a key part of the profession's own effort to address this problem. However, while there are clearly roles here for educators and employers, there is also a vitally important role for government. The Coalition has dramatically reduced state funding for science and engineering diversity activities, which suggests that they do not see this area as a priority.

Overall, engineering has held its ground in education since the Coalition came to power, but it has yet to achieve its full potential in contributing to the progress needed to "re-balance the economy". The IET, alongside partner organisations in the Education for Engineering initiative, will continue to press the case. "STEM" means different things to different people, but Ministers should not hear STEM and just think about Science and Maths. The "T" and the "E" matter too.

The UK's introduction of D&T as a separate subject has been copied in leading economies across the world