

Get them while they are young

Are the recent A-level results an encouraging sign for the future of engineering in the UK? Or – as Victoria Montag*, Gambica's new sector head for industrial automation, believes – should we be inspiring children at a much younger age?

So – A-Level results time has been and gone again! And every year, along with the customary pictures of smiley 18-year-olds jumping for joy, the annual hand-wringing over the education system begins. Are A-levels becoming easier? Is a degree worth the tuition fees? And so on.

Those of us concerned about engineering are doing hand-wringing of our own.

It is estimated that there will be a shortfall of 30,000 engineers in the UK by 2020. And that estimate was made before the EU referendum. Who knows what the impact of the Brexit negotiations might be?

So, the Joint Council of Qualifications 2016 results document seems like a good place to see if the various attempts to encourage the uptake of engineering in the UK are working.

At first glance, things are looking pretty rosy.

It is encouraging to see that mathematics is the most popular A-Level and AS-level subject, that chemistry and physics are also in the top ten A-level subjects (6th and 9th respectively). The subject with the largest increase in candidates was computing (a 16% increase – although this only amounted to 6,242 candidates, of whom a paltry 609 were female).

However, as great as it is to see the STEM subjects increasing in popularity over the past decade, this does not appear to be translating into engineering degrees – at least not in the numbers this country needs.

Why might this be? Well, the obvious answer is that engineering isn't the only subject to require physics and maths A-levels. Secondly, while students choose to study subjects for a variety of reasons, I believe that some are inclined to take STEM subjects along with arts or humanities as they are "good" to have on a UCAS application form.

So encouraging students to take physics and maths at A-level doesn't appear to produce more engineers.

Of course, A-levels and degrees don't tell the full story. There has been a huge focus on training engineers via apprenticeship schemes. About 265,000 apprenticeships were completed in England between 2005-2014. But it's still not enough.

I would argue that if we want more engineers, we need to be promoting technology and engineering to students ten years before they make their choices about apprenticeships or A-levels.

Think back to what it was that made you want to be an engineer? The chances are it was something that happened to you as a child – and not necessarily at school.

“How can we create more engineers when our education system doesn't introduce children to the very things that will inspire them to become one?”

I was lucky that my father, who had studied physics at university, is the sort of man who would regard it as a point of shame if he had to pay to have anything fixed (once with fatal consequences for the family TV), so I spent a lot of my childhood with my head under the car bonnet learning how to change a head gasket, or in the kitchen doing chemistry experiments.

My love of science and engineering started when I was a child. It is no coincidence that years later I studied physics at university.

But what about children who don't have parents who think that the twin paradox makes for a good bedtime story?

If it hadn't been for my father, the first time I would have wired something would have been at secondary school; the first time I would have built anything to perform a function, would have been at university. The first time I was asked to write a line of code was during my final year at university, by which time they may as well have asked me to write in Swahili. It was too late.

How can we create more engineers when our education system doesn't introduce children to the very things that will inspire them to become one?

Schemes like Primary Engineer (www.primaryengineer.com) are trying to address this. They realise that while we can rant and rave about primary schools needing to teach children about technology, the fact remains that without teachers who are confident around technology themselves, or have the resources to create lessons that are engaging, relevant and easily understood by small children, teaching STEM "by force" is likely to do more harm than good.

Primary Engineer offers primary schools "a way to deliver practical mathematics and science to design technology activities". It has created programmes which offer teacher

training, resources and engaging engineering projects that are tailored to individual year groups.

They call it "STEM by stealth", which is how I became a geek. Six-year-old Victoria didn't have lessons about mechanics or electronics, she was just hanging out with her dad.

Schemes like Primary Engineer and others – Big Bang and Tomorrow's Engineers to name a couple – only work if industry engages with them. Engineers

of today are the best people to inspire the engineers of tomorrow. So, if you are concerned about the forecasted skills shortage, you can either sit back and look at the statistics every year and wring your hands, or you can – and I really encourage you to do this – do something now. ■

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