



RAEng Responses

Potential Questions regarding Engineering Education:

1. Is it changing?

- If so, what motivated the change? What are the barriers/impediments to change? If so, who is driving the change? Faculty? University Leadership? Professional Organizations? Government? Other key stakeholders (e.g. Industry)?

UK

It is widely understood both in government and engineering communities that there is an engineering skills crisis in the UK. One of the largest barriers that has been identified by the Academy, engineering institutions and the government is that of perception. Young people, women in particular, do not see the engineering profession as having a place for them. There is a strong desire at government and Academy level to change this and both are engaging in large scale campaigns, among other activities to address the problem at varying levels of the education system.

Africa

The Academy also recognizes that this is not solely a UK problem. In 2012 the Royal Academy of Engineering published a report entitled 'Engineers for Africa' aimed at identifying the engineering capacity needs for the continent (<https://www.raeng.org.uk/publications/reports/engineers-for-africa>). Subsequently the report found that sufficient engineering capacity is essential to the social and economic development. Although the national contexts differ hugely throughout Sub-Saharan Africa, the report identified that a common trend throughout the region was that 1) there was a shortage of engineers and 2) those engineers that were graduating were doing so without the necessary skills to be employable. This indicated a disconnect between academia and industry which was leading to insufficient indigenous engineering capacity.

2. Is quality improving?

- **What are the relevant measures of quality?**

As many strategies employed to enhance engineering education and engineering awareness are medium-long term, measuring and tracking success presents difficulties. For example, the success of the *This is Engineering* Campaign will not be measurable until the medium to long term as there is a lag effect of the time it takes young people to progress through the education system before potentially pursuing an engineering career or higher education in engineering. However, it is possible to monitor more short-term metrics such as social media impact; these can act as a proxy by indicating if campaigns are reaching the intended audiences. Such monitoring is essential as it allows opportunity for iterations which can help achieve the longer-term objectives. For example, by mid-April 2018, the 5 short films produced under the *This is Engineering* campaign has been viewed 10 million times.

3. Are new techniques being used?

- **If so, what are the most widely used? Have measures of effectiveness been implemented?**

The Academy is directly involved in implementing change in the field of engineering education, both in the UK and Sub-Saharan Africa. This is through partnership with government and partnerships with engineering institutions. Such partnerships add value in helping the engineering community to speak



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with a united voice. The Academy has integrated engineering education into its overall strategy; one of its four primary objectives is: Address the Engineering Skills Crisis.

The aim is to meet the UK's needs by inspiring a generation of young people from all backgrounds and equipping them with the high-quality skills they need for a rewarding career in engineering. To achieve this, we are working to help teachers to embed engineering in schools and colleges through programmes that support teaching and learning and bring real-world engineering into all stages of the formation of engineers

Social media has been recognised as an essential tool in reaching young people. Ensuring that digital media on websites etc. is up to date, interactive and engaging is critical as this is the most popular medium for your people to use in order to engage with our content.

4. **How are topics like project-based education, multi-disciplinary education, and innovation being integrated?**
5. **Is your academy directly involved in stimulating change?**
 - If so, how? What can you share with other CAETS members?
 - How could CAETS help facilitate the sharing of relevant information?
6. **Is there a role for CAETS to help motivate/facilitate evolution of engineering education from an international perspective?**
 - **If so, what is that role and what are the necessary next steps?**

The most challenging aspect of engineering education from an international standpoint is the appreciation of differing national contexts. Perhaps then, the most apt role for CAETS is to amplify and support Academies in their efforts to enhance engineering education globally; providing a network for sharing of best practice, supporting Academy-Academy partnerships where appropriate. Given the challenges of resourcing, CAETS is likely only in a position to advocate and support higher level principles such as increasing engineering education capacity, increasing access to engineering education and increasing the diversity within engineering education.

Royal Academy of Engineering Background Information

Royal Academy of Engineering Activity*

This Is Engineering

- *This is Engineering is a new multi-year campaign led by the Royal Academy of Engineering in partnership with eleven major engineering organisations to change the perception of engineering among young people aged 13-18.*
- *This is Engineering challenges those misconceptions, by presenting a positive image of modern engineering. Through real young engineers it illustrates how engineering is behind many of the things they are already interested in – sport, fashion and tech for example – and that they can follow what they love into engineering, and in doing so help shape the future.*
- *The first year of the campaign will challenge young people (13-18) to reconsider what engineering really looks like with bold advertising on social media platforms. Supporting PR will encourage parents and teachers to talk about engineering in*



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positive ways with young people, and also communicate the skills and diversity challenge to policy makers and business leaders.

- *This is Engineering* is a key partner in HM Government's Year of Engineering, which was launched on 15 January 2018. Together the two campaigns will help inspire the next generation of engineers, raising public awareness about engineering's variety, appeal and impact.
- At the heart of *This is Engineering* are five 40-second videos, each of which profiles a young engineer who is doing something remarkable. Watch Pavlina, Chris, Vinita, Charles and Daniella and be inspired by the power and potential of engineering!
- <http://www.thisisengineering.org.uk/>

Higher Education Partnerships in sub-Saharan Africa (HEPSSA)

- HEPSSA improves the quality of teaching in higher education institutions in sub-Saharan Africa through collaborations with local industry and UK academia.
- The programme provides funding to 'hub' universities in the region to enable two-way work placements; of teachers into industry to provide them with hands-on local engineering experience, and of industry partners into academia, to enable them to mentor students, deliver workshops and advise on curriculum updates. The insights and learnings from these secondments are then shared more widely with 'spoke' universities in the region via a series of knowledge-sharing workshops.
- The hub university also partners with a UK university, which provides expertise specific to the university's need. The UK role could include: curriculum reviews, staff exchanges, training staff and joint research projects.
- There are currently nine active hub universities working with a total of 55 spoke universities across 16 countries.
- <https://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/higher-education-partnership-sub-saharan-africa>

UK Government Activity

UK Government 2018 Year of Engineering

- **What:** The Year of Engineering is a government campaign, which celebrates the world and wonder of engineering. It also forms an important part of our Industrial Strategy which is committed to boosting engineering across the UK, ensuring everyone has the skills needed to thrive in a modern economy.
- **Goal:** A career in engineering is exciting, rewarding and creative. Yet there is a big shortage of young people that think it could be a job for them. Over the course of 2018, we want to shake-up people's ideas about engineering, inspiring the next generation of innovators, inventors and problem solvers by showing them what engineers actually do.
- **How:** Throughout the year, with the help of engineers and hundreds of organisations, including museums, galleries, schools and brands, we'll be showcasing the world of engineering. Initiatives across the UK will capture the imagination of a generation, showing that if you want to shape the world, engineering's the way to do it.

*More information available on RAEng programmes in hard copy at the session