SCIENCE, TECHNOLOGY, ENGINEERING & MATHS (STEM)

March 2018

Coordinating STEM promotion and outreach

Science, Technology, Engineering & Maths (STEM) fields are currently transforming how we live and how we work. An understanding of these subjects is vital to addressing global challenges, such as climate change, and to informing public decision-making in our democracy. Yet there are concerns regarding the 'quantity and quality of the STEM pipeline' in Ireland.

Engineers Ireland is a leading advocate for STEM education, STEM career pathways and public engagement with engineering for many years through the STEPS programme (see overleaf). We favour the continuation of a coordinated national outreach effort, where all parties have clear visibility of all STEM outreach activity and partnerships are encouraged.

Inspiring at primary and post-primary levels

Many of the core engineering traits/behaviours – curiosity, exploration, creativity, problem-solving, collaboration – overlap with the principles of early childhood education (e.g. discovery and exploration). These links could be highlighted and made more prominent for teachers and parents. These behaviours could also be recognised and linked in to the primary school curriculum.

Learning environments which embrace the complexity of the world should be used to encourage critical thinking and problem solving from a young age. Real-world applications of STEM should be promoted in student learning and assessment, initial teacher education and teachers' professional development.

Contact with role models is an influential factor for young people, and visibility of female role models is especially important for young girls. The engineering industry is very willing to engage with young people (and their teachers) to help spark their imagination about STEM and to provide them with careers information.

We must inspire students at primary and post-primary levels to equip themselves with an adequate knowledge of STEM, to study engineering at third level and go on to work in the profession. Particular attention should be paid to encouraging young women to study STEM. The recommendations of the STEM Education Policy Statement should be implemented without delay.

Need for additional third level funding

Engineers Ireland accredits engineering programmes at levels 6, 7, 8 and 9 and our experience gained during on-site visits at over 20 HEIs is that the reduction in funding to that sector has had a detrimental impact. We note with great concern that core funding per student has decreased substantially in recent years and there has been a considerable lack of investment in facilities.

Laboratory equipment and facilities have become almost obsolete and not being able to expose students to experiments using world-class equipment hampers the ability of our higher education institutions to be globally competitive. Additional funding could be made available for bursaries and scholarships for STEM courses.

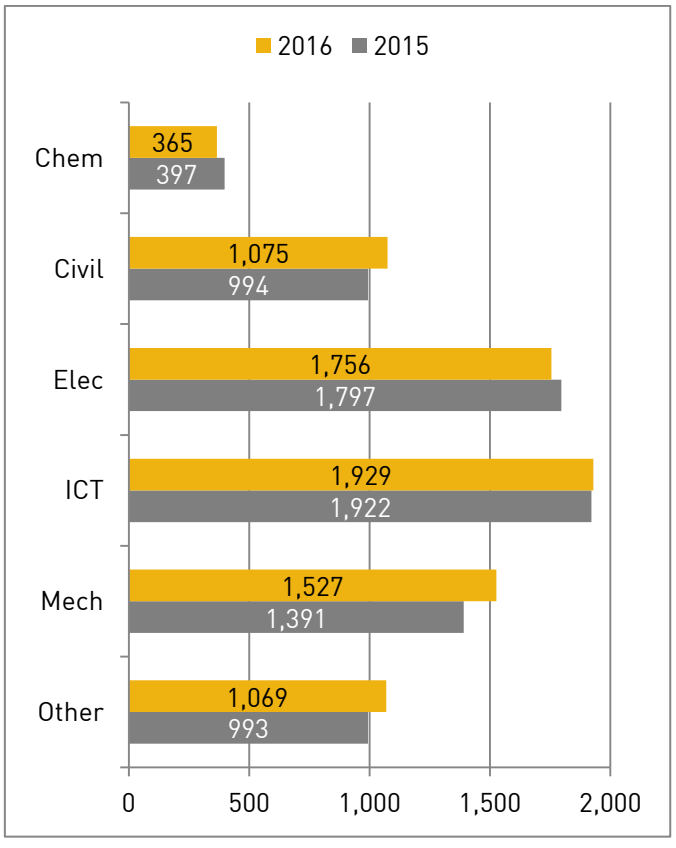

Figure 1. Engineering graduates by broad discipline

Engineers Ireland Policy
Click here for more policy briefs on Engineering Education.

Further reading

Engineers Ireland (2018) Engineering 2018: A barometer of the profession in Ireland
DES (2017) Action Plan for Education
DES (2017) STEM Education Policy Statement 2017-2026
DES (2017) STEM Education Policy Implementation Plan 2017-2019
HEA (2017) What do graduates do? The Class of 2015
DES (2016) STEM Education in the Irish School System
DES (2016) Action Plan to Expand Apprenticeship and Traineeship in Ireland 2016-2020
HEA (2016) Key Facts and Figures
Solas (2016) Monitoring Ireland's Skills Supply

Contact

Dr Richard Manton
Policy Officer
Engineers Ireland
22 Clyde Road,
Ballsbridge, Dublin 4.

+353 1 6651300
rmanton@engineersireland.ie

Engineers Ireland
With over 25,000 members, Engineers Ireland is the voice of the engineering profession in Ireland. Engineers Ireland was established in 1835 making us one of the oldest and largest professional bodies in the country.

Members come from every discipline of engineering, and range from engineering students to fellows of the profession. For more information, see www.engineersireland.ie.

Engineers Ireland's STEPS Programme

Engineers Ireland has been a leading advocate for STEM education for many years, coordinating the STEPS programme, a strategic funded partner of the SFI Discover programme. STEPS aims to inspire the next generation of engineers. We help companies to bring students out into industry situations, we train industry volunteers to run hands-on workshops in the classroom, and we provide teachers with suggestions for running their own make-and-do STEM activities.

Over the last 12 years, STEPS has engaged with 934,417 people through its outreach efforts. In the past year alone, volunteer engineers donated 14,692 hours to the programme (activity worth an estimated €242,000), delivering more than 73,000 direct engagements with students, teachers and parents. With support from STEPS, 786 events were held during Engineers Week 2017, reaching an audience of 63,254 people.

Overcoming the shortage of engineering graduates and apprentices
The economic recovery and demographic trends are placing extreme demands on Ireland's infrastructure and technology, including in housing and the digital economy. The acute shortage of skilled professionals is threatening the supply of new infrastructure and technology, potentially undermining future prosperity, sustainability, and health and wellbeing.

While the number of new entrants to engineering-related courses has risen in the past few years (see Fig.1), graduate numbers remain significantly down on peak levels. For example, the number of graduates from undergraduate Civil & Building Engineering courses has fallen from 1,984 in 2010 to 963 in 2016. Engineers Ireland would like to see a substantial increase in the number of STEM graduates, particularly engineers from a variety of disciplines, in the coming years.

Moreover, the number of apprentices is far too low to meet the needs of industry. Apprentice registrations fell from 6,763 in 2007 to 1,204 in 2010, though there was an increase to 4,147 in 2017 with new apprenticeships launched. The number and variety of apprenticeships must continue to increase as part of an integrated, recognised and sustainable framework.

We would also like to see those engineers who emigrated during the recession return to Ireland. Employment conditions have improved considerably in recent years and now over 93% of graduates get a job or further their education within 9 months of graduating (Fig.2). Starting salaries have also increased by 11% over the past four years.

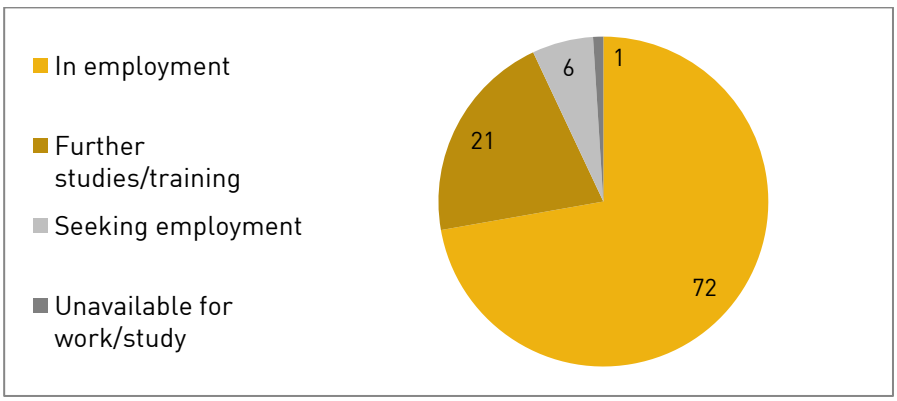

Figure 2. First destination of engineering-related graduates, class of 2015 [HEA]