

Growing the technical STEM talent pipeline



Cerian Ayres raises a number of talking points for teachers working in further education or in schools to encourage discussion on how best to work in partnership to grow the technical STEM talent pipeline

There has never been a more important time to be involved in technical STEM education and training. Science education in particular is a great enabler, ‘opening doors’ to a diverse range of opportunities including progression to further or higher technical study and employment.

Further education (FE) is currently in the spotlight and receiving long-deserved recognition for the central role it is playing in building a greener, brighter future, prioritising social mobility through the levelling-up agenda and working to address longstanding inequalities. Technical skills lie at the heart of job opportunities in the UK’s recovery plan.

The UK has some of the greatest regional variations in productivity of developed nations, which not only holds back the nation’s economy but leads to lower earning potentials in some areas. Education and skills outcomes also vary significantly between regions and are strongly related to regional productivity.

To deliver high-quality technical education and training requires teachers who have the technical expertise, knowledge, skills, behaviours and relevant industry experience to bring learning to life, inspiring their learners to progress and realise their ambitions. Teachers are the single biggest influence on a learner’s enjoyment, engagement and progress in a subject.

In January 2022 the Department for Education launched its Teach in FE campaign. The aim was to encourage more industry, armed services technical experts and graduates into FE teaching, often into ‘hard to fill’ roles. The further education and training sector cannot achieve this vision in isolation. Development of a technical STEM talent pipeline requires working in partnership across education sectors and in collaboration with industry and wider stakeholders.

Before considering how the FE sector can best work in partnership with schools and other stakeholders to develop this pipeline, it is important to understand

some of the barriers that learners may be facing when working to progress to higher levels of technical STEM study and employment in science industry sectors.

Recruitment, development and retention of science learners is a challenge on multiple fronts including:

- low science capital in UK homes;
- learner perception that science is ‘hard’ or ‘not for me’;
- challenges of recruiting and retaining science teachers (in a competitive market for scientists);
- issues of diversity and inclusion in science including a lack of positive role models for under-represented groups and individuals;
- leakage at every stage of the STEM talent pipeline (Figure 1).

There are plenty of myths and stereotypes that act as barriers to access and inclusion in STEM:

- All scientists are (white) men in (white) coats working alone.
- Science is difficult.
- You must be exceptional at science to pursue a career in it.

Evidence suggests that these perceptions are learnt through school and socialisation. In 2018, a UK charity, Education and Employers, released a report called *Drawing the Future*, of a survey in which primary school children from the UK and internationally were asked to draw themselves in their future job. Children drew a whole range of jobs, such as sportsperson, vet, scientist, movie star and teacher. STEM careers featured prominently, with ‘vet’ (second) and ‘doctor’ (sixth) dominant in children’s choices, scientist seventh and engineer eleventh. However, a gender gap begins to open at age 7 and the number of girls drawing themselves as scientists and engineers drops away steeply. These patterns do not change significantly between ages 7 and 17: perceptions, expectations and stereotypes embedded in primary

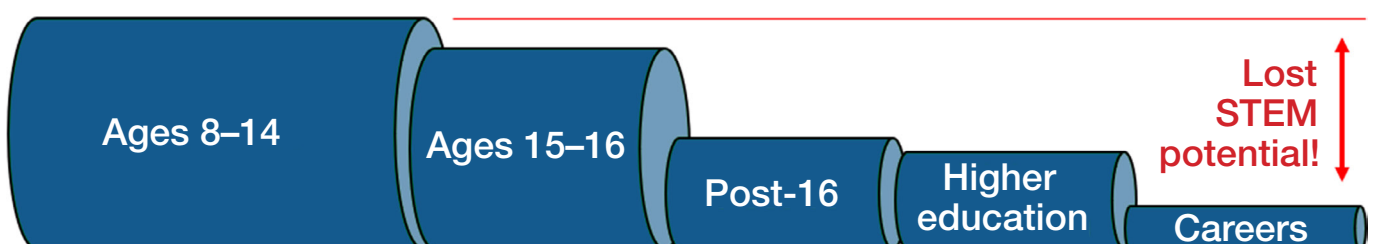


Figure 1 There is leakage at every stage of the STEM talent pipeline

school children persist right through to the entry point for post-16.

Development of the technical STEM pipeline therefore needs to start early by developing links between FE providers and local primary and secondary schools. The FE sector can provide meaningful encounters with employers, STEM Ambassadors and key stakeholder partners, bringing real-world contexts for learning that will motivate learners. This could provide the inspiration to ignite a 'spark' that could encourage some of them to progress to higher levels of technical study and employment.

When learners are considering progressing from GCSE into post-16 education, the FE and school sectors should ensure that they are sharing the breadth of STEM careers and celebrating the STEM content in a wide range of courses. Both sectors should aim to demonstrate to learners, and their parents and influencers, that STEM knowledge and skills will open up career opportunities in their subject area.

Talking points – FE

- What positive action are you taking as FE professionals, with your partners, to ensure that you are contributing to the growth of the technical STEM talent pipeline?
- What does your promotional activity and outreach do to avoid embedding unhelpful myths and stereotypes?
- How are you addressing and advancing inclusion and diversity in STEM?
- How do your outreach activities and teaching and learning materials expand learners' career horizons and encourage them to access higher levels of science technical learning and employment in the STEM industry sector?
- Do you consider the Gatsby Benchmarks for Good Career Guidance?
- Do you have a whole-organisation approach to embedding high-quality, impartial STEM careers education information advice and guidance?

Talking points – schools

- Have you developed effective partnerships with colleagues at your local FE college and with wider sector providers?
- How could you work with FE providers, employers and stakeholders to ensure that there is high-quality, impartial careers education information, advice and guidance available to all learners?
- What CPD would be useful to allow you to better understand the possible progression pathways to further and higher technical study and employment?



- Are you working with employers, stakeholders and FE providers to provide support for STEM outreach opportunities?
- How could you resume or start conversations with FE colleagues that would enable your learners to explore next step technical STEM learning?

Useful links and references

- Teach in FE* (Department for Education): www.teach-in-further-education.campaign.gov.uk
- Drawing the Future* (Education and Employers): www.educationandemployers.org/research/drawing-the-future
- Gatsby Benchmarks for Good Career Guidance: www.gatsby.org.uk/education/focus-areas/good-career-guidance
- Education and Training Foundation. *So what is the FE sector?*: www.et-foundation.co.uk/wp-content/uploads/2020/08/200729-ETF-FE-Sector-Guide-RGB-v10.pdf
- Resources from the Association for Science Education (ASE) for primary, secondary and for science technicians: www.ase.org.uk
- Good Practical Science* – a framework for good science in schools from Gatsby Foundation and Sir John Holman: www.gatsby.org.uk/education/programmes/support-for-practical-science-in-schools
- Gatsby Foundation. *Engaging parents in careers guidance: Innovations in practice*: <https://resources.careersandenterprise.co.uk/resources/engaging-parents-careers-guidance-innovations-practice>
- Medical Mavericks – offers free high-quality careers education resources and tools for teachers, learners of all ages and parents: www.medicalmavericks.co.uk
- Royal Academy of Engineering *This is Engineering* site – supports learners to relate their interests in everything, from films to fashion to medical engineering, to STEM careers: www.thisisengineering.org.uk
- WorldSkillsUK Educator Resources* – tools and resources designed to support educators to inspire and develop learners and apprentices: www.worldskillsuk.org/educator-resources
- Bring a STEM Ambassador into your college* (video): www.youtube.com/watch?v=43mfKt0VKOI
- Good Practical T Level Science* (video) – ASE member Alison Ackroyd explores ways she has found to naturally embed careers education information advice and guidance: www.youtube.com/watch?v=O35ziN2hoi8

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