



Call for Evidence “Fit for the Future”: Apprenticeships

Submission by

UK Electronics Skills Foundation, ERA Foundation and TechWorks

February 2023

Fit for the future: growing and sustaining engineering and technology apprenticeships for young people.

Opportunities. What part do apprenticeships play in helping to meet the UK’s skills needs in engineering and technology?

State of play. What are the reasons behind the overall decline in engineering apprenticeship starts in recent years? We are particularly interested in understanding more about supply and demand.

Barriers. What are the barriers for businesses taking on young people as apprentices and what are the barriers for young people in accessing them?

Solutions. What do you think needs to change to help increase the number and diversity of young people taking up and completing engineering and technology apprenticeships?

Introduction.

This submission to the Call for Evidence for the inquiry about apprenticeships led by Lord Knight and Lord Willetts, in partnership with Engineering UK, is made by the UK Electronics Skills Foundation, TechWorks and the ERA Foundation. We speak about skills on behalf the Electronics Systems, semiconductors and ElecTech sectors in the UK. TechWorks members include close to 300 employers and include SMEs, as well large, global, companies.

The Sector.

The semiconductor and Electronics sector is a critical, fundamental, enabler of the UK economy. In 2021, it contributed £12B turnover, 8% GVA and 12% of R&D spend in the UK¹. Globally, the semiconductor industry is the 4th largest in the world behind oil production, automotive and oil refining and distribution, and revenue from semiconductors accounted for 0.5% of global GDP in 2020. Over 1.1 trillion semiconductors were sold in 2021 and the sector is thought to generate between 500 and 600 billion US dollars annually in revenues². However, over many years, too few young people have studied Electrical & Electronic Engineering in the UK, either as apprentices or undergraduates. As a result, there are insufficient engineers and technicians to drive forward innovation and progress.

¹ ONS Blue Book 2021, quoted in Make UK Electronics Sector Bulletin: [UK Manufacturing, The Facts 2022 | Make UK](#)

² BEIS Select Committee Report, published in Nov 2022: [The semiconductor industry in the UK - Business, Energy and Industrial Strategy Committee \(parliament.uk\)](#)

This shortage is particularly acute in the sphere of semiconductor ('chip') design. We know that over 80% of UK companies involved with chip design have unfilled vacancies. There is widespread consensus within the semiconductor sector that the lack of a secure skills pipeline is the greatest threat to the health the UK semiconductor sector and its ability to compete on a global scale³.

The Equality, diversity and student characteristics data 2022 from the Office for Students¹ found that just 17.9% of engineering, technology and computing undergraduate entrants were female. The IET have reported that 11% of the Electronics workforce in the UK is female. In 2021, UCAS data² showed that as few as 335 female students started Electrical & Electronics Engineering degree courses in the UK. Therefore, without urgent reform and action the problems of gender imbalance and overall shortages in our sectors will only get worse.

Opportunities.

Employers in our sectors are supportive of apprenticeships and many have run programmes for decades. Since 2015 the 'trailblazer' group of employers has developed new apprenticeship standards for the sector, these are degree apprenticeships at L6 and L7⁴. Employers use standards from L3 (Eng Tech) upwards. Apprenticeships are seen as an integral and important part of employer's skills pipeline.

State of Play.

Engineering, manufacturing and technology apprenticeships are expensive. It can cost an SME circa £100k to train an L3 apprentice and much of the costs are front-loaded. However, both for the employer and the provider, the phasing of the governmental contribution to costs is not in sync with the front-loaded phasing by which costs are accrued. As a result, for both employer and provider there is a cash constraint and consequent disincentive to use the apprenticeship model. This is particularly acute with SMEs for whom cash is invariably scarce. To exacerbate this problem, a residual contribution from government is retained until after the End Point Assessment (EPA). This is substantially beyond the point at which costs were incurred and when these assessments are delayed, that further stretches cash. In the event the apprentice fails their EPA, the funds are withheld.

There is an absence of suitable and relevant Standards for our sector at L4 and L5 (previously these were based around HNC, HND and Foundation Degree). The principle of 'employer-led' standards is good in theory; however, in practice the development process for new Standards, through the IfATE, is time consuming, bureaucratic and complex.

The long term value and benefit vs 'costs' of apprenticeships is not always well appreciated. We know of senior industry leaders who joined large companies as apprentices. After 30 or 40 years in industry they observe that a significant proportion of senior colleagues also joined as apprentices. Whilst it may not be that employees remain in the same company for as long as they did in the past, the value proposition of properly investing in the core skills at apprenticeship level disproportionately contributes to the creation of exceptional senior management particularly in the technology and engineering fields.

The tax-take from the Apprentice Levy is also not hypothecated to apprenticeship training. We understand that the majority of Levy funds ends up in general taxation, as it is not ring-fenced for skills and training.

³ BEIS Select Committee Report, Op Cit. Paras 122&123.

⁴ Level 6 is Embedded Electronics Systems Design & Development Engineer and Level 7 is Electronics Systems Principal Engineer.

We understand that employers have to fund (and apprenticeship providers, organise) remedial Maths and English for those apprentices who have failed to reach the required basic entry grade at GCSE. For the employer, this additional cost is a dis-incentive to take-on applicants who would otherwise be good candidates; whilst for the provider, this compresses the training timetable. It seems that failings of the education system are being left for employers to remedy, within the apprenticeship. Therefore, we believe that the funding of these remedial Maths and English courses ought to be met by the DfE, and not by the employers as part of apprenticeship funding.

Barriers.

Specific elements of the secondary education sector are not engaged with apprenticeship. For instance, we understand the grammar schools do not have students taking apprenticeships as part of their success measure, so they focus instead on university placements. Apprenticeships are not tracked post in the same way as university graduates are, so it difficult to demonstrate long term benefit to individual, organisation and society.

Also, the Higher Education sector is not sufficiently engaged. Too few universities offer degree apprenticeship programmes in Engineering, alongside their traditional undergraduate courses. As a result, here is a low take up of degree apprenticeships in our sector.

There is no equivalent mechanism for apprenticeship application as UCAS for university degrees. For school to support apprenticeship and degree-apprenticeship applications there are considerable hurdles. Different companies have different approaches at different times in the year (often much earlier than UCAS applications have to be made). Similarly, there is no 'clearing' process whereby an excellent candidate for an apprenticeship offered by one employer but misses the 'cut' can be re-directed to another employer.

Employers note that here is a lack of teaching regards hands on 'tools' skills at secondary school. Prospective apprentices have barely ever used basic tools. It is noted that D&T uptake at GCSE and the number of D&T teachers is declining significantly (20% of teacher requirement not filled last year). Furthermore, D&T is not part of the EBacc. As a consequence, we believe basic familiarity with engineering and manufacturing skills is increasingly undermined for pupils and unless they either have a parent in the sector or (if they are really lucky) an enlightened teacher, the whole idea of a career in engineering/manufacturing/technology through an apprenticeship route is invisible to them.

The Inquiry provides a data point that there is only 42% awareness of apprenticeships with young people (knowledgeable, or very knowledgeable). It is self-evident that if people aren't aware, then they will never consider an apprenticeship. There is a clear need to improve marketing and careers advice about the value of apprenticeships within schools. Also, to improve awareness of apprenticeships among teachers.

Solutions.

We offer the following suggestions for change, to improve the current situation with apprenticeships for our sector:

1. Reform of the Apprenticeship Levy. More flexibility with how employers spend their Apprenticeship Levy money. For instance, promoting apprenticeship and careers advice and more broadly on training and skills development, rather than 'rigidly' on specific apprenticeships. The current Levy system creates a 'cap' beyond which there is no further financial incentive to an employer to offer apprenticeships.
2. Too few universities are offering degree apprenticeships. There is a need to make them less complex and create incentives to make them more attractive to both universities and employers. For instance, start-up incentives to help academic institutions establish courses to

support apprenticeship programmes (while cohort numbers are low and this would otherwise not be economically viable).

3. Increased Govt investment in promoting STEM in both primary and secondary education to improve availability of candidates for apprenticeships in engineering. In particular, to develop the enabling, 'hands-on' practical skills. Also, more and better careers advice and teacher education to encourage uptake in apprenticeships.
4. There is a need for more support and greater flexibility from the IfATE when developing and updating Standards. "Employer-led" is a great principle but the workload and time/effort on Standards is too much.
5. Apprenticeships are complex for employers operating in different parts of the UK – skills and apprenticeship policy is devolved and so there are different systems in different parts of the UK. There needs to be better alignment across the UK.
6. More and better support for SMEs to engage with potential apprentices. There needs to be a more systematic solution, akin to UCAS, to help both applicants and employers.



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Attachment:

1. About the UK Electronics Skills Foundation, The ERA Foundation and TechWorks

About the UK Electronics Skills Foundation

The UK Electronics Skills Foundation (UKESF) is an educational charity In the UK, Electronics, especially semiconductor design and manufacture, is a growing and strategically important sector of our economy. However, the demand for capable graduates far outstrips supply.

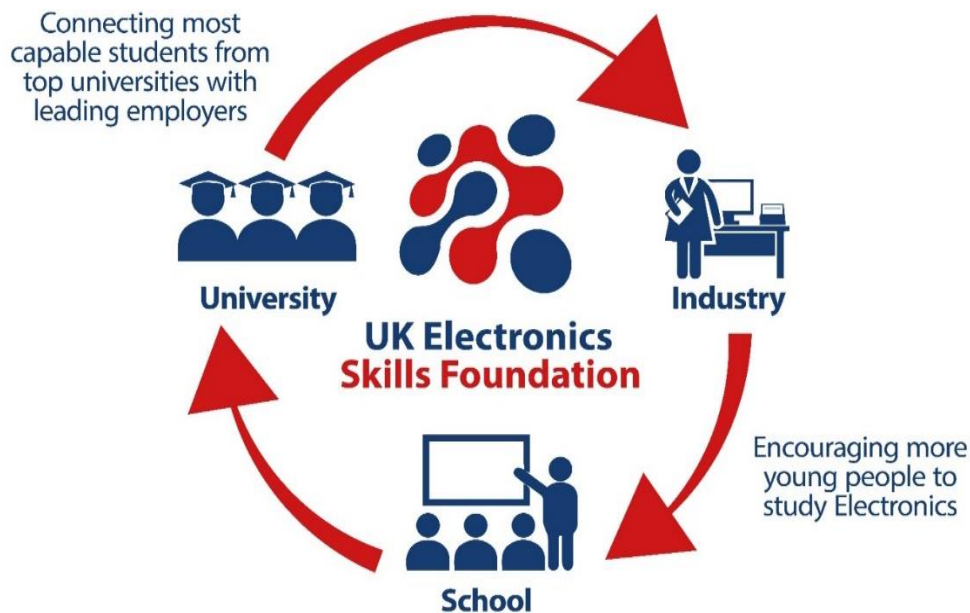
The UKESF works to tackle this national skills shortage in a coherent way; it operates collaboratively with major companies and leading universities. The UKESF also undertakes outreach and engagement activities to ensure that more schoolchildren are aware of Electronics and the opportunities available. This is achieved through a range of education Electronics-focused activities, projects and teacher training.

At the heart of the UKESF is an undergraduate Scholarship Scheme. This training programme provides professional education, development activities and work placements with leading employers for students from universities right across the UK. The Scholarship Scheme is now considered to be an exemplar of effective engagement between industry and universities. It is the basis of the UKESF's wider collaboration between higher education, industry and schools.

"The UKESF is the body responsible for education and skills in the UK Electronics sector. We've been really impressed with the quality of people coming through their programme." Director Engineering Development, ARM

Registered charity number: SC043940

www.ukesf.org



"Moving beyond talk about the skills shortage to take positive action is what the UKESF is all about."

Stew Edmondson, CEO, UKESF



About the ERA Foundation

The ERA Foundation is a non-profit organisation. We support Electech manufacturing across the UK by supporting engineering, innovation and skills development programmes. The ERA Foundation has been supporting UK engineering and innovation skills development in Electech manufacturing since 1920. Our aim is to ensure the important role that the Electech manufacturing sector plays in the UK economy is recognised, to support the next generation of UK engineers, and to encourage entrepreneurship, innovation and technical excellence in individuals and organisations.

We work with organisations which share our principles, and ensure all of our partners have a significant stake in what we do and how we do it. Our work with partners can involve generating new policy ideas; developing, funding or delivering skills programmes; supporting engineering engagement activity; or coordinating the sharing of skills and knowledge between partners.

Partnerships are at the heart of the Foundation's work to achieve its aims. Our partners range from prestigious national institutions, STEM skills delivery organisations and large corporate institutions to local community groups. We also work with government departments, policy think-tanks, and the financial sector. The relationships we have built with our partners have allowed us to develop a wide range of successful initiatives and to achieve a much greater impact from the outcomes of our work in the sector.



About TechWorks

Techworkshub Ltd is a not-for-profit industry association consisting of member companies across the UK Deep Tech scene. We build collaborative networks to support the UK Deep Tech Sector, forming adjacent, connected communities which represent major players in technology industries to create vision and scale, driving profitable growth for UK Deeptech business. Originally conceived as the National Microelectronics Institute (NMI) in 1996, Techworks now consists of 270 member companies across four collaborative networks:

- National Microelectronics Institute (NMI): Semiconductor manufacturing and associated supply chain. It has a Senior Leadership Group representing UK industry interests across the full microelectronics eco-system from Intellectual Property (IP) and 'chip design, product engineering, tooling and manufacture, test, packaging and sales.
- Technology Network for Embedded Systems (TechNES): Microelectronic IP and design.
- IoT Security Foundation (IoTSF): Internet cyber security.
- Automotive Electronics Systems Innovation (AESIN): Automotive electronics sector.

