# ‘Grow your own’ biomedical engineers

A new biomedical training facility at the Black Country and Marches Institute of Technology, in Dudley, aims to tackle key STEM skills gaps and help future-proof the biomedical engineering sector. Apprenticeships could provide a cost-effective strategy to enable Trusts to ‘grow their own’ professionals to ensure the safe management of healthcare technologies. **Louise Frampton** reports.

In 2019, the Department of Education made £170m available to establish a national network of Institutes of Technology (IoT), to offer training opportunities with clear pathways to skilled jobs. The aim of the initiative was to help close skills gaps in key STEM areas.

To help deliver this ambition, Avensys UK was invited to move into a new IoT site in Dudley to provide biomedical engineering and decontamination/sterilisation training and apprenticeships.

One of only 12 IoTs nationally, the state-of-the-art facility boasts a complete suite of replica hospital departments with the latest technology devices. The IoT recently received the approval of the Rt Hon. Michelle Donelan, Minister of State for Higher and Further Education, who opened the flagship centre on 20 October 2021. She believes the new IoTs represent “the height of technical training”.

“By uniquely bringing together further education colleges, universities and businesses, IoTs ensure people can get the skills they need to progress into better paid jobs, and businesses get the talented workforce they need to thrive,” she commented.

Complete with a ward, theatre, diagnostic imaging room, sterile services room, dental suite and equipment library, the ‘mock hospital’ enables apprentices and learners to experience the reality of working in a hospital environment. The training provided will help build the vital skills needed to develop the next generation of biomedical engineers.

The Avensys conference and open day was attended by representatives of the NHS and private hospitals from across the country.

“All of the apprenticeship courses offered are sponsored by the Government Apprenticeship Levy scheme which is good news for the future of the biomed sector – employers can train engineers ready to look after NHS biomed equipment for future generations,” commented Andrew Cross, sales director, Avensys UK.

A conference and open day was held at the IoT, on the 19 October, and included a number of CPD accredited industry lectures covering hot topics in EBME – including:

- ‘Growing your own professionals’: the value of modern apprenticeships – Chris Gale, Avensys.
- Human factors training to help reduce errors – Chris Gale, Avensys.
- The importance of decontamination training – Doug Butcher, Avensys.
- Digital prototyping – Ben Haldin, Fulcro.
- RFID integration and medical device management – Andrew James, Lyngsoe Systems.

## Dispelling stereotypes

Training academy manager, Chris Gale, opened discussion with an explanation of the fundamental aims of an apprenticeship, while dispelling some misconceptions – he emphasised that the image of an ‘apprentice’ as a recent school leaver “who didn’t do too well at school” and therefore “works with his hands”, is far from the truth, today. An apprenticeship is ‘a qualification’ – the same as a degree, an HND or an ONC – and is essentially ‘a job with training’. ▶

"We need to steer away from associating the word 'apprentice' with 'apprenticeship'. An 'apprentice' is usually viewed as someone starting out in their field, who isn't knowledgeable. But apprenticeships can go all the way to Master's level…we need to move away from the stereotype," he commented.

He pointed out that training is not an option – it is an essential requirement. The MHRA requires all service staff to be appropriately trained, and they must have sufficient work experience on the devices they repair and maintain. All those undertaking repair and maintenance should be able to provide written evidence of appropriate and up-to-date training – preferably "as part of the documentation required by a quality management system". They should also be able to show they are up to date on new maintenance techniques. The CQC also states that patients and staff should be protected from harm, by ensuring staff have the qualifications, competence, skills, and experience required.

'Growing your own professionals' is an extremely cost-effective way of ensuring a skilled workforce and future-proofing clinical engineering departments – for organisations that pay into the Apprenticeship Levy (companies with a payroll of more than £3m a year), training costs are zero. The Government will also pay up to £4,000 for each apprentice employed.

For non-levy paying organisations, or if the 'levy pot' runs out, the Government will pay 95% of the cost of the apprenticeship. For example, the Government will pay £4750 of the £5000 cost of a Level 2 apprenticeship, which means the organisation will only pay £250 for the full apprenticeship. Furthermore, this is paid monthly, so the cost of a Level 2 apprentice would be just £20.84 per month.

He explained the different levels of apprenticeships and their equivalent in traditional education:

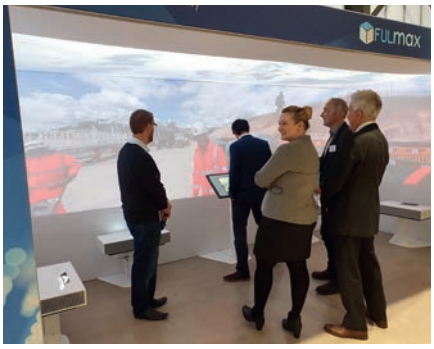
- Level 2 = just above GCSE
- Level 3 = standard college
- Level 4 = first year of a degree
- Level 5 = a foundation degree
- Level 6 = a degree
- Level 7 = a Master's degree

Avensys currently offers training for Level 2 (Healthcare Science Assistant), Level 3 (Healthcare Engineering Specialist Technician) and Level 4 (Healthcare Science Associate) in biomedical and sterile services. However, Gale revealed that there are plans to introduce training for higher levels, in the future.

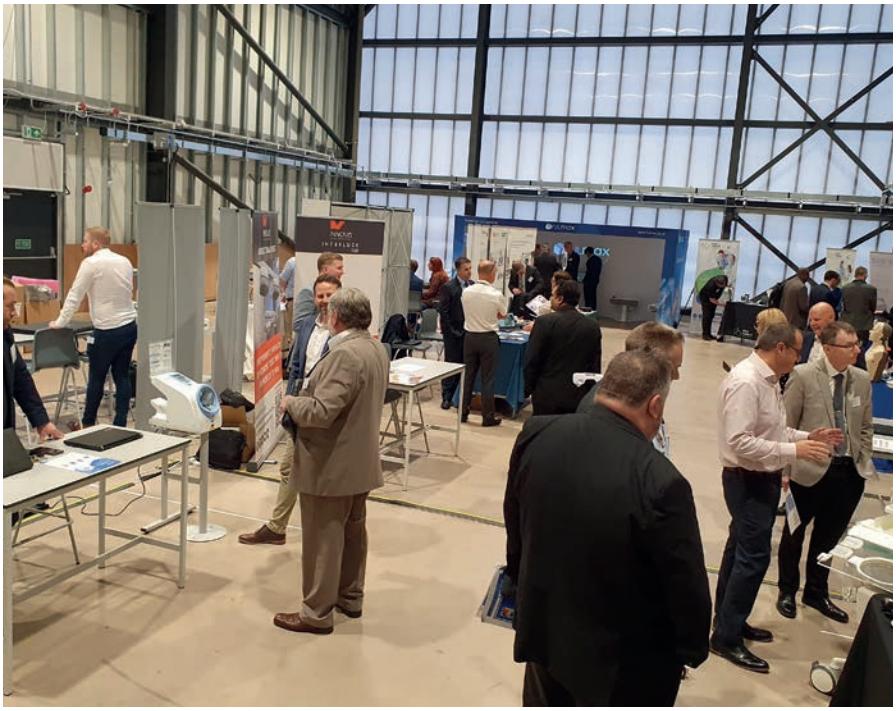
In fact, apprentices do not have to be new recruits. A biomedical engineering department can enrol an existing employee onto a higher apprenticeship – all the way up to master's degree level apprenticeship, so they can benefit from training and gain qualifications, making them more useful to the department. Apprentices are not required to take each level sequentially but can skip levels and advance to the higher levels – if this best serves their level of competence and experience. Assessment methods can also be adapted to suit the individual's strengths – it doesn't have to be all 'work-book and written assessment'; video-based assessment or witness testimony may be used for an individual who is dyslexic, for example.

Apprentices are less likely to drop out of the training because the approach can

The conference day included a series of demonstrations of high interest technologies. Here, Lyngsoe Systems demonstrates various RFID hardware options and the associated software interface.




Ben Haldin of Fulcro demonstrated the FULmax, a virtual environment in which a digital twin of a development enables faster and more efficient project delivery.



The exhibition hall at the conference was a great success, as both exhibitors and delegates mingled to discuss products and industry developments.

be tailored to the individual. Gale pointed out that some of the best engineers may be turned off by mainstream teaching and assessment methods and this flexible approach makes it much more inclusive and suits a wider range of learning styles. This ensures providers retain and develop the right person for the job.

"The beauty of these apprenticeships is that it allows people to get into learning and to become competent individuals, but they can also be adapted in the way they are delivered …people will have very different learning journeys," he commented.

> We need to steer away from associating the word 'apprentice' with 'apprenticeship'. An 'apprentice' is usually viewed as someone starting out in their field, who isn't knowledgeable. But apprenticeships can go all the way to Master's level… we need to move away from the stereotype.
>
> Chris Gale, Avensys training academy manager.

## Benefits of 'growing your own'

He went on to highlight the benefits of 'growing your own professionals'. Apprentices benefit from receiving the provider's industry specific teaching, which in turn increases performance. The apprentice bases their learning around the hospital's own department, equipment and procedures, so they quickly become productive within the workplace.

"Why send an individual to college when you have to train them when they get back?" he commented. Gale pointed out that some of the general engineering principles learnt at college will never be used outside of the classroom, but industry specific teaching offers a targeted approach to 'real-world' learning. Efficiency is also improved by cascading knowledge in a structured way with clear learning outcomes. This means the provider knows exactly what equipment the individual is competent to service and maintain, throughout their learning journey. This is much harder to establish if they are undertaking a generic 'electronics unit', as part of an external college course, for example.

Gale concluded that work-based apprenticeships will lead to better standardisation across medical engineering, which in turn will lead to higher quality and improvement. Ultimately, this will help to ensure the safety and reliability of medical equipment – uptime will be crucial to tackling the backlog, as the NHS recovers from the pandemic, and biomedical engineers will have an important role to play in supporting this recovery.

More than 40 Colleges, 18 universities and around 60 leading employers are now directly involved in IoTs, with more to follow. Since the opening of the facility in Dudley, the Department of Education has announced a second wave of nine additional IoTs in areas not currently served by the existing network. These have the potential to access £120 million capital funding to become operational if they pass each stage of DfE's due diligence process. CSJ