

T-level Science:

Bridging the gap between the classroom and the workplace



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RLC LAB in collaboration
with Ufi VocTech Trust

This paper focusses on the T-level Science course. The UK faces a well-documented shortage of technicians in the chemical and life science sectors, clearly the T-level Science route has real potential to contribute to a solution to this problem.

A qualification built for the skills the UK needs

T-levels represent one of the most significant reforms to technical education in a generation. Designed to be employer-led, work-ready, and rigorous enough to compete with A levels on equal terms. However, college providers, awarding bodies and government agencies have been open and candid about the challenges that remain in making that ambition a reality. Chief among them is the need for teaching resources that genuinely reflect modern workplace practice and the availability of suitable, good quality, work placements. The Department for Education has sort to tackle some of the challenges of securing work placements by introducing flexible 20% remote employer supported placements, for all subjects, in January 2025.

Solutions start with finding the right partners

Discussions with T-level Science providers pointed consistently to two main areas of challenge and opportunity:

- Access to teaching materials with genuine industry currency, with active support from employers.
- Work placements. This is a challenge for all T-levels, but the added complications of laboratory safety make it particularly difficult for science courses. Is this an opportunity for remote employer support?

To find a solution to these challenges we assembled a group of like-minded organisations to conduct a pilot project. The cohort included.

RLC LAB, a contract laboratory with > 20 years' experience in the pharma/biotech/manufacturing sectors

Ufi VocTech Trust, an independent charity focused on unlocking the full potential of technology to get adults learning.

Four FE colleges: Bury College, Cambridge Academy for Science and Technology, Derby College and Warrington UTC

A pilot approach: bringing the laboratory into the classroom

Modern analytical techniques, such as HPLC (High Performance Liquid Chromatography) and LCMS (Liquid Chromatography Mass Spectrometry) are essential laboratory tools and central to careers in research and manufacturing sectors, including:

- Pharmaceutical research
- Environmental analysis
- NHS diagnostics
- Forensics
- Food safety
- Manufacturing R&D and quality control

However, for colleges, this type of equipment is way outside budget constraints to purchase and maintain. Plus, most course leaders are unable to access CPD training opportunities to investigate and embed these type of techniques as part of their course content delivery.

This is precisely the kind of gap that industry is well placed to help address. Organisations working with these technologies every day hold something FE colleges cannot easily generate themselves: access to equipment, authentic raw data, current practice

protocols, and the ability to translate laboratory reality into meaningful learning. The question is how to make that expertise available at scale, to colleges across the country regardless of their location or existing employer relationships. The solution – equipment simulators (Figure 1).

The project centred on the development of online HPLC and LCMS equipment simulators built using real experimental data generated at RLC LAB. The simulators replicate the appearance and interactive features of the physical instruments. Each student is allocated their own online system. Students log in remotely using their unique user ID and have full control over instrument settings and selection of sample vials to be analysed. Using the supplied lesson plans, students conduct experiments in real time, including the analysis of calibration standards and tablet extract samples. The generated analytical reports (Figure 2) are automatically stamped with their user ID and the exact date and time that each sample was analysed – creating a genuine sense of operating professional equipment and direct ownership of real data, rather than textbook approximations. Note, logging in remotely to run experiments is common practice in industry, hence the project gives students a real sense of the type of practical and data analytics work they would be expected to perform in the workplace.

Scalability was designed in from the outset. Delivering resources digitally removes geographic constraints and provides all participating colleges with a standardised set of experiments in a safe, controlled environment. The model

Figure 1. Online HPLC system

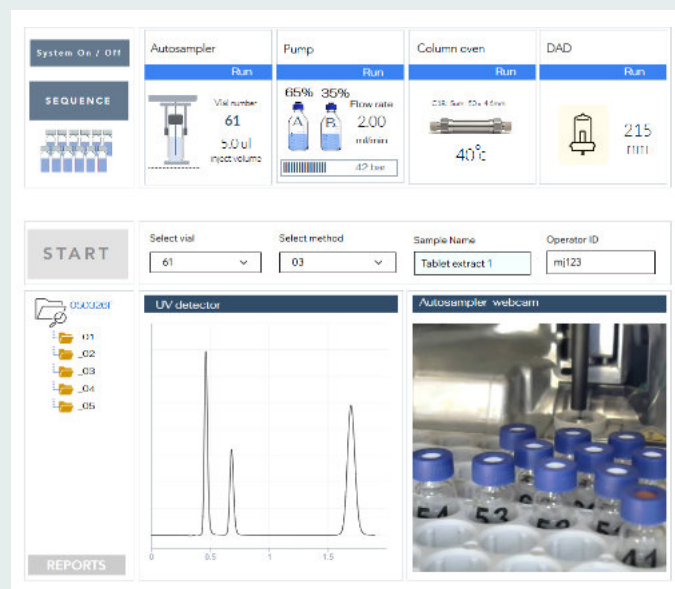
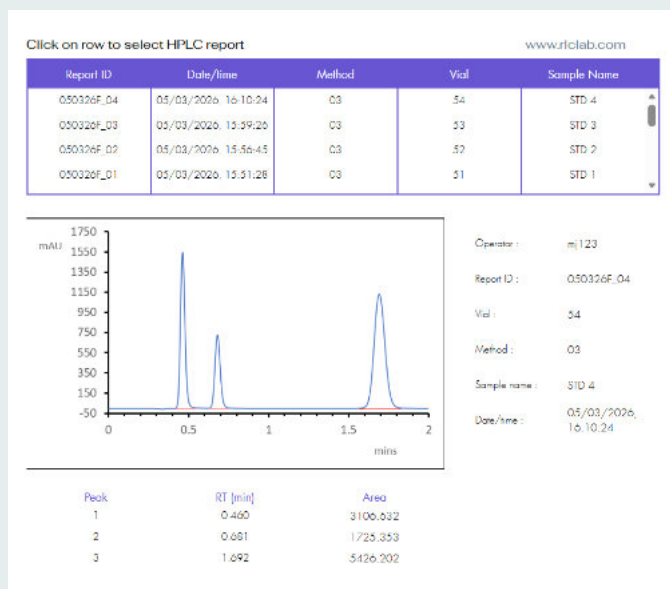


Figure 2. HPLC reports



also has direct potential as part of the new 20% remote employer work placement element of T-levels, offering a structured, quality-assured placement experience independent of where a college is located.

Evidenced-based results

Feedback from all four colleges was substantive and consistent, demonstrating clear evidence-based results that have a positive impact on student learning outcomes.

At Bury College, course leader Martin Attree described the impact both on subject understanding and on broader employability skills:

"The virtual placement programme has been an extremely valuable experience for our students. It has provided meaningful insight into industry practice and helped learners develop a clearer understanding of HPLC. Students have engaged positively with the activities and have benefited from the experience. The flexibility of the virtual format has enabled consistent participation while still maintaining a strong sense of professional expectation. Students have developed key employability skills such as collaboration, problem-solving, independent working, and digital confidence."

Jenny Moss at Cambridge Academy for Science and Technology highlighted what industry-originated resources provide that standard classroom materials cannot:

"The resources provided offered a clear, engaging and industry-focused way to explore modern laboratory techniques, giving students a far more authentic sense of the workplace than traditional classroom materials."

Catherine Walls, at Derby College, noted the value of a safe environment for building scientific confidence:

"This programme has given students the opportunity to put their theoretical understanding of HPLC to the test; they have been able to make errors and take risks in a safe environment which has helped build their confidence and resilience. The analysis of Anadin very much brought the subject to life and allowed for much deeper understanding."

Daniel Twist, at Warrington UTC, articulated the broader principle that the pilot illustrates:

"Employer and industry partner input is not just an attractive 'add-on' but should be baked into the programme's delivery and is, in this teacher's opinion, vital in ensuring the T level achieves what it is built to achieve."

A call for industry to step forward

This pilot is one example of what becomes possible when organisations with relevant scientific expertise choose to engage with FE colleges as curriculum and remote work placement partners. It demonstrates that industry-led resource development for T-level Science is

achievable, scalable, and valued by the professionals delivering the qualification.

The policy framework is already in place. The Department for Education T-level strategy, including the new remote placement provisions, supported by networks such as the T-level Ambassadors Network provide mechanisms through which industry knowledge can be channelled into colleges

T-levels can be a genuine and effective route into apprenticeships, employment and higher education in the sciences and other sectors from construction to digital and the creative arts – but only if the resources preparing students for those pathways reflect the reality of the workplaces they are heading towards. Industry has both the knowledge and the means to make that happen and I would encourage all sectors to take a proactive role in shaping the next generation of employees their businesses will depend upon.

Acknowledgments

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