

SUPPORTING EXCELLENCE IN SCIENCE EDUCATION:

What role can commercial companies play in supporting schools and colleges?



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RLC-lab is a commercial SME company providing chemical analysis and research support services to a diverse range of companies in the pharmaceutical and fine chemical sectors.

From the outset we were keen to develop a company based on commercial activities to fund in-house research projects and provide free support services for schools and colleges.

In 2011 we set up a unique chemical analysis service for A-level Chemistry and BTEC Science students. The service is free to schools and colleges in the UK.

The aims are:

- to give students access to modern laboratory technology
- bring the theory alive with real data – add value & excitement
- generate positive competition – students comparing data
- provide the teacher & students with an independent measure of their laboratory skills
- build links between Schools, Universities and commercial partners

At school the students are taught about advanced laboratory

techniques as part of their course – but for the majority this is limited to a paper exercise. The service gives students access to the real thing – the same technology used by pharmaceutical companies.

Inspire students with modern laboratory technology

The service is based on an outsourced model – common practice in industry but rarely encountered in the education sector.

The process is simple:

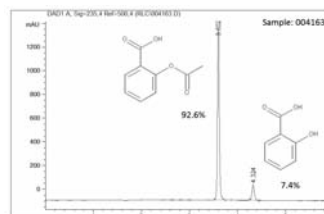
- The teacher registers online at www.rlc-lab.com and requests barcoded plastic sample vials. There is no limit to the number of samples or the number of experiments
- The student places a small amount of their product in the vial and the samples are returned to RLC-lab in the addressed packaging provided
- RLC-lab performs the chemical analysis – the data are reported online via a secure account for the school. Teachers and students login to view and download their data

The recent SCORE report highlighted a list of concerns about the lack of support for practical science lessons in schools and colleges. I would add another concern to that list – we need students to gain experience of relevant *modern* laboratory skills, as used in industry, to compete in a global market. Due to cost and resource constraints UK students are limited to older, seldom used techniques. For example, when performing a chemical synthesis the key questions the student needs to answer is a) has the reaction worked and b) how pure is the isolated compound. For the majority of students the

only technique they have access to, to answer these questions, is a melting point measurement – an important and useful technique to learn – but is it really relevant to *modern* laboratory work life? Short answer...no and not a very interesting technique (when performed in isolation) to excite students and encourage them to consider a career in science and technology.

Bring the theory alive with real data – your sample – your data

An example of the data format that the students can generate when using the service is shown below – HPLC analysis of aspirin sample



Following a successful pilot study, supported by the Royal Society of Chemistry (RSC), the service has now been rolled out to all schools and colleges in the UK.

The best measure of the impact of the service is the feedback we receive from teachers.

Jacquie Hanmer, Robert Smyth Academy, said: "I cannot emphasise how wonderful it is for students to be able to see real data on their products. I used it as an example on open day and it generated huge amounts of interest".

Dr Claire Badger, Haberdashers' Aske's School for Girls, said: "This has been of real benefit to our students ... these

methods are on the syllabus but to see a method applied to their own samples makes it real".

The most important part is to work in partnership with the teacher – provide the resources and the right level of support to enable teachers to inspire their students.

Using automated equipment and protocols, we have the capacity to support all schools in the UK – using commercial know how to deliver a national outreach programme at low cost.

Universities and learned societies play a vital role in outreach programmes – providing guidance and numerous resources with emphasis on encouraging widening participation (WP) in regions where progression to Higher Education is traditionally low.

Once established we were keen not to operate the service in isolation – we wanted to work with like-minded partners to add value and resources to ensure 'best practice' with respect to working with schools and to address WP concerns. This has been achieved through our partnership with Loughborough University and the Royal Society of Chemistry. Our aim is to maximise uptake of the service and to develop other STEM resources in partnership with teachers.

The service is sponsored by RLC-lab, Loughborough University and the RSC.

On a personal level I really enjoy working with enthusiastic teachers and students. I would encourage other SME companies to use their expertise and resources, based on a similar collaborative model, to help inspire the next generation of scientists, technologists and engineers.