

Ensuring the pipeline: laboratory training in the time of coronavirus

The recognition of COVID-19 as a pandemic which required extreme control measures has impacted severely on all walks of life: even with moderated control measures, it threatens to impact on our ability to work and study effectively for some time to come.

This is nowhere more so than in the biological and biomedical sciences, where the move to increased laboratory, field and skills-based teaching was one of the major pressures for accreditation¹ – employers need skilled employees, and in the life sciences this means either an appreciation of the needs of laboratory working, or the skills derived for and from working in a laboratory.

Now, more than ever, there is a demand for skilled laboratory workers at all levels, including through Higher Education routes.

What to expect

Two things seem likely: first, that social distancing in some form or other will be required for a considerable period of time; and secondly, that COVID-19 infection rates will cycle, with further waves likely in the future.

Keeping these waves below critical levels is what will require social distancing, and yet we need to be teaching people about laboratory work with hands on experience to ensure the pipeline of skilled employees and entrepreneurs is there to deal with this and future problems.

We cannot magically provide more laboratory space without significant investment in both money and time, neither of which are in great supply. The general view seems to be that we will have issues for the first semester of 2020/21 (September-December 2020), and thereafter we can find ways to 'catch up' skills training for those that have missed key learning outcomes.

However, the likely wave nature of infections, and the impacting of one cohort's training on the next cohort, argues that we should be looking for longer-term, sustainable approaches to safe laboratory teaching.

Calculating capacity

Before we can return to the labs, we need to first calculate safe capacities for students and staff in each of our laboratories, before we think about what we will do in there.

Capacity drives the occupation of the labs, and with the needs for deep cleaning between sessions, it is likely in any case that laboratory availability will be much lower than we would like.

¹ Abpi, Sustaining the Skills Pipeline, abpi,(2005), viewed 19/06/2020
<<https://www.abpi.org.uk/publications/skills-pipeline/>>

Timetabling cleaning

With an hour at least, and possibly two needed between sessions – with one hour of deep cleaning, and one hour of laying things out, we may find we are limited to two, possibly three two-hour sessions a day, with a timetable something like the below:

Standard Day	Extended Day
9-10 Laying out	8-10 Session 1 with students
10-12 Session 1 with students	10-11 Cleaning
12-14 Deep cleaning, (lunch) and laying out	11-13 Session 2 with students
14-16 Session 2 with students	13-14 Cleaning
16-17 Deep clean	14-16 Session 3 with students
	16-18 Cleaning and lay out for next day

That means no more than 30 teaching hours in laboratories a week, using the extended day, and only 20 for the standard working day, or 28 (18) if Wednesday afternoon is maintained as a sacrosanct sports afternoon – of course, Saturday classes and evening classes could be used as well, although the added staff resource needs and costs of such an arrangement may be prohibitive.

The alternative, of a single long session each day, may give more laboratory time in one session, but can be very challenging to fill appropriately, and goes against the advice to shorten periods of time spent in groups. Not to mention the need for students and staff to be moving in and out during the day, for personal needs as well as lunch.

A risk-based approach

The question becomes whether, coupled with the full social distancing requirement, this is such a short amount of available time in the laboratory that individual students are unable to become practiced in the skills they need for employment in the industry.

In 2005, we were told that our graduates were not equipped for work in the life sciences sector, a key economic sector in the UK, because they had few developed laboratory and research skills, and employers typically had to retrain them. Accreditation aimed to address those problems, and accredited life science courses are recognised at providing a much better practical, skills and problem-solving graduate.

Social distancing is effective in large open spaces, and can work well in situations like supermarkets and large shops, where one-way systems and floor marking can be used effectively. Teaching laboratories are much more complex environments, and space available depends on the layout of benches, equipment and specialist rooms – calculating the number of students and staff that can be in a laboratory is going to depend on more than just the area.

The UK Government has produced guidance for safe working in commercial laboratories², which argues that a risk-based approach is the most appropriate, recognising that the two metre distancing approach is very difficult in an environment where researchers have to move around to use equipment and carry out experiments.

This approach, of assessing risk and managing it appropriately, is the way that science and engineering already operate in the workplace as well as in the classroom. And what better way to teach our students about health and safety, risk assessment and risk mitigation if not through their laboratory classes?

Using the Safe Working approach advocated by Government, but in the context of our teaching laboratories, should be a better and more rational way to ensure not only safe working, but better training for our graduates.

² UK Government, *Working safely during coronavirus (COVID-19)*, viewed 19/06/2020
<<https://www.gov.uk/guidance/working-safely-during-coronavirus-covid-19/labs-and-research-facilities>>