

Title of case study

Using 360 images, and reporting 'near misses', to engage students with Health and Safety

Staff Lead

Dr James Gaynor

School/ Department

Department of Chemistry

Faculty

Science and Engineering

Contact Details

jwgaynor@liv.ac.uk

Name of course and module (if applicable) case study took place within

Preparative Chemistry: Synthesis and Characterisation (CHEM245)

Please briefly describe the activity undertaken for the case study

The Department of Chemistry started an overhaul of undergraduate Health and Safety (H&S) training from 2016-17. This involved 2 key areas outlined in this case study:

1. Introducing new safety documentation closely aligned to our research processes.
2. Introducing a number of H&S related activities that run alongside our lab courses.

Two of the activities allow students to report H&S 'near misses', and we give students the opportunity to critique 'bad lab' scenarios using mock ups of some of our research laboratories, with 360° images being easily created using Marzipano software and uploaded to the University website with help from the Webteam. You may have seen similar images in the timetabling room catalogue which allow you to look around a teaching space from your computer. The images work just as well on mobile devices.

How was the activity implemented?

We achieved the changes to our curriculum by harmonising our pre-research laboratories involving 10 staff across 7 modules and encompassing 75+ experiments. In terms of safety documentation and gaining access to the laboratory, all modules have a minimum threshold requirement to allow students to gain access to the lab, which involves obtaining 100% on a pre-lab H&S test. Each course then has add-on processes to meet the needs of a specific course. The activities that run alongside our lab courses are year and module specific.

- The 'near miss' activity is completed in the synthetic laboratory in years 1 and 2. During year 1, students complete a form when they see something that isn't quite ideal, report it to a demonstrator who then deals with it, and the students post their near miss through a letterbox in the laboratory.

- The 'bad lab' scenarios are completed during a 3 hour workshop during year 2 (from 2017/18)

Has this activity improved programme provision and student experience, if so how?

Prior to these changes, most modules implemented their own H&S requirements after years of deviation from a previous system. It was quite confusing for students whereas this new system gives a level of consistency throughout. Previously, the only H&S related workshop type activity beyond the lab course was a short safety test in year 1, so provision has certainly increased. In terms of student experience, 68% of undergraduates indicated that they felt prepared for the laboratories (survey taken in 2 consecutive years and students in years 1-3 completed the survey). Whilst still not ideal, and we're working on improving this, 81% of students in year 2 (2016/17) who had experienced both the old and new system of H&S training preferred the new system (and 48% of these strongly preferred it).

Did you experience any challenges in implementation, if so how did you overcome these?

The main challenges in implementing a consistent approach in all lab courses was getting the agreement of all 10 staff members involved. Through constructive meetings and dialogue, this was eventually achieved. The separate activities that ran alongside the lab course were relatively unproblematic as they were implemented mainly by 1 staff member in a particular module.

Which Liverpool University Hallmarks and Attributes does this case study relate to (tick all boxes that apply)

Research-connected Teaching **X**
Active Learning **X**
Authentic Assessment
Confidence **X**
Digital Fluency
Global Citizenship

How does this case study relate to the Hallmarks and Attributes you have selected?

Research-connected Teaching

We've removed the huge disconnections between our undergraduate and research processes. This is achieved by undergraduates using safety documentation produced from our Electronic COSHH system (ECS). 90% of our undergraduates agreed the paperwork, which is aligned to our research processes, was easy to understand and interpret.

Active Learning

Firstly, building on our research-connected approach, researchers in Chemistry can report 'near misses' as a way of improving practice. We have encouraged undergraduates to do the same in our year 1 and year 2 synthetic laboratory courses. We've modified the procedure slightly for undergraduates, including an element of reflection and forward thinking. Secondly, a new 3 hour workshop has been developed (year 2) which includes an interactive group activity critiquing 360° images of "bad lab" scenarios. These can be accessed from the web page: [Undergraduate health and safety training scenarios](#) and were developed in summer 2017 with the help of colleagues around the department allowing us to use their laboratory space.

Confidence

Building on research-connected approach and active learning, after engaging with the safety documentation, students are required to take pre-laboratory safety tests and score 100% before accessing the lab. 96% of students agreed this was a fair requirement and indicators suggest this gives a sense of confidence when entering the laboratory setting. Completing the bad lab activities prepares students for their research years within the department and helps them to transition much more effectively.

How could this case study be transferred to other disciplines?

Capturing the 360° degree images using an appropriate camera (loaned from timetabling) and the use of Marzipano software (Webteam help – Joanne Ginnever) was actually very quick and easy and could easily be used by others for a wide range of teaching activities. The risk assessment approach uses an electronic system developed for Chemistry but we're looking into redeveloping it so it could be used more widely across the University.

If someone else were to implement the activity within your case study what advice would you give them?

The most translatable activity is the 360° degree images which are surprisingly simple to create using free-to-use web based software. The limitation is getting your hands on the 360° camera and it is recommended that anyone thinking of having a go should investigate the limitations of the image quality. They are good, but it depends how much you want to be able to zoom in!



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