



PTAS Project Report (for SMALL PROJECT GRANTS)

Project Title: Peer assessing laboratory skills

Principal Investigator : Michael Seery
School / Department : Chemistry

Team members : Amy Price, Euan Doidge, Helen O'Connor, Maciej Kucharski

For further information, please contact:

Brief Report (maximum 500 words)

What did you do?

Laboratory skills are a crucial aspect of laboratory education. In modern chemistry education, these are often overlooked, and students are not formally trained in handling and using apparatus or instrumentation, with the assumption that they will learn on the go. After observing that this was particularly acute in Year 1 laboratories because of the wide variety of schooling students can undergo, we launched a laboratory skills protocol to be included in the chemistry laboratory programme. A series of demonstration videos were produced outlining correct protocol for a variety of core chemistry techniques. The videos are:

<http://bit.ly/skillstitrating>

<http://www.bit.ly/skillsdistillation>

<http://bit.ly/skillsstandardsoln>

<http://bit.ly/skillsvolpipette>

Students are required to prepare for labs by watching these exemplar videos and then demonstrate them to each other while recording each other on their mobile phones. This allows for initial peer discussion and feedback, and then videos are submitted to Learn for assessment. The entire process enables the issuing of digital badges to reward micro-competencies.

What did you find out?

The process was trialled as a pilot in 2016/17 with 150 Year 1 chemistry students. We explored students' knowledge, confidence, and experience prior to and after completing the lab activity, and found a significant increase in these. We also found a significant increase in students' ability to answer competency-related questions. Technical and teaching staff in the lab noted that students performance in later weeks was "much improved" after students had formally learned these techniques.

How did you disseminate your findings?

The approach was evaluated formally and published: Seery, M. K., Agustian, H. Y., Doidge, E. D., Kucharski, M. M., O'Connor, H. M., & Price, A. (2017). "Developing laboratory skills by incorporating peer-review and digital badges", *Chemistry Education Research and Practice*, **18**, 403-419. There was also a presentation at the PTAS annual forum, and the project website has



been updated to share our work in digital badges more widely (<https://badginglabskills.wordpress.com/>).

How could these benefits be extended to other parts of the university?

The approach has also been extended to higher years, where the focus is on instrumental techniques. This focus on instrumental techniques was launched during the Festival of Creative Learning and student opinion was incorporated into a 'Teaching Matters' blogpost, which includes positive student commentary on this approach (<http://www.teaching-matters-blog.ed.ac.uk/?p=1432>,). The approach has been used as a case study by colleagues in LTW for their "DIY Film School". Colleagues from health sciences were very interested in this approach when it was presented at the PTAS forum and we are establishing a loose network about digital badges in collaboration with the University's Wikimedian in Residence.

Who can be contacted for further details?

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Financial statement

This project has utilised the funding awarded to it by the PTAS adjudication committee and the Principal Investigator or School Administrator appropriate can provide financial statements showing the funding usage as and when required by the UoE Development Trusts who may require it for auditing purposes.