

Poster Presentation

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Delivering practical crystallography experience to undergraduate students

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Teaching of laboratory-based chemistry in universities has barely evolved since its inception. Practical work is generally conducted in a highly structured, dedicated teaching laboratory environment or on a 'student-as-apprentice' basis in an active research laboratory. Exposure to crystallography as an undergraduate is generally limited to theoretical lecture-based courses, with little or no practical experience, despite the fact that training in the use of expensive research-based instruments is becoming a necessity of modern science. We present a course based around the solid-state structural chemistry of a molecular polymorphic system, delivered to third year undergraduates (70 students) at the University of Southampton which contains numerous novel features: 1) Students work in pairs (maximum group size of 8). 2) It is a 'hands-on' experience for every participant, involving single crystal and powder diffractometers (Rigaku XtaLab mini and MiniFlex benchtop systems) dedicated to educational activities. 3) It is a student-led activity, designed as an 'advanced practical' providing a taste of the research experience. 4) Laboratory manuals are available to students via an Electronic Laboratory Notebook (ELN) system. 5) Plans, experimental enactments, observations and conclusions are recorded by students in the ELN (directly linked to the manual sections). 6) Feedback and assessment is delivered through the ELN by directly linking instructor comments to the student ELN record. The experiment comprises about 15 manual sections in the LabTrove ELN system, which has a similar design to a blog, enabling student comments and assessor feedback to be linked to these sections. This talk will outline the design of the experiment and instruments involved, the mode and logistics of delivery, and will discuss the evaluation of its impact on student learning by analysis of feedback questionnaires.

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