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Enhancing Forensic Science Context-based Laboratory Activities for Undergraduate Chemistry Students

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Title: Enhancing Forensic Science Context-based Laboratory Activities for Undergraduate Chemistry Students.

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This paper discusses the development of student centred context-based practical activities for use in third level Forensic Science/ Chemical Analysis courses. The project is a joint initiative between the Dublin Institute of Technology (DIT) and Strathclyde University with the aim of developing innovative student centred context-based practicals to engage the students entering the relatively new course in DIT and to build-on the existing undergraduate practical courses at Strathclyde University. It was intended to phase out some of the current “recipe-style” practicals and replace them with problem based laboratories similar to those designed by Seery et al¹. Due to timetable allocation for running of laboratories there are constraints on time and resources and due to these implications the methodology used was to update the current recipe-style laboratory procedures incorporating (i) chemical risk assessment, (ii) practical learning outcomes, (iii) student self assessment tables, (iv) end of laboratory reflective questions and (v) a case study. Laboratory supervisor guidelines were also designed to enable flexibility in supervision of such laboratories. This will allow for easy assimilation of the new context-based labs into the current module timetable system. It will also facilitate transfer of the labs developed within the discipline. Initially the project was aimed at first year undergraduate chemistry laboratory activities but it has since developed to include second year. The first year manual now contains a case study for each of the individual five experiments selected. In second year there is one case study to be examined using experiments to be carried out on rotation. In fact, two case studies were developed in total to enable parallel sessions to run. The purpose of the case study is to make the students focus on ‘why’ they are carrying out the laboratory work and to encourage critical analytical thinking. This pilot launch of the forensic laboratories in first year and second year has been evaluated and a qualitative methodology has been used to evaluate it. We are interested in examining alternative methods to enhance the student learning experience derived from practical work and are conscious of constructively aligning² the learning outcomes and assessment methods in order to ensure the achievement of the learning outcomes. Our work to date in this area has shown that enhanced understanding of the underlying theory, greater interest in the practical aspect of the curriculum and increased overall motivation are among the main benefits of this context-based approach. Moreover, student enjoyment, engagement and interest are noticeably higher based on informal staff feedback.

1. C. Mc Donnell, C. O'Connor, and MK. Seery, Chemical Education Research and Practice, 2007,8(2), 130 - 139.

2. J. Biggs, Teaching for Quality Learning at University, (1999).