

AN ACTIVE LEARNING, STUDENT-CENTRED APPROACH IN LABORATORIES: THE LABORATORY AS A PRIMARY LEARNING ENVIRONMENT

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Laboratory based teaching is a fundamental component of the chemistry curriculum. Traditionally, the laboratory has been used as a tool for reinforcing theory learnt within the lecture and to enhance the student's conceptual understanding of the theory-practice relationship. For many students, particularly those who do not undertake undergraduate research experiences, laboratory classes are critical for the development of the inquiry and research skills required to meet the Science Threshold Learning Outcomes (Jones et al, 2011). As part of the curriculum renewal at Federation University Australia, a new cross-discipline laboratory-focussed course has been introduced into second year of the Bachelor of Science and associated programs. In this course the principles of chemical and biochemical analysis using a number of different analytical and instrumental techniques is examined with an emphasis on the practical application of these techniques. Rather than a traditional lecture/laboratory schedule, this course is focussed on active learning within the laboratory environment, with students spending the majority of their contact hours in the laboratory. Each laboratory session is inquiry based, incorporating student-led design of experiments, critical thinking and analysis of results. As such, the laboratory is the vehicle for the majority of learning in the course, so becomes not just a place for consolidation, but the primary learning environment. A range of advantages for learning in the practical domain exist: increase in student confidence and sense of achievement, deeper understanding through trial and error, development of critical and independent reasoning, the development of interpersonal skills such as team work, negotiation and collaboration. Laboratory work also allows staff more opportunities to interact with students and monitor learners in person, providing assistance and feedback that is timely and personalised. This paper will present an overview of the structure of the course and results from surveys and focus groups held with the students regarding their experiences and perceptions of lab-based learning.

Text

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