Learning in labs

The interactive and “hands-on” nature of science laboratory sessions gives them great potential to be interesting and engaging. How many students do not experience at least some initial curiosity about the unusual and varied objects found in the laboratory environment, and how many are reluctant to abandon their pens, paper and lecture halls to explore them? Yet although the laboratory environment naturally lends itself to high quality learning by “doing”, there are many reports of science laboratory sessions falling far short of this potential, and questions are being raised as to the type and quality of learning gained by students taking part in them.

Several modules within the laboratory program of a third year university course, Environmental Microbiology, were remodeled into a “problem-based learning” format with a view to increasing student engagement and the quality of learning taking place in the areas of problem solving, experimental design and data interpretation. A CD-ROM containing selected course content and movie clips previewing observations through the microscope and scientists performing experimental techniques was also developed in order to complement and enhance learning in the laboratory. Several compromises were made in order to control the logistics and expense associated with allowing the students increased choice in experimental design.

The impact of these changes upon student learning was evaluated by contrasting their performance in assessment tasks before and after the laboratory re-design and by contrasting modified and non-modified laboratory modules within the same year. Student feedback on their positive and negative experiences and perceptions of the new laboratory format revealed a number of issues of interest to anyone considering a review of student learning in the laboratory environment.

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Presenter details:

Dr Sally James
Project Officer (Education), University of New South Wales
L2 Dalton Building F12
Faculty of Science, UNSW
Sydney, 2052
Telephone: (02) 9385 7929
Fax: (02) 9385 7920
E-mail: Sally@unsw.edu.au