Improving learning outcomes for students in Clinical Physiology

C.R Dallemagne, School of Life Sciences, Queensland University of Technology, GPO Box 2434, Brisbane, Queensland 4001, Australia.

Principles of effective teaching and good practice have been explored by several authors, and is the corner stone of learning (Crickering & Zelda, 1987; Ramsden, 2003). Two are encouraging active learning and emphasizing 'time on task'. Application of these principles can be facilitated by the various media modes available. Interactive media form gives investigative and exploration experiences and are facilitated by web resources (amongst others) (Laurillard, 2002). Learning facts does not necessarily increase understanding and critical thinking. Self confidence in one's ability is needed to engage in critical thinking activities (Van Wiegel, 2005). A lack of such confidence leads students to rely on a surface approach of learning facts and figures as this seems safer. Learning and thinking skills are distinct entities but necessarily complement each other (Marton & Ramsden, 1988). Similarly, reflection on learning in specific content domains is preferable to learning "metacognitive skills" (ibid.). Dispositional behaviour modulates students' approach to their learning of specific topics. The Project Zero "patterns of thinking" project has identified three distinct components necessary for a favourable dispositional behaviour towards critical and creative thinking, namely ability, inclination and sensitivity (Harvard Graduate School of Education, Project Zero). Not all students may possess all three, some may lack the discipline-sensitive imagination to develop their own activities for their learning: technology helps us devise well-designed exercises. Clinical Physiology is an advanced unit, designed for students in Biological Sciences and Nutrition. It builds on understanding and knowledge of basic Anatomy and of 2nd level Physiology. The teaching strategies assist students in understanding the rationale for development of the pathophysiology, diagnostic investigations and treatment of major disorders of the human body. Designing activities that students enjoy interacting with, will encourage them to spend more time with the material, hence increasing 'time on task' in a productive way. Developed on line resources were analysed by the Flashlight Evaluation model consisting of a triangulation between technology, activity and learning outcome (Ehrmann 1998). The methodology for the study has been described elsewhere (Goss *et al.*, 2003). Results showed that access and navigation were satisfactory, but there was poor use of interactive activities. Students' answers in examination reflected mostly a surface approach to learning: facts, but no development of reasoning in the answers.

The results of the evaluation of the on line site, and the examination answers motivated us to further develop the on line site with the aim of encouraging active learning and time-on-task. Using interactive activities that are interesting and enjoyable can help students develop inclination and sensitivity in the thinking of the discipline. The topics were clearly identified and within each topic case histories were or are being developed with a common structure. Active learning will be fostered by generating discussion using several on line strategies including a general discussion forum and a chat room. Critical thinking will be developed by some of the elements of the site as students reflect on their conceptualisation of case studies. Time-on-task is the third element we wish to address. As the activities are more enjoyable, and the students perceive the benefit of engaging with them for their studies, they will increase time spent on the subject matter. Feedback given *via* the on line teaching, in lectures and tutorials, should encourage students' participation.

Chickering, A.W. & Zelda F.G. (1987) *American Association Higher Education Bulletin,* 39, 3-7.

Ehrman S. (1998) *TLT Group,* http://www.tltgroup.org/about/ehrmann.html.

Goss H., Winslett G., Matt I. & Rowe J. (2003) Flashlight - an evaluation model with enlightening outcomes. Brisbane: Effective Teaching and Learning Conference Proceedings 2003.

Harvard Graduate School of Education Project Zero (2001). Dispositional characteristics. http://www.pz.harvard.edu/Research/PatThk.htm.

Laurillard D. (2002) *Rethinking University Teaching. A conversational framework for the effective use of learning technologies.* 2nd ed. London: RoutledgeFalmer.

Marton, F. & Ramsden P. (1988) What does it take to improve learning? Chapter 14 In P. Ramsden (Ed), *Improving learning : new perspectives*. London: Kogan Page.

Ramsden P. (2003) *Learning to teach in higher education*. 2nd ed. London: RoutledgeFalmer.

Van Wiegel (2005) From Course Management to Curricular Capabilities. Chapter 12 In P. McGee *Course Management Systems for Learning: Beyond Accidental Pedagogy*, Patricia McGee, Ali Jafari & Colleen Carmean (eds). Idea Group Inc. http://www.idea-group.com.