An interactive, self-instructional, online respiratory control practical: design and development

Laura C. Minasian-Batmanian and **Gautham Jayachandran**
School of Biomedical Sciences, Faculty of Health Sciences, University of Sydney
L.Batmanian@fhs.usyd.edu.au G.Jayachandran@fhs.usyd.edu.au

Introduction

The current University environment places substantial limitations on the funding of personnel to continue running practicals face-to-face. Pedagogically however, health science students require physiology that has a functional basis, which by its very nature needs to be dynamic and interactive. Most existing online resources refer almost exclusively to structural anatomy and present an obvious need for animal-based practicals in systemic physiology. To solve this problem, we used our expertise in this area (Jayachandran, Lee and Batmanian 1998) to design and develop a novel interactive practical, which allows students to question and understand the roles of various chemical, mechanical and nervous factors important in the regulation of ventilation.

Method

Use was made of the already existing video of the practical which was developed to reduce the need for animal experimentation, eg the rabbit in this case and thus replace animal-based learning. When designing the flexible learning environment, care was taken to develop domain specific educational strategies. These include demonstrating the experiment, section by section in the form of streaming videos, dependent on *QuickTime* Apple technology (Figure 1), followed by quizzes on each segment of the practical.

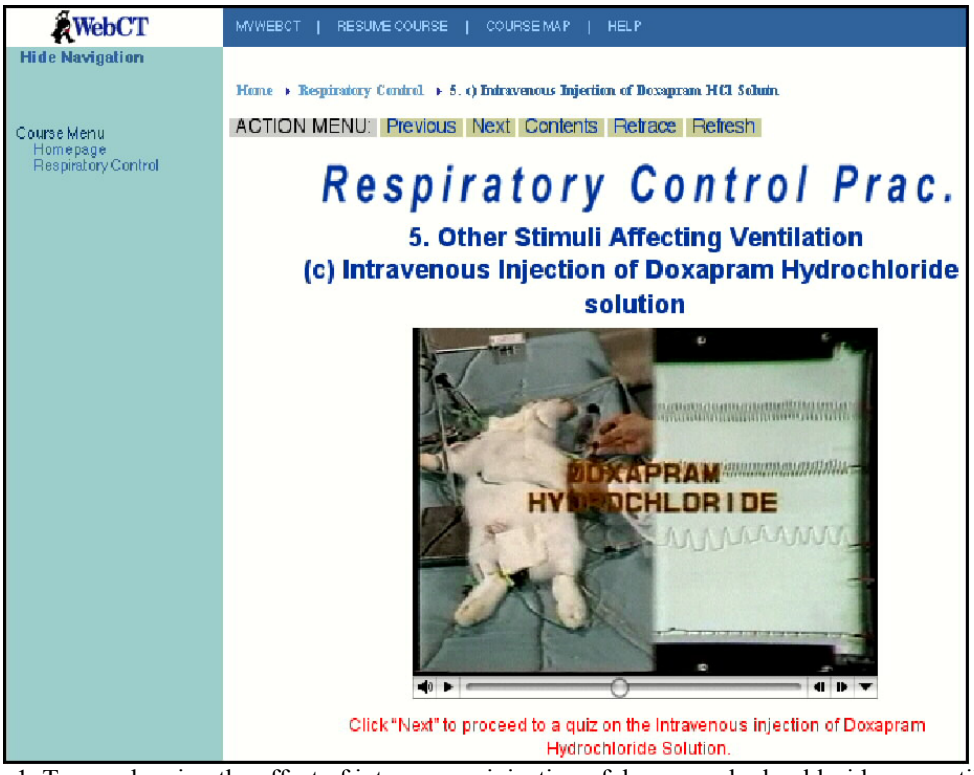

Figure 1. Traces showing the effect of intravenous injection of doxapram hydrochloride on ventilation

Results

This practical was offered on *WebCT* to undergraduate physiotherapy, and exercise and sports science students to reinforce important concepts developed in their physiology lectures in *Body Systems* at the Faculty of Health Sciences.

Discussion

The opportunity for students to extend their understanding of respiratory physiology, in this case by viewing animal experiments and to be able to interactively add or subtract factors that might affect ventilation, e.g. chemicals, is completely new. The program mimics the exact steps the student would be following if the practical were performed in the laboratory. This then represents huge savings with respect to academic, technical staff and student availability, laboratory running costs and the use of animals. Moreover, feedback from health science students has been extremely positive and has resulted in improved learning outcomes through a student-centred approach to learning, which has been established to be beneficiary (Ramsden 1988) and flexible teaching.

Acknowledgements
This project was financially supported by The University of Sydney Apple Scholarship.

References
Jayachandran, G., Lee, G. and Batmanian, L. (1998) *Protein Synthesis, The Vice-chancellor's Showcase of University Teaching*. University of Sydney, 6.

Ramsden, P. (1988) Studying learning: improving teaching. In P. Ramsden (Ed.) *Improving Learning: New Perspectives*. London: Kogan Page.