

UniServe Conference 2008 : abstract

Seeing is understanding: the use of online Pre-lab. exercises to enhance learning in Zoology practicals

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Cognitive load theory suggests that a student's learning will be inhibited if "the instructional materials overwhelm a learner's cognitive resources" (Cook 2006: p.1076); the less prior knowledge a learner has, the more susceptible they are to overload. Cognitive load theory provides the basis for a number of instructional design rules. These include the use of multiple representations, and the use of dual mode presentations (e.g. verbal plus visual).

In our first year Zoology practical classes, we have observed that many students have difficulty visualizing what they will do in class from reading a set of written instructions. Thus they are less well prepared, and less able to take full advantage of the learning experiences offered by the practical exercises. When that exercise involves a dissection, there are ethical implications (ANZCCART 2005). We therefore prepared a series of Pre-lab exercises to support each of our dissection-based practical classes. These are PowerPoint shows illustrating the procedure for each stage of the dissection, with written comments and questions designed to highlight key learning concepts: they are loaded into our online learning site the week before the relevant practical.

To gauge the impact of this initiative, we surveyed our students before releasing the first Pre-lab, and in the penultimate week of semester. The surveys were designed to elicit information on how well-prepared they feel for their classes, and what type of preparation they do: 68% commented that they 'like to see or be shown what I have to do'. We also sought feedback from the demonstrators about the types of questions being asked by the students to gauge the effectiveness of the Pre-labs in helping the students conceptualise what they would be doing in class. Preliminary analysis suggests that the pre-labs were enthusiastically embraced by the students, and that there may be enhanced learning outcomes.

ANZCCART (2005). Ethical guidelines for students using animals or animal tissues for educational purposes. <http://www.adelaide.edu.au/ANZCCART/resources/>

Cook, M. P. 2006. Visual representations in science education: the influence of prior knowledge and cognitive load on instructional design principles. *Science Education* 90(6): 1073-1091. DOI 10.1002/sce.20164.