

How should we teach cardiovascular physiology and what do we want students to learn?

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Over the last twenty years there has been a significant reduction in the number of undergraduate physiology practical classes involving the use of animals. Since the 1970s the “Regulation of blood pressure in the anaesthetized rabbit” laboratory class was used to teach cardiovascular physiology at Monash University. Sometime prior to 2008 an undergraduate student took a video using their mobile phone of parts of the animal surgery performed during this practical class. This video was placed on YouTube at the beginning of 2008 and became part of an Animal Rights demonstration outside the Physiology teaching laboratories during the weeks in which the anaesthetized rabbit practical was run, resulting in a lockdown of the building and the need for increased security for staff and students. This external pressure from Animal Rights campaigners and the negative publicity for the University, made it problematic to continue with the practical. Consequently, the Physiology Department received additional funding to develop an alternative practical class for Science students. The Finapres system, which non-invasively and continuously records cardiovascular parameters was purchased and incorporated into the cardiovascular physiology course from 2009. This study examined the attitudes of the 2008 Science student cohort towards the anaesthetized rabbit (blood pressure) practical and investigated and attempted to gauge whether substitution of this practical with a human based exercise affected the efficacy of the course as a whole.

A student survey was administered to the 2008 cohort of students to collect data about their attitudes to the rabbit blood pressure practical class. The survey data showed that most students in 2008 enjoyed the rabbit blood pressure practical and found it worthwhile. We asked the 2008 student cohort if the rabbit blood pressure practical should continue in future years. There were 103 student responses to the question, 91 (88%) students thought that the class should continue in future years, 8 students (8%) were not sure and 4 (4%) said it should not continue. Of the students who answered “yes”, 21% gave the reason as “there is no substitute for hands on experience”, 21% said that the practical helped their understanding of the concepts and 19% said that exposure to animal work was an important component of their undergraduate education. Of the students who answered “no”, 20% said that the practical was only relevant to those who wanted to continue on to an Honours degree and research, 20% said that the video was an adequate substitution, 20% said that it was not ethical to kill animals and 20% said that it would be better if they were given the data to analyse and did not have to do the surgery.

To determine the impact of the practical class on students learning of cardiovascular physiology an analysis of exam and mid-semester test results for 2008 and 2009 was undertaken. The analysis indicates that students in 2009 obtained a similar level of understanding of integrative cardiovascular physiology as the 2008 cohort even though they did not do the rabbit practical. This supports the idea that the substitute practical class using the Finapres was able to provide an equivalent learning experience. Data about the development of skills from the rabbit blood pressure practical was obtained from semi-structured interviews with staff who had taught Honours students from both 3rd year cohorts (2008 and 2009). These staff indicated that there were numerous factors which had led to a decrease in technical and research skills of Honours students over the past few years, so it is not possible to say if the demise of the rabbit practical specifically diminished the skills of incoming Honours students.

In conclusion, our study has shown that although most students enjoyed doing the rabbit blood pressure practical and appreciated the hands-on nature of the practical, the replacement of the practical with the Finapres practical did not appear to negatively impact on student learning of cardiovascular physiology.