



**The University of Edinburgh
Principal's Teaching Award Scheme**

Project Final Report

Preparing medical students for self-directed learning in statistics: What should we expect of tomorrow's doctors?

Principal Investigator (PI): Margaret MacDougall

Project Partners: Helen Cameron, Simon Maxwell and the College of Medicine and Veterinary Medicine Learning Technology Section

This action-based research project carries the long-term aim of defining a statistics curriculum for undergraduate medical students which is informed by the working experiences of practicing clinicians and medical educators from a wide range of specialties and by the learning experiences of undergraduate medical students at Edinburgh.

A comprehensive online survey was conducted from July 2013 to August 2014 with a view to identifying statistical competences for ensuring thorough preparedness of medical graduates for clinical practice. Out of a target group of 463 medical graduates with current or prior experience of teaching undergraduate medical students of the University of Edinburgh, 279 (60.3%) responded. Practice-based evidence has been gleaned for the need for a theoretical understanding of statistics and for the ability to perform statistical procedures and calculations using relevant data. Variation in such needs according to statistical topic has provided a basis for introducing new statistical learning into the undergraduate medical curriculum according to the popularity of these topics and reviewing possibilities for further curriculum development on an annual basis. There were many potential impediments to completion of the study questionnaire by the target group. These included the tendency for statistics to be unpopular among non-specialists; the competing demands on time of potential respondents in relation to their teaching, research and clinical commitments, and the comprehensive nature of the questionnaire. Nevertheless, the response rate and level of generosity in attention to detail reflected in the responses was immensely supportive in contributing to a reputable evidence base for statistical learning needs. This is likely to have been enhanced by the substantial time spent in teaching by a typical respondent and the wide range of specialties represented overall.

The PI has prepared a draft of what she intends to be the first in a series of papers

which seeks to offer a viable evidence-base for the statistical learning needs of practicing clinicians. On 23 September 2015, she forwarded this draft for comments to Helen Cameron, Simon Maxwell and a research assistant, Christine Campbell, who assisted in the organization of the response data from the survey and in reporting summary findings based on the final group of eligible respondents. Christine took on the above work during the period between submission of her PhD thesis and being awarded a PhD. The PI has provided the above colleagues with the opportunity to become involved as co-authors, pending receipt of feedback on the draft paper. The PI's intends to submit a revised version of this draft paper in October 2015 to the journal *Statistics in Medicine*.

The PI has also already published a paper on the PTAS project through the Higher Academy. The details are as follows:

MacDougall M (2011) An overview of Preparing Medical Students for Self-Directed Learning in Statistics: What should we expect of tomorrow's doctors? MSOR Connections, Special Issue: Flexible Learning, 11(1): 18 - 22. [Link](#)

Of further relevance to the above publication is the additional eLearning development work which has occurred in parallel with the above survey. Through collaboration with members of what was known at that time as the CMVM Learning Technology Section, the PI has developed a modularized version of pre-existing eLearning materials to allow the resources to be presented as manageable learning objects. The PI has presented on this output at the annual 'showcase' of conference papers on topics to do with online or 'blended' learning and teaching at the University of Edinburgh.

In addition to the above dissemination activities, the PI has presented on the project:

- 1) internationally at the 8th International Conference on Teaching Statistics (<http://icots.info/8/session.php?s=7E>), which was held in Ljubljana, Slovenia and
- 2) nationally at the Annual Meeting for Teachers of Medical Statistics ("Burwalls") (http://www.phc.ox.ac.uk/events/burwalls-annual-meeting-for-teachers-of-medical-statistics/programme_2013-allstat-edition.pdf), which was held in Oxford

As a spin-off from the PTAS project, the PI has recently prepared a research proposal for educational research involving use of an electronic form to review the above eLearning resources. The target group is the eligible respondents for the original PTAS survey. The proposal is currently undergoing a stringent ethical review with the assistance of the Centre for Population Health Sciences ethical review team. Through involvement of medical graduates in the above exercise, the PI hopes to move forward in implementing ideas gleaned from the PTAS survey on ways of integrating statistical and clinical learning throughout the Edinburgh MBChB curriculum. The feedback from the ethical review will contribute to improvements in the design of a similar electronic form which was designed under the PTAS project for use with undergraduate medical students.

The PI would like to take this opportunity to express their unreserved appreciation to Carolin Kreber and members of the University of Edinburgh Institute for Academic Development for their involvement in supporting this project.