

Bringing Physiology Alive for Students: A Workshop on Active Learning in Lectures and Laboratories

Held at the Joint Annual Meetings of the Chilean Physiological Society and Latin American Pharmacology Society,
October 14 2008, at Hotel Casino Enjoy, Coquimbo, Chile

Objectives:

By participating in this hands-on workshop, physiology teachers, post-docs, and graduate students will learn about innovative methods of active learning that they can adapt for use with their current and future students.

These include:

- interactive lecturing and self-assessment of learning using a personal response system;
- inquiry-based labs in which students make and test hypotheses by designing experiments and by collecting and interpreting physiological data on themselves;
- collaborative small group discussion and learning in a lecture room.

Organizer/presenters:

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Program Aims:

This four-hour workshop was part of the activities during the 2008 Annual Meetings of the Chilean Physiological Society and the Latin American Pharmacology Society. The meeting was announced in the web page (www.cienciasfisiologicas.cl) of the Society, by posters placed in most Chilean universities, and by e-mail to every member of the Chilean Physiological Society. The number of participants was initially to be limited to 50. In the event, because of an enthusiastic response, 62 participated.

The workshop was planned to model an introductory lecture and lab session on cardiovascular physiology. Participants were to experience the session as their students would, but with interspersed explanations and evaluations of the teaching and learning methods. The organizers worked as a team to lead the session, both role-modeling teachers and explaining the methods.

Planned implementation

Part I – 17:30: To begin, in a lecture setting, participants will make hypotheses about the effects of fitness, age, and sex on resting pulse rate. The participants will report their hypotheses using a personal response system (InterwritePRS™ “clickers”), in which the class responses are shown immediately as a PowerPoint™ slide. The class can see the range of hypotheses and discuss (in small groups of 2 or 3 in the lecture room) the physiological bases for them. After a whole-class discussion of the related physiology, the leaders will show some clicker MCQs to test the participants' understanding of the physiology. Participants will receive immediate feedback on their understanding when the class's MCQ results are shown as PowerPoint™ slides. The “teachers” will clarify any common misconceptions, based on the MCQ results.

Then, still in the lecture room, each participant will determine his or her own resting pulse rate and report these along with age, sex, and self-reported fitness level, again using the clickers. Class discussion will follow, using the results automatically collated and presented by the response system as a PowerPoint™ slide. Participants will evaluate and interpret the findings, including their relationship to the hypotheses, sources of error, and appropriate and inappropriate ways to present these data.

Part II – 19:00: After a break, participants will move into another room where the leaders will demonstrate the use of modest equipment from ADInstruments™ for measuring and recording heart rate and blood pressure. Participants will be divided into groups of four to make hypotheses and design experiments to test the effects of exercise, stress, or posture on heart rate and blood pressure. Simple equipment and supplies will be provided, such as step-stools for exercise, ice water to produce stress, flat “beds” and chairs for posture experiments, and forms for reporting data. The leaders will collect and collate the groups’ data as it is being generated.

Part III – 20:00: Everyone will return to the lecture room to view the collated data and discuss the underlying physiology. Participants will discuss and evaluate the feasibility and potential application of these approaches for their classes. In addition, the participants will receive tools to facilitate transforming “cookbook” demonstrations to inquiry-based lessons and to promote student-centered lectures. The ADInstruments™ equipment and the Interwrite PRS™ response system will be available during the rest of the meeting for participants to examine more closely with the help of the leaders.

Report on the workshop

The workshop “Bringing physiology alive for students”, supported by IUPS was entirely successful. It was held on October 13 in Coquimbo, Chile. Participants were members of either the Chilean Physiological Society or one of three Latin American pharmacology societies. Although we planned to limit attendance to 50, we had many more requests and in the end, we allowed 62 participants including faculty members, trainees, and students, whose affiliations are detailed on an enclosed sheet. We conducted the workshop in both English and Spanish.

IUPS generously supported Penny’s role in leading the workshop. We are very grateful for this support. After the conference, we were able to present a similar workshop at Universidad de Santiago de Chile (USACH) for faculty from many disciplines. The workshops were only possible due to that support, together with grants and in-kind contributions from APS, Videocorp Chile, and ADInstruments Company. Please accept our sincere thanks.

After the conference, a similar workshop was presented at the Universidad de Santiago de Chile (USACH) for faculty from many disciplines.

Participants

In a total of 62, 52 were from 8 universities in Chile, 2 from different universities in Peru and in Portugal, and one each from Argentina, Cuba, New Jersey Medical School (USA), and 1 from Canada.

Acknowledgements

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