

## **PES 2**

### **TO TEACH OR FACILITATE? WHAT DIFFERENCE WOULD IT MAKE IN STUDENT'S LEARNING?**

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The education of physiology is the most important in not only medical students but also many other schools related with life science education. In rather long time ago, pedagogy is thought to be enough for education, because less amount of the information is available. However, as the progress of the life science expands both the quantity and quality of the contents in physiology education, we have to recognize the needs for the andragogy-dependent education style. In andragogy-dependent education, the students find the problems/questions by themselves and start self-directed learning. During this process, the students learn at library, auditorium, or home by using textbooks, medical journals, internet, or visiting resource persons. Then, the students summarize the results of the self-directed learning and present them with discussion to teacher and/or students. At this points, students reflect and check the whole process. For the goal of teacher, he should be a facilitator. When the students meet good facilitator, the self-directed learning is extensively stimulated and their learning issues are easily transported to long-term memory. The learning issues give by the teacher during lecture remain about 5% after long time period. Thus, the physiology education requires good facilitator for self-directed learning, and not poor teacher.

## **PES 3**

### **CAN PHYSIOLOGICAL LABORATORY COURSES BE MADE SELF-DIRECTED?**

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Laboratory work has traditionally been a part of tertiary level physiology courses. The reasons for this have included that, through these students learn (i) to appreciate real data, (ii) to understand biological variability, (iii) to understand experimental method, (iv) to develop manual skills (eg in animal laboratories), (v) to gain experience in writing reports, (vi) to learn to work collaboratively in a small group. All worthy goals we would agree. But in the past it has often been difficult to decide to what extent these aims have been met in the courses we offer. Certainly many students have gone through physiology programs and not appreciated what we as teachers thought that we were achieving in the laboratories. Common student sentiments include "labs just filled in time in the course" and "they don't help us pass exams". Among our challenges are (i) to clearly define the objectives of the laboratory course, (ii) to create a laboratory environment in which students obtain knowledge and learn skills that they cannot easily acquire elsewhere in the course, (iii) to make the laboratories relevant to the students, and (iv) to design assessments that recognise the value of the time spent in the laboratory. Many, if not all, of the objectives should be unique to the course and not be more easily met through other activities in the course such as lectures or tutorials. And throughout it all our aim must be to develop the student's ability for critical thinking. How can we meet these challenges. It does not require a revolution to do so; we can build on what we presently have. It is perfectly possible to take our conventional 'cook book' approach to laboratory work and, by changing our approach, have the students identify questions that they would wish to investigate and design the ways that they will do this using exactly the same preparations and equipment as they use now in the conventional laboratory. This will be illustrated with examples from classical animal and human physiology experiments. Recent advances in the use of computers for data acquisition in student laboratories will also be illustrated.