

**Title:** Revitalizing students' motivation in PBL with computer enhancement

**Authors:** Yasser El-Wazir\*, Somaya Hosny\*\*, Ola Farouk\*\*\*

**Context and setting:** The Faculty of Medicine at Suez Canal University started in 1981 as the first medical school in Egypt to adopt problem-based learning (PBL) as a core educational strategy.

**Why the idea or change was necessary:** One of the universal challenges for educators is keeping core curricular material engaging for successive generations of students. Novelty can be an important tool in addressing this. Together with technology, it can help to revitalize learning in a small-group, problem-based curricula. A recent self-study at our school showed that 46% of the students and 35% of tutors gave relatively low scores to the PBL classes. This alarmed the education management because there had been ongoing efforts to sustain quality of teaching and learning through problem improvement and tutor training. A promising alternative approach to sustain student motivation is to use a new, engaging learning modality. We decided to introduce computer enhancement of the problems and collect data to determine the impact and results of introducing this technology into a very person-centered approach to learning.

**What was done:** Computer-enhanced problems were implemented in the first three years of the medical program. Ten graduate students converted all 90 PBL problems in the curriculum to a digital format and added hyperlinks to multimedia, so that students could see video clips and hear sound illustrating physical signs of the patient in the case being discussed. Each adapted case was then reviewed by one or two senior faculty to validate the relevance and adequacy of the inserted multimedia. The revision process (approximately eight hours per case) was completed in three months.

Each PBL group of 8-10 students had access to one computer, and all computers were interconnected by a LAN.

**Evaluation of results:** Students' satisfaction was measured one year after implementation using a 15-item anonymous questionnaire. A total of 175 out of 330 students, who had previously experienced both classic and computer-enhanced PBL versions, responded to the questionnaire. The questionnaire addressed the perceived effect of computer enhanced cases on the PBL process in general, on stimulating discussion, knowledge acquisition, and achievement in exams. Students reported that computer enhanced problems helped them to understand better (79%), learn more deeply and remember longer (61%), participate more in discussions (70%), render PBL sessions more interesting (79%), better focus their discussion (63%), improve their achievement in problem solving exams (49%), and in written exams (39%) as compared to the previous classic version of problems. Student open-ended comments indicated a desire for more multimedia and less text (36%), the opportunity to show their own electronic illustrations during the discussions (33%), ensure better technical support (34%), and train all tutors on how to moderate discussions of computer enhanced problems (12%). Analysis of tutors' responses showed opinions similar to those of students.

Based on the results of this questionnaire, the school administration decided to undertake a more extensive review of problems to insert more multimedia, provide more professional technical support, and to create a section in the system for students' e-resources.

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Departments of Physiology\*, Histology\*\* & Clinical Pathology\*\*\*, Faculty of Medicine, Suez Canal University, Ismailia, Egypt

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