EVALUATION OF STUDENTS’ KNOWLEDGE AND LABORATORY COURSE SUCCESS

We used both formative and summative evaluation techniques which tell us (1) whether students like these labs and what needs to be improved; (2) whether students mastered particular concepts.

Formative evaluation was carried out by six students enrolled in the laboratory course. These evaluations took place both in oral (after each lab) and in written (after the whole course) forms. All students evaluated the course very positive that indicates the success of the course. The main improvements of the course should be in more intensive homework tasks. Some students wanted to build experimental set-ups from scratch.

Summative evaluation was accomplished by two ways: (1) using different questionnaires (without grading) and (2) using the grades for each lab. Two teaching assistants helped in summative evaluation. For instance, using questionnaire with 36 questions on photon quantum mechanics showed that one half students answered correctly more than 75% of questions, 70% of students answered correctly more than 70% of questions and all students answered correctly more than 60% of questions. It shows the success in students’ learning.

Students’ mastery in photon-counting instrumentation showed that 50% of students received total scores of “A” and the rest of students received total scores of “A-“. The grades were based on students’ capability of carrying out the experiments, writing the reports, and delivering oral presentations.

To recognize and analyze alternative explanations and models students were asked to write the essays on alternative technologies to single-photon sources based on single colloidal quantum dots.

For communication skills development students were divided into groups (two or three students in each group depending on particular lab). Each group of students presented a single report written by all group members although students within each group can received different grades for the lab. The grade also depended on students’ activity and knowledge during the whole lab. Before each lab students were asked and were able to ask their instructor any questions.