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Virtual laboratory: assessment of a b-learning experience for teaching Physics in Engineering

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During the autumn semester of 2008/09 term, we have carried out an experience of teaching an innovative subject at our University. The subject is open and elective for all the students at the University, most of them in Engineering degrees. We call it “Physics virtual laboratory “.
The students use a CMS (course management system) for accessing the syllabus, and the materials for the course. These materials include videos, sound and rich text for describing some well known experiments in a Physics lab. They also have a test for each unit and have to submit a written essay for every experiment at a fixed date. They work with the help of the teacher that answer their questions and provide solutions for the exercises, so this course is not entirely e-learning, but rather blended learning.
For every unit, we have prepared materials that serve as a guide for the experiment, without being physically at the laboratory and without measuring any physical quantities. All the necessary data are given, and the real apparatus are shown in videos embedded in the document and described in detail. The experiments chosen cover those found in a typical Physics lab: kinematics in an air-cushion rail, Boyle-Mariotte law, magnetic field inside a solenoid, simple circuits, lenses... The number is limited to seven experiments for time constraint reasons. In a given experiment, we put emphasis in quantifying the uncertainty of the results, and several ways of calculating it are explained in detail using Excel spreadsheets.
After the subject has ended, we have gathered feedback from the students, and have taken note of how they rate it compared with more traditional subjects. Also, we assess our work and the usefulness of the materials and the fitness of the structure of the subject. This is important for assuring that the change in methodology is better for the learing process. In this communication we present the results of this assessment and try to reach some conclusions that might be useful in many engineering subjects that use b-learning methodologies.