

HYPERMEDIA APPLICATIONS ON EXPERIMENTAL PHYSICS FOR USE IN HIGH EDUCATION

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Abstract

At first university courses, two extremely important aspects of the teaching-learning of physics relate to the experimental nature of the discipline itself and the widely recognised importance of educational experiments. Students are expected to solve practical problems which provide concrete examples of physics theories. However, in their first year of university studies, they often possess no more than a very basic knowledge of general physics, are unaware of how to deal with practical problems, and need additional experience of experimental work and making scientific measurements. In response to this need subject matter of varying difficulty taken from a general physics course is presented to the student in a hypermedia application as practical experimental problems. This paper presents the results of applying the new technologies to the resolution of several problems of physics in the first-cycle of university courses in general physics. Problems and experiments have been prepared with a level of different difficulty. Questions are formulated on the basis of models to which established theory is applied. We have used digital photography, videos and tailor-made software for making scientific measurements. The hypermedia also contains an exposition of the experimental problems, theoretical explanations, complementary exercises and background scientific articles in five ebooks, the development of which was guided by the constructivist approach to the teaching-learning of scientific subjects. A total of seventeen experimental problems were formulated.

Keywords

Experimental physics education, digital images, measurements, automated experiments for learning, hypermedia technology.