

Development of The Computer Simulation of Oscillation in Physics Learning

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First Author	
Last Author	
Authors	Sumardi, Y; Amalia, AF; Prabowo, UN;
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Abstract	<p>The simplest mechanical system that shows such motion oscillation is a simple pendulum, which consists of a mass suspended from a rope, so that it can swing freely in response to the force of gravity. This teaching material is in the Fundamental Physics subject. Other teaching materials related to oscillation motion are simple linear harmonic oscillations. This research aimed to develop the computer simulation of oscillation in physics learning by using MATLAB. The use of simulations within teaching process had a positive impact on students' being able to predict and explain the phenomena. It also designed to provide possibility to explore physics phenomenon which cannot be realized in school conditions. The simulation can direct the student to reveal the existence of equilibrium between the two sides of an equation rather than causal relations. The research method used was Research and Development (R&D) developed by Borg & Gall (1983) for developing educational products. They are the pre-product form was developed by creating computer programs based on algorithms, validation through forum group discussion carried out by several lecturers to provide validation of the pre-product, major product revision, the pre-trial by 10 students, operational product revision, the operational product trial carried out by a class of students at the computer laboratory, final product revision, and dissemination. The steps were research and information collection, planning, develop a preliminary form of product, preliminary testing, main product revision, main field testing, and operational product revision. In the step of the main field testing, it was applied to the class of students. The 33 students and 6 lecturers were asked to respond about it. A qualitative test review was conducted through expert judgement for validation. They provided an assessment of suitability between the item with the indicator in the form of a Likert scale with five answer options. Based on expert judgment related to the feasibility of the test, V Aiken index is also calculated. The data analysis techniques were descriptive analysis conducted using Microsoft Excel and continued by looking for effective contributions to the relationship of each independent variable to work readiness. According to the statements of questionnaire given from the lecturers, the computer simulation of oscillation felt into a good and very good category. Meanwhile, the students' responses showed that it was fair, good, and very good. The oscillation simulation software developed has good criteria and is suitable for use in learning oscillation systems. The benefit of this research is to determine the form of the wave propagation simulation and its superposition which later can be used for physics research and suitable for students to learn physics.</p>
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Author	URIP NURWIJAYANTO PRABOWO, S.Pd, M. Sc