REAL SIMPLE HARMONIC MOTION PROBLEM SOLVING WITH HIGH-SPEED VIDEOS

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We are presenting research that aims to construct real problems in simple harmonic motion (SHM) for students to enhance their understanding and apply their problem-solving skills. Participants were 59 Grade-10 students at Chiang Mai University Demonstration School. Teaching simple harmonic motion consists of eight 50-minute lectures and one 100-minute laboratory. In this study, we developed high-speed videos of SHM of mass hanging from a spring. Students spent one lecture performing high-speed video analysis of this system with varying masses, maximum displacement, and spring constant. A mass attached to two springs oscillating on the air track was used as a real problem for students to apply both the force approach and the energy approach to solve for position as a function of time.

A conceptual survey on simple harmonic motion concepts based on Somroob and Wattanaksiwich (2017) was used as pre-test and post-test to investigate student understanding. Student problem solving skills were examined from a quiz after instruction on this topic. Student responses from pre- and post-test were analyzed using the paired sample t-test, effect size, and average learning gain. Students' quizzes were analyzed to identify their skills in setting up the equation of motion.

REFERENCE

Somroob, S & Wattanaksiwich, P. (2017). Investigating student understanding of simple harmonic motion. *Journal of Physics: Conference Series 901*, 01212371. https://doi.org/10.1088/1742-6596/901/1/012123

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