Contribution ID: **169** Type: **Poster**

Investigating Student understanding of Simple harmonic motion

Wednesday, 24 May 2017 15:45 (15 minutes)

This study aimed to investigate students'understanding and develop instructional material on a topic of simple harmonic motion. Participants were 80 students taking a course on vibrations and wave on the 2nd semester of an academic year 2016. A 20-question conceptual test and tutorial activities had been developed from previous research findings and evaluated by three physics experts in teaching mechanics before using in a real classroom. Data collection included both qualitative and quantitative methods. Item analysis and whole-test analysis were determined from student responses in the conceptual test. As results, most students had misconceptions about restoring force and they had problems connecting mathematical solutions to real motions, especially phase angle. Moreover, they had problems with interpreting mechanical energy from graphs and diagrams of the motion. These results were used to develop effective instructional materials to enhance student abilities in understanding simple harmonic motion in term of multiple representations.

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Session Classification: Poster Presentation I

Track Classification: Physics Education