

Cambodian Students Understanding of Forces and Motions: A Comparison with US, Australian, Japanese and Thai students

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This research aims to explore Cambodian students' understanding of forces and motions using the force and motion conceptual evaluation (FMCE) test. The 43 items of FMCE, excluding an energy concept, were translated into Cambodian language, validated by experts, and modified to reach a statistically acceptable version. After that, the assessment instrument was applied to 73 tenth graders of a medium-sized school located in the central region of Cambodia. These students have learned the forces and motions via a lecture-based conventional teaching method. Results showed some students' misconceptions, for example, around 70% of these students believed that for a moving object, a force is always in a direction of its velocity. They also claimed that an acceleration is proportional to a velocity. Moreover, most believed that during an interaction of two objects, the object of the greater mass (or velocity) can exert the greater force to the other.

A cluster of Newton's 1st and 2nd laws was the most problem of these Cambodian students. When we analyzed four sets of questions in this cluster, it revealed that the coin toss and the cart on ramp contexts were the most difficult questions of the students. Moreover, when we compared the results of Cambodian students with published FMCE results collected from US, Australian, Japanese and Thai students, we found a very similar trend of students' ideas. This preliminary outcome will be used as a primary resource to design instructional media for Cambodian students in a following part of our research.

Summary

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