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Activities to enhance students understanding of acceleration

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According to literature, the most important factor in education is to determine what students already know and to consider when teaching them. Unfortunately, there is a body of knowledge from physics education research revealing that we cannot simply build onto all existing knowledge that students have, because they contain misconceptions that differ from the accepted scientific understanding. As an example, students understand acceleration as an increase in the magnitude of speed or velocity. Based on that understanding, a brake pedal and a steering wheel of a motor car are not regarded as accelerators because they don't increase the magnitude of speed. That is caused by the everyday usage of the term which differs with a scientific understanding. Other examples in mechanics where students have lack of understanding is their understanding of the concept of force. Literature revealed that students believe that a constant force causes an object to move with a constant speed, some force always acts in the direction of motion and that a larger mass falls faster towards the earth than a small mass. Some physics education researchers argue that productive elements in learners' existing knowledge should be determined and used as bases for building scientific knowledge. Despite an earlier teaching of the concepts of motion in relation to acceleration from high school and in their first-year of physics at university, many of the students have difficulties in the problem solving required for the acceleration assessments. It is against this background that this paper presents and evaluates the impact of the activities that were designed to enhance students' understanding of the concept of acceleration. The evaluation of the impact of intervention was done through Google forms. Preliminary analysis of the results reveals that if the vector nature of acceleration is emphasized, students would also value the importance of including the change in direction as the result of acceleration. The results implied that teaching mechanics should start with the impact of force in our everyday life since acceleration is the visible impact of force.

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