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Undergraduate students' difficulties with motion of hooked objects on inclined and horizontal surfaces

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The purpose of this study was to investigate the conceptual knowledge and skills of undergraduate physics students on the motion of two objects on a surface, inclined and or horizontal. The study was conducted with 103 introductory physics students in B.Ed (FET) Natural Science programme at Central University of Technology (CUT), Free State, Bloemfontein campus. A pre-test was administered to test and investigate their pre-knowledge of concept. The test was on problem-solving on the concept. The results indicated that the majority (more than 80%) of students had huge difficulties with where and how to start in order solve these problems. They lacked basic knowledge of free-body diagram and vector analysis and as a result they could not apply or deduce equations to solve. A follow up remedial class was conducted to clear up the confusion and to assist them to acquire necessary and basic skills and knowledge of vector analysis, viz., free-body diagram, finding vertical and horizontal components of vectors, equilibrium conditions as well application of Newton's Second law of motion. With this skill, they were introduced to deriving equations to calculate the acceleration of the objects and the tension of the wire connecting them (mathematical skills). A post-test was thereafter administered and the results indicated a great improvement (more than 70%) in the vector analysis and mathematical application of vectors in problem solving. Follow-up interviews indicated deficiencies and confusion from their previous learning although some students (about 30% of the 70%) indicated they need to be taught the concept first before the test. Their reasoning was that they forgot the concept as they didn't understand it previously and or they had previously learnt it to pass before.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD, N/A)?

PhD

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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