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Vectors in Physics: Challenges for First-Year University Entering Students

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Physics education covers various topics, including classical mechanics, electromagnetism, thermodynamics, quantum mechanics, and relativity. In most topics in physics, vectors are essential because they represent physical quantities such as displacement, velocity, acceleration, force, and momentum. These quantities have both a magnitude and a direction, and vectors provide a convenient way to represent them mathematically. In summary, vectors are essential in mathematics, science, engineering, and technology. They provide a way to express and manipulate complex physical and mathematical quantities and are used in various applications. Teaching about vectors in the first year includes theoretical and practical aspects. It aims to equip learners with the mathematical and scientific skills necessary for higher levels and career paths. This paper investigates how first-year physics students deal with vector problems in physics. The study formally assessed over 200 students, focusing on vector concepts to explore the challenges students face in answering questions, intending to equip first-year students with the right skills to solve vector problems. The study aimed to investigate the conceptual difficulties that the First year entering students have in understanding vector concepts. The results show that most students need help understanding vectors in physics. The study has highlighted the areas where these students need help understanding vectors.

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

No

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

N/A

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