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Investigating the causes of unsatisfactory performance on the Physics section involving vectors in basic mechanics

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Abstract content
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Students' conceptual difficulties associated with mechanics as a broad conceptual area are well documented. Adequate understanding of vectors in relation to forces and equilibrium systems is central to successful solving of mechanics problems in a variety of conceptual settings. However, a section on vectors is perceived to be a difficult area by a significant number of students even in subsequent stages of their degree studies. It has been observed that students' largely positive response before assessment does not translate into satisfactory performance during the assessment. Thus, a particular focused attention to this section is crucial as it lays a solid foundation for the overall meaningful conceptual understanding of mechanics. The results of the investigation carried out in this regard suggest that students have inadequate knowledge and understanding of magnitude, direction and the significance of free-body diagrams as basic tools to aid understanding. In addition, students also appear to encounter difficulties with the use of trigonometric ratios.

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