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Attitudes and Approaches to Problem Solving as Predictors of Physics Achievement Among First-Year Students

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Students' success in physics is influenced not only by their content knowledge but also by their attitudes and approaches to problem solving. This study investigates the correlation between first-year mainstream physics students' attitudes and approaches to problem solving and their academic achievement in the subject. A sample of 100 first-year students from the Department of Physics and Astronomy at the University of the Western Cape participated in the study. Students completed the Attitudes and Approaches to Problem Solving (AAPS) survey, and their responses were compared to their performance on a curriculum-aligned physics assessment designed to evaluate conceptual understanding and procedural skills. The findings reveal a moderate to strong positive correlation between students' problem-solving attitudes and their academic performance, suggesting that those who adopt more expert-like approaches—such as drawing diagrams, reflecting on their solutions, and persisting through challenges—tend to achieve better results. These outcomes underscore the importance of fostering productive problem-solving mindsets alongside traditional content instruction. The study offers valuable insights for improving teaching strategies, curriculum design, and learner support within South African physical sciences education.

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