Patterns of Incorrect Responses on the FCI and Course Success

JAMES WELLS, Keck Science Department of Claremont McKenna, Pitzer, and Scripps Colleges and University of Connecticut, FRIDAH MOKAYA, DIEGO VALENTE, University of Connecticut — The Force Concept Inventory (FCI) is often used to measure the effectiveness of instructional pedagogy in introductory physics courses both at the algebra- and calculus-based level. Scores on the FCI are correlated with the performance of students in a class, as measured by their final course grade. We have collected data from several semesters of first-semester introductory mechanics courses at a public 4-year university, taught in large-scale classrooms with pedagogy including elements of Just-in-Time Teaching pedagogy along with active learning course components. The data collected includes pre- and post-test FCI scores, midterm exam grades, and final course grades. We examine whether certain patterns of incorrect answers on the FCI post-test are predictive of course grades, indicating whether certain specific student preconceptions are more detrimental than others to the success of students in an introductory mechanics course.

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