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Assessing Knowledge Gain for General Physics Courses ANTHONY COOPER, Texas AM University — article
In fall 2014, the Department of Physics and Astronomy at TAMU introduced important changes in the general physics courses that are taken mostly by freshmen engineering majors. The impact of these changes is assessed by several tools, including the widely-used Force Concept Inventory (FCI) that is testing Newtonian thinking. The FCI can diagnose the students at the beginning of their Calculus-based Mechanics course, and can identify the concepts the students did or did not learn before the final exam of that course. We have isolated subsets of items from the FCI and calibrated them invariantly on the target population. If the invariance of this calibration across semesters is confirmed, this item scale can be established as a reference for learning gain measurement in any Mechanics course. The reference scale would allow objective comparison across semesters and rapid adaptation of the teaching based on the needs of the students. The results reported here refer to the population of the summer 2015 semester.

Anthony Cooper
Texas A
M University

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