AN: PER: Innovative Assessment Methods

7/8/2024 | 9:00 AM to 10:00 AM
Room: Lobby Level, Stone

Moderator: Trevor Smith

(AN-04 9:36 AM-9:48 AM) | *Contributed Talk (12 Minutes)* | Relationship between course grades in introductory physics and pre-instruction assessment scores

Presenting Author: David Meltzer, Arizona State University

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We have examined the relationship between various pre-instruction assessment measures and final course grades for students enrolled in introductory general physics courses at five campuses of four universities; the total sample included 26 separate classes and over 2000 students. The three assessments were the Force Concept Inventory, the Lawson Test of Scientific Reasoning, and a mathematics diagnostic test that we have developed and tested over the past seven years. We find, with nearly 90 percent consistency, that top-quartile scorers on the pre-instruction assessments have double or greater probability of receiving high (top quartile) course grades, and half or less probability of receiving low (bottom quartile) course grades, compared to students who scored in the bottom quartile on the assessments. Predictor variables have some inter-correlation but models incorporating two or more predictors generally have more predictive power than single-variable models. The most successful sets of predictors appear to vary from course to course. Linear models do not fully reflect the strong relationship between predictor variables and grade outcomes for the top and bottom quartiles, and so we are exploring models that restrict the sample to the top and bottom quartiles only.

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