

Instruments Used to Measure Student Performance

The FCI was employed. David Hestenes, Malcolm Wells, and Gregg Swackhammer, "Force Concept Inventory," *The Physics Teacher*, Vol. 30, 147 (1992)

Data and Analysis

Efforts have begun to systematically improve the materials to introduce more interactive engagement in the discussion (lecture) sections and to improve the quality of the supporting materials, to ease adoption by non-PhysTEC faculty, or other institutions. (Fall 05 and Spring 06 the course was taught by a new visiting professor.) In UPI the post test average is close to the exam average. The class does not appear to be "teaching to the test".

University Physics I Summary Statistics, FCI (30 possible)

Sem-ester	N*	Pretest score	Std dev	Posttest score	Std dev	Hake gain	Std dev	Test Ave.	Std dev
F 01	133	11.6	5.2	19.1	6.1	42.5	27.3	76.8	20.3
S02	105	7.4	2.0	19.6	4.8	54.0	21.7	74.9	18.2
F02	138	7.8	2.0	19.7	5.4	53.2	24.5	77.9	16.6
S03	145	12.2	5.4	18.9	6.4	40.7	25.7	76.2	19.2
F03	179	12.6	5.7	19.3	6.1	41.1	26.5	77	17
S04	157	12.7	5.5	20.1	5.6	43.7	26.9	81	17
F04	162	11.7	5.5	18.9	6.2	41.8	26.0	79	17
S05	196	12.7	4.6	24.0	8.2	63.6	21.9	76	16
F05	163	12.8	5.8	21.1	5.0	46.7	30.2	77	18
S06	170	10.7	5.1	19.5	7.3	45.5	19.2	70.6	18.4
F06	186	12.4	6.2	21.8	5.8	56.0	24.5	75.6	19.3
S07	191	14.0	5.5	22.5	5.0	56.0	24.0	82.6	10.4

*N is the number of students that had both a pre and posttest for calculation of the normalized (Hake) gain.

Some of our preliminary research on the Hake gain can be found at our website, at [General Physics Educational Research](#).