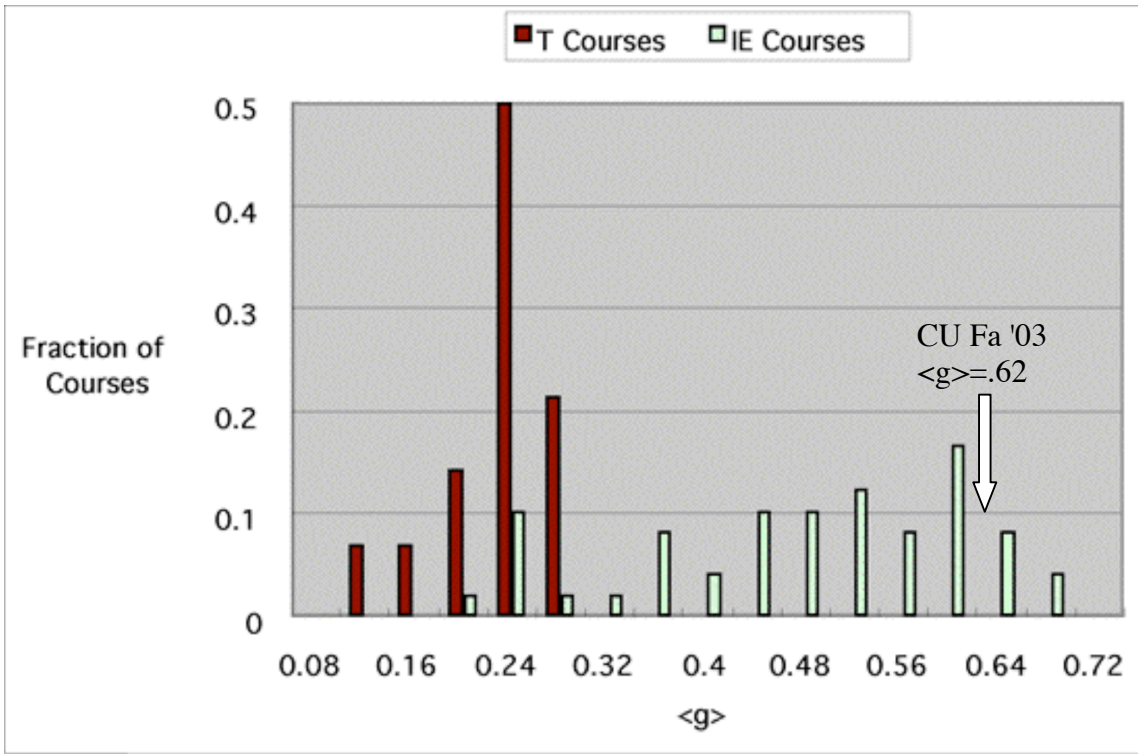
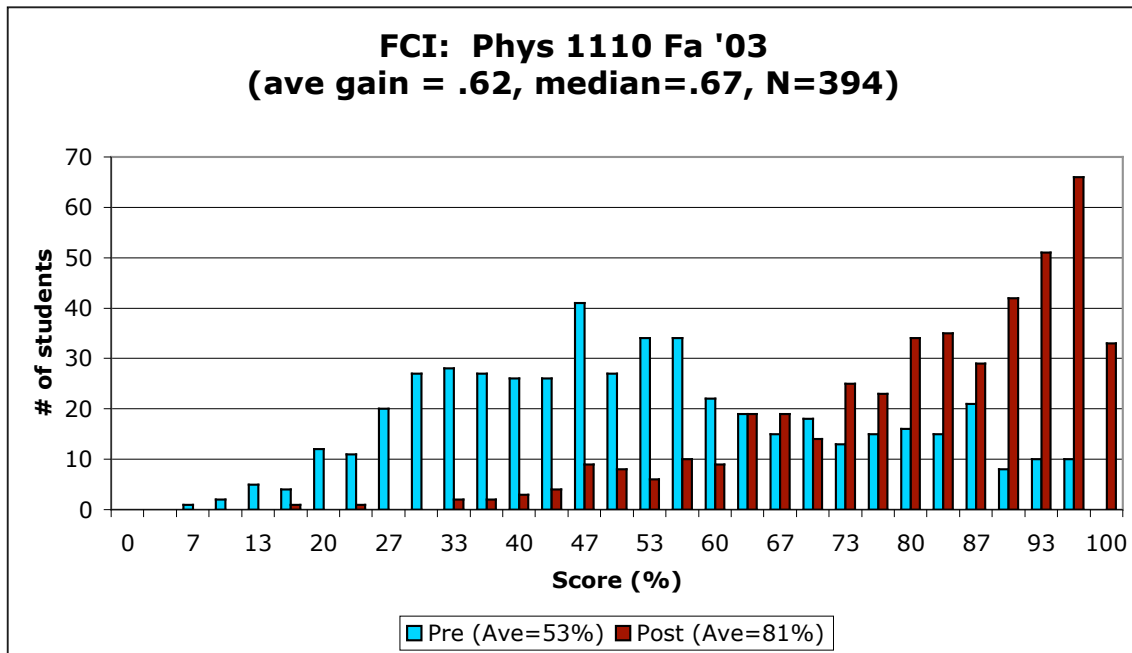


Learning gains Phys 1110 Fa '03: Force Concept Inventory.
 David Hestenes, Malcolm Wells, & Gregg Swackhamer (1992). Force Concept Inventory. *The Physics Teacher*, **30** (3), 141-151



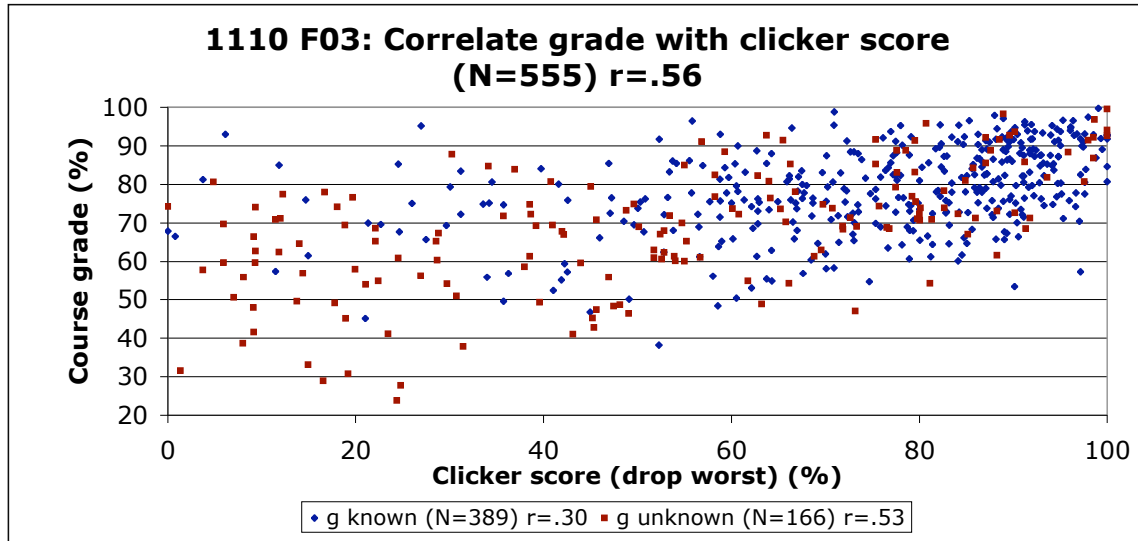
R. Hake, "...A six-thousand-student survey..." *AJP* **66**, 64-74 ('98).



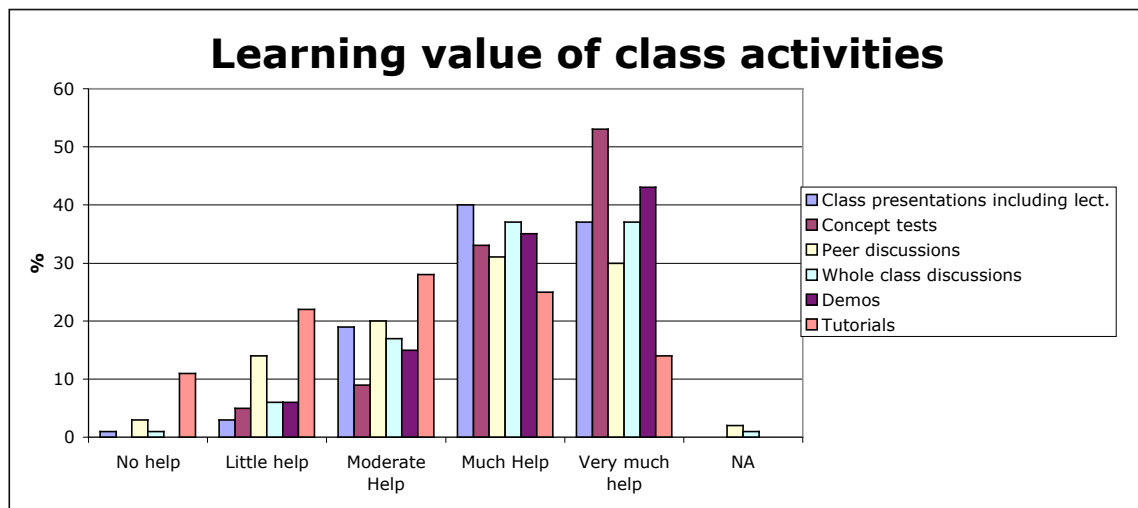
Impact of clickers:

1110 Fall '03: Average lecture attendance $\approx 80\%$

Correlation of course grade to clicker score:



Student perceptions of value: ("Concept tests" = "clicker questions", the highest peak in "Very much help" category).

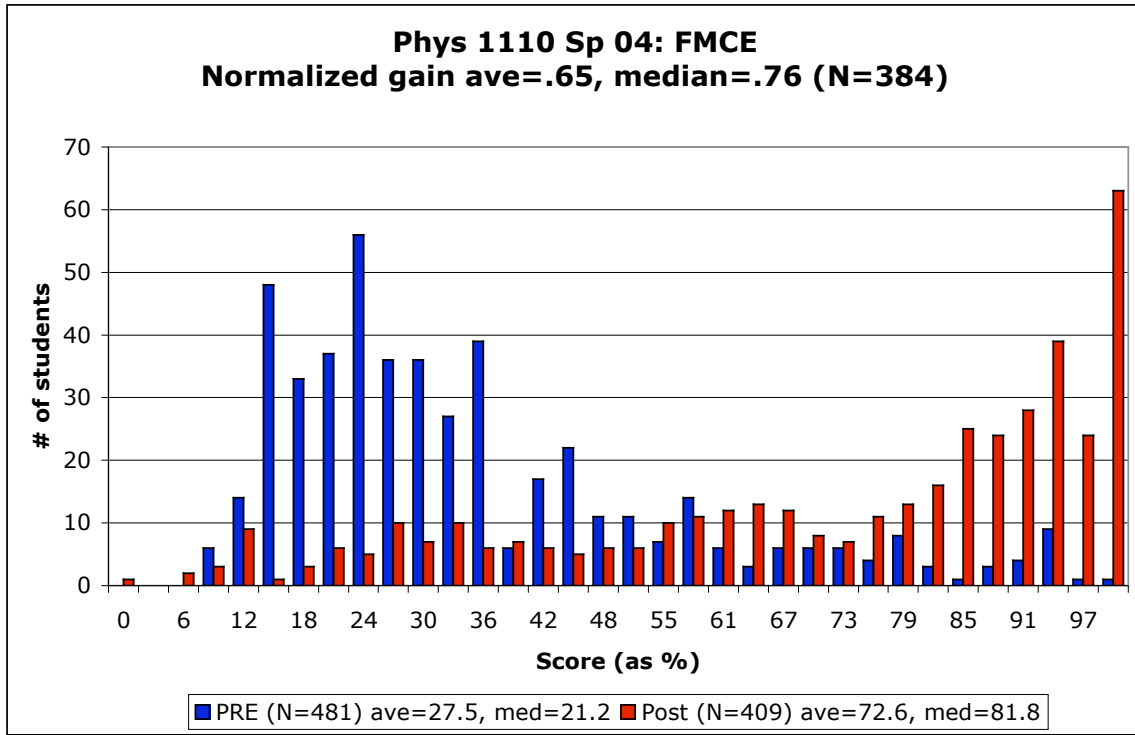


Data collected with SALG: Student Assessment of Learning Gains:

<http://www.wcer.wisc.edu/salgains>

Learning gains Phys 1110 Sp '04: Force and Motion Conceptual Exam.

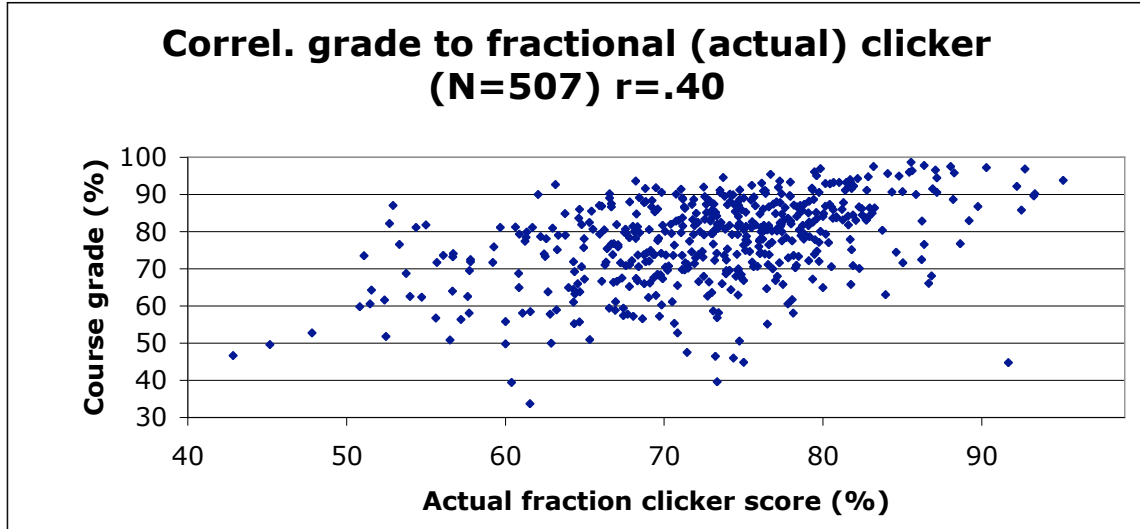
R.K. Thornton and D.R. Sokoloff, "Assessing student learning of Newton's laws: The Force and Motion Conceptual Evaluation," *Am. J. Phys.* 66(4), 228-351 (1998).



Impact of clickers:

1110 Sp '04: Average lecture attendance $\approx 80\%$

Correlation of actual clicker score (not counting absences) to course grade:



Student perceptions of value: ("Concept tests" = "clicker questions", the highest peak in "Very much help" category).

