Learning gains Phys 1110 Fa '03: Force Concept Inventory.

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

FCI: Phys 1110 Fa '03
(ave gain = .62, median=.67, N=394)
Impact of clickers:

1110 Fall '03: Average lecture attendance ≈80%
Correlation of course grade to clicker score:

![Graph showing the correlation between clicker score and course grade](image_url)

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

![Bar chart showing the learning value of class activities](image_url)

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.


**Phys 1110 Sp 04: FMCE**

Normalized gain ave=.65, median=.76 (N=384)

<table>
<thead>
<tr>
<th>Score (as %)</th>
<th># of students</th>
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<td>0-6</td>
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<td>6-12</td>
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PRE (N=481) ave=27.5, med=21.2  Post (N=409) ave=72.6, med=81.8
Impact of clickers:

1110 Sp '04: Average lecture attendance ≈80%

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

![Correlation graph](image)

Correl. grade to fractional (actual) clicker
(N=507) r=.40

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

![Perceptions graph](image)