

The right moves?

How student feedback informs faculty teaching decisions

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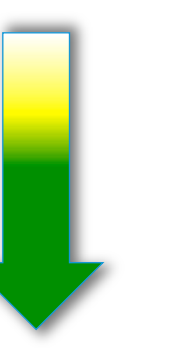
*Collaborations in Discipline-based Education Research (CiDER)

RESEARCH QUESTIONS:

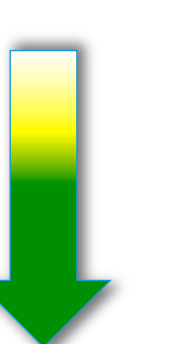
How does feedback from students influence instructor's pedagogical decisions in the classroom and to what extent are student's concern reflective of the learning that occurs in the classroom?

To what extent do students' rating of instruction correlate with normalized gains on a conceptual survey and pass rates for the course?

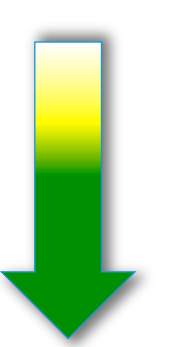
Faculty attend NFW



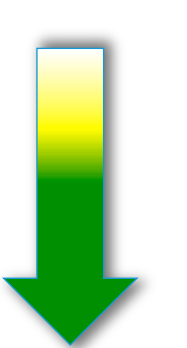
Invited to participate



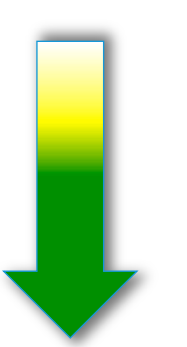
Pre-course interview & assessment



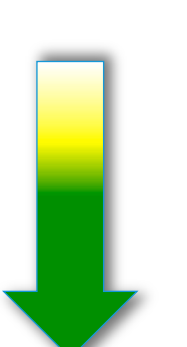
Teach Classes starting Fall 10



Post-course interview & assessment



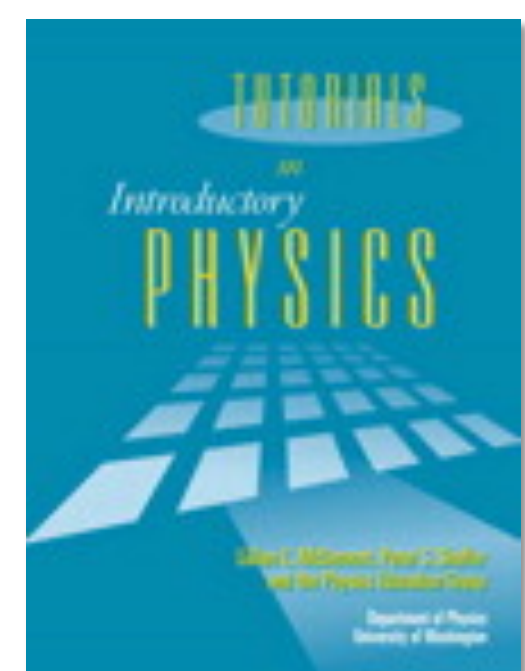
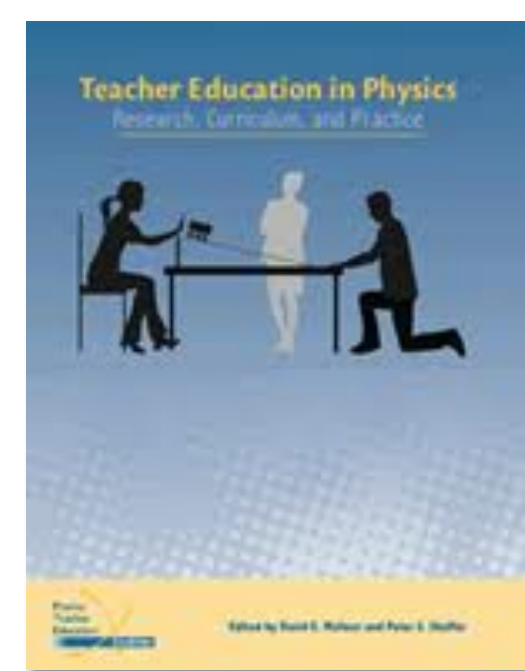
Repeat over several semesters ending in Spring 13



Analysis of data

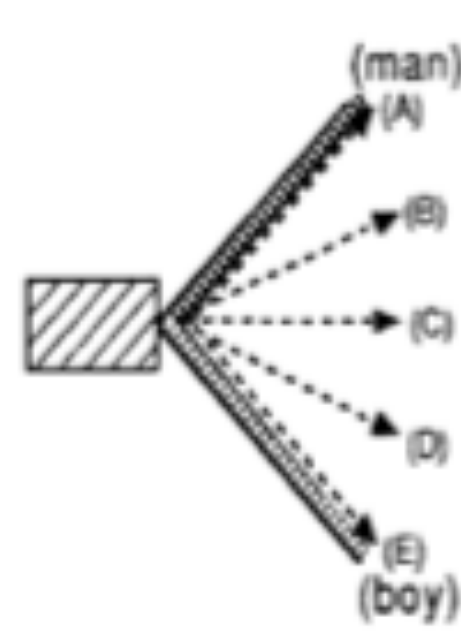
New Faculty Workshop

- Created to improve the quality of physics teaching on a national scale, supported by the American Association of Physics Teachers (AAPT).
- Each workshop presents research-based pedagogical techniques that can be implemented with minimal time and effort have proven to be effective in a variety of educational environments.
- Participants are flown to Washington for three days and often funded by their home departments



Students' rating of instruction ...often the only measure of "Instructor Quality"

Two people, a large man and a boy, are pulling as hard as they can on two ropes attached to a crate as illustrated in the diagram below. Which of the indicated paths(A-E) would most likely correspond to the path of the crate as they pull it along?



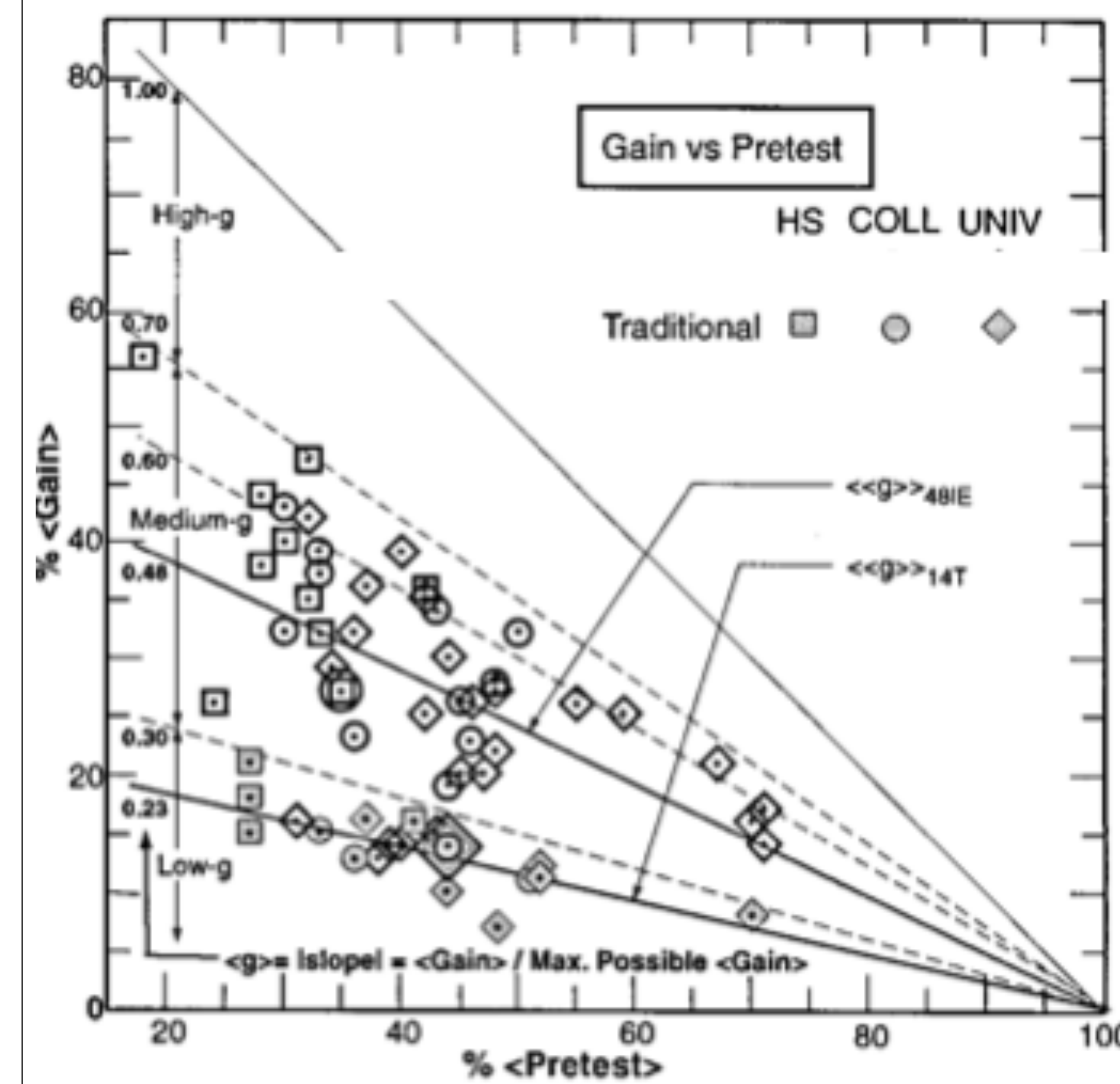
Force Concept Inventory

- 30 question MC survey
- Valid and Reliable
- Used before and after all instruction to measure gains

Hestenes, David, Malcolm Wells, and Gregg Swackhamer. "Force Concept Inventory." *The Physics Teacher* 30.3 (1992): 141.

Normalized Gains

$$g = \frac{\langle post \rangle - \langle pre \rangle}{100 - \langle pre \rangle}$$



Traditional Instruction $\langle g \rangle = .23$

Interactive Engagement Instruction $\langle g \rangle = .48$

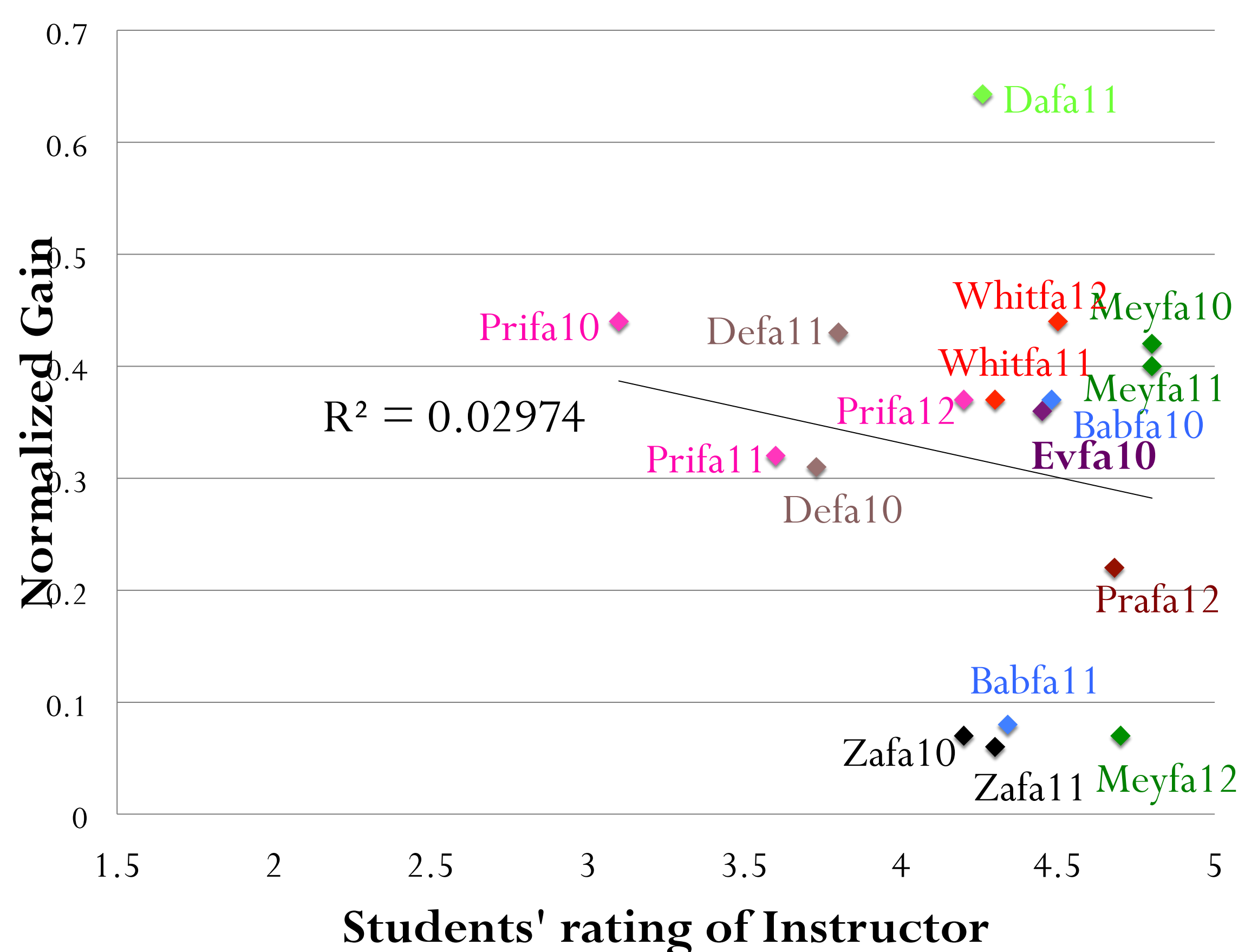
Hake, Richard R. "Interactive-engagement versus Traditional Methods: A Six-thousand-student Survey of Mechanics Test Data for Introductory Physics Courses." *American Journal of Physics* 66.1 (1998): 64-74.

Participating faculty

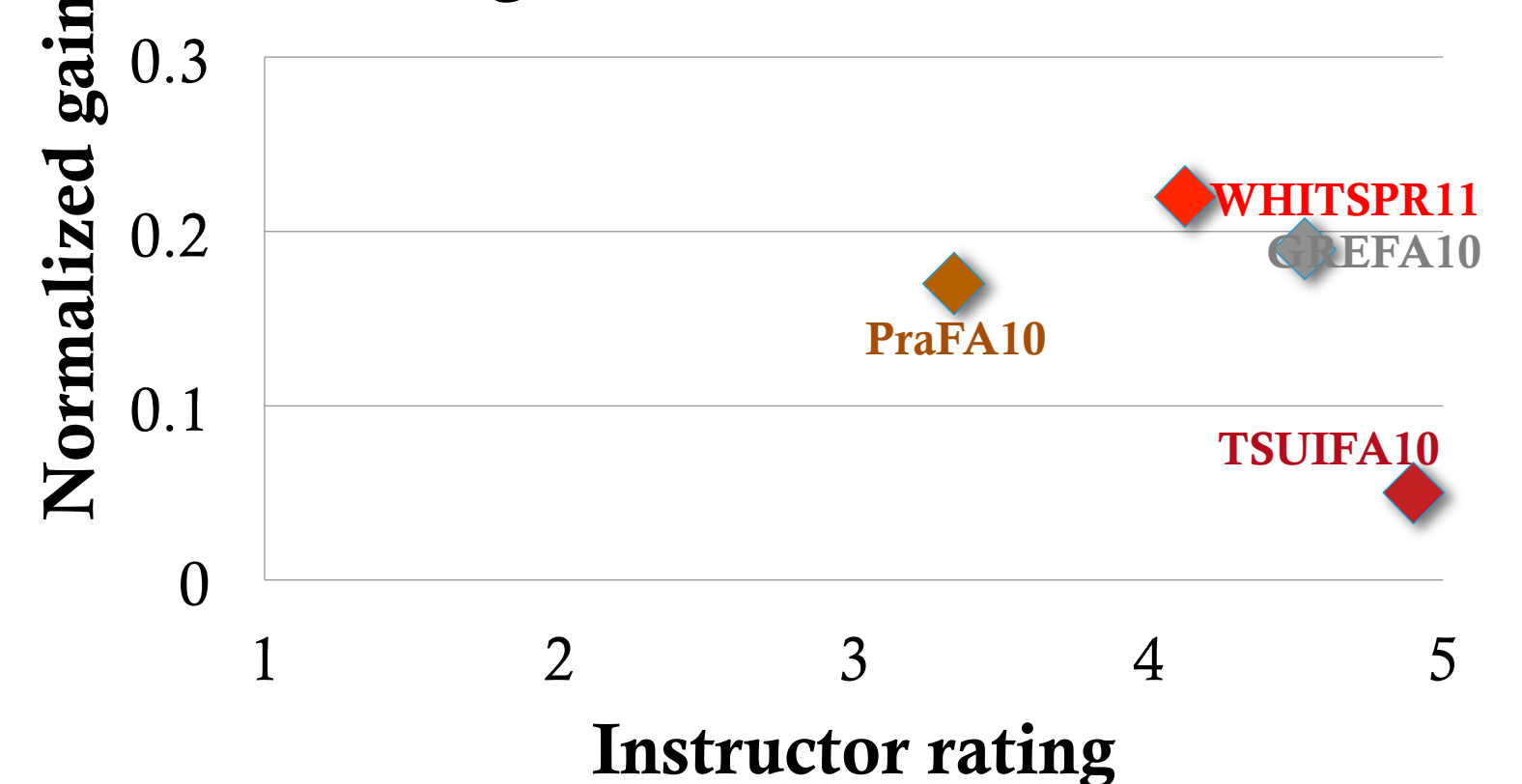
- Were petitioned to participate at NFW
- 14 total faculty participated
- Selected their own conceptual survey
- 9 total faculty used the Force Concept Inventory



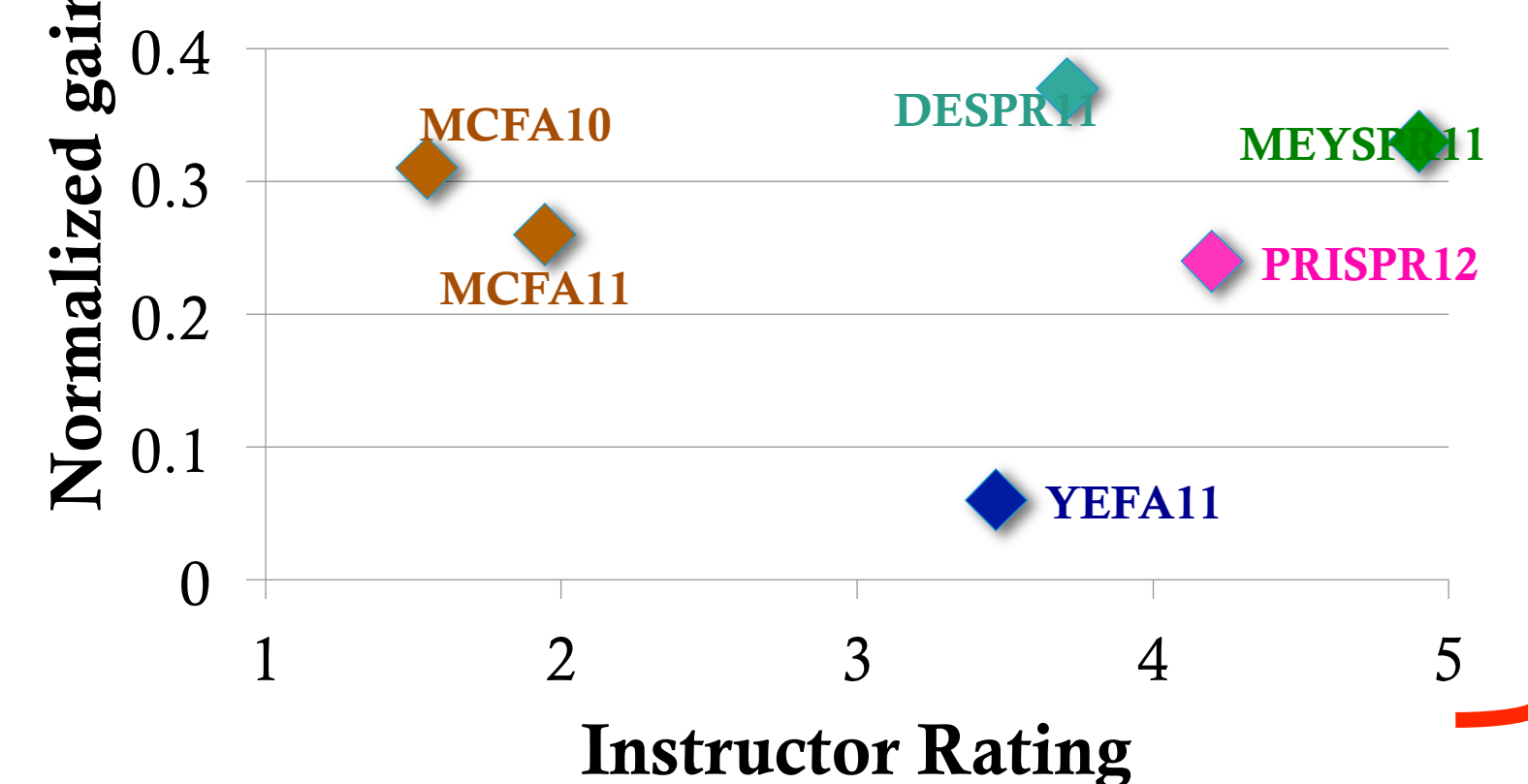
Instructor ratings vs. normalized gains on FCI over semesters and instructors



Instructor ratings vs. normalized gains on BEMA



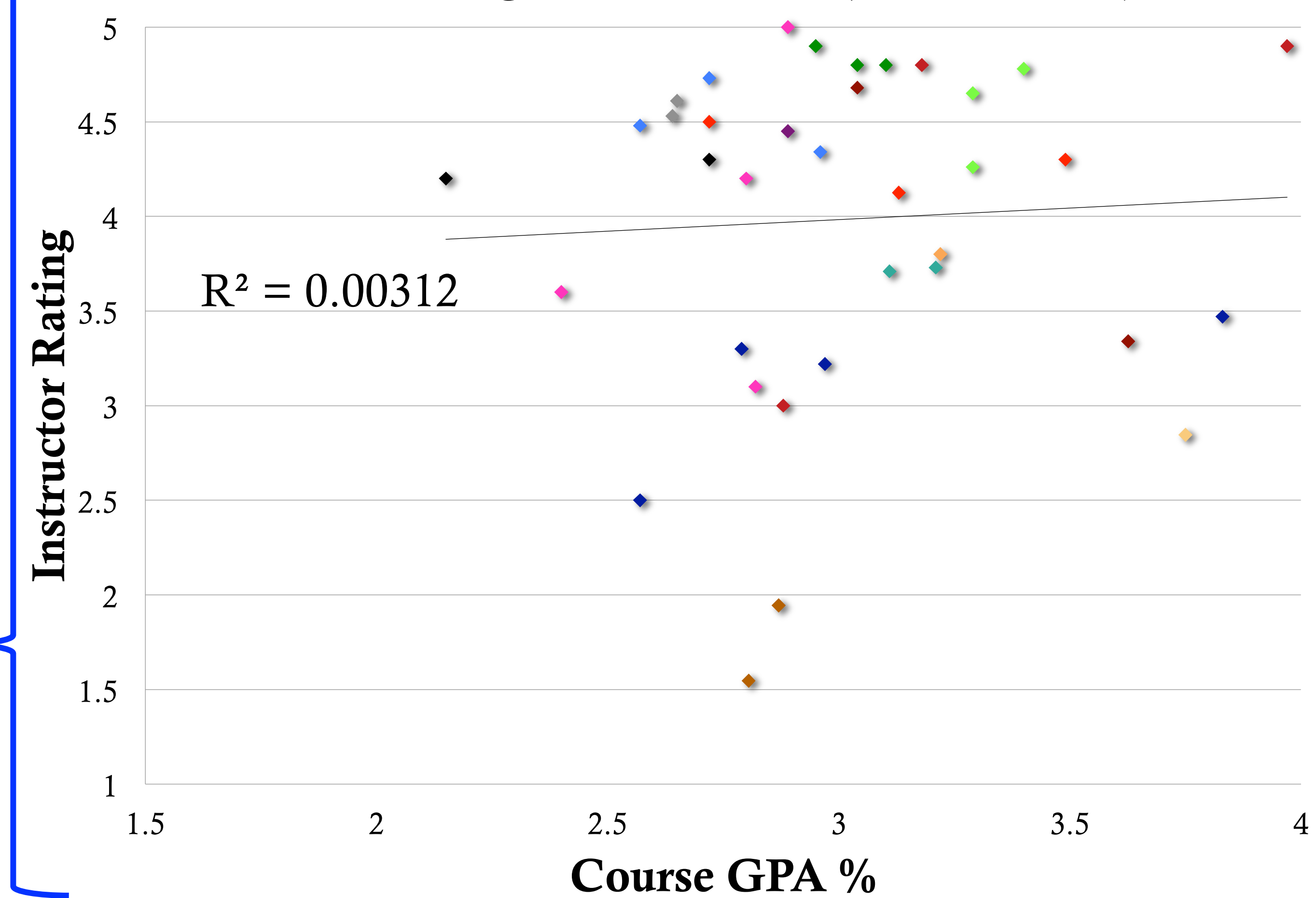
Instructor rating vs. normalized gains on CSEM



Some faculty chose other surveys, i.e., Brief Electricity and Magnetism Assessment (BEMA) and Conceptual Survey in Electricity and Magnetism (CSEM), and they, similarly, yield no clear trends.

These data represent all faculty ($N = 14$) over all semesters ($N = 37$). GPA calculated as a weighted average of course performance

Instructor rating vs. Class GPA (All semesters)



Conclusions

- Although correlations between "conceptual learning" and instructor ratings are implicit in Hake's graph. The results in this sample explicitly suggests there is no correlation.
- In addition, it was hypothesized that there may be a correlation between instructor's ratings and course pass rates however in this sample no correlation was shown.

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