Show Me the Data

. . . on what our students are learning

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A Department Head's Confession

Most annual faculty reviews I write contain a passage like this:

Department of Statistics

Faculty Performance Review – 2015

Employee Information		
Name: **XXXXXX**	Date:	**May 2, 2016**
Job Title: **XXXXXX**		

Major Activities

Instruction and related activities: In the fall semester of 2015, XXXXXXX taught XXXXXXX, as well as XXXXXXX. His average SRTE scores for "overall quality of instructor" were 6.82 and 5.85 out of 7.00, respectively. He also gave

*NB: "SRTE" = Student Ratings of Teaching Effectiveness

With thanks to Angela Linse at Penn State...

Student ratings are just a single source of information about things we actually care about in a teaching context.

- Student ratings aren't going away.
- (but) Student ratings aren't measures of student learning.
- (and) Student ratings aren't faculty evaluations.

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I hope the stats community will continue to develop other sources!

GOALS* and others: One way to assess overall objectives

- *GOALS: Goals & Outcomes Associated w/ Learning Stats.

  (Garfield, delMas, Zieffler, and Pearl, NSF grants DUE-1044812 & 1043141)

- Overall national average: 47%
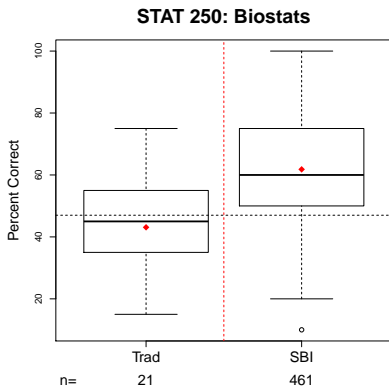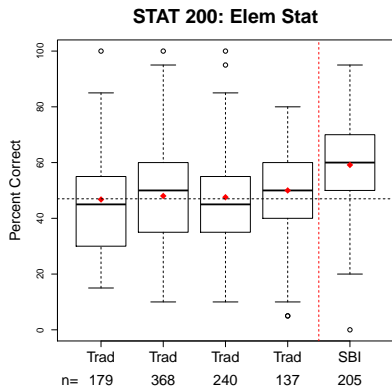
Trad: Traditional approach   SBI: Simulation-based inference

Thanks to Daisy Philtron, Kari Lock Morgan, Pat Buchanan, Bruce Lord, and Jenny Shook for these data.

A bit more effort: Assess individual learning objectives

- Data from bank of final exam test questions
- Red: Significant at $\alpha = 0.05$; Gray: Significant at $\alpha = 0.01$

Question differences, same instructor
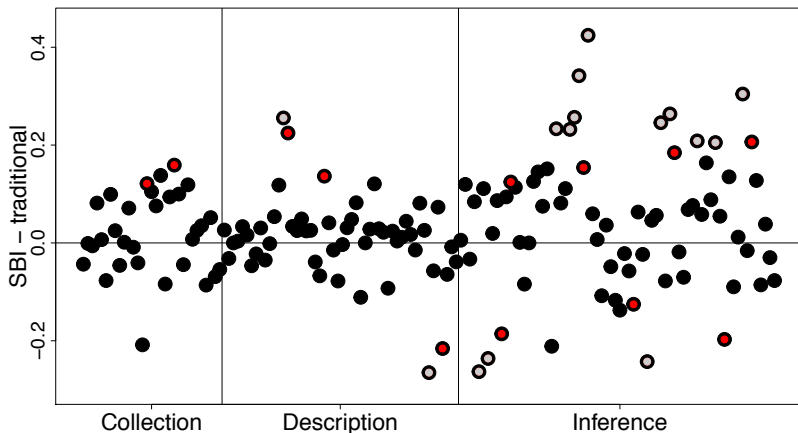
Guidelines for evidence-based statistics education?

- Establish what students should learn.
- Scientifically measure what students are actually learning.
- Adapt instructional methods and curriculum and incorporate effective use of technology and pedagogical research to achieve desired learning outcomes.
- Disseminate and adopt what works.

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Disclaimer: I blatantly stole this list from the Carl Wieman[*] Science Education Initiative website.

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I'd say that item #2 is the one where we statisticians could use the most improvement.

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