

Mid-Semester Active Learning Intervention In A Large Lecture

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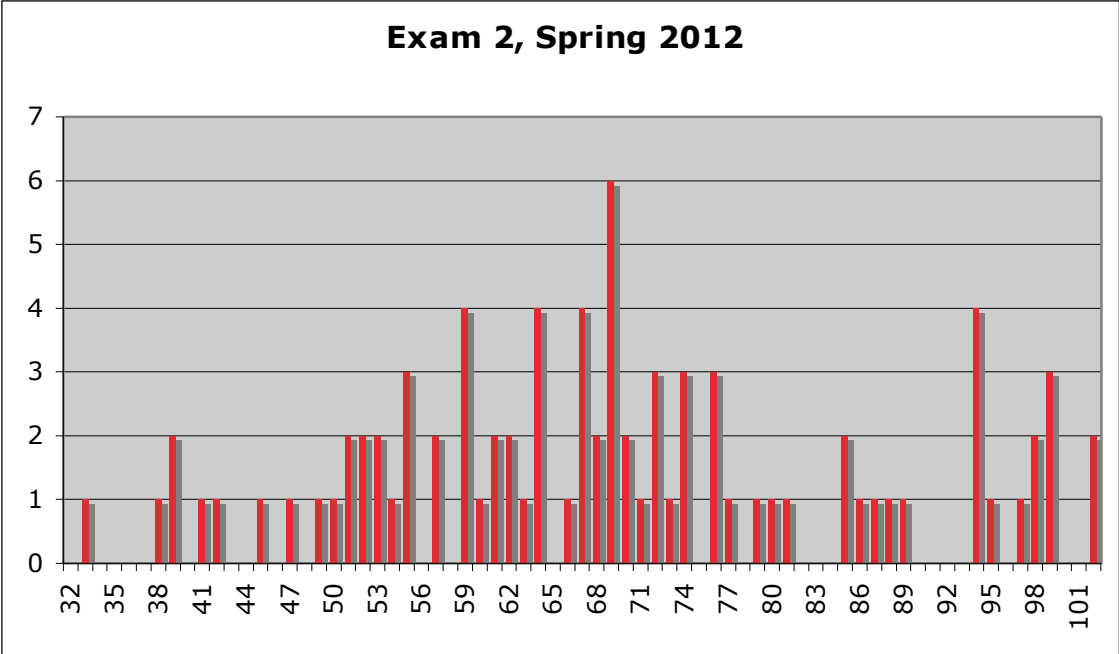
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Organic Chemistry Is....

- required for many pre-health majors
- taken by mostly non-majors
- dreaded by many students
- at 7:45 a.m. (in spring)

What Do You Do....

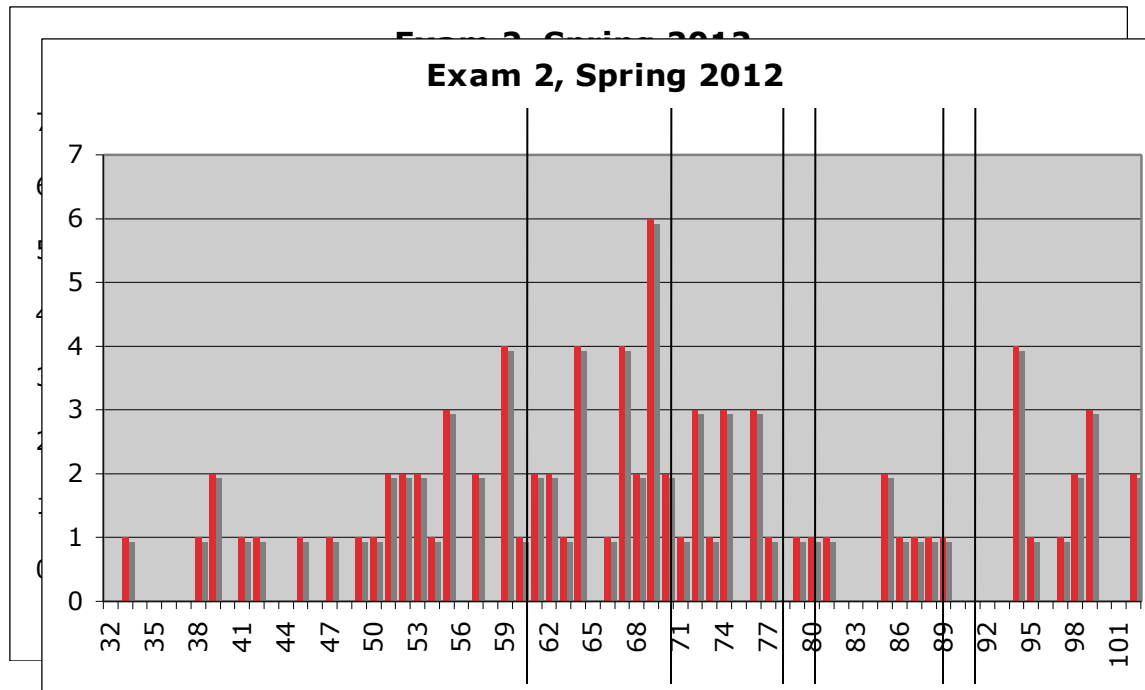
....when the wheels fall off?



What Do You Do....

....when the wheels fall off?

49%
D's & F's!



14% A's

Some possible diagnoses, and responses

“It’s my fault.”	TEACH HARDER!
“It’s their fault.”	Take no prisoners.
“Learning style mismatch?”	Try something - ANYTHING - but try something.

“Teach harder”how’s that work?

It’s a LOT of work:

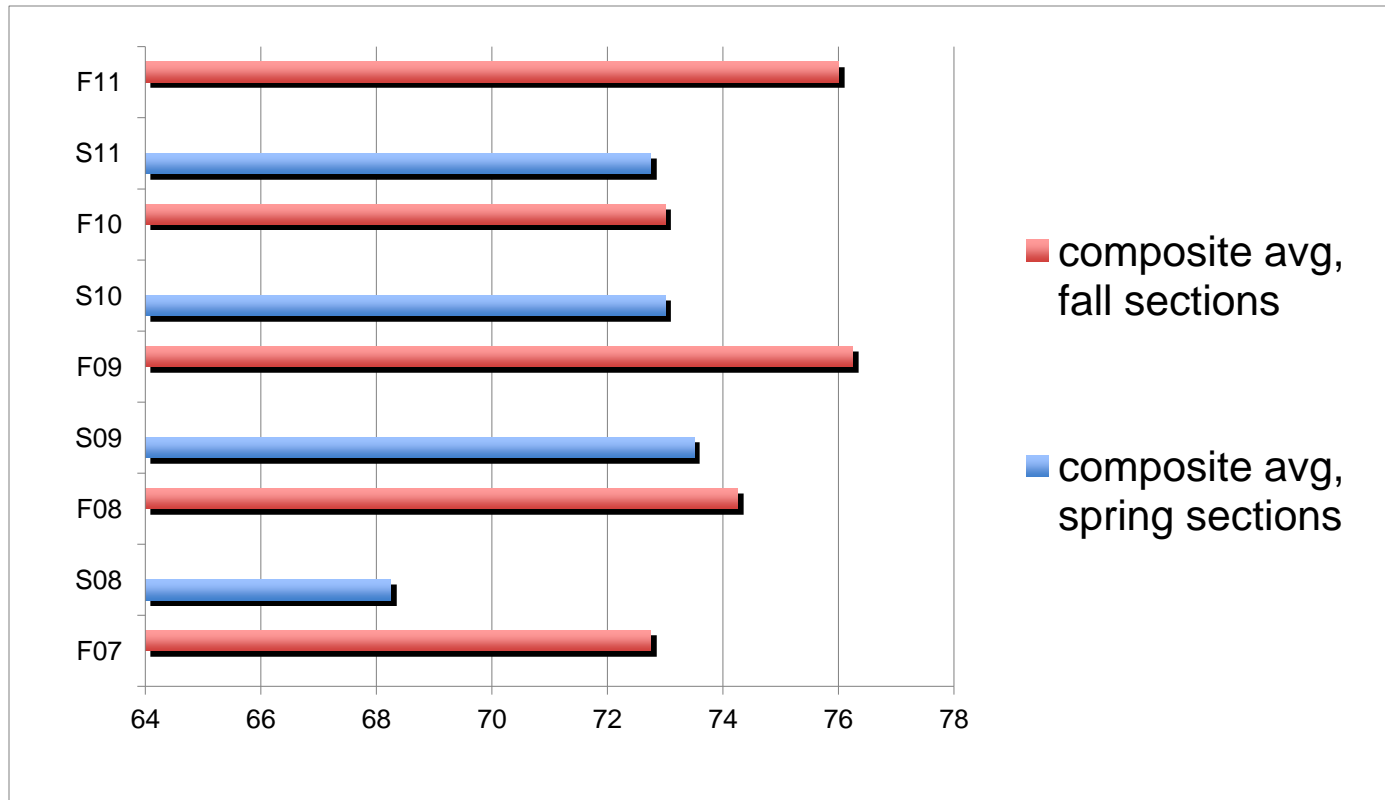
- more examples
- done more slowly
- less material gets covered

What about, “It’s their fault.”?

Welcome to “the trailer section” phenomenon!

- Students take CHM303 in fall of their sophomore year, unless they
 - ❖ had to retake a semester of chemistry
 - ❖ needed remedial math
- A percentage of *spring* CHM303 students are KNOWN to be weaker in chemistry: we see it *every semester*

The “trailer section” phenomenon



Now, what about “learning styles?”

My hypothesis: the trailer section contains more students who take accurate notes in lecture, but *without engagement*.

To test this, require them to engage:

stop lecturing.

Stop lecturing? Scary...

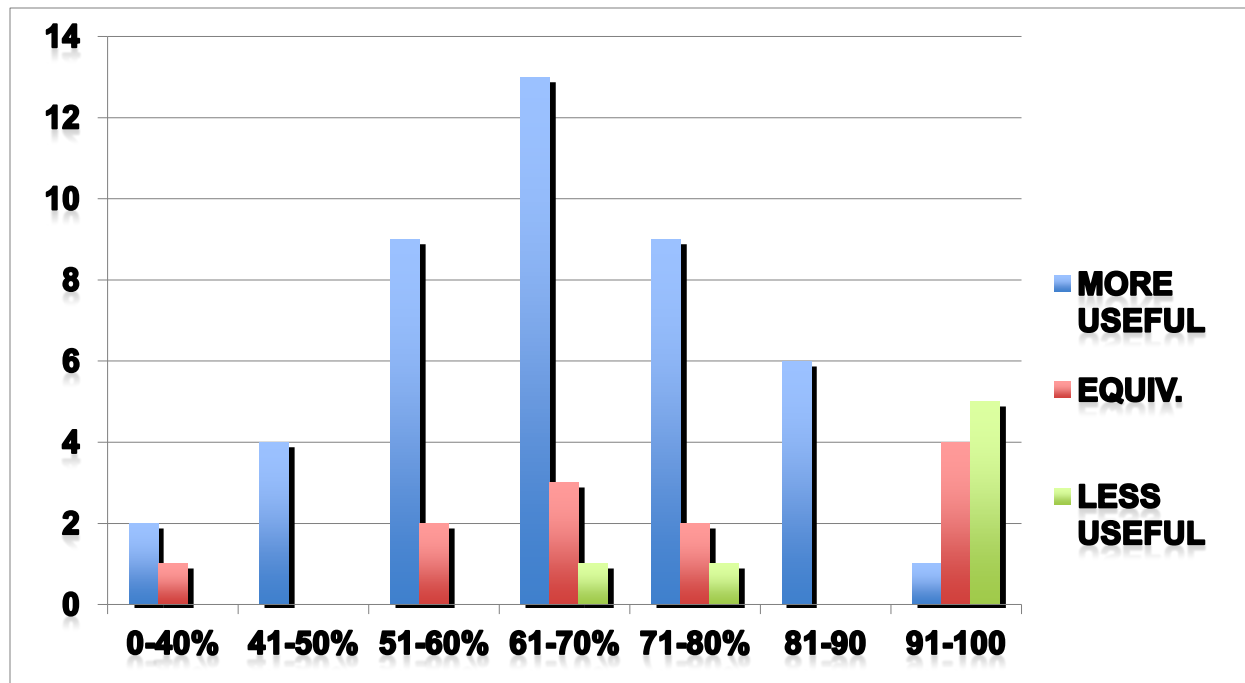
But necessary for the following experiment:

Have students *reason out* new reaction mechanisms, *by analogy* to prior mechanisms.

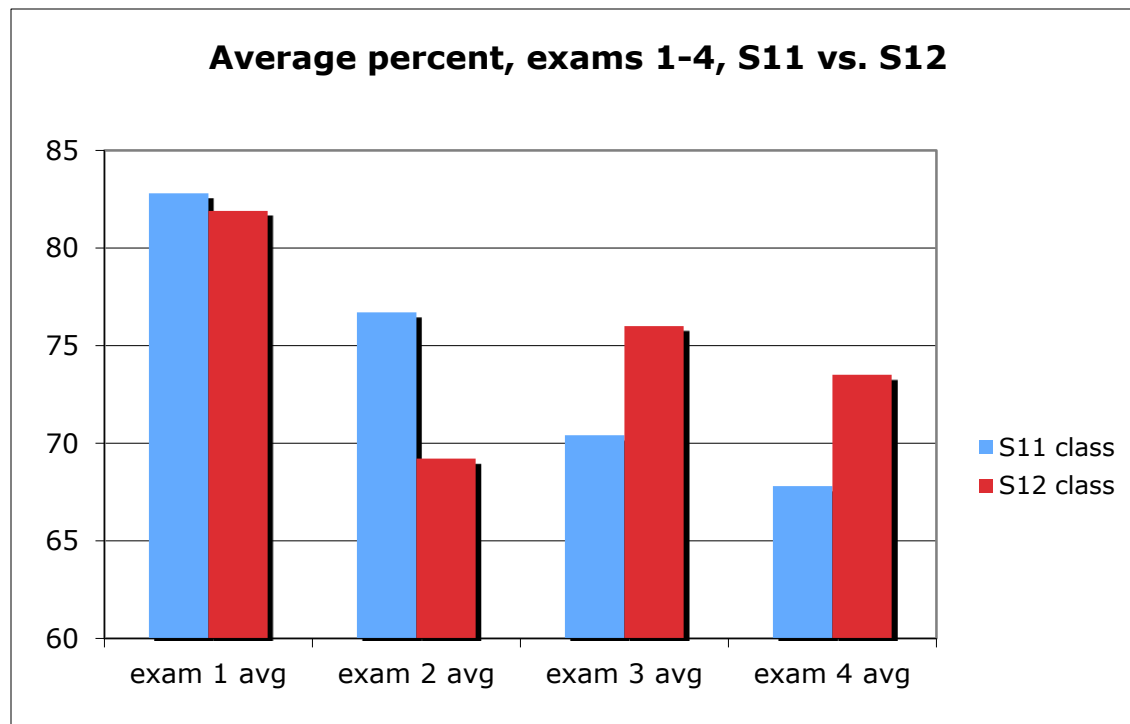
Will THIS help them better internalize the concepts used in organic chemistry?

Results #1: Student perspective

I asked them to rate the method compared to regular lecture. I cross-referenced the rating to their exam 2 score. The weakest students liked the new method best!

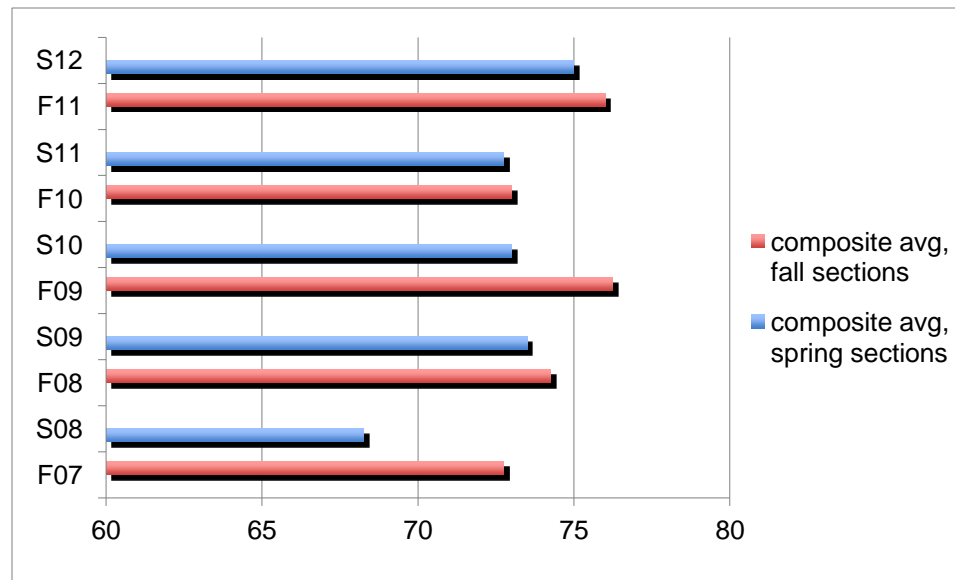


Results #2: Follow-on exam scores (comparison to prior spring's class)



Results #3: Mitigation of “trailer” phenomenon!

This section had the strongest aggregate exam score of any spring section I’ve ever taught; the aggregate included the weak second exam.



Conclusions

- *Compelled* engagement by active learning works to improve student comprehension 😊
- Results suggest a more significant impact on students who do worst in standard lecture
- Active learning in large lectures can be used strategically, and cause a “halo” effect on material not covered with active learning
- Active learning is adaptable to organic chemistry!