

UBC Biology Classroom Observation Study

CWSEI Life Sciences STLFs:

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And thanks to Trish Schulte, Martha Mullally,
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From our presentation at last year's biology teaching retreat...

Refining what works: active learning in practice

Our Upcoming Research Questions:

1. Do different active learning techniques contribute more to student learning than others?
2. Is more always better?

Approach and Tools

Classroom activity

Tool: COPUS class observations

Objective characterization of classroom practices, over 2-minuted intervals.



For each class section, observed a typical week of class time (~3 hours).

Readout:

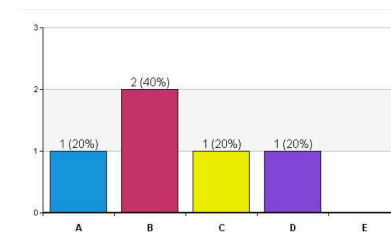
% of 2-minute intervals where a given activity takes place.

Student Performance

Tool: Concept diagnostics

Multiple choice tests, aligned to each course & developed with instructor feedback.

Deployed at start & end of semester.



Readout:

Average normalized learning change (matched students).

Scope

Three semesters of data;
33 lecture sections in 17 biology classes.

Course Year	# course sections
1	13
2	9
3	5
4	6

Diagnostic questions compiled/developed for each class.
(~200-300 questions, depending on how you count)

**Diagnostic feedback & data collection done
with lots of instructor support. Thank you!**

Breadth of teaching practices in biology

As a percentage of 2-minute intervals during class, instructor is...

Giving lecture

Guiding whole group

Facilitating student work

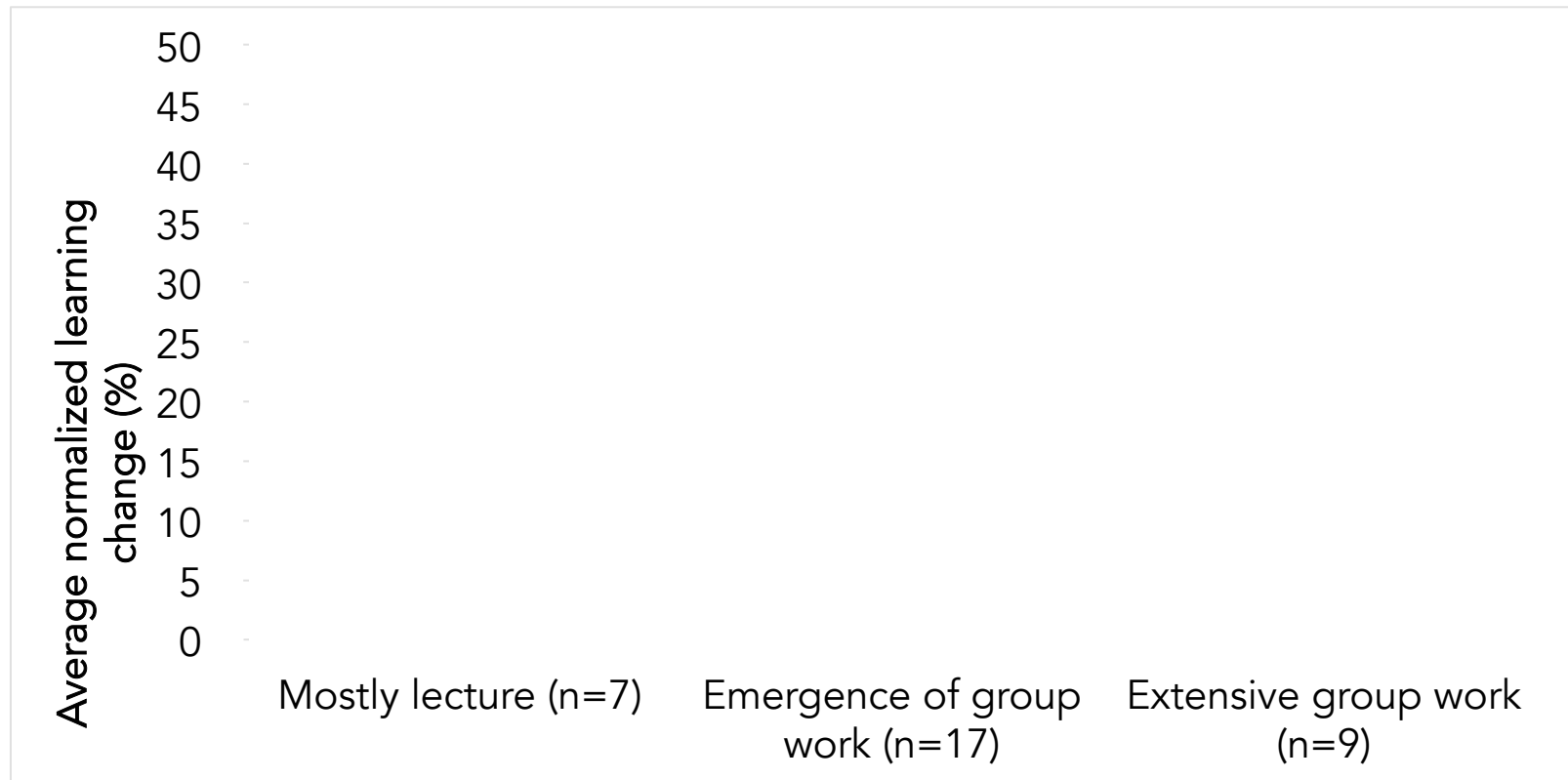
Admin/other

(e.g. Q&A with whole group,
providing feedback on clicker...)

(e.g. moving through the group
during peer discussion...)



Clustering classes & measuring learning changes



Cluster analysis done as in Lund et al (2015) and from personal discussions with Marilyn Stains

Normalized change for a given student:
for gains: $(\text{Post} - \text{Pre}) / (100 - \text{Pre})$
or, for decreases: $(\text{Post} - \text{Pre}) / (\text{Pre})$
(Marx & Cummings 2007)

Large classes: specific practices and learning gains

Class level	# sections	Section size (+/-SD)	% sections using groupwork
Years 1&2	22	242 +/- 48	100%
Years 3&4	11	99 +/- 88	64%

100% using clickers
41% using worksheets
91% using other (e.g. discussion Qs)

Using the 1st/2nd year data:

Use of worksheets, in particular, supports student learning



Next steps...

- Further analysis... lots!
- Collect diagnostic data in the fall, on the same courses after some changes?
- Departmental outreach ongoing – workshops in the fall and beyond
- Continuing 'field notes' on our blog (<http://ls-cwsei.biology.ubc.ca/>)