Comparing Student, Instructor & Observer Data to Assess a 7-Year Department-wide Education Initiative
Improving University Teaching – July 23–25 2014, University of British Columbia, Vancouver
http://eos.ubc.ca/research/cwse/ Contact jfjones@eos.ubc.ca

Background, context and the data sets

EoS-EI: Earth & Ocean Sciences – Science Education Initiative* 

* 7 years support from the Canada Research Chairs Education Initiative (DRI/ESF)

22 courses “transformed”;
79% faculty participation rate;
6 STU*, 2 for 7 years;
25 grad. / 10-grad. contributors;
9 publications, ~40 presentations, ~ many workshops.

*STU=Science Teaching and Learning Fellows (education support). See ref. 5.

Stakeholders

Who Data (Measures of impact)

Students

- Measures of learning
- SEL: Perceptions of learning experiences

Instructors

- TPI; teaching practices inventory
- Evaluations, interviews and focus groups

Teaching assist’s

- Contributions to development

Dept’s / Faculty / UBC

- Changes in programs & management

SelT and KELP (eg. STU’s)

- Research project output
- Contributions to DIBER and development

Data sets

Data When

Students

SLES
• Fall 2013, Spring 2014
• 2600-5000 students
• 57/63 ESQ courses
• Including Workshops & Enthusiast 0 of 2014

Class size • Various prior to SLES
• Same as SLES in 2013/14

Instructors

TPI
• 2006/7 & 2012/13
• 40 courses in both years
• 60 TPI

• 2007/8
- 22 courses (pre-COPUS)
- 30 courses; 24 instructors

Observations COPUS
• Spring/Fall 2012
• Fall 2013
• 29 instructors

Summary and directions

All three perspectives independently suggest increased use and student appreciation of active classroom strategies.

Student perceptions identify what they see as motivational and worthy of effort.

Instructor perceptions of their teaching practices indicate increased use of research-based teaching practices across the years.

Classroom observations give objective insight about student & instructor actions during classes, and enable opportunities for instructors to engage with colleagues & support staff to communicate about teaching.

These rich datasets also yield a wealth of other aggregate and specific information.

Next – complete data sets need mining for insight about individual course needs and those of the department, curricula and students.

Next – these data sets provide rich baseline information to help with evaluation of ongoing and future innovations.

Next – work with instructors on specific improvements identified by lower helpfulness scores (eg. click discussions, feedback on homework).

References


FRANCIS JONES, BRETT GILLIEY AND SARA HARRIS EOS-EI: Earth & Ocean Sciences – Science Education Initiative, UBC, Vancouver, BC.

STUDENT PERSPECTIVES: Student Learning Experiences Survey = SLES

Purpose relates to motivation… hence… “Which teaching/learning strategies will students respond to productively?”

Data = survey asks about 4 types of experiences:

1. Info: provided (Q1 & 2), classroom strategies (13 qns) 3. homework & feedback (18 qns) 4. workload/enthusiasm

Multiple choice questions use a 5-point Likert scale based loosely on Seymore et al. 2007

• STU* = Science Teaching and Learning Fellowship (education support). See ref. 5.

Some learning experiences students found “extremely very or extremely useful.”

Do students perceive courses with RBS interventions as more helpful than those without?

• Classroom practices: see the greatest distinction between “X”, “C”, “I”, and “W” courses.

Impacts on 4th year (senior) classes are less distinct.

Classroom strategies:

How does perceived helpfulness of active strategies relate to intervention type?

• Over ¾ of respondents said extremely or very helpful in most courses with “X” & “C” interventions. ¾ of respondents said extremely or very helpful in 60-70% of “I”, “T”, & “W” year courses.

• 4th-year courses are variable, smaller, more “expert-like”, and more hands-on.

Classroom strategies as: Average “helpfulness” score per class:

Table 1: Average “helpfulness” score per class

<table>
<thead>
<tr>
<th>Strategy</th>
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</tr>
</thead>
<tbody>
<tr>
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Information provided:

Teachback was not well-used in most (although not all) courses.

• Instructor’s lecture notes: most important source for most students.

• Are instructors spending too much time creating notes & content?

Learning goals

Course goals are low or high helpfulness scores for learning goals. With no intervention goals were less useful.

Homework and feedback

Online notes: Helpfulness pattern is very similar to “active classes” by intervention and year (above).

• More students studying MORE helpful than SLES, studying in 11 of 54 courses; mostly courses that encourage group work.

• Students: 50% of respondents say they are extremely or very helpful in 19 of 54 courses.

• Feedback on preliminary work: 80% say is extremely or very helpful in 17 of 54 courses.

• Homework was surprisingly “low” endorsement overall. (No area worth improving)

Workloads and enthusiasm

Question: “Compare this course to other course you take.” Answered by >2600 students taking EOSA courses.

Enthusiasm for EOSA courses fairly “negative” (negative = less enthusiasm).

High workload + Low enthusiasm may suggest de-motivated students.

Active strategies are prominent in “I”, “T”, and “W”, 2nd, 3rd year courses.

Correlating TPI and SLES w.r.t. active classes (42 courses)

• Students in most courses say active classes are ‘helpful’.

• Activity observed in these classes average 59% of 2-min intervals (i.e. 24%).

• Low SLES “active class” helpfulness correlates with low COPUS score.

• No high COPUS score with low SLES scores; i.e. No “active classes” observed that students said were “NOT helpful”.

INSET = EOS-EI: Earth & Ocean Sciences – Science Education Initiative, UBC, Vancouver, BC.

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Analytical

Internal consistency: related questions, paired course sections; compare science/engineering students (figure 4-). For each question: helpfulness score = Percentage of students saying extremely or very helpful

Rank experiences in order of “most helpful”… Discuss results with each instructor.

Comparative impacts of 4 intervention types:

• RBS** introduced during a full 2-year course transformation project
• RBS improved by consulting with STU*.
• RBS changes made largely by the instructor alone (after working with STU*).
• Flabbily little or no RB introduced.

Processing: sorting, ranking, correlating, plotting

* Science Teaching and Learning Fellowship (education support). See ref. 5.
** RBS = Research Based Instructional Strategies.

Actionable

Taking the survey helped me adjust teaching strategies in my own classes.

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