

Student performance after in-class activities in a large EOSC course

EOS-SEI – S. Harris & EOSC 310 students.

Looking for a way to break up the lecture?

Consider focused in-class activities

Are in-class activities effective?

Is it worth the class time?

If performance on high stakes exams is a useful indicator, the answers are **YES**¹. EOSC 310 implemented a 5-10 minute engaging, low-stakes activity, linked to a learning goal, during each class period in spring term 2008. Students who participated in >75% of in-class activities scored on average 9-10% higher on exams than those who participated <75% of the time (Figure 1; p-values <<0.001). Student written responses to activities also revealed misconceptions previously unknown to the instructor.

Tips for implementation:

- Use activities that get students to engage with something you consider important, and test the same concepts on high-stakes exams.** Students who participated in particular activities did significantly better (p-values <<0.001) on exam questions that tested the same concepts than those who did not participate, even though all activities were posted on-line for anyone to study (Figure 2: Results from a stratigraphy question).
- Use activities regularly.** Particularly if you're going to assign participation marks for activities, do them on a regular basis, so students know what to expect.
- Have students turn in something written** as a "product" showing their thinking. Read enough of their responses to get an idea of common misconceptions. Index cards work well.
- Resources for activity ideas.** There are many ideas out there, so you don't need to invent everything from scratch. One good resource to search is http://serc.carleton.edu/teachearth/search_activities.html

Here's what students had to say about it:

"I liked how the exam integrated in-class activities, it makes it worth-while to be in class for not only the participation marks then but also for answering the exam."

"I really liked that a lot of the material tested was taught in class and required understanding and interpretation rather than just straight memorization out of the text."

"I wish all my classes did this."

[...OK, OK, I highgraded the comments. They run ~4:1 positive:negative. Contact me for full survey data.]

¹ Disclaimer: These data are not from a controlled experiment. Maybe you're thinking the students who participated in activities might have done better on exams for some other reason... Yes, further analysis is needed. For evidence that interactive engagement techniques improve student learning, see, e.g. Hake, 1998. Amer. J. Phys., 66 (1), 64-74.

Figure 1: EOSC 310 Participation and Exam Scores
n = 103 for >75% particip., n = 84 (85) for <75% particip. for midterm (final)

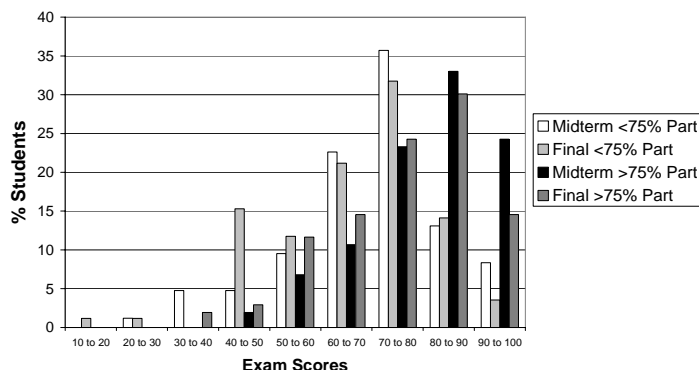
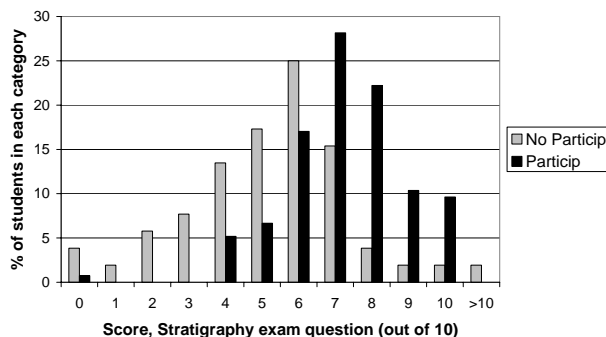


Figure 2: EOSC 310 Midterm question, stratigraphy
n = 135 for participation, n = 52 for no participation



What's happening...

Fall term targeted courses:

111, 112, 114, 210, 212, 220

TA training:

Encourage your grad students to take this 2-credit directed study!

Student attitudes survey:

Interested in having your students take part?

Curriculum discussions are coming up soon!

For paired activities, exam questions, survey questions and responses from EOSC 310, contact sharris@eos.ubc.ca.

Contact EOS-SEI: If you're interested in talking about your course(s) or teaching and learning in general, feel free to drop by EOS-South 361 or contact Francis Jones (fjones@eos.ubc.ca), Brett Gilley (bgilley@eos.ubc.ca), Ben Kennedy (bkennedy@eos.ubc.ca), Erin Lane (elane@eos.ubc.ca) or Sara Harris (sharris@eos.ubc.ca).

For more faculty resources and information, see <http://www.eos.ubc.ca/research/cwsei/>.