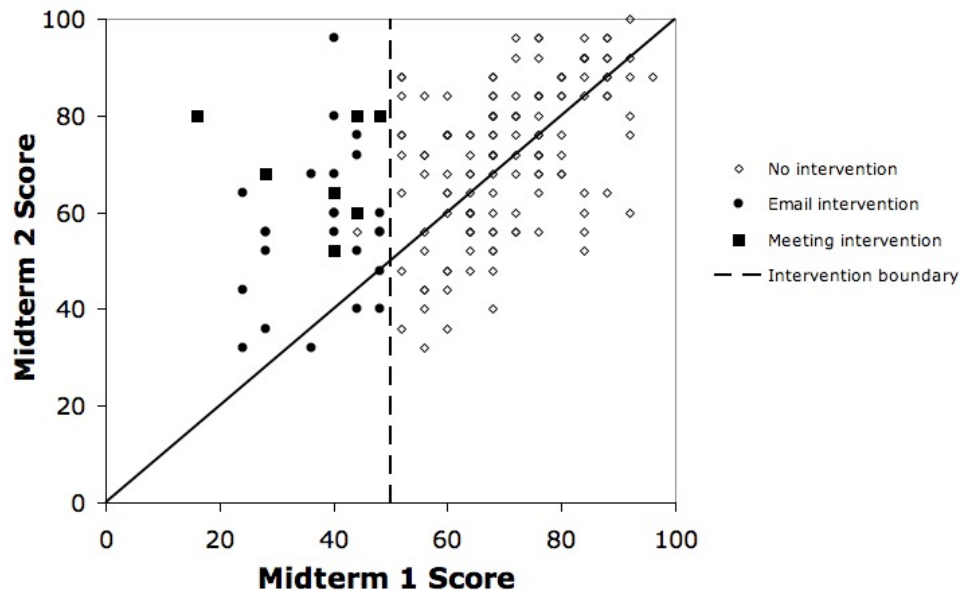


Students don't know how to study. So train them.

You expect your students to know how to study. You hear "I studied SO hard for this, but failed". Did these students spend their time how you would have spent yours? Likely not. Can they learn from you how to study effectively for your class? Yes.

In EOSC 112, we have "intervened" with failing students for two years now, particularly with those who report spending more time studying than the class median. The point is to help students learn how to spend their study time effectively. Here's what happened in Fall 2009:

- ALL students had access to a document with study advice (see next page).
- Students who met with us to talk about study tactics ALL passed Midterm 2, after failing Midterm 1.
- Students who merely received an email from us, with study tactics, did far better on M2 than on M1.
- Students who did not receive any intervention did about the same on both midterms.



Are they spending more time, or spending their time more effectively?

We think the latter. Students we met with slightly decreased their study time for M2, while dramatically increasing their scores. Neither scores nor study time changed for non-intervention students.

This year (Fall 2010), we expanded this effort to test whether a meeting about "content" was a more, less, or equally effective intervention compared to a meeting about "study skills". Among students who studied more time than the class median yet failed M1:

- Those with whom we discussed **content** increased their study time for M2 by 23% over M1.
- Those with whom we discussed **study skills** slightly decreased their study time.
- The two groups made identical gains on M2 compared to M1 scores.

CONCLUSIONS:

- **STUDENTS CAN LEARN TO STUDY MORE EFFECTIVELY, WITH A LITTLE HELP.**
- **INTERVENTIONS TARGETING STUDY SKILLS APPEAR TO INCREASE EFFICIENCY.**

Helping students learn to study is pretty easy. Write down what you think students should DO in order to study effectively for your course. An "intervention" can be as easy as an email to failing students, reminding them of this (written) advice, or it can be a short meeting with the particular students who could benefit the most. By targeting these students, you can maximize the impact of the little time you can spare for face-to-face meetings.

On the reverse is the written study advice we provide to EOSC 112. Feel free to steal/adapt/use next term.

STUDY ADVICE for EOSC 112:

Your primary study guide should be the **LEARNING GOALS**, which are listed on a slide toward the beginning of each class. We write the exams to assess these goals. These should focus your studying.

What to do:

1. Check out each learning goal. Try to "do", in your own words, what that learning goal asks. For example, the first goal in Radiation Balance is:

"COMPARE infrared, ultraviolet, and visible electromagnetic radiation in terms of energy per photon, frequency, and wavelength"

So this requires you to be fluent in some of the characteristics of electromagnetic radiation and how those characteristics change along the spectrum. We do a few clicker questions in class that target this goal. See if you can match up the clicker questions to the goal. See if you can match up any review questions to this goal. See if you can match up any quiz questions to this goal. What are these questions asking you to do? Then, imagine ALTERNATIVE questions, variations that could be asked, or different questions that target the same goal. What are the answers to your own alternative questions? You'll likely need to consult the notes in order to answer some of these questions. This **TARGETED consultation of the notes** is far more productive than simply re-reading the notes from start to finish.

2. For every practice multiple choice question (either a clicker question, or a review question, or a question on a quiz), try to explain not only why the correct answer is correct, but also why all the other answers are incorrect. If you do this, you'll be prepared to answer many more alternative questions than just the one available for practice.

3. Also, students who re-write their own notes in their own words and practice explaining concepts to others learn more and do better on exams. Students who re-read and merely highlight passages, or, only re-read their own highlighted passages, do not do as well. There's important brain activity that comes with attempting to produce or create one's own explanations, in the context of what's already in your brain. If you find you are bored, or your mind is wandering, or that studying seems too easy, what you're doing is probably a waste of your time!

4. Students who get a good night's sleep the night before an exam do better than students who stay up to "study". Make yourself go to sleep at a decent hour!

The "Notes" slides contain examinable information, unless noted as "optional". But again, don't study them just to study them. Study them in the context of the learning goals!

If you would like more information and details about conducting an intervention in your own course, please contact Sara Harris.

Contact EOS-SEI: To talk about your course(s) or teaching and learning in general, visit EOS-South 361, or contact Francis Jones (fjones@eos.ubc.ca), Brett Gilley (bgilley@eos.ubc.ca), Erin Lane (elane@eos.ubc.ca), Josh Caulkins (jcaulkins@eos.ubc.ca) or Sara Harris (sharris@eos.ubc.ca). See also <http://www.eos.ubc.ca/research/cwsei/>.