

MAGNA SEMINAR

The Flipped Classroom: Rethinking the Way You Teach
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Questions from the Chat Window

The Chat Window was filled with a ton of great conversation during our recent online seminar. While we tried to address as many of these questions as we could when they arose we realize that the seminar proceeded at a rapid pace. What we have done below is to group a lot of the concerns and questions and addressed them in a more thorough manner. We hope this document helps to augment the information you received before and during the seminar. Consider this your post-seminar development. We hope you are more confident about flipping your classroom and that you will continue to experiment and improve your current course design.

HOMEWORK

What happens when students don't do the homework? They don't do the homework anyway so why would they do this ahead of time? Students are going to complain that this is more work? How to adapt this concept in college nursing where 'homework' is primarily reading the textbooks? What about student motivation?

We understand that students will not always do the homework. Our job as educators is to create a climate where the homework is viewed as a vital component of the course. Maryellen Weimer has said that on cold days you walk out the door without a coat and will be reminded to run back in and grab one. We want course design that helps remind students to put on their coats before they leave. A simple way to do this is by requiring some type of online assignment: a survey (where they earn a nominal number of points just for completing it), an online quiz, a dropbox where students have to submit some type of pre-class work (a short written paper, the response to an essay question, etc.), or perhaps an online forum where the students have to post two questions they want to review in class based on the reading. The goal here is to encourage students to complete, and perhaps more importantly, think about the work not by harping on them but by creating a course structure—with points assigned to it—that will encourage students to prepare ahead of time.

The Nursing question is widely applicable because a lot of us want students to read BEFORE class. So create an assignment that relies on the reading. Make sure to close the assignment at the start of class. When students miss an assignment they will ask you to re-open it and you can tell them just to make sure they complete the rest of them on time so that they don't jeopardize their grade. This teacher behaviour will also reinforce the importance the student behaviour of completing the prework prior to class such that they can get past the idea of passivity in the "new" form of lecture hall.

Look, we know students can be frustrating: they ignore us, try to find shortcuts all the time, and they complain. But our responsibility, nay, our mandate, is to create the best learning environment that we can. It's too easy to try something and then complain that it's the students fault when it doesn't work. One joy of teaching is that every class is different, every student is

unique, and our jobs impel us to improvise and adapt so that we reach as many students as possible in every single course that we teach. A flipped design offers you so many choices for how to motivate students to learn. It's your job to figure out how to best motivate them.

PRE-CLASS VIDEOS

The short video was great, the other (longer) was horrible (slow and boring)—was that purposeful? How do you get the technical skills? Will students buy-in, participate? How is this different from having students do READING before class and basing class time on the reading? Time consuming and expensive for faculty to create the 'flipped' content, i.e. videos, etc.

We loved the comment about the 'horrible' video even if it did hurt a bit—since we made it! The short video about “Flipping the Classroom: Simply Speaking” was professionally made and probably took several days to create. The longer 'horrible' one took only the time required to make the slides and then record it. We thought it was a bit better than 'horrible' but we also wanted to show how you can create a short introduction in very little time once you know the software (and the software can be learned in about ten minutes). Recording videos takes a lot of expertise that teachers do not have. We are not skillful in creating concise, visually appealing, engaging videos. But we can learn how to do it effectively AND methodologies are informed from the literature on cognitive load. (R. E. Mayer & R. Moreno, *Educational Psychologist* 38 (1), 43-52 (2003) . . . Yes, it will take time. Once you invest the time, though, the dividends are huge because now you have a new way to create novel learning experiences for your students. These students by the way, may now have a different set of skills, time constraints, and expertise set to learn your course content that you did as a student. (S. Bennett, et al., *British Journal of Educational Technology* 39 (5), 775-786 (2008).

We are not saying that pre-assigned reading is bad but these videos are a different modality of content transmission and are decidedly different than just telling students to read. All learners need guidance and our job as educators is to provide the clearest, more efficacious guidance possible. Students are still doing the work: we are like mountain guides who can lead the way but students are still doing the hiking. Telling students to read is easy. But have you picked up a textbook outside your field and tried to read it? And then prepare for an exam? Textbooks contain so much information (vignettes, online links, summary questions, reference lists) and that is a complete source but it's a bit like asking students to attend a buffet and eat EVERYTHING. Students need our help in figuring out what to focus on, how to frame questions about the reading, and what type of organizational structure might work for deeper comprehension. We worry that teachers dismiss a flipped design as coddling students but developing learners is our primary task. Yes teaching is demanding work and is more demanding in a technological age. You will need to attend more workshops about technology, follow a blog or two about technology, sit in on a colleague who effectively marshals a lot of technology, go to a conference on technology, surf the web for technological tools, and keep talking to colleagues in all disciplines.

Ike's wife did her PhD research under the direction of Pat Terizini (of *How College Affects Students* fame). Pat always said that research involves one compromise after another. So, too, does teaching. We could always create better videos, with more graphics, cooler edits, more

delightful music...you will need to start somewhere so start small and through experience you might mix the pre-work bag of tricks. Make a video like the longer one that we created. Some people will think it is 'horrible' but other students will watch it if you have appropriate assignments and evolving course context for them to complete and build their knowledge. As you create more videos they will get progressively better, they may even get simpler rather than all the bells and whistles (ahem cognitive load again). You may start trying to hire an intern to help you edit and to help you in the process of storyboarding. Yup, it'll take time! Only you can decide how much time you are willing to invest in order to improve your course delivery and enhance learning. Teaching is one compromise after another but to remain stagnant because of the possible time required seems an abrogation of our professional responsibility.

OTHER PRE-CLASS ACTIVITIES

Do you provide any other pre-class activity other than video? Do you inform students of your specific learning goals during class? How to condense 2 hours of lecture content into short prep lectures suitable for pre-work? What about the role of repetition for (memory/learning) reinforcement?

The possibilities are limitless for other pre-class activities. If you have a multi-media specialist at your institution there may be exciting ways to create online and off-line activities for students. At Penn State we adopted a limiting-reagent module and then modified it to fit our needs. Students can practice as often as they'd like and then access tutorial help if they run into trouble. In the example from Tim's lab (http://www.anatatorium.com/CRIPT/Media_files/3D-X.swf) some preknowledge of several anatomical lectures is portrayed. Students come to the lecture having worked with the model and Tim uses pictures from the model itself to form clicker questions and medical case studies to highlight the pertinent information students might need to know from not only the class at hand but pulling up previous classes, using prior knowledge, or using outside resources online to then report to the class their findings. This approach can bring community back to the class. Indeed, these types of activities require technical expertise that an instructor will not usually have time to develop. Collaboration will be a buzzword in 21st century curricular design because of the technical complexity required to navigate the myriad of pedagogical choices. The technical experts need the content experts to help guide the design and the content expert needs the technical expertise to make the activity as engaging as possible for the learner.

Putting learning goals on the LMS is a great idea so that students know up front what they are expected to do. Lecturing to them about the goals seems like a misuse of face-to-face time. Once those goals are established the faculty member can get to work creating activities that help students meet those goals in the students' own way, taking ownership and ideally experiencing a great sense of accomplishment as they master course requirements, harness course knowledge, and build learning on their own terms. If memorization is one of the goals then creating a quiz bank where students can repeatedly take a quiz until they have something perfectly memorized should work fairly well. Asking questions of colleagues and other professionals at your institution is of paramount importance. "No one is an island" so you need to ask for assistance.

And don't forget to ask your students what they need as well; it might simplify the process more than complicate it.

LARGE CLASSES

Recommended size for the class? How does this work with large class sizes (> 100 students)?

There is no size limit for blending. The main considerations, as with most pedagogy, are the combination of course factors: subject area, student population, teacher characteristics, and institutional culture. Almost any course can be flipped (see below). At Tim's institution one professor often teaches 700 - 1000 students at a time in his introductory Biology class, he uses clickers religiously and starts lectures with provocative questions based on student pre-work and their own ideals, for example, "Evolution is finished". Can you imagine the discussions and joy he must experience as he feels the power of individuals learning in bold new ways directly in front of him?

SPECIFIC COURSES

Implementation for an English class—how do we cover everything? Can you explain how this fits with seminar and lab courses? How does the flipped classroom work in relation to courses that do not necessarily work problems (for example: history, political science)?

A flipped design is as good as the designer. While faculty are trained as content experts they are being asked to become more adept at course design. An English class will benefit from pre-class activities that introduce a reading (like a podcast or a short video—either yours or one from the web), ask students to complete some type of short assignment (a factual multiple-choice quiz, a short essay on a specific aspect of the reading, a blog post), and then (most importantly) implement your face-to-face class as if the students had completed all the work. The same idea holds for political science or history or philosophy or economics or business or music...really any discipline is open to be flipped. The goal is to think about what you normally would do in class that could be moved outside out class. What can students accomplish BEFORE class that will improve your ability to help them learn while they are in your presence? Maybe it's because we're both scientists but we think that other disciplines actually lend themselves to a flipped design better than science. Reading prior to class in science often presents challenges because students cannot make sense of the terminology. The goal of a flipped class in science is to help students gain some understanding of definitions and maybe have them solve a few straight-forward problems. While science students can spend lots of time problem solving in class other subjects lend themselves to more creative activities like debates, role plays, small/large group discussions, etc. We encourage you to try to erase all pre-conceived notions of learning as primarily telling and embrace the myriad possibilities that today's technology provides.

You ask a tough question too as we don't know what "everything" is, it's a disciplinary norm isn't it? Our evolving understanding of modern lecture is that we do not need to cover everything. If we provide a framework in which "everything" can be covered perhaps that starts to address your question. Think of perhaps this scenario, and I'm speculating:

- pre-reading

- accompanied by the pre-class video or “Coles Notes of importance”,
- some inclass activity, like a modern re-enactment, a jeopardy game, or a discussion of the key points of the passages, then isn't “everything” covered without you having to say it? Without being contextualized in your discipline, our examples might seem off, foreign we can take. You might feel a little foreign as you commence down a flipped approach.

MENTORS/STUDENT INTERNS

What would you suggest for those colleges that do not have student assistants, etc. available? For mentors, do you mean internal mentors or external professionals?

Mentors are usually undergraduate students who have done well in a course previously. Often they are not paid but instead get credit for learning how to mentor: you can offer a course that helps students learn how to be a mentor. Penn State has a course for Chemistry Assistant Training so students can earn credits. But we would encourage you to approach your administration for monetary support. You can pay a mentor for the semester as a lump sum (at Penn State we pay \$300 per course but wish it were more) and students are grateful. We explain that mentoring is a great way to truly learn a subject. Evidence is accumulating that mentors benefit from the experience. Students who mentor chemistry, for example, almost always do stellar on the chemistry portion standardized exams like the Medical College Admissions Test (MCAT). And mentoring can help develop self-confidence as students learn to help other students. The mentoring program at Penn State Berks is one of the most successful programs we offer.

For Tim at the University of Western Ontario in anatomy, we have near-peers (similar to the mentors above). Because we have many lab sections we encourage the near-peers or volunteer teaching assistants to “give away their secrets to success” in the course. And, as mentioned above, there is no better way to learn a subject area AND to build extra communication, pedagogic, and people skills than to experience the mentorship role in a controlled environment. This approach is so wildly popular at our institution, we need to turn some students away. In his large undergraduate Health Science anatomy course Tim had 128 volunteers for 30 positions! These student TA's occupied a central place in the socialization and information sharing processes that students needed to master. A word of caution however, all these volunteer TAs eventually asked for multiple reference letters so treat this as fair warning.

MISCELLANEOUS

Does the flipped classroom work in an accelerated learning model?

We think that flipping actually works better in an accelerated model because students have even more control of their learning under time constraints. They have access to information 24/7 so they can keep up or get ahead if they need to.

Tim has used a pseudo-flipped model (not all materials were or could be addressed ahead of time) in an intersession course. Intersession is a term (13 wks) compressed to 6 weeks. It was hard at first to consider doing this but the smaller class seemed primed already to conquer the

course materials so it worked wonderfully. In this case we also used the laboratory portion as reiterative, explorative, and integrative environments.

Doesn't how we test/assess students play a HUGE role in what is attended to by students?

William James wrote that his experience is what he 'attends to'. As an educational designer you want to help students figure out what to attend to so that they can meet the learning outcomes of your course. A theme in these answers has been that teachers too often assume that students are expert learners and can figure out what they need to attend to. When students get confused and their attention wanders we have a knee-jerk reaction and blame them. Sometimes that blame is earned but often—we would argue that it's most of the time—the teacher should look at the course design for ways that they could better direct student attention. One easy way is to give them learning goals that directly align with our assessments. Students use assessments (quizzes, exams, papers) as a guide to what the teacher thinks is important and the student therefore attends to those concepts and issues. Too, too many classes have misaligned learning outcomes and assessments which hopelessly confuses students.

It is easy to create a course where almost all students will fail by testing them in ways that you never allow them to practice. Imagine teaching a ski course by lecturing about ski design, artificial snow making, tournaments around the world, etc. then assessing the student by putting them on a pair of skis at the top of a black diamond run. Teachers often do this and then are frustrated when students fall going down the hill. Our response is to tell them to get off the slope rather than reconsidering how our teaching might have led to the student's failure. This may seem harsh but we hope is to convince you to take a critical look at your own course. Look at the learning outcomes and the assessments and then design a course that prepares students for success. If we want them to ski then put them on the slopes early and often: let them fall during class and during their time outside of class so that when the exam rolls around they have the best chance possible of making it down the hill.

Does that disenfranchise auditory vs. visual learners?

ADA regulations encourage faculty to make their online resources ADA-compliant so that no one is disenfranchised. The goal of a flipped design is to give students MORE control of their learning, not less. We believe that flipping actually accommodates more learners than a traditionally taught class.

To build on Ike's accommodation of learners, and to throw some theory for thought out there, a clear distinction has not been established between auditory vs. visual learners although we "hear" about it a lot. In fact some researches argue of not of sensory input being the funnel but instead of multiple "intelligences" that influence learning from the rhythmic ta-ta-tee-tee-ta in kindergarten to the complex 3D mental imagery of performing a laparoscopic colectomy. Ideally, we resort to the appropriate personal intelligences when the time calls for us to comprehend and interpret what our sensory systems are reporting about situation or surroundings. Kolb's learning inventory would suggest that the sensory modality is somewhat irrelevant, what matters is that the learner "work" with information in their own way (concrete, abstract, experiential, or reflective) to move it from their sensory memories (visual and auditory being the primary

modalities) into long term memory. It is here at the process of “work” that empowers a flipped class model.

How do we help students develop the ability to concentrate and follow an argument if we keep chopping everything into 10-minute segments?

Not all learning should be broken into 10-minute chunks. We sense some hostility toward educators who use 10-minute learning as possibly undermining goals for those teachers who want to teach concentration. A course can teach concentration and perhaps 10-minute chunks are a good start to build toward longer attention spans. We'd point out that our pre-recorded video was only 7 minutes and that at least one participant did not want to concentrate on it. Encouraging students to stay on task is a noble goal. As an educator you could possible model a sustained argument by outlining a complex piece for students and then assessing them on their ability to read a longer piece of criticism for an exam. You can still utilize a flipped design for this even if you don't have any videos. (See the response above under 'other pre-class activities').

One could also envision a series of reading, video, even musical (context specific) pre-class primers that students could do. The idea of a hard and fast 10 minute chunk is limiting and narrow but that is not flipping, instead, creativity and free thought is encouraged. Using your institutions learning management software one might imagine a short set of pre-class informatives that could prime students for your next inclass, virtual, group, or field experience.

End-of-course evaluation?

Tim is in the midst of forming his tenure and promotion portfolio, and thus, has all the data handy. To give further context, not all of his classes are flipped. He's an experimenter and this doesn't stop at the lecture hall door. As such, he has several classes and they span the spectrum of completely traditional anatomy to undergrads, an integrated professionalism course for graduates, to two courses in dental anatomy where the progression or goal is to flip. Thus, as a person who is on the road to flipping he can tell you that there will be some resistance from your students and from your colleagues as it's new ground. Now, Tim doesn't answer to his colleagues but he does take big responsibility for his students.

From his last two years of slowly moving content out of the class he can report that student success is still very high compared to the previous years in the traditional course offering. The overall content in the dental curriculum has not changed. Tim has changed. The way the class looks has also changed. Tim has taken a bit of a “hit” as some students don't completely buy into the understanding that lectures and materials need to be previewed and we won't be “repeating” the lecture in class, instead we build on the simple pieces and explore the challenging ones. This can be expected as they, just as we, expect ‘things’ in certain ways and flipping starts to change that. Regardless, and Tim shares this only for the sake of effect, our overall evaluation scores for the past 5 years have remained steady at 6.57 out of possible 7 with a standard deviation of 0.227 (min=6.3 max 6.9). If we break this to pre and post transition to flip, our pre-flip teacher average (2 years) effectiveness ratings is 6.55 ± 0.35 while post-flip ratings are 6.57 ± 0.2 (past 3 years). From generally positive student feedback and maintenance of good, well pretty good, effectiveness ratings of ~93%, Tim would say it had no effect on students or on him. What it might have done is simply offer a new experience to high functioning

students in a day that receives 4-5 other hours of lectures based on a classic model of teacher centred approaches and gives us a wonderful new set of tools for our professional toolbox.

Do you think that faculty who are also teaching online have less of a challenge flipping the classroom because their instructional philosophy has moved toward a learner-centered approach?

Ike has been teaching online for five years and is convinced that teaching online makes one a more learner-centered instructor. And, yes, teaching online will alter your educational philosophy for the better. You will be a better teacher because of it and flipping will seem even more vital to you. Plus, you'll love having time to interact with your students in more engaging ways inside the safety of the classroom. When you throw away the lecture notes you get to replace the lecture time with quality interaction—teacher-to-student and student-to-student. Having active learning in the classroom is one of the most satisfying aspects of a flipped approach.