









How to improve the learning curve

By embracing innovation and new technologies we can better engage and inspire every student

"Let's make education better." That's the simple idea that brought my co-founder, Mohsen Shahini, and I together. We're both engineers and, like engineers everywhere, we can't resist fixing things. With student engagement at an all-time low—the graduation rate among university students is less than 50 percent across North America—we decided that if there was something that needed fixing, it was the modern classroom.

The educational experience is totally out of touch with today's students: they're disengaged and they're not succeeding. Plus, they're paying between \$200 and \$300 per textbook—the price has risen more than 1,000 percent over the last 30 years. Many university students graduate with a useless degree and a massive pile of debt.

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engaging course material. With Top Hat, every educator has the tools to make class fun and engaging.

Top Hat is now used at 75 percent of the top 1,000 leading colleges and universities in North America, with millions of students learning on our teaching platform. We're aggressively expanding into academic content, creating and distributing interactive materials that will finally provide a viable alternative to overpriced textbooks.

We treat instructors like heroes, elevating their work inside and outside the classroom with compelling content and activities to engage their students. We believe collaboration with our coworkers and with frontline educators is the key to our success.

I hope the collection of stories in these pages inspires you to consider new ways to reach today's students. The old education system may be broken, but with a little ingenuity and innovative thinking, we can fix it together.

Mike Silagadze CEO & Founder, Top Hat



Introduction

"Flipping the classroom" is an idea that has arrived in full force in higher education, and is part of broader movements as well. The basic idea is to move away from using class time for lecturing, and to instead provide that information in video form so students can review it ahead of time. This makes it possible to use class time engaged in truly active learning.

And of course there are many other ways to promote active learning in the classroom. These days even research universities not historically known to focus on teaching are pushing new efforts to promote active learning – and these efforts appear to be working.

The articles in this compilation explore some of the many ways colleges are promoting flipped classrooms and other innovations in teaching. *Inside Higher Ed* will continue to cover these issues. We welcome your comments on this compilation and your ideas for future coverage.

--The Editors editor@insidehighered.com

News

A selection of articles by *Inside Higher Ed* reporters

To Flip or Not to Flip

MARK LIEBERMAN // SEPTEMBER 13, 2017

A Harvard professor no longer thinks students benefit from skipping lectures for his rigorous course. Experts weigh in on what his decision says about the flipped classroom and other alternative learning approaches.

The Harvard computer science professor David J. Malan has reversed course on his recommendation from last year that the 800 students in his CS50 course skip attending most of the semester's lectures in person. Malan argued at the time that students could be just as successful, if not more, by watching recorded lectures online at their convenience, and he maintains that student outcomes didn't vary between face-to-face and asynchronous learners.

But Malan now says some of last year's students reported feeling that something was missing outside of the classroom, and he thinks students lose out on an essential component of the academic experience if they opt for the online lectures.



Malan's reversal prompts several questions, so "Inside Digital Learning" posed them to a panel of experts: Do you share the Harvard professor's sense that online lectures alone can't entirely replace the unique qualities of a classroom

experience? Do his comments represent an indictment of the "flipped classroom" approach, or are they representative of a more specific setback? If a professor at one of the elite universities teaching one of the most sought-after courses reports

difficulties in transitioning online, what challenges does that pose for similar course structures going forward?

Here's what the experts had to say.



Yakut Gazi, associate dean of learning systems, professional education, Georgia Institute of Technology and Stephen W. Harmon, associate dean of research and professional education; director of education innovation, Center for 21st Century Universities; professor, College of Design; Georgia Institute of Technology

Online lectures alone do not a flipped classroom make. Nor, for that matter, do lectures alone, either online or face-to-face, comprise an optimal learning experience. Learning is best facilitated by a combination of instructional events, including content presentation such as the lecture, as well as practice, feedback, and about six others. Any one

of these events alone is insufficient for the most efficient and effective learning experience.

In flipped classes, the passive elements of instruction - the lower levels of learning - are moved to outside of class, which creates opportunities for in-class time to be used for active learning experiences such as teamwork, problem solving, hands-on experiences that tap into higher thinking skills. Typically, this approach has recently been translated into recording lectures for student consumption outside of class. While much emphasis has been put on the production of these lectures, data-driven approaches and best practices on what needs to take place inside the classroom are rare. What makes flipped learning successful is not just content. The following three elements are essential for the success of flipped classrooms: learning analytics systems that feed information and insights to the faculty member about students' consumption of the lecture content; instructor's action on this insight to address misconceptions and provide clarifications; and what replaces the lecture, instruction, or passive elements of the classroom. This latter is a critical element to which not much attention is paid.

Flipped classrooms offer notable benefits, including flexibility, student engagement, and opportunity for the development of "whole person" skills such as autonomy, communications, teamwork, and problem solving, among others. Of particular



Stephen Harmon

note, traditional lecture classes support a transmission model of education that works best for learning outcomes on the lower end of Bloom's taxonomy. To reach more complex learning outcomes, student engagement and higher learning skills are needed, which flipped classrooms support.

It's important to note that social aspects and the context of learning are also an essential part of the learner experience. At Georgia Tech, we engage teams of instructional designers and video production professionals to ensure that we make the best use of the methodologies and tools we have at our disposal to deliver a comprehensive online learning experience that goes beyond mere presentation of content. We encourage students in creating their own learning communities. Our learning environments have affordances for students to collaborate and build robust networks to enrich their learning experiences.

Successful flipped classes are more work to develop than traditional classes. Apart from requiring learning design professionals to produce them, flipped classes also demand larger front-end engagement from faculty. Students and faculty, who are not accustomed to the flipped model, may need time to get used to this way of learning and teaching. In addition, students may need a greater degree of self-discipline and organizational skills than they do in traditional classes to benefit fully from flipped classes.



Jonathan Rees, professor of history, Colorado State University -- Pueblo

Last year, when Harvard Computer Science Professor David J. Malan decided to encourage his CS50 students to watch his lectures online, he told them that this was the result of going "back to first principles, rethinking every aspect of the course's design, taking no feature for grant-

ed." This is a laudable step to take, but now that Malan has changed his mind one can't help but wonder whether he rethought every aspect of his course quite hard enough.

Today's education technology can do so much more than present taped lectures. It can change class-room dynamics by restructuring interactions between professors and their students. It can even eliminate the need for a set meeting time, since learning can occur asynchronously now. It can also greatly expand the audience for the work that students do.

Flipping the classroom by taping your lectures and letting students watch them online may be just about the most conservative use of education technology available today. It seems unlikely that someone has completely rethought every aspect of their course if it's still centered around lectures. Preserving the basic information-presentation method of the old course but displaying it in a new setting retains all the problems with lectures without adding all that much to the pedagogical equation. The student's ability to rewind the "tape" and listen to their professor again is more than offset by the natural inclination to open a new tab in their browser and start checking Facebook, because nobody is watching them to be sure that they're paying attention.

Faculty who are interested in education technology should consider redesigning everything about their classes – including its goals and structure – rather than just trying to

recreate different features of existing face-to-face courses in an online environment. In 2015, I wrote that the flipped classroom was "professional suicide," because it opened up faculty to being replaced by technologies which they do not control. I still believe that. However, there are now more than enough good tools available for faculty to tear their classes down and build them back up in a digital environment without making themselves obsolete in the process. The key is that faculty themselves must be the ones to decide which tools work for them and their students and which ones don't.

Don't change your whole approach to teaching just because it's suddenly the hip thing to do. Do some research on new digital tools, both commercial and open source, then change your approach to teaching if you think some combination of those tools will help you design a better educational experience for your students. The real shame about flipped classrooms isn't necessarily the effect on the educational experience provided by the faculty who flip them, it's that all the publicity they've received might convince reluctant faculty that flipping is the only strategy that education technology has to offer.

Robert Talbert, associate professor of mathematics, Grand Valley State University; scholar-in-residence, Steelcase (on next page.)

Harvard's CS50 course has an issue with attendance, as reported at *Inside Higher Ed*. At the center of the issue is whether online lectures



can truly replace the classroom experience. The answer is: It depends. Specifically, it depends on what the "classroom experience" is.

A classroom experience that consists of direct instruction can be, and has been, replaced with online video, with CS50 as a highly visible example. And perhaps such an experience should be replaced. The professor for CS50, David Malan, is exactly right in his assessment of live lecture: There's something to be said for shared experiences, but in terms of actually learning things, students need more than the "energy of the crowd". They need to be able to access lectures on their own

schedules, at their own pace, in their own contexts.

Above all, for real learning to take place, students need active experiences. By "active", we mean more than just asking questions in a lecture and taking notes. We mean participation in tasks that are at the edge of students' basic knowledge of a topic, causing students to stretch and encounter real difficulties that are best resolved with other people.Lecturing has a valuable role to play: It can inspire students, create connections, and provide perspective. But it cannot do the heavy lifting of learning. In the end, only students can do this.

The kind of classroom experience that cannot be replaced by online video places this kind of serious, difficult active learning at the heart of its design. In such a class, the group context is used for student work on tasks centered on application, evaluation, synthesis, and creativity --- tasks where students need each other, and need us professors, the most. Lectures, as I said, still have a

place in this kind of course, and they are put in a position where they will do the most good for the greatest number of students: Online, available on demand, and out of the way of active learning.

Harvard's CS50 was described as "a very public version of flipping the classroom". Is CS50 an indictment of this pedagogical concept? No, because CS50 isn't a true flipped learning environment. As I've written elsewhere, flipped learning classes do more than just shift lecture from in-class to pre-class: They transform the group context into a time and place focused on the active learning described above. Without this transformation, it's not flipped learning, and it's hard to see why students would come to class at all.

I have great respect for what Prof. Malan and his team have done with CS50. The challenge for him and for all of us is to find ways to use our scarce class time to the students' maximum benefit through active learning.

If we build it, they will come.

https://www.insidehighered.com/digital-learning/article/2017/09/13/harvard-professor-reverses-course-online-lectures-debate-over

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TOP HAT

Become a Doctor, No Lectures Required

By Carl Straumsheim // September 26, 2016

University of Vermont's College of Medicine announces it will get rid of lecture courses and completely reshape the faculty role -- a first for a traditional medical school.

Four years after two senior academics at Stanford University challenged medical schools to stop lecturing and start flipping their classrooms, major reforms at underway at a handful of colleges to change the way they teach medicine.

The University of Vermont last week became the most recent institution to join the trend, announcing a pedagogical reform in its College of Medicine that observers say is the most sweeping yet.

The college will over the next several years remove all lecture courses, replacing them with videos students watch on their own time. And instead of sitting through lectures, students will meet in "active learning" classrooms, led by faculty members, working with their classmates in small groups.

"We teach evidence-based medicine all the time," William Jeffries, senior associate dean for medical education at UVM, said in an inter-



An instructor at the University of Vermont's medical college teaches in an "active classroom."

view. "If you have the evidence to show one treatment is better than the other, you would naturally use that treatment. So if we know that there are methods superior to lecturing, why are we lecturing at all?" The approach builds on experiments at Stanford, which has worked with Khan Academy to test a flipped classroom model in certain medicine courses. Other institutions have taken that model a

step further. The Touro College of Osteopathic Medicine in New York, for example, has since the 2012-13 academic offered an entirely flipped curriculum.

UVM's announcement, however, marks the first time a member of the Association of American Medical Colleges has declared it will abolish lectures across all its programs, Lisa Howley, the organization's senior director of educational affairs, said in an interview.

"What we know about learning in general is different than it was decades ago," Howley said. "Our medical students are of a generation that has grown up differently when it comes to technology and the impact that has on their ability to receive and retain information."

But moving away from how medical schools have trained new physicians for centuries is no easy task. Major curricular changes could jeopardize the schools' regional and professional accreditation statuses, repel prospective students, offend alumni donors and alienate some faculty members, to mention just a few.

The most pressing concern, Jeffries said, is also the simplest: money. "Most schools do not have the resources to 'turn the battleship around," he said.

UVM will put a \$66 million gift, announced Friday, toward building renovating classrooms and retraining faculty members. It has also renamed its College of Medicine in

honor of the donor, alumnus and retired physician Robert Larner.

The college will spend part of the gift on expanding its <u>Teaching Academy</u>, founded last year. Faculty members in the College of Medicine join the academy for three- to five-year periods, during which they are mentored by more experienced instructors, attend conferences and workshops, and complete self-paced courses, among other activities.

The overarching goal of the academy, Jeffries said, is to help faculty members discover teaching methods that can be as rewarding -- if not more so -- than lecturing.

"That internal oomph or dopamine release that you get when you lecture and are the center of attention is a barrier to converting faculty over," Jeffries said. "What we need to do is ensure they have the time and support to develop alternative ways of teaching."

The most powerful tool the med school has to win faculty members over is that they are "scientists at heart" and "understand the evidence" suggesting students in flipped classrooms perform better than students in lecture courses, Jeffries said. At Touro, for example, the pass rate on an important licensing exam has climbed to above 95 percent -- higher than the national average -- since the college flipped its curriculum.

About 80 faculty members joined the Vermont academy when it first

opened, but the College of Medicine has a long way to go before the faculty is prepared to teach in the new classrooms. The med school has more than 700 faculty members in total.

The transition to an all-flipped model at UVM has already begun, and the university plans to complete it by 2022, Jeffries said. Lecture courses now make up a minority of the college's foundational curriculum -- about 40 percent, down from 50 percent two years ago. The first semester courses have already been redesigned into a series of connected components, and the college plans to pour over data collected from them during a curricular retreat in February, where administrators and faculty members will produce a strategic five-year plan.

There are some major unanswered questions facing UVM, including what an education at the college will look like in 2022, how much time students will spend in the classroom and how faculty members will respond to their roles changing from lecturing to facilitating. Jeffries said he expects some of those details will be settled during the February retreat, while other pieces will fall into place as the medical school transitions away from lectures.

"A lot of this is a great unknown to us," Jeffries said. "We are starting an evolutionary process in making this initial commitment ... to formulate a new model."

https://www.insidehighered.com/news/2016/09/26/u-vermont-medical-school-get-rid-all-lecture-courses



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'Flipped Learning'

By Doug Lederman // May 17, 2017

In an interview, Robert Talbert discusses his book on the instructional approach and how college instructors can use it effectively.

It's easy to be distracted by the bright shiny objects in higher education. This innovation or that technology is often presented as the Next Big Thing that is going to change how (or how much) students learn.

Buzzwords rule: competency-based education, MOOCs, adaptive learning.

It's tempting to put the "flipped classroom" in that category; the concept is frequently discussed by advocates for changing up how learning is delivered, and often linked to the latest technology.

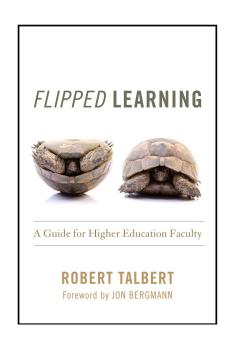
But the reality is that like many so-called innovations, the idea of altering when and how students are exposed to new concepts and material, and focusing the time they spend with their instructors on applying and more creatively working with the ideas, is not a new one. While it is being embraced more widely and enthusiastically than ever before, it is time-tested, and significant research has been done to prove its efficacy. This is no flyby-night concept.

Robert Talbert makes that clear in his new book, Flipped Learning: A Guide for Higher Education Faculty (Stylus). Talbert, an associate professor of mathematics at Grand Valley State University, lays out the history and theory behind the pedagogical approach, but spends much more of the book in practical exploration of how to use it. He describes various case studies in which institutions have experimented with flipped models, and then dives deeply, in great detail, into numerous approaches to designing courses in this way.

In the following exchange, which was conducted via email, Talbert discusses the book and the concept of flipped learning.

Q. Why do you believe flipped learning is so important to the present and future of higher education?

A. We're at a crossroads in higher education today where many of the practices and beliefs about col-



lege that have worked over the last 100 years simply aren't fit for the needs of the world today or the future. Flipped learning on the other hand embodies many of the practices and beliefs that are found in the best of higher education in years past, and frames them in updated and coherent ways that can be used to move forward.

Flipped learning is a paradigm that brings together many of the practices that will make higher ed-

ucation viable for the next 50 to100 years and situations them in a form that any professor can use. Those practices include intelligent use of technology without demanding any specific type of technology; focusing on active learning, which is something we now know helps all students succeed; and providing students with the opportunity to practice independent learning and self-regulation as they are given a significant portion of the responsibilities for learning.

These are the types of academic experiences that have been the hallmarks of the best teaching and learning of the last few centuries and which have the greatest relevance for our future, and they are the focal points of flipped learning. And all of this is couched in a radically student-centered approach that is predicated on relationships—especially caring, productive working relationships between students and instructors.

Q. You note that your first experiment with flipped learning occurred out of necessity (when a computer programming course you believed required three hours a week was shrunk to half that). You write that your attempt (making the students watch preexisting videos) was largely a disaster. Rather than give up, you kept at it. But lots of professors -- lots of humans -- are surprisingly afraid to

Flipped Learning Is...

"a pedagogical approach in which first contact with new concepts moves from the group learning space to the individual learning space in the form of structured activity, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter."

experiment, and the rewards may not encourage it. How does higher education as an enterprise better encourage instructional experimentation (and tamp down fear of failure)?

A. Some of my colleagues at Grand Valley State University and I looked into this recently (others have done so as well), and we found that there are two common issues among faculty that can inhibit them from thoughtful experimentation: The rewards structure in terms of promotion and tenure and the perception of isolation.

We found that promotion and tenure, even when not primarily based on student course evaluations, often provided few or no incentives for trying new teaching approaches in the classroom. If you tried something new with a course and it succeeds, then you have good evaluations, but you also might have had good evaluations without trying the new thing. And if it fails, which is always a possibility, then you'd have a mark on your record that you might not have had if you'd stuck with the old method. So from a purely pragmatic standpoint, there's little to no upside in experimenting.

And in some cases this experimentation is actively discouraged. For example we found a department that explicitly states that scholarship in teaching and learning --- for example, if you publish the results of a classroom experiment in a peer-reviewed journal --- would not be counted towards a faculty member's scholarship requirements, period. And we're a teaching-focused university! It's far worse at other places that are focused much more heavily on discipline-specific scholarship of discovery or that put a lot more emphasis on course evaluations. So the criteria for rewards in higher education is not set up to reward sticking one's neck out to try something in teaching that might improve student learning.

Regarding isolation, it means that faculty members often read about things like flipped learning and would like to try them out, but they feel as though they are going it alone without sufficient support. Even if you are in a department or university that does value excellent teaching and even has explicit language that ties the promotion and

tenure structure to experimentation in teaching, if you feel like you're doing it by yourself, then you're less likely to do it. We found that the No.1 factor for whether faculty members adopt what's called an "evidence-based" teaching practice wasn't the preponderance of research evidence for that practice, but whether there was a colleague readily accessible to them -- a "person down the hall" -- who had tried it before and could be trusted for support.

What can higher education do to help address these two needs? Promotion and tenure structures can be rearranged so that thoughtful experimentation with new forms of teaching can be rewarded in some way and the failures that often come with experimentation put into context. For example, if a professor tries a flipped learning environment and it fails, don't simply downgrade the professor for it, but rather factor in how the professor responds and makes changes. We want faculty who are reflective and can teach like scholars, not merely faculty who don't run into problems.

Second, universities can create explicit pathways for like-minded professors to connect with each other on teaching and learning, for example, through faculty learning communities within a department or across multiple departments.

Q. Lots of innovations are probably worse done badly than not at all, and particular when technology is involved (and companies and sometimes policy makers pushing those technologies), there's a tendency toward faddishness. How do we make use of digital technologies to improve practice without letting them become ends in themselves?

A. The key is simply to keep students and student learning at the center of all decisions about teaching and learning, including technology. "Improving practice" means improving student learning, and you can't have a sense about whether student learning improves without having a sense of, and a relationship with, students themselves.

So you don't simply choose to use a piece of technology because it's nifty or because a company is selling it to you. You should choose particular technologies because they solve problems with student learning, in the simplest way possible. Otherwise, the technology is a solution in search of a problem and the student is just a test subject.

An example from mathematics is the graphing calculator. These devices have been around since the 1980s and are heavily marketed to mathematics teachers. Many times, teachers or departments simply require students to buy the latest model for class, without asking the core questions: What problems does this technology solve, and is this particular technology the best solution?

Today, I think you can point to technologies like smartphone and tablet apps or websites like Desmos.com and make a strong case that graphing calculators just aren't the best choice any more. The same teaching and learning problem --- the visualization of mathematical functions --- has a better solution in terms of all the things that matter to students like price, ease of use, and so on. But you have to see it from the student's perspective to be able to buck the trends and the marketing.

Q. What are the best tools (other than your book, of course, which presents lots of good models) for spreading thoughtful experimentation and good practice? And are there ways to do so at scale, or is it inevitable that it happens one professor at a time?

A. As I mentioned earlier, the best tools are those that foster communication and relationships among like-minded faculty that work at a local level, to alleviate the perception that a faculty member is going it alone. The "tool" here need not be anything more complicated than email and a local coffee shop. Mainly, faculty just need a commitment to communicate, to listen and to help on a regular basis. It does not have to be one professor at a time, and in fact, the perception that it is just one professor makes it far less likely that anything will happen. If you're one of those professors, the best thing you can do is seek out others who are willing to work with you. If your campus has a teaching and learning center for faculty development, let them help you make

connections. Otherwise, your dean or department chair can help.

At a larger scale, there are many robust online communities that bring together people from all over the world who are try-

ing different teaching approaches. One example is the Flipped Learning Global Initiative that brings together experts and practitioners worldwide who are dedicated to advancing the cause of flipped learning. There are associated message boards and Slack teams where day-to-day communication can take place. I'd also recommend conferences like the Lilly Conferences that focus on evidence-based teaching practices, which are great places to get face time with like-minded people.

Q. Professors are often caricatured as technology haters and, therefore, impediments innovation and "proqress" in higher education. My sense is that faculty members aren't crazy to fear that the use of technology to deliver knowledge/content will lead cost-cutting administrators to perceive less need for instructors, because some of the rhetoric used by said administrators implies that. Do you believe that concepts like flipped learning can be used to pursue the wrong ends?

Promotion and tenure structures can be rearranged so that thoughtful experimentation with new forms of teaching can be rewarded in some way and the failures that often come with experimentation put into context.

A. My personal experience is that faculty aren't Luddites. They don't fear technology as much as they fear (or rather, despise) pointless time-wasting, or fear the loss of their autonomy and what they know to be the best environments for teaching and learning.

Not only can some of these evidence-based practices like flipped learning be used for these wrong ends, they have been and will continue to be wrongly used. For example, I've read about flipped learning environments used in secondary schools for the purpose of converting class sessions, which were formerly 25 to 30 student traditional classes, into 100-plus student meetings where students just do exercises on the computer, for the purposes of cutting costs and eliminating teacher positions. Higher education is no better; administrators might surmise that space and expenses can be consolidated in exactly the same way.

What all of the things I just mentioned have in common is that students are on the periphery of those decisions rather than at the center. Flipped learning is radically based on the idea of relationships, espe-

cially between instructor and student. A flipped learning environment is one where you as a faculty member can have meaningful contact with every student (or at

least every group of students) every day. Implementations of flipped learning that avoid or even negate this premise always fail. On the other hand, if you keep a sincere desire for student success at the center of your decisions, then you won't ever go far wrong.

I've already mentioned the dual issues of the rewards system of higher education and the perception of isolation as big impediments to thoughtful experimentation in teaching and learning. Those are very big indeed. At the same time, they are not hard to fix, and doing so would provide powerful incentives to try flipped learning or any of a number of other innovative yet proven teaching and learning approaches. It will just take some courage on the part of campus leaders, including faculty leaders, to fix it.

Another issue for flipped learning specifically, possibly shared by other pedagogical approaches, is a corollary to the isolation issue -- that's that many of us are working on flipped learning without an understanding of what other people are doing or have done. For example, in my book I show that since 2012, the number of peer-reviewed articles on

flipped learning has been increasing exponentially, more than doubling in quantity each year, and that growth is on pace to continue in 2017.

And yet, many well-intentioned articles on flipped learning don't reference many of the other articles on flipped learning but instead

frame it as something that was only invented last year. In my book, too,



I talk about how in the early 2000's, flipped learning emerged from three different sources in higher education almost all at the same time (with two of those sources being universities 40 miles apart from each other), and then reemerged in the 2010's in the K-12 world, all mostly unaware of each others' existence. We just all need to be more aware of what we are all doing, and it makes the im-

portance of communities of practice that much more urgent.

https://www.insidehighered.com/digital-learning/article/2017/05/17/author-flipped-learning-discusses-what-it-and-how-professors-candidates.



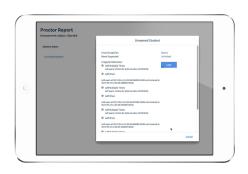
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Trial and Error: Flipped Classroom Boosts Passing Rates

By Jennifer Goodman // May 10, 2017

Students taking general chemistry at Hunter and Lehman Colleges were passing at 60 and 35 percent rates, respectively. A new course format that includes videos, podcasts and no textbooks quickly improved outcomes.

The Institutions: Lehman and Hunter Colleges, City University of New York

The Problem: Students at Lehman and Hunter -- and across the country -- struggle with General Chemistry, a gatekeeper course required for many science and medical-related majors. With average national passing rates of 50 percent to 60 percent, the class presents a challenge for students and instructors alike.

The Goal: Faculty at Hunter College in Manhattan wanted to find a way to boost student success in its large General Chemistry lecture classes, which had a passing rate of about 60 percent. Instructors at the selective CUNY institution aimed to come up with technology-driven improvements for teaching the subject matter.

The project team set out to accomplish four goals:

■ Increase the passing grades of students, particularly women and minorities who are underrepresented in science.

- Reduce students' out-of-pocket costs.
- Find effective teaching practices applicable to resource-limited public institutions like CUNY.
- Show instructors how to adapt to the new pedagogies.

The Experiment: The team restructured the one-year course, starting with a spring 2014 pilot designed as a lectureless hybrid. Instead of the traditional three-hour-a-week lecture, the new model consisted of two hours per week of iClicker-based class and a one-hour workshop.

In a "flip" from the traditional-style course, students completed most of the instruction outside of class through a set of short instructor-made videos, podcasts, an online homework system and Word-Press website.

During class time, instructors quizzed the students via personal handheld response devices, or iClickers, to see if they understood the video material. This new model put the onus for learning on the



students, who were encouraged to work together to formulate their responses, said Donna McGregor, an assistant professor of chemistry and one of the course designers.

The results were dramatic: More than 85 percent of the 200 students in the new course passed, exceeding the college's passing rates for even its most effective lecture classes.

In spring 2015, McGregor and another professor moved to Lehman College, a CUNY school with an 80 percent minority student body, where the GenChem passing rate was about 35 percent. They offered the flipped course and the passing rate soared to 80 percent.

What Worked (And Why): McGregor and the other instructors were pleasantly surprised at stu-

dents' reaction to the at-home video portion of the course. They found that students watched videos multiple times and even rewound and slowed the speed in order to master the relevant points. "We polled students after the course and 90 percent of them approved of the model," she said.

Another student favorite was the iClicker-based instruction, which had been used before in chemistry classes. Lehman student Stephanie Onyekaba said the devices enhance student collaboration and motivate her to be prepared for class.

"During class, students around you will ask questions and I don't want to feel left out when everyone else has clues on how to solve the problems," she said. "This flipped model really forced me to know the material well."

The iClickers also help professors to know in real time what aspects of the lesson students are struggling with based on their responses, added McGregor.

Another advantage of the flipped class was that students were not required to purchase a textbook. All materials were imbedded in the platform, including an OpenStax e-textbook, which reduces student costs by 50 percent or more -- from \$300 to between \$100 and \$150.

Since its inception, the course has

been offered to over 3,000 students at both institutions and is now taught by 13 instructors. Last year, Lehman College and CUNY won the Online Learning Consortium's Digital Learning Innovation Award in the faculty-led team category for advancing undergraduate student success through the adoption of digital courseware.

What Didn't (and Why): With less emphasis on lecturing, the course instructors had the freedom to restructure the class sequencing, but this proved to be a lot of work

each class was also a challenge. One of the most daunting aspects was deciding what material to include in each 10-minute-or-less presentation.

"In a normal lecture we work through multiple problems in six different ways so the students can see the answer in multiple ways,"McGregor said. "In video backbone part of the class you have to choose your example carefully so you cover exactly what you want to cover."

Another challenge is that faculty have had to reboot their teach-

ina style. For example, the instructors are cautioned not to lecture during class about the material in the videos because students will not watch them beforehand if they know the lesson will be covered in

class. This leaves some instructors wondering what their new role is.

"What am I going to do in the classroom if my students are watching videos instead of listening to my lectures?" McGregor said. She counsels instructors to use class time to actively engage with students, and said the course creators hope to offer formal faculty development for instructors who are interested but nervous about teaching the course.

In addition, the peer-supported portion of the class can have a downside, said Onyekaba, because

[F]aculty have had to reboot their teaching style. For example, the instructors are cautioned not to lecture during class about the material in the videos because students will not watch them beforehand if they know the lesson will be covered in class. This leaves some instructors wondering what their new role is.

in the beginning, McGregor said, because they were literally rewriting the way they taught the class.

"Neither of us loved the sequence in the textbook," she said of course co-creator Pamela Mills, chair of Lehman's chemistry department. "So coming up with a new sequence was fun but implementing it was scary." After the initial work, implementation actually went well, although the team continues to tweak content and video presentations on an ongoing basis.

Creating videos to accompany

collaborating with other students is helpful only if they are also working hard. "If you sit around students who don't contribute or don't make effort to study the material in advance, it makes you disadvantaged in the class," she said.

McGregor agreed, saying that there is a subset of students who blame a professor's style for their challenges. "Some percentage of students will always struggle with the subject matter, no matter how it's taught," she said.

Faculty plan to continue to study student outcomes and behaviors to find ways to meet the needs of more students, McGregor said. For instance, many Lehman students who took the initial class said they wanted more classroom time, so course creators added an extra hour of iClicker instruction.

Finally, figuring out the right software system has been an ongoing issue. The CUNY tech team initially built a digital platform for the course material, but once the class started to scale, the team moved to a system from <u>Sapling Learning</u>. They're also looking into new platform development with a cloud-based company <u>Top Hat</u>.

"As the technology gets better

and better, we have to keep learning about it," McGregor said.

Next Steps: The course instructors plan to partner with faculty in the CUNY chemistry department and other disciplines to develop flipped/active learning modules for other courses.

McGregor said finding ways to innovate class time is never over. "One of our next steps is to work on integrating new and emerging technologies to improve the online student experience," she said.

More Information: To view a video from the flipped chemistry course, <u>click here.</u> ■

https://www.insidehighered.com/digital-learning/article/2017/05/10/trial-and-error-lehman-and-hunter-colleges-boost-chemistry

A 'New Normal' in STEM Teaching

By Colleen Flaherty // October 2, 2017

AAU wanted to improve science education beyond an instructor-by-instructor basis. Five years on, a major initiative piloted on eight campuses seems to be working.

Science instructors increasingly are moving beyond the lecture to more innovative -- and effective -- teaching methods. But professors with a taste for change often enact it alone, as their colleagues continue to lecture.

The Association of American Universities wants to change that. In 2011, it launched its <u>Undergraduate STEM Initiative</u> to encourage systemic reforms to science education to improve teaching and learning, especially in first- and second-year courses.

Early feedback was promising, and AAU is this week releasing a formal five-year status report detailing progress at eight project sites: Brown University; Michigan State University; the University of Arizona; the University of California, Davis; the University of Colorado at Boulder; the University of North Carolina at Chapel Hill; the University of Pennsylvania and Washington University in St. Louis.

Mary Sue Coleman, president of AAU, wrote in the report that the initiative is a "significant test of the degree to which a group of prominent research universities can work collectively with their national organization to improve the quality of teaching in undergraduate STEM courses, especial-

ly large introductory and gateway courses, thereby enhancing the learning experiences of many thousands of their undergraduate students." And so far, she said, results "indicate a resoundingly affirmative answer to this test."

Additionally, she said, the initiative has helped AAU understand how it, as group of research universities,



John Pollard, associate professor of practice, teaching a chemical thinking course at the University of Arizona

can better help to "support meaningful change at various institutional levels to improve undergraduate STEM education."

Higher education is "now reaching a major tipping point," Coleman added. "We cannot condone poor teaching of introductory STEM courses because we are trying to weed out the weaker students in the class or simply because a professor, de-

partment and/or institution fails to recognize and accept that there are, in fact, more effective ways to teach." Failing to adopt evidence-based

We cannot condone poor teaching of introductory STEM courses because we are trying to weed out the weaker students in the class or simply because a professor ... or institution ... fails to accept that there are, in fact, more effective ways to teach.

teaching practices in the classroom "must be viewed as irresponsible, an abrogation of fulfilling our collective mission to ensure that all students who are interested in learning and enrolled in a STEM course -- not just those who will choose to major in or pursue an advanced degree in that discipline -- are provided with the maximum opportunity to succeed," she said.

The report says that participation in the initiative beyond the eight project sites has been high: all 62 AAU institutions now have a designated STEM campus point of contact, for example. Some 55 member institutions have participated in the initiative in some way, including more than 450 faculty members and administrators. Departmentwide innovations are becoming institutional priorities, teaching and learning centers are being redesigned, and data and analytics are being used to monitor and improve student learning.

Campuses are also exploring new hiring practices to advance improvements in STEM education, learning spaces are being reimagined and campuses are addressing the critical issue of meaningful evaluations of faculty teaching, by AAU's accounting.

Every project site reported some improvement in student learning outcomes, according to the report. Degree of improvement varied, but "dramatic reductions in achievement gaps especially for women, underrepresented minorities and first-generation students" were observed in some sites. Reports of decreased D's, F's and withdrawals were common, as were increased persistence and success in subsequent courses.

Project Sites at a Glance

Improved performance on exams sponsored by disciplinary societies was observed, as was stronger performance on key disciplinary concepts, the report says. And some sites that managed to track the effects of instructional interventions on more general psychological factors reported increased self-efficacy, metacognition and attitudes toward science among students.

The initiative looks different on every campus but everywhere hinges on evidence-based practices. Arizona, for example, has focused some of its efforts to redesign classrooms into collaborative learning spaces: there are currently 10 such spaces, ranging in size from 30 to 264 student seats (10 additional spaces

are planned). AAU's report quotes Zoe Cohen, a professor of immunology at Arizona, as saying that she's been thinking about trying a "flipped" classroom and

applied for one of the new rooms. Once she started teaching in 2015, she said, it "changed me as an educator."

Cohen joined a faculty learning committee and an educational faculty learning committee and learned and developed active learning techniques. As a result, she said, she's seen her students earn more A's and B's and fewer D's on the final exam for her physiology of the immune system courses. Students also report more active and meaningful engagement and understanding.

Cohen's experiences match those of other Arizona professors teaching different courses in other departments, including physics, chemistry, molecular, cellular biology and engineering, according to AAU.

North Carolina, meanwhile, has taken a mentor-mentee approach, embedding fixed-term faculty members skilled in teaching within departments to train colleagues. Failures and D's in redesigned courses dropped from 11.5 percent in 2013 prior to the AAU project to 9.5 percent in 2016, while the learning gains in these courses were 13 percent higher than in traditional courses, the report says. Departments have promoted training by giving

faculty members course releases to compensate for the course they are revamping that term.

Teaching assistants at Davis trained to use active learning practices and adaptive learning technology were able to raise student outcomes in introductory biology by half a letter grade. Washington University, meanwhile, found that clicker-based active learning in high-enrollment introductory science courses was positively associated with exam performance.

Boulder's Departmental Action Teams worked toward department-level consensus on learning goals, pedagogical approaches and assessments aligned with learning goals. Results from the physics department there indicate that students from all four courses had post-test scores between 25 percent and 30 percent higher in reformed courses.

Michigan State started with faculty discussions of core ideas in each discipline, and the ways that knowledge is used, rather than changing pedagogical approaches and assessments: the assumption was that teaching changes would happen naturally when professors were thinking about big ideas and scientific practices.

Other changes include the formation of an institute, CREATE for STEM, to coordinate science education activities across campus, and they've had a large-scale impact,

according to AAU.

And at Penn -- which AAU says is the most faculty-centric of all project institutions -- individual faculty members within six departments are change agents, and their nexus is the Center for Teaching and Learning. The center administers Penn's four-year-old Structured Active In-class Learning (SAIL) program, which assists instructors as they develop, adopt and evaluate active learning activities to transform their classes. SAIL classes are designed to allow students to struggle through the application of course content, an often difficult part of the learning process, with the guidance of instructors and help from peers, and require students to do work outside class time to prepare for in-class activities, according to AAU.

Common Themes

Half of the project sites expanded their reach to departments not originally included in their proposals. Graduate and undergraduate assistants were called upon across campuses to help with the initiative. "With more trained individuals in the room, the capacity to facilitate and evaluate evidence-based pedagogy increases," the report says. "The experience also benefits the students themselves by reinforcing core concepts and helping them to learn effective teaching practices."

Recurrent themes among institutions include a shift from individual to collective responsibility by departments for introductory course curriculum, hiring educational experts within departments to bolster reforms, and a harnessing of (not just collecting) institutionwide data to support student learning.

Institutions were also found to have reorganized administrative support services to better support departmental reform efforts, such as by connecting centers for teaching and learning with department-based instructional efforts. Crucially, too, institutions found ways to better manage the simultaneous pursuit of high-quality teaching and research and signal the value of both. Washington University's Center for Integrative Research on Cognition, Learning and Education (CIRCLE), for example, includes tenure-track faculty, in addition to permanent research scientists. Consequently, according to AAU, the campus has been able "to focus on curriculum and scaffolding rather than individual course reforms as well as target sustainability and cultural [reform]."

Over all, said Coleman, of AAU, while there is much work to be done to realize "a 'new normal' -- one characterized by personal and institutional expectations that all faculty members will both use and be rewarded for using evidence-based approaches to instruction -- our initiative suggests that progress is being made."

https://www.insidehighered.com/news/2017/10/02/aau-reports-efforts-improve-science-teaching-research-universities

Breaking Out of the M-W-F Routine

By Colleen Flaherty // October 5, 2017

Coker College shakes things up by allowing interested professors to break out of the 50-minute routine.

Despite the increased chatter about evidence-based teaching practices, traditional academic structures don't really support them: the average lecture hall screams for, well, lectures. It's also hard to start and finish a dynamic learning activity within a typical 50-minute class block.

Seeking better ways to engage students and integrate its liberal arts and preprofessional missions, Coker College in South Carolina is doing away with that last convention, starting this semester – sort of. Instead of holding classes on Mondays, Wednesday and Fridays for 50 minutes, the college has changed its schedule to allow interested professors teaching Monday-Wednesday-Friday courses within certain time slots to teach for an hour each on Mondays and Wednesday and for two hours every other Friday.

The Friday block is now an opportunity for pedagogical innovation and deeper student learning. Courses on many campuses are already offered in blocks of up to three



One of Jennifer Borgo's Friday classes doing fieldwork

hours, of course, but sometimes they are sustained lectures of the type that might take place in shorter periods. The idea at Coker is to actually use the time.

"Higher education in the last five or six years has reached a point where we talk very well and have a lot of good evidence about engaged learning, like flipped classrooms and active learning, but our basic systems don't actually encourage or foster that," said Tracy Parkinson, vice president for strategic partnerships and special assistant to the president at Coker. "So we were looking for relatively simple ways of creating an environment for faculty to do the kinds of instruction we're reading about all the time."

Parkinson and the rest of Coker's administration strongly backed the initiative, but it was also inspired, in part, by a majority-faculty committee white paper on recruiting and retaining faculty members (the oc-

casion for the report was a new college strategic plan).

The committee praised Coker's "supportive and positive" work environment, including the transparency of the tenure process and new improvements to classroom spaces and technology. It also acknowledged recent efforts to foster collaboration and innovation in teaching but urged even more.

Suggestions included more opportunities to co-teach courses, especially across disciplines; the adoption of cohort classes, with the same students in two or more

courses; linked courses that meet separately some days of the week and together on others; and more flexibility in scheduling.

"We were looking at anything

that we might need to change to improve student learning and student success," said Will Carswell, chair of the Master Academic Planning Committee, vice president of external relations and a professor of music. "We didn't shy away from the schedule, though any time you tinker with the schedule you are treading on thin ice."

The college considered a variety of options for adopting the schedule blocks, such as having one day a week dedicated to them, but eventually settled on doing it on a voluntary basis within four time slots. So a 10 a.m. class section, for example,

would meet Mondays and Wednesdays until about 11 a.m. and every other Friday until about noon; an 11 a.m. class would meet Mondays and Wednesdays and on the opposite Friday from 10 a.m. until noon.

Some faculty members who have been teaching for many years don't want to change how they teach, and others want to see how the first semester goes before opting in. That's fine with Coker, for now, but the college plans on talking about teaching blocks with prospective faculty hires going forward.

Approximately 20 percent of the

Jennifer Borgo, an associate professor of biology with a passion for undergraduate research, said she's already teaching two courses according to the new schedule: a sophomore biology core class on ecology and evolution, and an upper-level biology elective called Behavioral Ecology. In both, Borgo tries to incorporate hands-on activities, in-class assignments and videos.

The ecology and evolution block has been somewhat difficult to manage, given that the class already has a three-hour weekly lab; Borgo said she has to fight the ten-

> dency to go long on lectures but breaks them up with active learning exercises and videos.

> Borgo has "absolutely loved" the schedule for Behavioral Ecology, which has no

lab period, however. "Fridays have been my time for exploration," she said. During the first block, for example, Borgo assigned students an organism and they had to come up

with questions, hypotheses and an experimental design.

"Given the emphasis I place on testing [predictions] in the class, I thought the students would greatly benefit from the activity," she said. "And they did -- they were actively engaged and excited while working with their mealworms and beetles." The second block will consist of a field trip to Carolina Sandhills Na-

[W]e were looking for relatively simple ways of creating an environment for faculty to do the kinds of instruction we're reading about all the time.

faculty have opted in to the new schedule this semester, for at least one class. More professors may opt in next semester; English and business professors are currently planning linked courses.

Coker sees the future in that kind of collaboration — that which meaningfully blends the liberal arts and preprofessional studies and doesn't strain teaching capacity like traditional team teaching does (when two professors are responsible for the same course).

Among those who have opted in to the program, faculty enthusiasm seems high, with some caveats.

tional Wildlife Refuge, inspired by a conversation on helping behavior (nestlings from previous years that stick around and help the following year's offspring); a typical species that displays such behavior is the red-cockaded woodpecker, and the class hopes to see some.

Joshua Webb, an assistant professor of theater, said, "From the beginning, I felt I was at something of an advantage in teaching under the new modified [schedule]." His courses in technical theater tend to be hands-on, he said, so "planning longer lab sessions every other Friday is not only easy but quite valuable to my students."

Additional uses of the block period will include environmental science students visiting the campus's Kalmia Gardens, business professors taking students to nonprofits and businesses, and the Quantitative Literacy Center having students in targeted gateway math courses meet in small sections on Mondays

and Wednesdays and a in big block on every other Friday. Students in Spanish will have regular consultations and feedback sessions with professors and extra time for cross-cultural activities.

Some professors who want to teach in blocks were not able to this semester, due to scheduling. Joseph Flaherty, director of undergraduate research and assistant professor of biology, said he soon hopes schedule allows him to teach this way.

More recent innovations in teaching and pedagogy, such as active learning, seem to be highly constrained by relatively short class meeting times, he added.

"My hopes will be that once students and faculty adjust to the new schedule and realize the potential benefits, we will expand and include most, if not all, of our semester courses into the new framework," Flaherty said.

Over all, reactions from both stu-

dents and faculty to the new schedule are "what you might expect -- initially expressing some uncertainty but eventually realizing what's possible," he said. "I anticipate the trajectory of opinion from both students and faculty to continue on a positive path."

Parkinson said Coker opted not to study the effects of the first semester of blocks, beyond anecdotes. In the future, however, he said, the college will engage its institutional research staff to measure success; composition classes that are taught both in the new and "old" style are likely candidates for study.

Coker President Robert L. Wyatt said he believes that the new course blocks will help meet students where they are, since most high schools in the college's recruiting areas now have block schedules.

"I think this is consistent with thinking and looking at the needs of the 'homeland generation," he said, referring to today's undergraduates.

https://www.insidehighered.com/news/2017/10/05/coker-college-lets-faculty-deviate-standard-monday-wednesday-friday-teaching-routine

Views

A selection of essays and op-eds

Class Size Matters

By Deborah J. Cohan // September 19, 2017

Deborah J. Cohan suggests strategies for generating discussion and engagement in large classes.

Ideas vary as to what constitutes large classes. Some people say it's the 200-person chemistry class or the 400-person nutrition class at a major research university. At a smaller liberal arts college, a 35- to 40-person psychology class may seem big, whereas at many higher education institutions, that is just an average size. When a college is filling classes in rooms the size of very large movie theaters with amphitheater seating, we can probably all agree that those are enormous classes.

At one point, I was so used to teaching classes that hovered between 15 and 45 students that when I got assigned 70-person classes, I

worried that I would need to drastically alter my teaching style. I had figured out how to master facilitating meaningful discussions in those smaller classes, but I wondered how I could get discussion going with so many students. Would I have to ei-

ther get rid of, or really sacrifice, the open and intimate aspects of my classes -- which I regard as hallmarks of sound pedagogy?

Eventually, I learned how to effectively teach larger classes. So I'd like



to share some fruitful tactics and strategies for dealing with them.

For starters, when teaching large classes at colleges and universities that boast small class size and low student/teacher ratios on their websites and on campus tours, it is

important to comment on this early on in the classroom. On the first day of such a large class, I always acknowledge that I understand that many students probably chose the university because of the sense of a family atmosphere -- because it was a place where "everyone knows your name" -- and that this class may not have been what they initially bargained for. At my university, we offer few large classes; in fact, only three classrooms on the entire campus are built to accommodate more than 68 students. So, my large Introduction to Sociology class is an anomaly.

It's troubling to me that I am part of a broken promise on Day One. I explain to them that even the size is sociological, that individuals 'choices and behavioral options are constrained by social forces imposed by institutional structures. I also tell them that, as we will discuss later in the course, aspects of their lives including their education have been and will continue to be McDonaldized -- that bureaucracies which we all inhabit and will also explore in the course emphasize profit, the outcome of which can be alienating. I explain to the students at the outset that I craft my teaching in ways to counter the disconnection and isolation that is often experienced in large classes.

Reducing Anonymity

The vast majority of my large introductory classes are composed of first-year students, many of whom are also first-generation. And depending on the day when classes

start and the time of day, sometimes mine is the very first college classroom they've ever been in. I try to possess a beginner's mind that first day, recognizing that it can be overwhelming for new students to walk into a classroom with so many people. So the first thing I do when I enter the large classroom is to play loudly Bob Marley's song, "Three Little Birds." Hearing "Don't worry about a thing, 'cause every little thing gonna be alright" is a downto-earth, fun and easygoing way of letting students know we are all in this together.

At the same time, I ask students to take out a piece of paper and fold it, tenting it on their table with their name in bold print. And, although contested among colleagues, I do take attendance. I do this orally for about two to three weeks, at which point I then shift to printing out the sheets and distributing them for students to initial each class period. Usually, I am able to learn the names of at least half the class by the third week, and doing attendance orally helps to make that possible.

The photo roster feature on Black-board is also helpful for making names and faces more indelible in my memory, and I review it periodically. That is especially important when I notice students who do not talk in class submitting exemplary work. It ensures that I know who they are and can invite them to office hours to help them develop more confidence for sharing with the class, or to encourage them to consider a sociology major or minor

or at least more sociology courses. At the same time, we know that anonymity poses a great risk for students already in jeopardy academically and psycho-socially, and by doing everything to immediately set the tone that we are collectively reducing anonymity is a worthwhile and important, albeit ambitious, endeavor.

In attempting to get to know my students as learners and human beings with their own interests, hopes, fears, dreams and passions, I also post a questionnaire electronically that I ask students to complete, print out and submit to me in class. Questions range from asking about their course schedule that semester to whether they hold a job outside of school or have caregiving responsibilities for elderly or ill relatives or children. I also ask about their favorite books, music and movies, as well as social problems that concern them.

And I always ask what I can do to be the best teacher for them -- about their learning style and personality and what I should be aware of that might make learning about the material more challenging or painful for them. It is here that I often find out about mental-health issues, body image issues or identity issues; whether they have experienced a history of sexual and domestic violence or extreme poverty; or if they have parents who are divorcing, are addicted, have died or are in prison. Some of the responses break my heart, but they are all informative.

I collect upwards of 125 of these

student forms across all my courses every semester and review them, placing an asterisk at the top of any that necessitate a little more attention and dia-

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Some students choose to never see me and unfortunately and predictably, they are generally the same ones who wind up on academic probation or not returning for future semesters.

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logue. And I return to the next class session and read off the names of everyone who should plan to see me in that week or the subsequent week. I make it abundantly clear that nothing is negative in this since, after all, I have usually read off the names of three quarters of the class. I simply explain that some forms generate a more time-sensitive need for seeing me. I also strongly recommend that for those whose names weren't called that they should still seek me out so I can get to know them.

So within the first two weeks. I easily wind up seeing half the students in an introductory class. Some students choose to never see me and unfortunately and predictably, they are generally the same ones who wind up on academic probation or not returning for future semesters. The large majority of students who come to office hours tell me that they were initially a little intimidated, are glad they came, and are grateful for the additional resources and recommendations I give in that setting that are specific to each person. And it is one more opportunity for me to learn their names and what is capturing their interest or worrying them in the course and in their college experience.

Generating Class Discussion

All these efforts to reduce anonymity are paramount for cultivating the conditions necessary to generate meaningful and impactful class discussion. I have never taken the position that the only way to have discussions in large classes is to break everyone into small groups. I do that, for sure, and I also assign a small group project and presentation for the end of the semester for them to teach their peers.

But I also create possibilities for discussion among all the students. In some ways, if you were to observe me, you might think my class resembles a talk-show: I physically move around the room and communicate from the back of it as well, generating conversations with people and getting the students to talk with each other.

Having opportunities for students to speak in front of dozens of their peers becomes excellent practice for when they will have to do this during their end-of-semester presentation. Some students also remark that my classes become interdisciplinary experiences that dovetail with public speaking class-

es, for example.

I frequently assign short in class and out-of-class writings and collect them and read parts of them aloud anonymously so people have

the opportunity to hear everyone; in this way, all voices in the room become audible, especially amidst the most controversial topics in the course. It also becomes a great opportunity for the quietest students to be heard and for the frequently vocal participants to listen closely to their classmates. Sometimes, I have asked students to anonymously write responses in class to a guest speaker or film or to pose discussion questions for the class. I have circulated a basket where people put in comments and then take one to read aloud that is not theirs. It is powerful when students hear their work being read aloud by oth-

An Atmosphere of Connection

I routinely receive emotionally intense e-mails from some students grappling on personal and societal levels with what we are learning and I have occasionally asked permission from them to read aloud anonymously the content from the message. In asking students for feedback about what has helped to make these large classes feel smaller and more intimate, one student remarked to me, "If I had to choose, I would say I enjoyed when you read

the letters from my classmates. When coming into class we all had various struggles and obstacles we had experienced, and we were unaware of what others around us were going through. I loved hearing their stories, realizing that it wasn't just me that had struggled and that some of my classmates had been struggling with the exact same issue. It felt good knowing I wasn't alone and that someone else knew what I was feeling. Many of the stories and experiences you shared from your personal life definitely added to the intimacy of the class." Another student said, "You don't lecture -- you have a conversation with us. The energy and vibe you create, well, the class never felt as big as it actually was."

One of the most significant and powerful mentoring experiences I have enjoyed in 21 years of teaching has been with a young man who initially e-mailed me after my class presentation on body image and eating disorders. In that message, he disclosed his experiences struggling with self-harm, specifically anorexia and cutting. That e-mail exchange led him to enroll in five more courses with me, significant involvement in the Sociology Club, which I advise, and a continued conversation and friendship that has been sustained since he graduated in 2016.

This young man started off as an average student in a large class who truly blossomed, academically and emotionally, in his future classes with me.

His feminist voice for change around issues of violence against women was powerfully felt and his wisdom, far beyond his years, was hard-won as the result of witnessing a rapid succession of deaths of those close to him. So I invited him to speak at my large classes about body image, self-harm, masculinity, loss, trauma, recovery and what it means to be an ally. He quickly became an exquisite model for his peers.

The group project that I assign has also led to student involvement on speaker panels that I host in class and at evening events. A few years ago, another young man was part of a group investigating sociological aspects of fatherhood, and he spoke about helping his mother escape a lethal domestic violence situation. Since that moment, I have regularly invited him to speak at my classes on the effects of domestic violence on children, and he has spoken passionately and convincingly, serving as a true peer mentor -- reinforcing the importance of bystander intervention and an alternative to toxic masculinity. He went on to become the president of the student body, where he continues as a

role model.

At a recent conference, I was speaking with a colleague newer to teaching who expressed a lot of angst about her upcoming schedule with a large class. Another woman who was part of the conversation suggested she try things like clickers. Others assumed they had to give up on discussions altogether and resort to traditional lectures -- incorporating PowerPoint and game-based learning platforms like Kahoot. Implied in all of those suggestions is that we must pile on more methods and gimmicks to keep students' attention in a large class and acquiesce to the corporate mandate behind the impetus for large classes that we should not iust educate but also entertain the "customer."

I hope to convey to readers what I told those colleagues: that the heart of artful, transformative pedagogy is to connect with students and to create an atmosphere in which they can engage with each other over stimulating ideas.

That happens when we honor and retain the authenticity and integrity of the methods that are distinctly ours as teachers.

It may mean that we need to simultaneously think about size but not fixate on it, allowing it to help us consider new ways of being and knowing in the classroom.

Bio:

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https://www.insidehighered.com/advice/2017/09/19/how-teach-large-classes-students-effectively-essay

Let Them Play the Game

By Sarah Demers // April 23, 2014

Sarah Demers tried (and failed) to teach a new card game to her family. She's the one who ended up learning something -- about when lectures aren't the right approach.

My children and parents were in bed before 10 p.m. one night over the holidays. I sat at the dinner table with my brothers and our spouses. Quick glances around revealed that we all, miraculously, had enough energy for a game of cards. I knew a game that was the perfect balance of fun and simple. In the time it took me to push back my chair and stand up I'd fully morphed into professor mode. I launched into a mini-lecture to teach them how to play.

As an assistant professor in the physics department at Yale University, I am in my groove when I'm giving a lecture. Physics is a gorgeous subject, and shockingly counterintuitive even at the introductory level. You start students with the big picture. Armed with mathematics, you land on specific examples that shatter the framework they, maybe unwittingly, had developed for the natural world in their 18-plus years of walking around and paying attention.

What do you mean an object in motion stays in motion without an external force? How can it be that a ball you drop and a ball you throw horizontally will reach the ground in the same time? Doesn't that thrown object have additional oomph that translates into more time aloft?

And this is well before we get into 20th-century physics. You can't outpace the constant speed of light even if you let that flashlight beam loose from the front of a charging train. And the realm of the microscopic, with destiny governed by probability in the calculations of quantum mechanics, calmly tosses determinism out the window.

When your excitement for something you love is contagious, heads nod and questions fly. And the fact that the lesson can so easily turn catastrophic, with an extra minus sign or a botched explanation, kicks up the stakes. The students who sleep or text provide immediate feedback that you have failed to en-

gage everyone. The even balance between the times I leave class victorious and the times I'm ready to crawl under a table reminds me that teaching is one of those activities that will forever label me, "needs to improve." That's fine. I like to improve.

But this mini-lecture over the holidays wasn't one of those obvious catastrophes. I'd started with the foundation, telling them the big-picture goals of the game. Only when heads were nodding did I move to details, being sure to come back around to specific examples and the "here's how you win" take-home. It was so smooth and we were so together in it that I mentally noted, "this is what it feels like to give a good physics lecture."

That perceived connection makes what follows particularly humiliating.

I'd barely hit my seat when my older brother piped up with, "I have no idea how to play the game."

I was shocked. I immediately turned to my husband. He knew the game well and isn't afraid to give me honest feedback, but he justified my confusion by stating, "That was a beautiful explanation!" Someone who knows the material is best placed to recognize a well-crafted presentation, but not necessarily an effective one.

I turned back to my brother and asked, "Why were you nodding your head if I wasn't making sense?"

He replied, "You were making sense. Everything you said made sense as you said it. But now that you're finished, I don't know how to play the game."

By now my brothers were between giggling and guffawing at my consternation. My younger brother gently suggested, "Maybe if we just start playing the game we can learn as we go?" And it dawned on me that this had been quite close to a typical physics lecture indeed.

We all know that we can learn by doing. Many of us realize that we learn best by teaching. The act of gathering together the loose ends and tying them up into our own explanation, what I've learned to call "constructing my own knowledge" thanks to education research, is the surest way to adjust our existing framework. Constructing our own

knowledge isn't about getting us through the next test, but is about fundamentally adjusting how we view the world.

A set of well-tested interventions that can improve learning in traditional lecture courses are collectively known as "active learning." These activities seem most effective when carried out in small groups. To make the group work less awkward, instead of sitting in rows in a lecture hall and staring at me, my students in introductory physics sit around tables and stare at each other. It can still be awkward. Reminders that this is not just about having fun or being educationally trendy, but is instead about using our time effectively, are a necessary part of my routine.

When I handed out sheets of aluminum foil a few weeks ago in the middle of class I felt as if I were balancing on a high wire. Any hint that I am wasting their time sends students reaching for laptops to check email. The slightest sense that I am treating them more like my six-year-old than as budding scholars sends them to Facebook or to an assignment for another course.

I gave instructions for the students to wrap one of their phones in aluminum foil and to call it. The wrapped phones didn't ring. Their mission was to come up with an explanation.

I had told them weeks before that there are no electric fields inside conductors and tried to motivate why. I'd also derived the behavior of electromagnetic radiation from fundamental equations, revealing it to be electric and magnetic fields traveling at the speed of light. The signal to their phones (electromagnetic radiation) did not pass into the enclosure of aluminum foil (a conductor.) Their mini-experiments, surprise, five minutes of discussion, and a two-minute classroom-wide conversation resulted in learning that the theory alone didn't deliver.

There is a place for lectures in education. They can introduce, motivate and contextualize material.

However, we often want classroom time to go beyond equipping students to learn and into actual learning. My failed attempt to teach the card game is serving as a parable.

It warns me away from the false security of a lecture that feels good and might be admired by my colleagues but accomplishes little with the students.

If we want them to learn we need to cede time to them to struggle with loose ends. We need to let them play the game.

Bio:

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https://www.insidehighered.com/advice/2014/04/23/when-lectures-fall-short-teaching-tool-essay

Capturing Students' Attention in Lectures

By Christine Harrington and Todd Zakrajsek // October 3, 2017

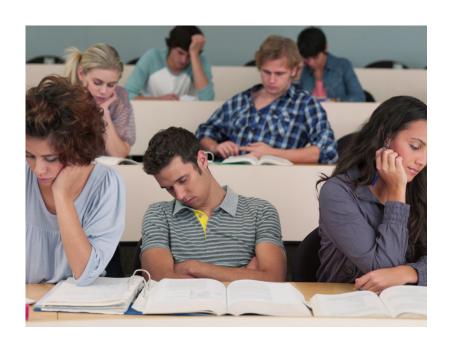
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With everything that is happening in the world, it is easy for students to become distracted during class.

Yet it is important to establish a classroom culture where learning is the focus and such distractions are kept to a minimum. To accomplish that challenging task, we as professors need to emphasize the importance of a learning-focused classroom culture on the first day and maintain that environment throughout the semester by addressing behaviors that can have a negative impact on learning.

In the course of our teaching over the years, we've identified the following strategies to accomplish those goals – and they often take only a few minutes of class time.



Create a classroom culture focused on learning. Actions before the semester even begins can have a significant impact on how much students pay attention and learn in the class. A first step is to develop a good rapport with students. Students are more likely to engage in learning-focused behaviors when they respect their pro-

fessors and believe they care about their learning. A simple action like sending out a welcome e-mail before the start of the semester can be a productive way to begin a positive relationship with your students.

Then, on the first day, it's important to develop a learning-focused culture in the classroom. You should clearly communicate poli-

cies that promote learning and minimize distraction, such as not using cell phones or other technology for non-learning purposes. And how you communicate those policies also matters. Syllabi that focus on negative behaviors and their consequences can send the message that you are expecting students to engage in inappropriate behaviors, which may not help you establish a good rapport with them. Instead, make a positive statement about how much you value a learning-focused environment and how you take your role in creating and maintaining this type of environment seriously. Providing students with a rationale for the policies can promote a respectful relationship while also increasing the likelihood that they will follow those policies.

Deal with off-task behaviors when they occur. Despites such efforts, some students may still engage in behaviors that distract others. A powerful, nonverbal way to address that is to walk closer to the student who is behaving off-task, making eye contact. Another strategy is to use the student's name in the context of the lecture. That is not the same as calling students out for their behavior. Instead, if John is off task, you might say something such as, "When John shared his experience with volunteering at his local elementary school, the scenario he described was a good example of operant conditioning."

If the nonverbal and name-dropping approaches don't work, you may have to have individual conversations with students outside of class in which you ask them to stop engaging in disruptive classroom behavior.

Discuss the detrimental effects of multitasking. Most students do not realize what a problem multitasking can be in the classroom. But using phones, tablets and computers for social purposes is a normal activity for most of us, and it can be challenging for students

to turn off their devices when entering a classroom. Review with them the research on how important attention is to learning and how distractions such as cell phones and laptops can have detrimental impacts on their success and the success of their classmates. Engaging students in activities or discussions about studies such as these at the start of the semester can help them understand the importance of being on task and focused during a lecture. A few minutes of class time can have a long-lasting, positive impact on the learning experience for all your students.

Identify the big ideas. Prior to each lecture, identify the three most important concepts and then develop a plan to emphasize those points. One strategy is to write the big ideas on the board or put them in a PowerPoint slide so students know to look out for them during the lecture.

Some faculty members might worry that by identifying just a few big ideas, they may be minimizing the importance of other content. Remember, however, that when stu-

dents learn the important points, it will be easier for them to take in and digest the details because you've created an organizational structure for the material. Providing students with assistance in determining the most vital points will lead to more, not less, learning in the long run.

During the lecture, we can inform students why we are using this strategy and how knowing the big ideas will serve as a springboard for them to take in more detailed information during the lecture and reading. In other words, we can help them understand that the big ideas are a great start to learning the course content, but they are expected to dive much deeper into it and learn more specific material as well.

One of the simplest strategies you can use to emphasize what is important is to simply tell them what is important. Some faculty members think it is the student's responsibility to decipher that, but it can be a difficult task for novice learners. Plus. why does it have to be a mystery? By making statements such as "This is important!" we can capture the attention of our students and help them know which topics demand more study time and energy. As students learn more about the discipline, they will be better equipped to identify the key concepts without as much support.

Use a hook or a cue. Once you've identified the big ideas, you'll want to think about how to grab students' attention. You might use a 90-second activity, or hook, based on content. Or you can establish a

cue that you use consistently to emphasize the importance of a concept.

Some examples of hooks are an interesting image, question, story or statistic that you communicate in a passionate way. Some examples of cues include straightforward language such as, "This is important" or "This is one of the big ideas" and making a visual gesture, using silence or a dramatic pause, or standing in a certain location in the room. In the beginning of the semester, you can explicitly describe such cues with your students, but as the semester progresses, this verbal explanation will no longer be necessary.

Be passionate.

Showing your passion about a subject matter is an excellent way to capture attention. Students respond positively to professors who

are excited about the course content, and your enthusiasm about a topic can certainly communicate importance.

Although you may naturally talk louder about content when you believe it is particularly exciting or important, consider developing an intentional plan to use your voice to draw attention to the crucial points. Talking more loudly or more softly will often capture the attention of your students.

When a professor speaks with a monotone voice that doesn't change, students will probably get

lost and have significant difficulty determining which concepts matter most.

Use gestures or symbols.

You can use them a couple of different ways to emphasize importance. For instance, you can explain to students that you will wave your hands above your head before presenting the big ideas. In essence, that serves as a retrieval cue, making it easier for students to extract information from long-term memory when it is needed.

Another related strategy is the use of symbols. A star next to a concept would be one example. You

class, they can be better positioned to differentiate between the important and less important content in a lecture. But that is only the case if the students understand what they read in the textbook, and unfortunately, they often fail to report a high level of comprehension after reading a textbook chapter. One of students' most widely used strategies while reading is highlighting parts of the text, but most students don't do that effectively. By teaching them a few basic tips, we can help them extract key points from both the text and the lecture.

One helpful approach is the 3R or

read-recite-review When method. using it, students

should first identify a manageable section of the chapter to read. After reading it, they should close the book and make

notes on that section, using their own words to summarize what they learned rather than simply copying text from the book.

Finally, students should reread the section and fill in their notes with any missing content. Students can use their highlighters because they now possess some knowledge on the content and will be better able to identify the most important points.

Encouraging students to only highlight one or two sentences from each paragraph or section also forces them to actively think about the content, determining what is most

" You can explain to students that you will wave your hands above your head before presenting the big ideas. In essence, that serves as a retrieval cue, making it easier for students to extract information from long-term memory when it is needed.

> can also use symbols consistently when discussing a specific concept. For example, if your goal is to help students in an introductory psychology course to understand the many ways cognition applies to different theories, a \blacklozenge symbol might be used. That symbol will remind students that it is a cognitive application of a given theory. Think about how well we -- and our students -- know the simple icons on our smart phones. Images are powerful learning tools.

> Teach students how to read and highlight effectively. When students read the textbook before

important. Teaching students some of these simple, yet powerful, reading strategies can help them learn course content.

Students often report that lectures are boring and that it is difficult to learn from them. That often happens because an expert, the professor, is attempting to inform novices, the students, and at times, novices do not understand the major point of the lecture and miss key information along the way.

Learners in such situations have a

difficult time determining what they should attend to at any given time and as a result get frustrated and lose interest. When you help them to better process the information, they will maintain focus and learn more.

Bio:

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https://www.insidehighered.com/advice/2017/10/03/how-keep-students-becoming-bored-during-lectures-essay

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