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of Higher Education

SPECIAL REPORTS

Bringing History Alive

By Ben Gose | OCTOBER 22, 2017

✓ PREMIUM

Dahpon Ho still remembers the first college course he taught.

As he stood before 40 students at American University, where he was an instructor, "my heart was beating so fast I thought it was going to burst." He was glad that a tall lectern hid his quaking knees.

He glanced at his lecture notes but cast them aside.

"Who are you?" he asked the students. "Why are you here?"

"I got to know their names," he says. "I established rapport, and that was immensely helpful to me as a teacher. If not for that, I probably would have quit in my first year."



Kyle Schwab for The Chronicle
Dahpon Ho, an assistant professor of history at the U. of Rochester: "Students have to feel that they're part of the historical community. If history is fossilized, it will perish."

The image of Mr. Ho cowering at the lectern is hard to square with his approach in the classroom today. He's an assistant professor of history at the University of Rochester who specializes in China and East Asia and tries to bring history alive for students. He wants his classes not only to inform students but also to help *form* who they become. A 2016 course on the Korean War was so full of role-playing and props that his teaching assistant, Jim Rankine, says it was "daunting" to take the position.

"He was willing to try things that had never even occurred to me," says Mr. Rankine, a Ph.D. candidate from Australia. "He asked students to enter into historical situations using techniques that are more akin to a drama class than a history class."

In that course, Mr. Ho split the class into two groups, North Korea and South Korea, for a competitive role-playing project set in the Demilitarized Zone (DMZ) separating the two countries. For eight weeks, during a short period at the beginning of class, the two groups plotted strategy, issued propaganda, held parades, and conducted "rocket" tests. They even re-enacted the 1994 funeral of North Korea's longtime leader Kim Il-sung, using a coffin built by one of the students.

Using their imagination, students absorb history far better than from a textbook, Mr. Ho says.

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"Students have to feel that they're part of the historical community," he says. "If history is fossilized, it will perish."

Yet Mr. Ho knows that for many students such role-playing can provoke anxiety — especially at a time when tensions between the United States and North Korea are so high. To encourage them to participate, he takes risks himself. Near the end of the course on the Korean War, he pulled out a guitar and, apologizing all the while, played a modified version of the Cat Stevens song "Father and Son," which Mr. Ho had renamed "History and Life."

"First we need to change ourselves, ... and it starts by living history," he sang.

"That's the way, and I know, that you won't forget this class."

Though he insists that such antics do not come naturally, he says he's willing to stumble through a song for the good of his students.

"I'm always willing to make a fool out of myself," he says, "if it will serve a

pedagogical purpose."

Mr. Ho's parents immigrated to the United States from Taiwan in the 1970s. His family had moved around the world during his youth, living in Saudi Arabia, Texas, Indonesia, Singapore, Switzerland, and China, as his father, a geophysicist, worked on oil projects.

At Rice University, Mr. Ho started out as a mechanical-engineering major but then took a course with Richard J. Smith, a history professor specializing in China. Mr. Smith not only urged Mr. Ho to become an academic but "taught me everything I know about how to be great professor," Mr. Ho says. (Mr. Smith is still at Rice, where he is a scholar at the Baker Institute for Public Policy.)

Mr. Ho arrived in Rochester in 2010, after earning a Ph.D. in history at the University of California at San Diego and spending a year teaching at American University. His courses include "Modern China," "Tibet: History and Myth," and "The Samurai." In 2013 he won a universitywide teaching award for his "dynamic and creative approaches," helping students discover the relevance of history in their own lives.

Mr. Ho sets the tone on the first day of class. Students are asked to create a slide introducing themselves, including a photo and anything that makes them special. "It's about building community," the professor says.

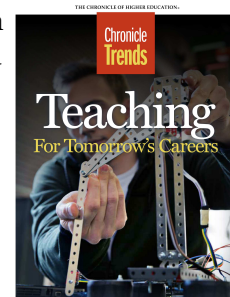
Rule No. 1, stated on every syllabus: No B.S. (He does not abbreviate the word.) "It means I won't B.S. my students, and if they don't know something, they should tell me, too," he says.

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Every class has a culminating project designed to fill students with excitement rather than dread. The course on Tibet ends with two debate projects: In one, a group of students argues for Chinese rule and says criticism of China's human-rights record hurts Tibetans by putting China on the defensive. The other side argues for a free Tibet and says global pressure will end atrocities there. The remaining students must vote for the winner based on the arguments presented. Those arguing the Chinese position usually win, Mr. Ho says.

Mr. Ho says such competitions work because students want to win and get a thrill out of presenting before their peers. He tried assigning routine term papers in his first year of teaching but found that students responded with the same lack of imagination reflected in the assignments.

"It's wrong to say that students don't want to write," he says. "They simply don't want to write in the ways that have been dictated to them over time. They want to write to speak, they want to get their message out. If you give them the chance, they will respond."

Matthew Sisto, a 2016 graduate who took five courses with Mr. Ho, praises all of them but says the first four were merely steppingstones to the Korean War course.

In that course, several Korean War veterans visited the class, as did a young North Korean refugee. The climax was the DMZ role-playing project. Mr. Sisto, assigned to North Korea, was voted Great Leader by his teammates, which meant he spent several weeks playing Kim Il-sung. He and his father built a coffin so that the team could stage Kim Il-sung's funeral; it was later donated to a student theater company.

Mr. Ho is now working on a documentary film about the Korean War course. He hopes to show it in a Rochester movie theater.

"As fun as the experience was, it was also quite a good learning experience," says Mr. Sisto, now an English teacher at a local Christian high school. "We really had to take on the mind-set of a side that most of us didn't even agree with. That's what critical thinking is all about."

He says Mr. Ho brings an energy to his courses that is contagious. When the professor outlined the DMZ project, Mr. Sisto recalls, he said he had taught the class once before, in 2012, and described some of the theatrics that students pulled in that class.

"Then he said: 'I'm sure you guys will do even more.' "

This article is part of:

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A version of this article appeared in the October 27, 2017 issue.

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SPECIAL REPORTS

Designing an Online Science Course With Video-Game Appeal



Laura Segall for The Chronicle

Ariel Anbar, a professor in Arizona State U.'s School of Earth and Space and Exploration, has designed innovative interactive science courses for students who aren't majoring in science.

By *Beth McMurtrie* | OCTOBER 22, 2017

✓ PREMIUM

Can you teach a student to think like a scientist in a class that works like a video game? Ariel D. Anbar believes so. A professor in the School of Earth and Space and Exploration at Arizona State University, he has earned a reputation as an innovative designer of online, interactive science courses for students who aren't majoring in

science.

The inspiration for his work stems from his frustration with the traditional lecture format. Early in his time at Arizona State, Mr. Anbar taught general chemistry. He won a teaching award, but felt nevertheless that it was a "dismal learning experience." Presenting 200 students with a series of PowerPoint slides and a host of material to memorize is exciting for exactly no one.

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Understanding science, he says, is not the same as mastering facts. It requires that you develop problem-solving skills based on logic and reason. Design a hypothesis, test it, and learn from it. The typical researcher masters just enough content to ask a good question. "That's how he learns," says Mr. Anbar. "This is the way we ought to teach."

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He wondered: If you design a science course like a video game, immersed in a world of choices, can you teach such skills? At other universities, Mr. Anbar says, his question would have most likely been dismissed. But at Arizona State, which has invested heavily in online, adaptive and interactive education, he was given the green light to explore his idea.

Together with Lev Horodyskyj, an instructional designer at Arizona State with a gaming background, and Smart Sparrow, a company that makes an adaptive, interactive technology platform, he designed "HabWorlds," which stands for Habitable Worlds. The online course, which has received support from the National Science Foundation, introduces astronomy, biology, geology and physics to nonscience majors as they explore the search for life

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beyond Earth. They must find and describe hypothetical habitable planets through interactive tutorials in which they test ideas in a simulator, which tells them whether they're right or not. For example, after watching a short video on types of stars, students are asked to hypothesize which ones live the longest. Then they run a test and are told whether their answer is correct.

Mr. Anbar runs the Center for Education Through Exploration. It opened last year to develop coursework that builds on the ideas behind HabWorlds, such as a series of open science lessons for students of all ages called Infiniscope. The center also leads the Inspark Science Network, created to share knowledge about adaptive and innovative science education, in collaboration with Smart Sparrow and backed by the Bill & Melinda Gates Foundation.

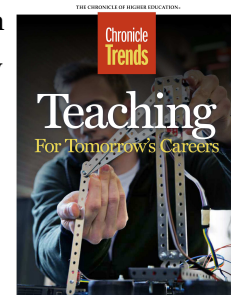
Rahim Rajan, a senior program officer with the foundation, says Mr. Anbar has tapped into two parallel movements. One is toward interactive, project-based learning in STEM fields. The second is to introduce new technologies to science education.

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"I credit Ariel for having the wisdom to try to bring these two things together," says Rajan. To make things even more interesting, he's adding them to our curriculum. "That's really innovative," says Mr. Rajan.



Mr. Anbar says it would be impossible to do his work without partners at Arizona State, Smart Sparrow, and elsewhere. And he says that that may be the future of higher education. "This every-professor-is-an-island model is not a very efficient model," he says, "when you're trying to do anything more sophisticated."

As for measuring the development of critical-thinking skills, Mr. Anbar says instructors can look at how students work their way through a problem. Are they making random choices or systematic ones? Some evaluations of another course he helped create, called "BioBeyond," and of virtual field trips, he says, show that those students perform better than the ones who took a class or field trip in person.

So, is any of this high-tech teaching relevant to old-fashioned classroom instruction? Mr. Anbar thinks so. This year he is offering an environmental chemistry course that he last taught in 2011. What seemed acceptable to him then, Mr. Anbar rejects now. Instead he spends two days a week in a traditional lecture format, with a fair amount of student participation required. The third day of the class is inquiry driven.

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One week, for example, he asked students to work together to come up with questions that spin off Hurricane Harvey and connect to environmental chemistry. The students picked their five favorites, such as asking about the economics of the chemical industry, which was hard hit after flood

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oil refineries and chemical plants. For homework they found resources online that advanced their understanding of the question or provided an answer, which they discussed in a later class.

Developing an online course trains you to be thoughtful and organized about what you are trying to accomplish, Mr. Anbar says. "You can't just show up with lecture slides that are cobbled together and glue it all together with your clever insights and commentary."

He believes the lessons he's learned teaching science are applicable to other disciplines. Content mastery used to be the mark of being well-educated. His father, for example, could always drop in facts or historical references when making a point at the dinner table. But now, he says, his kids can just whip out their iPhones and do the same.

If facts are now a commodity, their value is knowing how to wield them. "If we aren't using all this technology to know how to do that," he says, "we're not meeting the moment."

Beth McMurtrie writes about campus culture, among other things. Follow her on Twitter @bethmcmurtrie, or email her at beth.mcmurtrie@chronicle.com.

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A version of this article appeared in the October 27, 2017 issue.

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SPECIAL REPORTS

Getting Students Excited About Literature



Brett Flashnick for The Chronicle

John Zubizarreta participates in a dance demonstration led by his students as part of their study of the novel "Dancing for Degas."

By *Lawrence Biemiller* | OCTOBER 22, 2017

✓ PREMIUM

With polyglot quotations and characters lifted from an encyclopedia's worth of mythologies, T.S. Eliot's sprawling "The Waste Land" isn't the most approachable of poems. But when John Zubizarreta introduces it to his students at Columbia College, he tells them to think about it as "spilling out your personal life with no boundaries — in writing, in shouting, in tattoos on your body."

"In a different age, using a different modality, and coming at it from a very different cultural experience," he tells them, "that's exactly what Eliot was doing. Think of 'The Waste Land' as a bunch of texts." The students understand, he says. "They're like, 'Ah, ah, OK.'"

"Things fall apart; the centre cannot hold," he continues, quoting W.B. Yeats's "The Second Coming," published just two years before "The Waste Land." He tells students the chaos they see everyday in the news "is exactly what Eliot was seeing — he was texting it in the form of a poem."

Mr. Zubizarreta, a 67-year-old professor of English, has taught at the South Carolina women's college since 1988, and is also the director of its honors program and of faculty development. He was the Carnegie Foundation/CASE U.S. Professor of the Year for Baccalaureate Colleges in 2010-11, but he's best known on the Columbia campus as a champion of what he refers to as "reflective learning moments" — "RLMs," for short. He's talked about them so much, he says with a laugh, that "they satirize me on campus. But you can't satirize what you don't understand."

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Brynna Gregg, a senior majoring in English, explains that RLMs are "those times when he points out the intrinsic value of thinking about thinking or writing about writing."

"He regularly pushes us to reflect on how we learn, how learning in one class connects to learning in other classes and to our personal lives, and why our learning is important in the first place," says Ms. Gregg. "No other professor I've had has pushed me to be metacognitive — to think not only about what I'm learning but how I'm learning it and how my mind is processing it."

On a lighter note, she says Mr. Zubizarreta loves the Beatles, "so he's always finding ways to tie them into our class discussions." In every course of his she's taken, he's brought in his guitar and sung to the class at least once.

"I tell my students all the time, we're here to build bridges in your brain," he says. "I tell them, 'What do all of you notice about this conversation? Sally made some comparisons between this novel and another from a different class. Why is that good scholarly process?'"

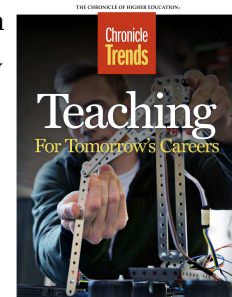
Mr. Zubizarreta is somewhat skeptical of the idea that what he does is innovative. But, he says, "we know a whole lot more just in the last 10 years from neuroscience about the ways in which the brain learns in different ways."

"Lecture is a venerable form of teaching," he says. "I had great lecturers in school, though I don't lecture much myself." Instead, he establishes an online forum for each course in which students trade ideas and reflections. He calls it "an incredibly rich pedagogical tool."

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"In class we look at what students have been writing on the forum, and that's what we discuss. Discussion is energizing. It gives students opportunities to test their knowledge and have civil conversations, to respect what others say. You have to back up what you say, be sound with your analysis, and back up your claims. They're teaching as much as I'm teaching.

"That's what collaborative learning is all about. They feel empowered as learners, they do a lot of the teaching themselves."

Mr. Zubizarreta describes his own life as "a story of how much difference a teacher can make in students' lives." He comes from what he calls a very poor immigrant family: His parents left Cuba "right before Castro came down from the hills," moving first to New York and then to Miami. When an 11th-grade teacher pushed him to continue his education past high school, he enrolled at what was then Miami-Dade Junior College (now Miami Dade College), working nights at Florida Power and Light to pay his bills.

Then a Miami-Dade professor, Marjorie Buhr (who died in 1992), promised to help him through his junior and senior years at Florida International University. Then, after her oldest son was killed in a motorcycle accident, she decided to help

Mr. Zubizarreta through graduate school at the University of South Carolina. Degree notwithstanding, he and his new wife outfitted a "hippie" Ford van with a plywood bed and drove west, spending the next four years working at ski resorts in Colorado and mountaineering in Alaska.

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They came back to South Carolina only when "we were absolutely destitute," he recalls. That's when his wife's mother asked if he had ever heard of Columbia College. "I was hired on the spot," he says. "This place changed me. It made me the teacher I've become."

Ms. Gregg points out another of Mr. Zubizarreta's distinctions: He doesn't give tests or quizzes. "There is always an open-ended assessment of our learning, which pushes us to think for ourselves in a very crucial way," she says. "Our final projects are collaborative and creative and entirely open-ended, the only requirement being that we must synthesize what we learned over the semester and show it to the class. People have made videos, board games, songs, and skits."

"He has a very high energy that automatically pulls students into the conversation," she adds. "It gives them permission to get excited about literature."

"I tell my students all the time, we're here to build bridges in your brain."

Lawrence Biemiller writes about a variety of usual and unusual higher-education topics. Reach him at lawrence.biemiller@chronicle.com.

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A version of this article appeared in the October 27, 2017 issue.

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SPECIAL REPORTS

Helping Students Find Their Voice — and Their Power



Amanda L. Smith for The Chronicle

Vicki Reitenauer of Portland State U. uses small-group discussions in her classes in gender and sexuality studies, and she asks students to grade themselves.

By *Fernanda Zamudio-Suaréz* | OCTOBER 22, 2017

✓ PREMIUM

Vicki Reitenauer wants the structure of her courses to align with the content in her lessons.

A faculty member in women, gender, and sexuality studies at Portland State University, she requires her students to help create the coursework listed in the syllabus and to grade themselves at the end of the semester. Her goal: To make sure classroom practices are consistent with the course's lessons on power relationships.

"I'm really especially interested in thinking about how I use power in the classroom," Ms. Reitenauer says. The syllabus for her "Introduction to Women's Studies" course transfers that power by requiring students to identify their course goals for the semester, the grade they expect to earn, and their plan for achieving both.

This assignment is repeated in the middle and at the end of the semester. Final grades aren't calculated based on a point system but on a self-evaluation. "In this course, I'll encourage you to claim every aspect of your experience — your thinking, your feeling, your doing, and your reflecting on that doing — and to grade yourself for your efforts and the results of your efforts," the syllabus states.

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It also states that if a student's final self-evaluation is too high or too low, the professor reserves the right to negotiate the final grade. (In most cases when she disagrees with a final grade, it is because the student has underrated herself or himself, she says.)

After they get past the initial surprise of self-evaluation, most students are curious about the process and eager to embrace the new transfer of power in the classroom, she says. For many students, this is the first time they can dig into their own work without thinking about what grade they will earn.

Before joining Portland State's faculty, Ms. Reitenauer worked with community-based nonprofit groups, including Planned Parenthood and groups that work against domestic violence. In her first job after college, at a battered-women's organization in Eastern Pennsylvania, she served as facilitator for a group of men who were largely court-ordered to take a course to help change their violent behavior. She allowed the men to tell their stories, and taught them that there were nonviolent ways to interact with others and deal with personal struggles.

"It was really only by being in a setting where I was open to learning from them, that I could assist them in learning something that could be important for their lives," Ms. Reitenauer says.

She wants students to have the same experience — a clear transfer of power that makes them more open to learning — in her classroom. She also wants to create trust in the classroom, and having students help craft the coursework and ultimately grade themselves gives them power and confidence.

The syllabus states that students will work on a "comprehensive project of your own design." Students create a project plan that outlines their proposed research, and includes a timeline for every step.

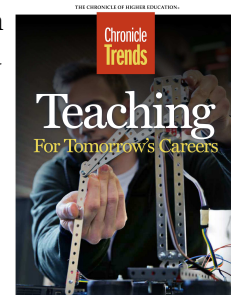
"A colleague of mine once said something to the extent of, 'How we teach is what we teach,' and I love that," Ms. Reitenauer says. "I think that's exactly right."

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Once students understand their roles as knowledge producers in the classroom, they can apply those reflections to other coursework and throughout their careers, she says. When she began the self-evaluated grading practice more than 10 years ago, one student, who worked on the campus newspaper and was very involved in other college activities, gave herself a C, she recalls. The student missed about 30 percent of the classes because of other campus commitments, but when she did come to class she was highly engaged. In her self-evaluation, the student wrote that because of grade inflation, her attendance and behavior in Ms. Reitenauer's course would have resulted in an A in any other course. But because she felt that she did not do A-level work, she gave herself a C.

"The depths of those reflections and the seriousness with which they take self-grading and the integrity with which they do that is really profound to me," Ms. Reitenauer says. (She did not change that student's grade.)

Sally McWilliams, chair of the department of women, gender, and sexuality studies at Portland State, says that Ms. Reitenauer's classroom transforms students from mere consumers of feminist and gender-studies knowledge to producers of such knowledge. "She has an amazing knack to connect with students from a variety of backgrounds and to get them to really think about what's at stake for them in the work that they're doing," Ms. McWilliams says.

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She saw that firsthand when she visited a session of "Writing as Activism," which Ms. Reitenauer teaches at the Columbia River Correctional Institution, in Portland. Half of the two dozen or so students are incarcerated men, and the others are Portland State students. The course meets in the facility twice a week. Like her traditional women's-studies courses, this one allows both groups of students to examine power dynamics, Ms. Reitenauer says. The Portland State students quickly realize that not much sets them apart from their incarcerated classmates other than circumstances like their social class, and how involved their parents were in their upbringing. The first time Ms. McWilliams attended a class at the facility, she realized that the course was able to tap voices that had previously been silenced or marginalized. She saw one of the major goals of feminist scholarship playing out in real time.

"It's the work of feminist pedagogy," Ms. McWilliams says. "And a feminist instructor like Vicki, that can really open things up."

Fernanda Zamudio-Suaréz is a breaking-news reporter. Follow her on Twitter @FernandaZamudio, or email her at fzamudiosuarez@chronicle.com.

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A version of this article appeared in the October 27, 2017 issue.

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SPECIAL REPORT

OCTOBER 18, 2017

Innovators: 10 Classroom Trailblazers



M eet our 10 teaching innovators. This is not a "Top 10" list, but a list of devoted

professors who might spark your interest in taking risks and trying new things in class. This is the first year *The Chronicle* has featured such a list, and we've learned a lot. We saw so many examples of innovation in campus classrooms, it was hard to narrow them down. We weren't necessarily looking for candidates who teach cool subject matter or use cutting-edge technologies, but for those who are in it for the long haul, who

constantly revise their teaching to find what works, who deeply want to connect with their students.

As part of the selection process, we sought nominations from our readers via social media, from college teaching advocates, and from higher-education leaders. We hope you'll find our teaching innovators as inspiring as we did.

Copies of the full report are **available for purchase here**.

Ariel Anbar Designs Online Science Labs With Video-Game Appeal ✓ PREMIUM

By Beth McMurtrie

The inspiration for his popular, interactive courses stems from his frustration with the traditional lecture format.

Alan Goldstein Makes Disability Less Abstract ✓ PREMIUM

By Ben Gose

His courses introduce engineering students to adults with disabilities, and together they make films about the adults' lives.

Dahpon Ho Brings History Alive ✓ PREMIUM

By Ben Gose

By using their imaginations, says the University of Rochester historian, students absorb history far better than from a textbook.

Amardeep Kahlon Tailors Courses to Students' Learning Styles ✓ PREMIUM

By Katherine Mangan

She puts the focus on online material that allows students to progress at their own pace but doesn't let them get ahead of themselves.

Justin McDaniel Opens a Door to Contemplative Life ✓ PREMIUM

By Beckie Supiano

The religious-studies scholar at the University of Pennsylvania oversees a course that requires students to live like monks.

Vicki Reitenauer Helps Students Find Their Voice — and Their Power ✓ PREMIUM

By Fernanda Zamudio-Suaréz

She requires students to identify their course goals for the semester, the grade they expect to earn, and their plan for achieving both.

Eric Saliim Puts Science Into Everyday Life ✓ PREMIUM

By Lawrence Biemiller

At North Carolina Central University, he uses cellphones and Snapchat to prove that research isn't too complex for anyone.

Catherine Shoulders Shows How an Expert's Opinion Unfolds

✓ PREMIUM

By Dan Berrett

By recording on video her initial reaction to students' assignments, this professor lets them see what an intellectual process looks like.

Stan Yoshinobu Spreads the Word About Inquiry-Based Math ✓ PREMIUM

By Kelly Field

The professor emphasizes that intellectual growth is based “on error recovery, not mistake avoidance.”

John Zubizarreta Gets Students Excited About Literature ✓ PREMIUM

By Lawrence Biemiller

The professor at Columbia College, in South Carolina, tells his students that “we're here to build bridges in your brain.”

Commentary: A Newer Education for Our Era ✓ PREMIUM

By Cathy N. Davidson

We need to teach creativity, collaboration, and adaptability.

Commentary: Could Apple Computer Have Survived Higher Ed? ✓ PREMIUM

By Jeffrey Ratje

Ideas for improving academic culture abound, but too many die on the vine. Universities can change that.

Commentary: How an Experiment in 3-D Printing Illuminated Our Humanities Classroom ✓ PREMIUM

By Marta Figlerowicz and Ayesha Ramachandran

The buggy unfamiliarity of the new technology helped students see older media with fresh eyes.

Commentary: What My Struggling Students Wanted Me to Understand

By Nicole Matos

Developmental instructors need to make room for students' feelings.

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SPECIAL REPORTS

Making Disability Less Abstract



By *Ben Gose* | OCTOBER 22, 2017

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Allan B. Goldstein spent more than 20 years as an actor in New York City, but he switched gears when his parents died and he became guardian to his intellectually disabled brother, Fred. Mr. Goldstein began writing essays about Fred and his family, and that put him on a new path that ultimately led to a career in academe.

Mark Abramson for the Chronicle
Allan Goldstein, a senior lecturer in NYU's engineering school, invites people with disabilities into the classroom to consult with students.

Now, Mr. Goldstein, a senior lecturer at NYU's Tandon School of Engineering, holds center stage every semester in a course that pairs engineering students with adults who have disabilities. They work in small groups throughout the semester to create short films that highlight some aspect of the life of a person with disabilities.

Mr. Goldstein teaches the course twice every semester — in one section, people with cerebral palsy participate; in the second, adults with intellectual or developmental disabilities join students. The course requires extensive interaction, including visits to the agencies where those with disabilities attend

day programs. The goal is to get the engineering students — some of whom will eventually design buildings that must accommodate the needs of the disabled — to see that people with disabilities have the same needs and wants as anyone else.

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"They no longer see the wheelchair, they see the person — that's where the empathy is," Mr. Goldstein says. "They learn that we're all just living differently."

For the participants with disabilities, known in the class as "consultants," the course is a chance to have meaningful interactions with people in broader society, says Peter Cobb, director of community outreach at Adapt Community Network (formerly known as United Cerebral Palsy of New York City).

"The class is unlike anything that I've personally seen," says Mr. Cobb, who has worked in the disability field for more than 30 years. "I really do think it's changing lives on both sides."

In February, Mr. Goldstein received the university's Dr. Martin Luther King, Jr. Faculty Award, for demonstrating excellent teaching and community building. His course is also the focus of a 2016 documentary, *The Ability Exchange*. And he's in the early stages of trying to replicate the course elsewhere, including at more than a dozen NYU academic centers around the world.

The awards and attention are all the more surprising given Mr. Goldstein's initial lack of academic credentials. When he created the course in 2012, he had no graduate-school training in disability studies — or any degree beyond the B.A. in political science he earned from the University of Denver in 1971.

"I'm a guy who happened to fall into this gig," he says.

As an actor, Mr. Goldstein had several New York theater roles, and once played a bellhop for a gorilla — receiving a banana as a tip — in a television ad for American Tourister. But he struggled to make a living and spent more time waiting tables than acting, so in the late 1990s he gave up acting and began teaching English as a second language. He also began writing about his brother, a survivor of the now-closed Willowbrook State School, on Staten Island, known for deplorable treatment of its mentally disabled residents.

Mr. Goldstein was already in his 50s when he secured his first full-time job — teaching ESL at what was then Polytechnic University. He eventually became assistant director of its writing program. But his job became threatened when NYU assumed control of the engineering school in a merger; NYU already had plenty of full-time writing instructors.

Mr. Goldstein decided to create a new humanities course for NYU's engineering students. He had spent time shadowing James Lawler, a professor of information technology at Pace University, who started a program in 2007 in which IT students helped local residents with intellectual and developmental disabilities.

Inspired by Mr. Lawler's program, Mr. Goldstein started his own disability-studies course in 2012. He also teaches "STEM and Theatre" — a course that features close readings of science-oriented plays such as *QED* and *Copenhagen*. He used the \$10,000 prize from a teaching award to help pay for a master's degree in disability studies, which he earned from the City University of New York's School of Professional Studies in 2015.

Tapping the aid network that he knew from his years of advocating for Fred, Mr. Goldstein created partnerships with the cerebral-palsy organization and, later, with an agency that runs programs for people with intellectual and developmental disabilities.

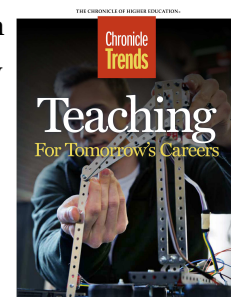
In his "Disability Studies" course, Mr. Goldstein assigns such readings such as Harilyn Rousso's *Don't Call Me Inspirational: A Disabled Feminist Talks Back* (Temple University Press, 2013), and each week asks volunteers to report the latest news from websites like Disability Scoop.

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But the main focus is digital storytelling. Bing Wang, director of the *Ability Exchange* documentary and an NYU alumnus, talks to the students about movie making. A sound engineer and a film-editing expert also address the students.

Andy Martinez, who expects to earn a civil-engineering degree from NYU next May, took the course last spring. He and another student created a short film featuring Luis, a disabled adult who loves to bake cupcakes. "It was a chance for him to share his story, and show that he's navigating his life just like the rest of us," Mr. Martinez says.

He says the course gave him a new perspective on his engineering work, especially in regard to laws designed to make buildings physically accessible. "Taking the class makes you feel more sympathetic to people with disabilities, as opposed to just following codes to stick to the letter of the law," he says. "You're doing it because it's the right thing to do."

As the course progresses, the students create storyboards and then first and second cuts of their films. The final cuts are presented — sometimes with popcorn — at the end of the semester.

In a scene from Mr. Wang's documentary, an NYU student named Derrick explains to Mr. Goldstein that he believes people with disabilities are often underestimated. Derrick and another student hope to illustrate what people with disabilities can achieve through a film sequence showing Chris, a consultant with cerebral palsy, beating Derrick in a game of one-on-one basketball. "We want him to ultimately win to prove that everyone is wrong," Derrick says.

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The problem, Mr. Goldstein points out, is that Chris is physically unable to get the ball to the hoop.

"He wants to show what — that he can shoot the ball? That's not what he wants to show, he wants to show what he's *able* to do," Mr. Goldstein tells Derrick in the film. "You guys do what you're comfortable with, we were just pointing out that it comes across as false."

The final cut of the short film doesn't include a victory for Chris, but it does show Chris holding a basketball while artfully steering his wheelchair around Derrick on the court. And the subtitles reveal Derrick's changing perspective — he comes to realize that even if Chris can't shoot, he has a love for the game of basketball just like anyone else.

"Where are you going to get better teaching about disabilities than from the people with disabilities?" Mr. Goldstein says of his course. "That's the innovation."

This article is part of:

Innovators: 10 Classroom Trailblazers

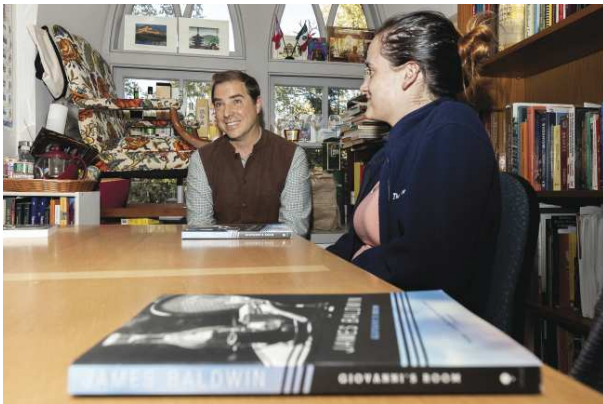
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SPECIAL REPORTS

Opening a Door to Contemplative Life



Jared Gruenwald for The Chronicle
Justin McDaniel, a religious-studies professor at the U. of Pennsylvania, teaches what his dean calls "the only humanities course that has a lab section." He talks to Thessalonica Goodine, a student.

By *Beckie Supiano* | OCTOBER 22, 2017

✓ PREMIUM

Students have no homework or exams in a course called "Living Deliberately: Monks, Saints, and the Contemplative Life." Still, they tell their professor, Justin McDaniel, that the course is a lot of work.

That's because Mr. McDaniel, a religious-studies professor at the University of Pennsylvania, has them spend a month of the semester-long course living like monks. That means no talking, no electronics, and no physical contact — in class or outside — among other restrictions. Students wake up early, keep a frequent journal, and practice an act of kindness each day.

The idea for the course grew from a question a student asked Mr. McDaniel during his first year of teaching, at Ohio University. The professor was explaining monastic life during an introductory Buddhism course. Most students, he says, think that monks are "cool." But this "really honest, good student" wanted to know: "Why would anyone do that to themselves?"

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Every religious tradition has some form of asceticism, Mr. McDaniel says, some sense that deprivation is the path to paradise. And there are all kinds of theories explaining why. But as Mr. McDaniel discussed them with the class, he realized none of them quite answered the student's question. "And I just said, well, what if we tried to do some of this and see how it feels," he recalls. "Instead of a sociological theory, a psychological theory, let's actually test it out."

He created the course after he had moved on to the University of California at Riverside, then took it with him to Penn, where, he says, his dean calls it "the only humanities course that has a lab section."

Looking across religious traditions, Mr. McDaniel came up with five categories of behavior that define monastic life. Four involve restrictions: on the body and sexuality, communication, food, and appearance. The fifth is a positive requirement: to live for others rather than oneself. Mr. McDaniel has devised rules for students to follow in each category. For example, during the month of practice, men in the course must wear white shirts, and women black shirts.

In addition, students are required to add to their journals every half-hour when they're awake. Mr. McDaniel also creates tailored assignments for particular students based on what they share in their journals.

The course includes traditional lectures about monastic life. That helps students understand what monks do. Spending a month living like them helps explain why.

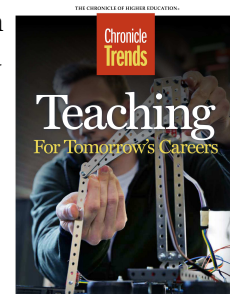
After taking the course last fall, Pierson Devers can point to several reasons people live monastically. "For some people, it's a way of simplifying their lives," says Mr. Devers, who plans to graduate from the university's Wharton School in December. Despite its restrictions, monastic life is easier in some ways, Mr. Devers adds — it reduces the number of decisions followers must make. Another appealing feature: The lifestyle "gives them a space to contemplate what life really is."

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One point Mr. McDaniel emphasized during the course was that time away from distractions like cellphones would allow students to resume their regular lives with newfound knowledge, Mr. Devers says.

"Living Deliberately" taught Mr. Devers a few things about himself: He's a visual person — and a romantic (forbidden to talk or touch, he wrote notes to a woman he was dating). It also persuaded him to become a vegetarian, which he had been considering.

After teaching the course seven times, Mr. McDaniel has noticed some patterns. His students earn good grades in all their courses that semester. They report increased concentration and deeper connections to others. That's not just according to Mr. McDaniel; it's been studied by the university's Positive Psychology Center. After a star soccer player took the course, Mr. McDaniel says, his coach wanted to talk with the professor about how to build nonverbal communication and awareness of one's body and those of others. Who wouldn't want to replicate these kinds of results?

But when a *Chronicle* reporter asked Mr. McDaniel to share the syllabus for "Living Deliberately," he said he couldn't: There isn't one, beyond what he must give students and the dean. The reason? He doesn't want other professors to try and peel off single components of the immersive experience. "Monastic life is not about individual techniques," he says. "It's about fundamentally changing the way you interact with others, and interact with the environment, and interact with the way you survive through food, and sexuality, and shelter."

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Mr. McDaniel has learned firsthand that the experiential piece of the course must be comprehensive in order to work. Once, in an effort to accommodate students' busy schedules, he taught a Saturday version of the course over multiple weeks, in which students followed a shorter list of restrictions just on course days. "They got nothing out of it," he says, "and they started to dread it."

In order to reap any benefit from adhering to the restrictions, Mr. McDaniel says, they must be followed, well, deliberately.

Beckie Supiano writes about college affordability, the job market for new graduates, and professional schools, among other things. Follow her on Twitter @becksup, or drop her a line at beckie.supiano@chronicle.com.

This article is part of:

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SPECIAL REPORTS

Seeing Science in Everyday Life



Chi Brown, NCCU Office of University Relations

Eric Saliim, an adjunct instructor at North Carolina Central U., says he tries to convey to students that "science is really fun. We don't wear suits all day."

By *Lawrence Biemiller* | OCTOBER 22, 2017

✓ PREMIUM

Eric T. Saliim didn't mean to become a college professor.

In 1999 he was working as a toxicologist at the National Institute of Environmental Health Sciences, in North Carolina's Research Triangle Park, when he noticed that interns who came to his lab from his alma mater, North Carolina Central University, struggled with basic scientific tasks. "If I would say, 'I need a five-molar solution,' it would puzzle them," Mr. Saliim says, referring to a common laboratory measure of dilution. "They would just kind of stand there. A lot of things that we thought they would be up to speed on, they really weren't — general laboratory-prep things, laboratory calculations."

"It was really kind of a drag on the work that we're trying to do," he says. "That led me to say, 'I need to call Central.'" Amal Abu-Shakra, a biology professor who had been his mentor at the historically black university, took him up on his offer to help, and together they organized a seminar to teach skills that the institute's interns would need when they got to the lab. (Ms. Abu-Shakra died in August.)

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"It kind of snowballed from there," says Mr. Saliim. His first cohort of interns did well, so the university asked him to repeat the seminar. Eventually it hired him away from the institute. Now he is an adjunct instructor at North Carolina Central and director of its fabrication laboratory, known as the Fab Lab.

His teaching is "consumer driven," he says. "I try to gauge my audience and their interests and use that as a vehicle to learning."

He starts by tying what might otherwise seem like abstract course content to everyday issues, like nutrition and public health. "I say to them, 'Science is in your everyday life, science is something that's tangible to you. You just don't understand the science behind what you do, so I'm trying to bring that to light.'

"If you came into my classroom, there might be some music. There might be videos playing. There's going to probably be a lot of engagement with the students related to subject matter. My class is very dynamic — 10 minutes of this, maybe 20 minutes of this, another 10 minutes of this. We are always in flux. It may look like this is a chaotic place, but we're learning."

There might also be students looking at their phones. "A lot of professors are like, No cellphones, no tablets — focus on *me*," Mr. Saliim says. Instead, he tells students to get out their devices. "You're going to use that as your research instrument. This is the topic, these are the objectives I need you to know in relationship to the topic, and we're going to take about 20 minutes."

"I try to infuse myself into their everyday lives. I know students are into Instagram or Snapchat, so those things become part of what we're doing in class."

"So that's my class," he says. "Instead of me saying, 'Here's the topic today. Here's my first slide.' "

His approach to grading is also unusual. "There are checkpoints. For information-gathering, that assessment is participation. Did you do the work, and did you get the outcome I was looking for?" The next checkpoint might employ a different assessment — a project, perhaps, that might involve a real-world use for what the student learned while gathering information. "It varies based on the student and their interest," Mr. Saliim says.

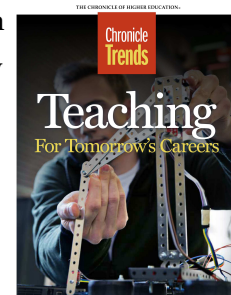
If a class he's teaching is one section of a course also taught by others, he has less leeway, he notes. But even if he's just substituting for another professor, he can have a big impact, says Nathalie A. Bravo Batista, a biology and chemistry major who is a senior.

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She remembers Mr. Saliim's filling in for a colleague in a microbiology course — "the class everyone fears," as she calls it.

"Saliim is old, 40-something, but he looks young is the funny thing," she recalls. (He's 46.) When he showed up for the class, "he didn't have a PowerPoint — he just had a marker.

"We were like, Are you really prepared to teach this class? But once he started talking, he didn't need a PowerPoint. We're like, This guy is not here to play. He was interacting with the class, making sure we knew the material. That was the only test on which everyone got over a C. It must be the professor, because why this drastic change?"

More recently, Ms. Bravo Batista has worked for Mr. Saliim as an assistant in the Fab Lab, which is, she says, where "any idea you have, you go in there and make it happen.

"If you don't know how to use a machine, you go to Saliim. He is so open-minded. He is creativity at its finest. You might think it's the craziest idea ever, and he's like, 'I like it! Let's do it!' For him, there's really no boundaries for what you can do."

Mr. Saliim grew up on his grandparents' farm in southern Virginia, where he was always curious about plants and animals. But he attributes his interest in pursuing a science career to a ninth-grade biology teacher — "I think he was my first black male teacher. Something with him being a black male in science in an academic institution led me to think, Oh, I kind of like this. When I came to Central, there were other scientists, and the world of science opened up to me."

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Now he tries to convey to students that "science is really fun. We don't wear suits all day. You get to wear jeans and play with things."

Lately the things he's playing with are increasingly robotic. "Robotics reminds me of the old shop class — it's like shop on steroids." Even though his background is in biology, he says, "I'm understanding that technology is the future, and if I can incorporate technology into biology for students, that will make them even more relevant."

"A lot of times," says Mr. Saliim, "particularly with the students that we serve here at our institution, there is this stigma that 'science is complex, and complexity is something I'm not capable of.' I'm trying to take the complexity away from science, to make it more engaging for the students so they feel like, 'Hey, I can do that.' "

Lawrence Biemiller writes about a variety of usual and unusual higher-education

topics. Reach him at lawrence.biemiller@chronicle.com.

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SPECIAL REPORTS

Showing Students How an Expert's Opinion Unfolds



Beth Hall for The Chronicle

"One way or another," Catherine Shoulders says, "I've got to provide that feedback. This is the most efficient way to do so."

By *Dan Berrett* | OCTOBER 22, 2017

✓ PREMIUM

Catherine W. Shoulders could tell that her students were struggling with the semester-long assignment that forms the core of her graduate-level course on research methods. They had to learn about 20 types of research designs and propose topics for each one. But they often ran into trouble or

veered off track.

Ms. Shoulders, an associate professor in the department of agricultural education, communications, and technology at the University of Arkansas, had tried providing them with written feedback and meeting with them in person to talk through their difficulties. But those efforts didn't always help. Besides, she says, "the meetings took forever."

So, three years ago, she tried something new: When she reviewed each student's work, she recorded herself on video and shared it with them.

The experiment paid off. She saved time. Her students could watch the videos

over and over, and their work improved.

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But something more profound happened as well. Ms. Shoulders's videos make her thought process visible to students. By sharing her impromptu, contemporaneous impressions of their work, she shows them what intellectual work can look like — that it's not about the end product but about a continual process of thinking, reflecting, and revising. Valuing that process is an emphasis she traces back to her doctoral adviser and mentor, Brian Myers.

Written comments, which are often edited and polished to arrive at a set of neat conclusions, can be only so effective. When she shows her responses on video, the professor says, students can "see that researchers don't go 'Poof' and have the final answer. It's a thought process. Even experienced researchers weigh their options."

he videos are fairly simple productions. Ms. Shoulders records most of them on her computer, using a program called Kaltura.

TIn an example that she shared with a reporter, most of the screen was taken up by an image of a "mind map" the student had done on presentation software called Prezi.

The first thing the professor looked at was her student's overarching research question: "How does a multicultural environment impact student learning in a business classroom?" The assignment was designed to have students — who come from social-science programs in the College of Agricultural, Food and Life Sciences — explore facets of their question through quantitative, qualitative, and mixed-methods research, such as single-subject, ethnography, and exploratory studies.

Once they finish developing 20 study proposals on the question, the students will have the basis of their master's thesis and, if they pursue further graduate study, a potential research agenda for the next five to 10 years.

This student's research question, however, was too narrow to generate multiple analyses. "OK," Ms. Shoulders said, "what I'm seeing here is, uh, it's really actually one study. I could answer this with one study," she said, drawing out the word "one" as she chose her words. "You want to take this to a bit of a larger scope."

She suggested reframing the question to make it larger in scope, riffing on a few possibilities. That portion of the video lasted just about a minute but had covered essential ground.

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She toggled from one circle of the mind map to the next. Each one showed a type of research design along with its corresponding question, with lines pointing to the variables and samples. The responses came quickly and off the cuff. By recording her initial reactions instead of rehearsing her comments, she says, her students see that "I don't have one right answer and it falls into place."

Sometimes this approach means that she sorts out her thinking on camera. She'll offer praise and encouragement where appropriate ("Perfect!"), constructive comments ("I'm excited to see how that's going to come out in your purpose and objectives"), or what she's still puzzling through ("I think that's where you're going; I could be wrong").

This video lasted 14 minutes, though the typical length is usually three to 11 minutes. The time can add up. Her course enrolls 35 to 50 students, half who attend in person on the campus, in Fayetteville, and half who take the course online. Each student completes nine assignments, and so she might end up recording as many as 450 of these videos during the semester.

But that's the nature of the course. "One way or another I've got to provide that feedback," she says. "This is the most efficient way to do so."

In their course evaluations, students make a point of describing how much they appreciate the video commentary, Ms. Shoulders says. But that's not how every student sees it at first.

Hailey R. Gates, who is in the second year of a master's program in agricultural and extension education, felt frustrated when she received her first video. Instead of providing a clear yes or no, she says, Ms. Shoulders was "hemming and hawing" and asking questions. It knocked the student on her heels.

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But in time, Ms. Gates understood that there was a larger message. "Your research is a process," she says, "not something you work on one day, you get a grade on, and you're done." Instead, she has seen that the nature of doing research is "rolling over a problem multiple times instead of getting the one right answer and moving on."

As effective as her use of video has been, Ms. Shoulders thinks its applications are limited. It's most appropriate for courses in which a professor needs to give detailed responses, the assignment is multifaceted, long-lasting, and complicated, and the students are struggling. Otherwise, it would be a lot of work for little added benefit.

But if you find yourself writing "see me" or "this needs work" on many assignments, she says, then maybe it's time to consider using video feedback.

"I don't want to use an innovation because it's innovative," the professor says, "but because it's helpful."

Dan Berrett writes about teaching, learning, the curriculum, and educational quality. Follow him on Twitter @danberrett, or write to him at dan.berrett@chronicle.com.

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SPECIAL REPORTS

Spreading the Word About Inquiry-Based Math



Courtesy of Stan Yoshinobu

"It's OK to be stuck," Stan Yoshinobu emphasizes in his syllabi. Growth is based "on error recovery, not mistake avoidance."

By *Kelly Field* | OCTOBER 22, 2017

✓ PREMIUM

Stan Yoshinobu didn't invent inquiry-based learning, a method of instruction that replaces the time-honored lecture with student-led presentations and group work. That credit goes to the late mathematician Robert Lee Moore, who taught at the University of Texas from 1920 to 1969.

What Mr. Yoshinobu, a math professor at California Polytechnic State University at San Luis Obispo, has done is to democratize the inquiry-based method. Over the course of a decade, he has convinced hundreds of fellow mathematicians that the strict "Moore method" can be adapted to any classroom context. (While Moore's legacy has been tarnished by racist attitudes he held toward black students, his contributions to mathematics remain intact.)

On his own, and now as a co-director of the Academy of Inquiry Based Learning, Mr. Yoshinobu has run a series of workshops that guide professors in undergraduate math courses through the process of converting from lectures to an inquiry-based format. But he doesn't insist on a complete overhaul, allowing participants to adopt what works for them.

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"Stan has been a key figure in helping people see this as a continuum," says Sandra Laursen, a researcher at the University of Colorado at Boulder, who has studied student outcomes in inquiry-based courses. "The 'big tent' is what we talk about now," she says.

In inquiry-based classrooms, students learn not by listening but by doing, working through problems in a collaborative atmosphere that encourages risk-taking. They are the team, and the professor is the coach, guiding students to their own answers rather than presenting them with the solutions.

That's a major shift from the traditional mathematics classroom, where the professor lectures and the students absorb the information and attempt to apply it afterward.

It's not an easy pivot for instructors to make. To convert to the inquiry-based approach, they must transform not only the way they teach but also the way they evaluate students. They must redesign their syllabi and choose new textbooks or create materials to supplement the required reading. Remaking a single course can take a couple of hundred hours, says Mr. Yoshinobu.

But there is evidence that the effort can pay off, particularly for female students. Research by Ms. Laursen and others has found that inquiry-based courses increase women's confidence in their mathematical abilities, leveling the playing field between the sexes. Much of the change is attitudinal — women aren't actually performing worse in traditional math courses; they just think they are.

Some of that increased confidence may stem from efforts by Mr. Yoshinobu and other advocates of inquiry-based learning to destigmatize mistakes. In his syllabi, Mr. Yoshinobu emphasizes that "it's OK to be stuck," and that growth is based "on error recovery, not mistake avoidance." Five percent of the grade in his course for prospective elementary-school teachers is based on "productive failure."

Still, getting students to embrace a new way of learning can be a challenge. Many college students, accustomed to professors' telling them how to solve a problem, don't appreciate being told to figure it out themselves.

Mike Ion, who was introduced to the inquiry-based method as a sophomore in one of Mr. Yoshinobu's courses, says he saw some initial pushback from his classmates. But as the course progressed, he says, "people got used to it."

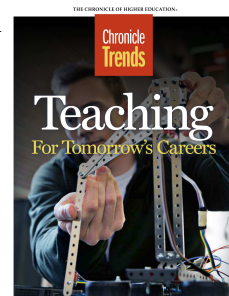
"IBL made me finally critically think about why things were happening," says Mr. Ion, who is now pursuing a Ph.D. in math education at the University of Michigan. "I felt like for the first time I was thinking for myself."

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Mr. Yoshinobu was trained under traditional lecture methods and taught that way himself early in his career. But when he discovered that his students weren't grasping deeper math concepts, he decided to try a different approach. He went to a conference on inquiry-based learning, found a mentor, and redesigned an upper-level math course. "When I saw how students were waking up and asking better questions," he says, he became a convert.

He organized the first IBL workshop for undergraduate-math instructors in 2006 and has helped run or plan a dozen workshops since then. Close to 400 professors have attended the workshops.

Sean Sather-Wagstaff, an associate professor of mathematical sciences at Clemson University, is one of them. Long intrigued by the learning method, he had tried a version of it at a previous institution, with some success.

But when his experiment in "do it yourself IBL" failed at Clemson, he decided to seek professional help. He spent a week at one of Mr. Yoshinobu's workshops this past summer mapping out a plan to remake an abstract algebra course. His goal is to limit lectures to just five minutes per month.

"That's a scary thing to do, and it's a scary thing to ask students to do if they've never done it before," he says. "It's not a complete paradigm shift, but it's as close as you can get." The workshop, he says, gave him the skills and the confidence "to try it again."

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It's a risk not everyone is willing to take. While there's a growing consensus that students benefit from active learning, many faculty members in mathematics remain attached to the lecture.

Mr. Yoshinobu acknowledges this resistance but says the profession is moving — if slowly. In an effort to change more minds, he's creating regional consortia of inquiry-based-learning advocates and training fellow converts to lead workshops. And he's willing to be patient.

"Fundamentally, teaching is a cultural activity," he says. "To change it is going to take a long time."

This article is part of:

Innovators: 10 Classroom Trailblazers

A version of this article appeared in the October 27, 2017 issue.

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THE CHRONICLE of Higher Education

SPECIAL REPORTS

Tailoring Courses to Fit Students' Learning Styles



Julia Robinson for The Chronicle

Amardeep Kahlon, a computer-science professor at Austin Community College, in Texas: "What can we do to allow students to leverage their prior learning and get some credit for it?"

By *Katherine Mangan* | OCTOBER 22, 2017

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Amardeep Kahlon was teaching computer science in one of the nation's hottest technology hubs. Local employers would often tell the Austin Community College professor that they couldn't find enough qualified workers. Meanwhile, students struggling to balance jobs and classwork were dropping out of programs that promised bright

futures.

Making matters worse, the competition for students was intensifying. Students were gaining credit for MOOCs and other free online courses that allowed them to burnish their résumés without quitting their jobs.

How was a community-college computer-science program to keep up?

Ms. Kahlon has done it with an intense focus on online, competency-based courses that allow students to progress at their own pace but don't let them get ahead of themselves. While many professors use competency-based approaches,

hers is distinctive because of how she has tailored her teaching to individual learning styles with a method she calls "read it, watch it, do it." After consulting with industry professionals, she has used it to train, and learn from, scholars in a variety of disciplines.

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"Amardeep is one of those people who's innovative and curious, and changes her course almost every semester based on what she's learning," says Linda Smarzik, dean of computer science and computer information systems.

"She creates her own videos to help students learn a hot topic" and adjusts her teaching to reach students who learn best by seeing, hearing, or directly applying a concept, the dean adds.

The projects appeal to students. Patricia Schutter, who took an introductory course in Python programming last year, says her favorite lab involved a fictional band, the BobbleHeads, performing at Austin's annual South by Southwest Music Festival. She created a program to determine how the band fared financially by

plugging in its costs for flying, checking extra baggage, renting a house through Airbnb, and so on. She also factored in the band's honorarium and proceeds from T-shirt and tote-bag sales.

"The labs were so much more creative than what you'd get out of a textbook," says Ms. Schutter, 23.

Since the shift to competency-based learning, which Ms. Kahlon has promoted since 2014, Austin's department of computer science and computer-information technology has more than doubled the number of associate degrees and certificates it awards, to 194 and 164, respectively.

Her department's work accelerated with a \$2.3-million grant from the U.S. Department of Labor to transform 25 courses to online, competency-based formats. The self-paced classes were designed for returning veterans, the underemployed, and recently laid-off workers, and created a system of stackable credentials that can lead to a degree.

The need to bridge the employment gap in one of the nation's major tech hubs was clear: "The first thing we saw was the knowledge gap between what employers wanted and colleges were offering," says the professor, who also trains educators statewide in competency-based approaches.

Chronicle Trends

Teaching for tomorrow's careers

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It's not just a local problem. By 2020, the information-technology field is expected to face a shortage of hundreds of thousands of workers, Ms. Kahlon says. Meanwhile, students with valuable work skills and half-finished degrees are taking out loans, cutting back on work, and starting over in degree programs.

The challenge for colleges like Austin: "What can we do to allow students to leverage their prior learning and get some credit for it?" Ms. Kahlon says.

She and an instructional designer, Nighua Han, brainstormed how students learn — some by reading, others by watching or doing something. "What if you combined all three — wouldn't that make it more powerful?" Ms. Kahlon asked.

With degrees in English, mass communications, computer science, and educational administration, she is comfortable reaching across disciplines and helping instructors transform lessons. Take the Gettysburg Address: An instructor might ask a class to read it, watch a short video, and create a skit or podcast that suggests what it would have been like to actually witness the speech. A presenting student's competency could be measured according to the sophistication of his or her understanding. Someone who analyzed the event and drew parallels with current events, for example, might earn an A.

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Ms. Kahlon divides her online computer-programming course into six modules. Students progress at their own rate but cannot move from one module to the next until they pass a proctored test on the campus and write, in a journal, what they learned and what is still confusing.

Ms. Kahlon is helping expand competency-based learning statewide as director of Fast Track to Success, a program supported by the Texas Higher Education Coordinating Board. She also works with South Texas College to create accelerated pathways to an affordable bachelor's-degree in computer science and applied technologies.

In her own course, when students are stuck, she may share her screen with theirs through Adobe Connect and walk them through the problem. Or she may record a two-minute lecture and send it to them.

"I tell them in the beginning that I'm only successful if you are successful," she says. "We're in this together."

Katherine Mangan writes about community colleges, completion efforts, and job training, as well as other topics in daily news. Follow her on Twitter @KatherineMangan, or email her at katherine.mangan@chronicle.com.

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