Active Learning:

The Perfect Pedagogy for the Digital Classroom

An Essential Guide for the Modern Professor

BY **PHILIP PREVILLE**

The Decline of Passive Learning

Donald Bligh, the former University of Exeter professor, was no fan of lecturing. He even put his disdain for it on display in the title of his 1971 book, *What's the Use of Lectures?* "The idea that lecturers should use the lecture method and no other for 50 minutes on end is absurd," he wrote, wondering aloud why students had not yet risen up in disgust. "The remarkable tolerance of students for this diet is all the more surprising when one considers that the effect of monotonous stimulation is common knowledge," he wrote. In other words: students were letting their professors bore them.

Now, the student revolt is upon us, though perhaps not quite in the way Bligh had imagined: the college classroom is rife with silent subversion. The advent of personal technology and free Wi-Fi has given students access to online shopping, sports scores, computer games and a host of other diversions. Doodling and note-passing are all but extinct, yet distraction is on the rise, with students checking their smartphones an average of 11.43

times in every class. Bligh suggested that no lecture should last more than 20 minutes. Since he made that recommendation, student attention spans have been cut to half that time.

Meanwhile, the other pillar of the read-a-chapter-hear-my-lecture teaching template—the required textbook—is also crumbling. A recent survey found that 65 percent of college students decided not to buy a required course textbook. Their stated reason is the exorbitant cost of the tomes, but behind that reasoning lies an even harsher judgment: students clearly don't see the value of textbooks, because it's not how they learn. In place of the traditional textbook, students reckon they

Instead of banning technology in the classroom, many professors are harnessing its potential to help students learn
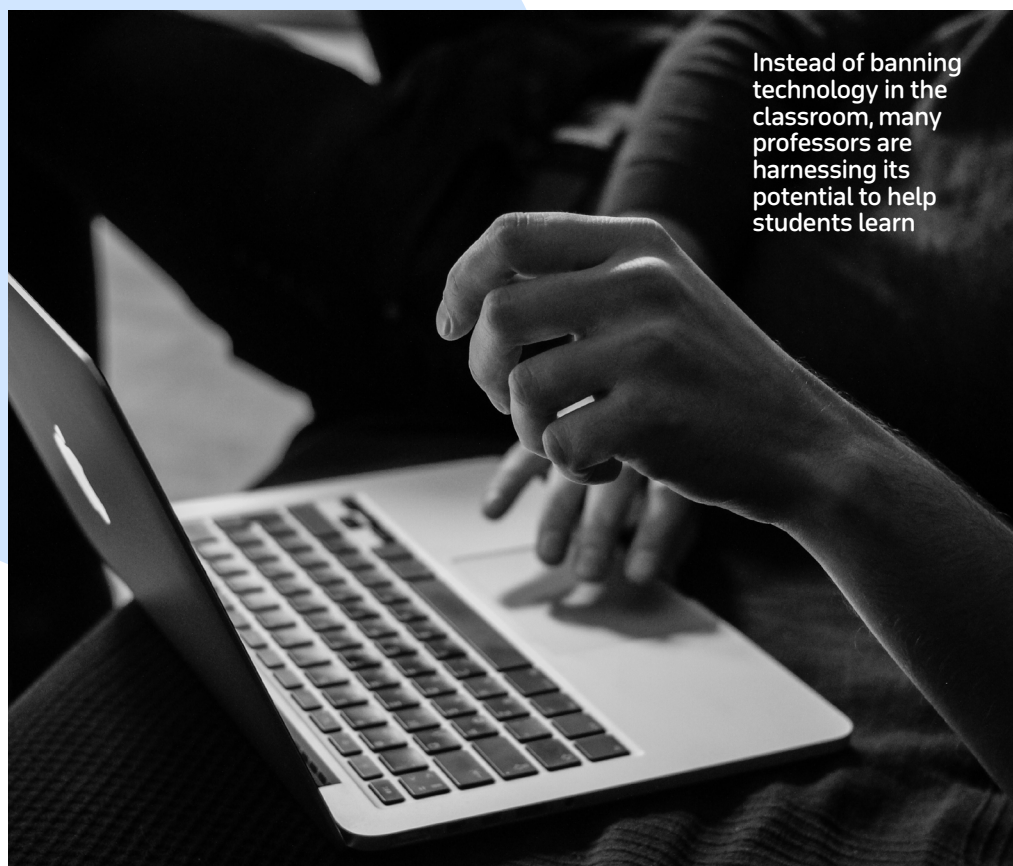
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can cobble together the knowledge they need from the same tools that enable their distraction: computers and the web.

This, ironically, is precisely the kind of bootstrap motivation most professors want from their students: to have them actively engaged in the course's subject matter, seeking out source materials and cobbling together knowledge and insight. Personal technology can enable and facilitate these behaviors, provided professors can harness it.

And more and more faculty are now trying to do just that, by sourcing and curating their own web of productive distractions—subject-specific internet links, digital maps, animations, videos, articles and active-learning exercises—and embedding them directly into the latest digital textbooks. Technology might just kill the classroom lecture, but it might also save learning itself.

Chapter 1

Why Active Learning Matters Now

Over the last 25 years, as lecturing's reputation as a sound teaching method has waned, the concept of "active learning" has arisen as an alternative. At its core, active learning is meant to engage students more directly in their course's subject matter through a variety of exercises and classroom strategies designed to get them immediately interacting with, and applying, the knowledge they are expected to master by semester's end. And in recent years, proponents of active learning have been adapting digital technology to achieve their goals—something lecturing is unable to do.

It was two Missouri State professors, historian Charles Bonwell and psychologist James Eison, who coined the term "active learning." In their 1991 book on the subject, *Active Learning: Creating Excitement in the Classroom*, they offered this definition of the concept: "active learning involves students in doing things and thinking about the things they are doing."

The definition, though it seems circuitous, marks a definitive pedagogical shift in college teaching and learning. Rather than think about what they are watching, hearing, or reading, students are

The central tenet of active learning—that practice and interaction matters—can be applied across disciplines

first encouraged to be "doing" something in class, and then to apply critical thought and reflection to their own classroom work and activity. Their argument was backed up by research. Even Bligh, 20 years earlier, had pointed out that the immediate rehearsal of new information and knowledge had a significant impact upon learning.

This approach is as helpful in the sciences as it is in the arts or humanities: whether it's organic chemistry, creative writing, or behavioral economics, concepts are all best understood through repeated practice and open, social exploration. The central tenet of active learning is that practice matters, and that classroom time is better spent giving students opportunities to work with concepts over and over, in a variety of ways and with opportunities

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More recently, the ubiquity of smartphones and tablets has become a catalyst for the creation of purpose-built, active-learning technology. Apps, social media and student engagement platforms are making the transition to active learning classrooms easier and more efficient. Minute papers, quizzes and muddiest-point exercises can all be executed and tabulated online. And all these tactics can now be embedded within the pages of the next generation of digital textbooks.

And digital technology is how today's students learn. Most of today's college freshmen are younger than Google and researched their first school project on Wikipedia. Studies show that they read books, magazines and newspapers far less than previous generations, yet because of technology, they are actually exposed to more information and knowledge than their predecessors ever were. So many of their daily routines—from purchasing habits to social interactions to learning routines—are wildly different than those of their parents, because they are all enabled through technology. Screens are the tools of everyday life. Educators are increasingly turning them into tools of learning as well.

Chapter 2

Inside the Active Classroom

Done right, active learning should create an entirely different classroom experience, something observers should be able to spot from the moment they enter the room. Listening to a lecture, even in an auditorium with 400 other students, is a solitary activity.

An active-learning classroom is louder than a lecture hall, with lots of people talking in pairs or groups. It's also busier, as students, faculty and teaching assistants move about the room. There's still lots of listening going on, but without the shushing. The classrooms themselves are often revamped: out with the theater seating and the pulpit, in with round tables and video screens. Students learn better when they learn with others, and

they learn best by talking. And while an active classroom may seem unstructured or even chaotic, students are usually engaged in a variety of carefully structured activities described below.

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form of a classroom engagement platform or a next-gen digital textbook. Many active-learning activities involve quick discussions followed by brief written responses—all of which can be submitted digitally. Those that involve student performances can be recorded on video and posted online. Ideally, active learning even continues outside the classroom, as students use discussion boards linked to specific activities or embedded within a digital text.

Take Your Pick: Active Classroom Tactics

THINK-PAIR-SHARE
Instructors briefly pause their lecture and ask students to pair up and discuss the material that was just presented, and to be prepared to ask questions or share observations with the entire class.

MINUTE PAPERS
During a brief pause, students alone or in pairs are asked to answer a question in writing about the day's teaching. The submitted responses can be used to gauge student comprehension of the material.

QUICK QUIZZES
Administered at the start of class or during a pause, not for a grade, but to assess comprehension, much like minute papers.

MUDDIEST POINT
Students are asked to write down and submit which part of the course material is least understood by them.

DEBATES
Having students defend different viewpoints for the class is a means of structuring class discussion and ensuring that even those in the back rows have the opportunity to speak.

CASE STUDIES AND PROBLEM SOLVING
Students work in groups, applying knowledge gained from lectures or reading materials to a given situation.

PEER INSTRUCTION
Have students prepare and present course material to the class.

Chapter 3

Active Learning and the Next Generation of Digital Textbooks

Because active learning places its emphasis on doing, any course built upon its principles typically results in far less reliance upon the crutch of a required textbook. A print textbook remains helpful to an active-learning course only insofar as it provides a strong foundation for "doing things" in the classroom.

Most textbooks don't serve this function; it's why they're called textbooks rather than workbooks. But the problem has less to do with their content or their authors, and more to do with the limitations of the print medium itself: the actions that print encourages best are solitary reading and writing.

The next generation of digital textbooks, however, are different. To begin with, since they reside in the cloud, all students are, in a sense, sharing a single copy, which makes reading a group activity: the latest digital textbooks can contain discussion boards and group questions within their pages, turning the act of home reading into a communal activity for those who want to participate.

From there, the new digital textbooks can embed many more active learning tactics and exercises within the body of the

text. Following the "read-a-little, do-a-little" ethos of sound learning design principles, walls of narrative are broken up to ensure that the textbook itself is checking for understanding, deepening learning and guiding students to mastery of concepts. Audio and video clips encourage students to make connections between different representations of concepts and ideas. Quizzes, minute papers

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and discussion questions can be administered at key points in each chapter—and with results tabulated in real time, faculty can quickly gauge student comprehension, identify gaps in learning and

adjust class activities accordingly. Responses can even be posted online, anonymously or named, for use in classroom discussion.

New digital textbooks are also quickly becoming indispensable for classroom flipping. It takes considerable effort to transition to a flipped classroom: combining readings with video lectures, then preparing problems and case-studies for use as in-class activities. Until recently, flipped classrooms had to rely upon more than one digital platform, listing web links within institutional LMS and other systems, a practice that often led students down the black hole of YouTube links and even further away from their studies. The latest digital textbooks, on the other hand, provide an integrated platform for the flip, allowing a video lecture to be broken down into smaller components and embedded alongside the most relevant textbook passages. They can get students started on case-study work by revealing only partial information, then releasing the rest in class for work in groups.

The ability to release information in stages is among the most clever advantages of digital textbooks. It can keep students from "skipping to the end" as a shortcut. But it can also help make content more meaningful.

Imagine, for instance, a history textbook that provides an interactive map of northern Europe in 1945 along with Allied and Axis troop placements, that asks students to plan and execute their own D-day invasion. Where would they seek their first foothold? How many lives would they risk? The next generation of digital textbooks can run a simulation of the student's scenario, post multiple student scenarios for comparison, then reveal what actually happened that day.

Finally, new digital textbooks make active learners of professors themselves. Because of their adaptability, they create a community of faculty users and adopters to share and adapt assessment resources, provide feedback and suggestions for future editions or to suggest changes that

Open-source, peer-to-peer collaboration on course materials marks a shift from the print textbook world, one that takes advantage of the digital platform to continuously improve course content

need making on the fly to reflect the latest advancements in the field of research. This kind of open-source, peer-to-peer collaboration marks a shift from the print textbook world, one that takes advantage of the digital platform to continuously improve course content.

The pedagogical shift to active learning has been underway for years now, but the next generation of digital textbooks provide the movement with a powerful new set of tools, both for consolidating existing practices and innovating new ones.

Case Studies

When Digital Textbooks Meet the Classroom, Good Things Happen

How dynamic texts helped four innovative professors make their classes more active

Adrienne Brundage

Lecturer, Forensic Entomologist, Department of Entomology, School of Agriculture and Life Sciences, Texas A&M University Galveston, TX

"I teach general forensics. All the freshmen in our program have to take my forensics course. They've been brought up watching *CSI* and they don't realize that forensics is a real science.

The biggest problem with forensics textbooks is they don't move as fast as the technology. Their chapters on computing are always two years out of date. They are perpetually behind on genetics.

Forensics is an applied science and the digital textbook had many advantages in that regard. Students need to know how certain microscopes work, they need to know how to collect evidence. I use videos to demonstrate all that, so they can see the science being applied. I even have videos of me collecting evidence at a crime scene.

The best thing about digital textbooks is that they are as up-to-the-minute as you want them to be. As new scholarly papers come out, I put them into the textbook. When Charles Manson died—every forensics textbook addresses the

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Manson murders—I was able to update my chapter right away. It's never out of date.

I deployed my digital textbook for the first time in the fall of 2017. I find that a lot more students are actually doing the reading. So these days in class I often say, 'I won't go into the full background—it's in the textbook. Let's go straight to the applied section.' Limited class time is better spent practicing actual forensic stuff than covering background. This textbook has opened up so much more time to do learning in class."

Thomas Morgan
Assistant Professor, School of Human Evolution and Social Change,
Arizona State University, Tempe, AZ

"Our first and second year undergrads all take a course entitled Bones, Stones and Human Evolution. The course content had been pulled together by the faculty over many years, but it hadn't been updated in a long time and my department director asked me to rebuild the course from scratch. As I gathered all the information I realized that I had the material for a textbook, and that I could tailor it to a flipped classroom.

I was slated to teach the course in September 2017 so I started writing in spring 2017 and devoted my entire summer to making both the digital textbook and the video lectures. It was a very quick timeline to stick to. Every video lecture in the course also has a corresponding chapter, so students can progress through the textbook chapters and the video lectures in parallel and it all fits with the course schedule.

When I look at my digital textbook from a cultural-evolution perspective, I think this is the latest technology in the transfer of information from teachers to

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students. People increasingly recognize the limits of paper textbooks. This technology has opened up new pathways."

Nicole McNichols
Lecturer, Department of Psychology,
University of Washington, Seattle, WA

Matthew Numer
Assistant Professor, School of Health and Human
Performance, Dalhousie University, Halifax, NS

Matt: Traditional textbooks are sex-negative. There were some attempts, in introductions and things, to talk about diversity of sexuality. But once you got into the material, they treat sex as dangerous, something to be avoided.

Nicole: Many of the textbooks on the market now are updates of books written 20 years ago. They just don't reflect the way we think and look at sexuality.

Matt: Even though they've been updated, the historical, conservative perspective was still in there. The perspective is always heteronormative. There simply wasn't a textbook out there that met either of our requirements.

Nicole: This field is rapidly changing and sexuality a topic of public discussion. Within the textbook we can link to *New York Times* or *Atlantic* articles. Students can read the most cutting-edge information, and think about their own opinions and attitudes. And they can respond to one another anonymously in discussion groups within the textbook.

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—Nicole McNichols

Matt: Blended learning works best—a combination of in-person and online, reading and interactivity. One student told me it's the only textbook he's ever read, which is a great improvement. You'd be surprised how boring a human sexuality course can be, because people have been afraid of the topic for so long.

The Active, Connected Professor

In the quarter-century since Bonwell and Eison's *Active Learning: Creating Excitement in the Classroom* was published, a movement has emerged from its pages: a vast network of evangelizers whose mission is to help professors switch from passive to active classrooms, and keep abreast of the latest research on teaching and learning.

They're everywhere. Nearly every college in North America has a teaching-and-learning resource center to support faculty in the transition to new teaching methods. Organizations dedicated to teaching reform have flourished, from the membership-based HASTAC (Humanities, Arts, Science and Technology Alliance and Collaboratory, pronounced "Haystack") to The Faculty Guild, an Arlington-based firm that offers professional development for faculty. Still, many professors have resisted the change.

With the advent of the latest digital textbooks, active learning may have reached its tipping point, the moment

By adapting digital technologies in the service of more active learning, innovative professors are delivering on a better education for students

when it becomes easier to adopt than to resist. New digital textbooks can compile nearly every kind of source material for learning into a single platform. They can embed everything from discussion groups to quizzes to highly complex case studies, compiling responses and helping to identify student misconceptions of key concepts. They can be used to flip a classroom. They are easier to update, making them able to move at the pace of knowledge in a digital world.

They also speak the language of today's students because they are digital, and easily transferable between smartphone, tablet and computer. While some lament these technologies for distracting students, others see a different future. With the help of their colleagues and their institutions, they are adapting digital technologies in the service of more active learning, and a better education for students.

PHOTOGRAPHER: ASH NAYLER

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