“The impatient future we face together summons us to reimagine how we teach and learn. Harvard can and should lead a revolution in pedagogy.”

— DREW GILPIN FAUST, PRESIDENT OF HARVARD UNIVERSITY AND LINCOLN PROFESSOR OF HISTORY
WHAT IS HARVARDX?

HarvardX is a University-wide strategic initiative, overseen by the Office of the Vice Provost for Advances in Learning, to enable faculty to build and create open online learning experiences for residential and online use, and to enable groundbreaking research in online pedagogy.

Above: (Clockwise) Behind-the-scenes at HarvardX: On the set of “Science of Cooking” with Pia Sorenson and Michael Brenner; the proverbial class-on-the-grass gets a reboot and wide lens; CS50x’s David Malan takes advantage of the green screen in the studio; Lisa New takes learners on a journey in “Poetry in America,” shooting on-location in Harvard Yard.
LEARNING ABOUT LEARNING IN THE 21ST CENTURY

Historian Peter K. Bol works out of the 18th-century Wadsworth House, in an office with slanting floors and tilting door frames. A Chinese scroll inscribed with a 2,500-year-old quotation from Confucius hangs on a wall.

Academic technology expert Samantha Earp spends her days in a low-slung modernist building on Mount Auburn Street, in an office that looks and feels like a Silicon Valley start-up.

Both Bol and Earp are protagonists in HarvardX, an exciting online initiative that has the potential to transform teaching and learning on the Harvard campus, and beyond.

“There is a growing interest in online learning all across higher education,” says Bol, Charles H. Carswell Professor of East Asian Languages and Civilizations, who was recently appointed Harvard’s vice provost for advances in learning.

“There is a growing interest in online learning all across higher education,” says Bol, Charles H. Carswell Professor of East Asian Languages and Civilizations, who was recently appointed Harvard’s vice provost for advances in learning.

“With the quality of our faculty, and with our commitment to constantly improve teaching and learning, Harvard is now in a position to lead with HarvardX.”

HarvardX is a key element in Harvard’s drive to re-imagine how we teach and learn—a drive with broad ramifications for the Harvard community and the world. Innovative and dynamic, HarvardX draws on Harvard’s myriad areas of strength.

There is no fixed template; participating Harvard Schools are encouraged to adapt and modify the program according to their particular cultures and goals, and to share observations and insights.

“Through HarvardX, we can take a successful method developed in one School and use it as an example for scholars in another School,” says Drew Gilpin Faust, president of Harvard University and Lincoln Professor of History, who believes HarvardX can help the University lead a revolution in pedagogy. “We can build on our knowledge at the same time we share that knowledge more broadly. This is something HarvardX can do in a magnificent way.”

Interest in HarvardX was keen from the start. Nearly 200,000 people signed up when the first courses were posted online in academic year 2012–2013; the courses were delivered on edX, the online learning platform founded jointly by Harvard and MIT. In 2014, the number of HarvardX registrants had surpassed one million, with 30 custom-designed courses and modules offered by 10 Harvard Schools open to residential students and online learners worldwide. HarvardX participants can study theories of justice with Michael J. Sandel, Anne T. and Robert M. Bass
Professor of Government; watch Elisa New, the Powell M. Cabot Professor of American Literature, read Walt Whitman beneath the Brooklyn Bridge; or explore the complexities of the human nervous system with David Cox, assistant professor of molecular and cellular biology and of computer science.

On campus, online technologies have recast the Harvard experience for students and faculty. In “blended classrooms,” undergraduates screen lectures and wrestle with problem sets on their own—freeing up class time for more meaningful interactions and richer, more informed discussions.

Through HarvardX, professors who once adjusted their lectures by reading their students’ reactions, now master techniques to captivate audiences whose faces they may never see. Faculty members accustomed to presenting their hard-earned research to a narrow band of professional colleagues now share their findings with audiences in the thousands, through online lectures. With accompanying HarvardX discussion forums, viewers become active learners, forming broad communities of interest among people of diverse education, ideology, and origin.

“The Harvard faculty is approaching us,” says Earp. As executive director of HarvardX, she oversees a team of more than 30 specialists who help faculty reframe their classroom courses for online learners, inviting them to try things they had only dreamed of attempting in the classroom. “And they’re not asking us for the simplest or fastest way to get their lectures online. They want to know how they can use our technology and research to improve their teaching.”

Already a dynamic and powerful teaching engine, HarvardX is also a laboratory that can help Harvard pioneer new ways of teaching and learning, both in the classroom and online. An amalgam of residential teaching, online teaching, and expert research, HarvardX forms a self-sustaining ecosystem; project leaders even plan for HarvardX to eventually generate enough revenue to fund itself.

“We have the most integrated model of any institution doing this,” says HarvardX faculty director Robert Lue PhD ’95, professor of the practice of molecular and cellular biology and the Richard L. Menschel Faculty Director of the Derek Bok Center for Teaching and Learning. “And we are the most committed to pushing the envelope in all directions.”

HarvardX promises to drive teaching and learning to new dimensions that will fit the challenges of the 21st century. It will also benefit Harvard, in both leadership and standing. “Our goal is to provide a form of learning that is useful, but that is also transformative,” says Bol. “And I can’t think of a better way to represent Harvard in the world than to show people what it means to learn at Harvard with the Harvard faculty.”
“Our goal is to provide a form of learning that is useful, but that is also transformative.”

—PETER K. BOL, VICE PROVOST FOR ADVANCES IN LEARNING
250,000+

CS50x registrants since its inception in 2012—more than any other HarvardX offering.

Caption: The HarvardX edition of CS50, Harvard’s introductory computer science course taught by David Malan, took advantage of the Rita E. and Gustave M. Hauser Digital Teaching & Learning Studio located in Widener Library. The live component of the course used the state-of-the-art facility to reach thousands of virtual learners in real time.
AN IMPACT ON THE LIVES OF THE MANY

CS50: Introduction to Computer Science has been one the most popular courses at Harvard since David Malan, senior lecturer on computer science at the School of Engineering and Applied Sciences, took over teaching it in 2007. The course is even more popular online; CS50x drew nearly 160,000 registrants in academic year 2012–2013—more than any other HarvardX offering. But the measure of CS50x cannot be taken solely by numbers.

U.S. Air Force pilot Michael Dunn took CS50x while he was stationed in Afghanistan. Upon completing the course, Dunn wrote to the teaching team to thank them for “an amazing experience.”

“Continue to make education available to the masses,” Dunn urged. “It’s the only way we’ll have a permanent, lasting impact on the lives of the many.”

HarvardX is already impacting many lives, both domestically and abroad.

In St. Louis, a local hi-tech placement service uses Malan’s HarvardX course to help teach aspiring computer programmers the skills they’ll need in the workplace. “I know a dozen companies in Silicon Valley that can’t get talent fast enough,” says Jim McKelvey, co-founder of LaunchCode. McKelvey had to move his company’s initial CS50x presentation from St. Louis’s Central Library to the Peabody Opera House after twice the expected number of applicants signed up. “We aren’t saying that one course will make you a pro. But this course is sufficient to let you work with a pro at a real company, and with a paycheck.”

In Mumbai, India, an alumna of Harvard School of Public Health (HSPH) uses a HarvardX offering from HSPH to help train personnel at Piramal Life Sciences. “One of the biggest shortages in Indian science is the lack of research curriculum in our medical training,” says Swati Piramal MPH ’92, vice chair of Piramal Enterprises, who enrolled her entire medical staff in PH207x: Health in Numbers: Quantitative Methods in Clinical and Public Health Research. “India has over nine million doctors, but few are trained to be physician scientists. By initiating this, we decided to fix the glaring gap in our country.”

Nearly 8,000 people across India signed up for PH207x—the most in any single country outside the U.S. In November 2013, students in Bangalore and Mumbai participated in virtual “meetups” with course instructors Marcello Pagano, professor of statistical computing, and E. Francis Cook, professor of epidemiology. “I only now begin to comprehend how vastly important statistics is in the field of medicine,” Khushboo Gala, a medical student from Mumbai, wrote to the instructors. “Thank you, not only on my behalf, but on behalf of the thousands around the globe who have greatly benefited by your excellent teaching.”
1,282,949

HarvardX registrants in 195 countries
as of May 13, 2014

The map above shows estimated HarvardX enrollment numbers from a selected sample of countries across the globe.
In 2012, the *New York Times* spoke of a coming “campus tsunami”—a headlong plunge into massive open online courses (MOOCs) offered by universities across the United States. Harvard’s entry into the space is more dynamic—a mindful blend of experience, experimentation, and analysis. “I think all of what HarvardX is doing is an experiment,” says Samantha Earp, executive director of HarvardX. “We’re studying what makes online learning effective in a particular domain or subject, and then mapping how those factors can apply to other subjects, and in on-campus learning.”

New technologies are more means than end in HarvardX—a tool to help Harvard deliver a superior learning experience and glean vital information about how people learn. Each HarvardX course generates around 20 GB of data, data that are mined and processed by the HarvardX team. While the research is still maturing, it has already yielded several important findings. The great majority of HarvardX registrants are college graduates. Almost one third of them live in the United States. The next largest group of registrants comes from India.

Initial data also show that approximately five percent of HarvardX registrants complete all of the course requirements and earn a course certificate. Rather than discouragement, Justin Reich, Richard L. Menschel HarvardX Research Fellow, sees opportunity in this data point. “We’ve learned that people register for our courses with varying levels of commitment,” says Reich, observing that it is easier to sign up for a HarvardX course than it is to open an iTunes account. “Some want to gobble up every learning opportunity. Others want to pick and choose among the lectures and exercises. This feedback can help us design more effective elements and courses for the future. Should we offer more self-standing modules? Should courses respond adaptively in presentation and design to things students tell us about themselves?”

On campus, HarvardX has galvanized a faculty with a historic commitment to teaching. “I’ve been struck by how many more conversations about teaching and learning are taking place since HarvardX began,” says Dan Levy, senior lecturer in public policy at Harvard Kennedy School and co-chair of the HarvardX Research Committee. “There is a lot more interest in experimenting in this space, to better understand the potentials and limitations of this technology to advance teaching and learning.”

Levy’s own experience integrating online lectures and problem sets into his classroom teaching has been informative. “I’ve created online materials that my students can engage with before class,” says Levy, who is also the faculty chair of the Harvard Kennedy School’s SLATE (Strengthening Learning and Teaching Excellence) Initiative. “It enables the students to participate at a more informed, elevated level during class. With online assessments and quizzes, I am more attuned to where my students are, and what I need to focus on during class. It’s made me a far more effective teacher.”
“I believe HBX is a powerful new way of extending our mission into the digital learning arena, while complementing and strengthening our existing offerings.”

—NITIN NOHRISA, DEAN OF HARVARD BUSINESS SCHOOL
HBX: HBS PUTS ITS STAMP ON ONLINE EDUCATION

All of Harvard’s schools are responding to the new world of online learning in ways that best meet their specific cultures, communities, and goals. HBX accepted that call to action with great aplomb.

First conceived in the summer of 2012 and launched in March 2014, HBX provides a new platform to support the delivery of distinctive HBS course offerings, using technology to bring together students, alumni, and faculty from around the world.

HBX offers two initial experiences: CORe (Credential of Readiness) and HBX Live. CORe provides a primer on the fundamentals of business thinking and includes three distinct courses: Business Analytics, Economics for Managers, and Financial Accounting.

HBX Live is a virtual classroom with 90 seats and 60 television screens, simulating the intimacy of an HBS classroom for participants, wherever they may be. Built in partnership with nearby WGBH, the virtual classroom allows HBS to gather executives, alumni, and MBA students around the world for case-based lectures and seminars.

Online, innovative, and inventive, HBX offers business education content specially created for new audiences. At the same time, HBS faculty, looking to teach traditional MOOCs (Massive Open Online Courses) can do so through HarvardX.

A case in point, Regina Herzlinger, the Nancy R. McPherson, Professor of Business Administration, taught “Innovating in Healthcare,” a HarvardX course designed to enable participants to meet, intersect, and even start a new business.

“If we just reproduce what we have on campus, online learning will always be a second-class citizen,” says Anand, who also is an active member of the HarvardX Faculty Committee. “What you are seeing in both HarvardX and HBX is the culture of this institution, transposed into digital space.”
Like so many alumni, Robert Lue PhD ’95 enjoys staying connected with his Harvard classmates. “Being a part of the community was and is one of the great things about being a student here,” says Lue. “Of course, that community stays with you throughout your life. But what if your Harvard community could evolve with you as you evolve, as you change jobs and interests and locations? What if your community could connect you not just with your own class and school, but across all Harvard generations and disciplines?”

In March 2014, Lue and his colleagues at HarvardX partnered with the Harvard Alumni Association (HAA) to offer Harvard alumni a first opportunity to expand and enliven their community through HarvardX for Alumni, an experimental HarvardX primer created exclusively for Harvard alumni. Curated and presented by Lue, HarvardX for Alumni is a seven-module program—a sort of “greatest hits” culled from HarvardX—specially edited, adapted, and offered free of charge to alumni of all Harvard Schools. The online segments, which launch every two weeks and remain available through the spring of 2014, include China—a survey of 6,000 years of Chinese history taught by Peter Bol and William C. Kirby, T. M. Chang Professor of China Studies in the Faculty of Arts and Sciences and Spangler Family Professor of Business Administration at Harvard Business School—and The Ancient Greek Hero, taught by Gregory Nagy, Francis Jones Professor of Classical Greek Literature and professor of comparative literature. Other segments explore Harvard’s historical artifacts, American poetry, Albert Einstein and the changing role of physics, and introductions to computer science and neuroscience. There is even an interview with President Faust about innovative teaching and learning.

“From the launch of HarvardX, our alumni have been asking how they can participate,” says 2013–2014 HAA president Catherine A. Gellert AB ’93. “With the launch of HarvardX for Alumni, we are able to connect all our alumni to the exciting things happening in Harvard’s classrooms—and, “Being a part of the community was and is one of the great things about being a student here.”

—ROB LUE, FACULTY DIRECTOR OF HARVARDX
with the marvel of technology, meet everybody’s schedule and interests.”

Defying the stereotype of online learning as a solitary experience, HarvardX for Alumni provides Harvard alumni a chance to forge new, dynamic connections and create a living community. But animating the alumni network is only one of the goals of the program. Lue and his colleagues believe HarvardX for Alumni will also help Harvard better fulfill its mission to prepare leaders for an increasingly complex and interconnected world.

“In the past, a person pursued lifelong learning for intellectual stimulation, out of a desire to do interesting things,” says Lue. “With the rate of change in technology and knowledge we see today, lifelong learning is no longer a luxury. It’s a necessity. Through HarvardX, we will be able to continue this ongoing process of enrichment for our alumni.”