

Image by: Gretchen Ertl



IMPACT REPORT



Open Learning



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WELCOME to Open Learners Everywhere

Humanity faces challenges in the coming decades on several fronts, such as health, climate, the environment, borders, poverty and injustice. Students are our future, and today, they are striving for success despite unprecedented upheaval. They inspire us.

We feel deeply committed to bringing open education to the world using all the tools available to us: accessible content, digital technologies, and the most updated pedagogy.

We know that we cannot do it alone. Thank you for joining us in building a brighter future. **Together, we open learning.**

A handwritten signature in black ink that reads "Sanjay Sarma".

Sanjay Sarma
Vice President for Open Learning

OPENING LEARNING TO THE WORLD

Providing learners and educators with the tools and pathways to improve their learning, livelihood, and skills is what we hope to achieve by opening up learning opportunities from MIT to the world.

When people [use Open Learning \(OL\) resources and programs](#), they are empowering themselves with knowledge that can ultimately change their lives and communities. This is especially important for students and instructors learning and teaching in difficult and less than ideal circumstances.

Whether on campus or afar, we're grateful for the communities who are determined to achieve their goals and the Open Learning staff that have helped make those accomplishments possible. Here are the stories of impact from OL's online learning programs this year.



How MIT OpenCourseWare Became an Educational Resource to Millions Around the World

OpenCourseWare enters its third decade on the heels of unprecedented global disruption. During the first months of the Covid-19 pandemic, when schools and businesses closed and billions of people around the world sheltered in place at home, traffic to OCW spiked to 2.2 million visits a month, a 75 percent increase from 2019. Since then, site visits have settled into a 15 percent uptick in use. More importantly, the massive shift to remote and hybrid learning over the past two years has brought into sharp relief both the opportunities of online education and the disparities of access, technology, and equity for learners everywhere. In charting a course for the future, the OCW team has the opportunity to draw on 20 years of experience in addressing the issues brought to the fore in 2020.

“The first years of OCW have been primarily about the power of access,” says Curt Newton, Director of MIT OpenCourseWare. “A core principle of where we’re heading in our upcoming program is the progression from giving access to knowledge to really driving towards educational equity.”

Later this year, OpenCourseWare will launch its NextGen platform and program. Its three principal aims are offering a vibrant reflection of MIT education as it evolves, delivering a more user-focused design and experience, and broadening access and usability to a larger global population. The NextGen platform will support a more dynamic experience of OCW’s robust multimedia content, allowing users to seamlessly search, browse, download, remix, and redistribute all materials more easily. Individuals can get a sneak peek of the new OCW and sign up to be a beta tester.

Another major pillar of the NextGen platform is mobile optimization, a user-friendly interface to provide readable, searchable content on any device. With 92.6 percent of internet users around the world using mobile devices at least some of the time, and with smartphone use growing at a rate of 7 percent per year, this change represents not only a catch-up to current need but also a purposeful approach to finding and engaging with future learners.

“As we look at the next year, five years, 20 years of OpenCourseWare, our goal is to keep pace with the evolving artifacts of MIT teaching and learning, offering the best possible experience to our growing community of learners,” says Newton. “We are also committed to continually reinvesting in the OER community — working collaboratively to share resources and engage with the people and organizations at the vanguard of access and equity in education.”



Read the complete article on *MIT News*

In 2020-2021, learners and educators used Open Learning resources to ensure continuity in their studies, satisfy their curiosity, and enhance their skill sets. We're proud to serve millions of learners in their educational pursuits.

2,519

courses available on the OCW website

22.2M

visits from over 11M unique users to OCW resources

438

mirrored copies of OCW are accessible in low bandwidth regions

93K

registered learners across 55 Open Learning Library courses

180

online courses launched, the most in MITx's nearly 10-year history

5.4M

unique learners enrolled in MITx MOOCs to date

75%

increase from 2019 in website traffic to OCW during the first months of the pandemic

Expanding Free Course Offerings

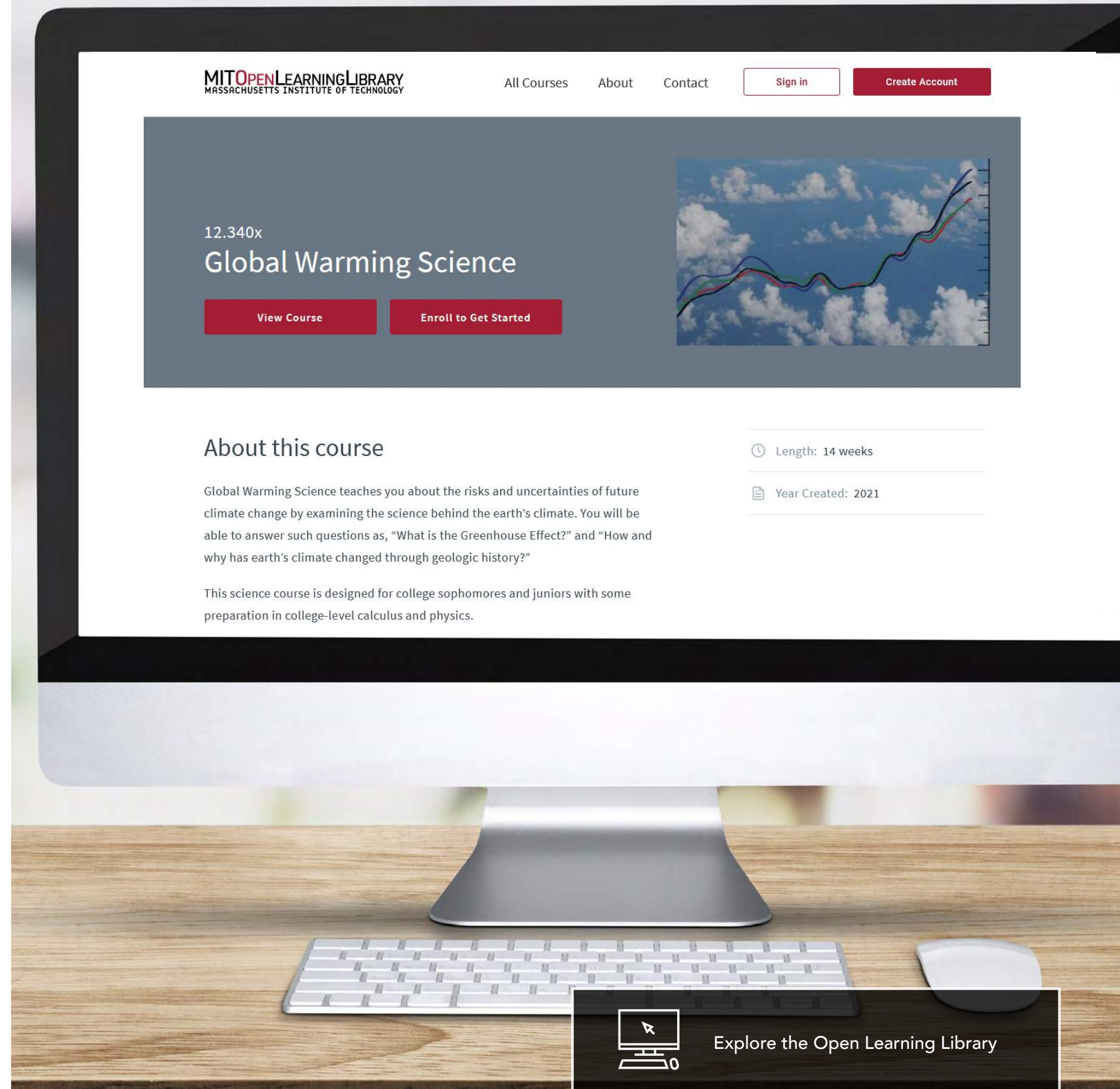
MIT is committed to sharing learning materials with the world. The [Open Learning Library](#) is one of the latest examples of this promise. The website offers more than 50 free self-paced courses that walk you through coursework, learning activities, assignments, assessments, and completion checklists to help you gauge your progress. Many of the courses come from MIT OpenCourseWare and MITx.

The Open Learning Library allows anyone to access courses without registration, with the intention of eliminating any barriers to course content. However, if you wish to track your progress or save your answers, you can register for an account and enroll in a course.



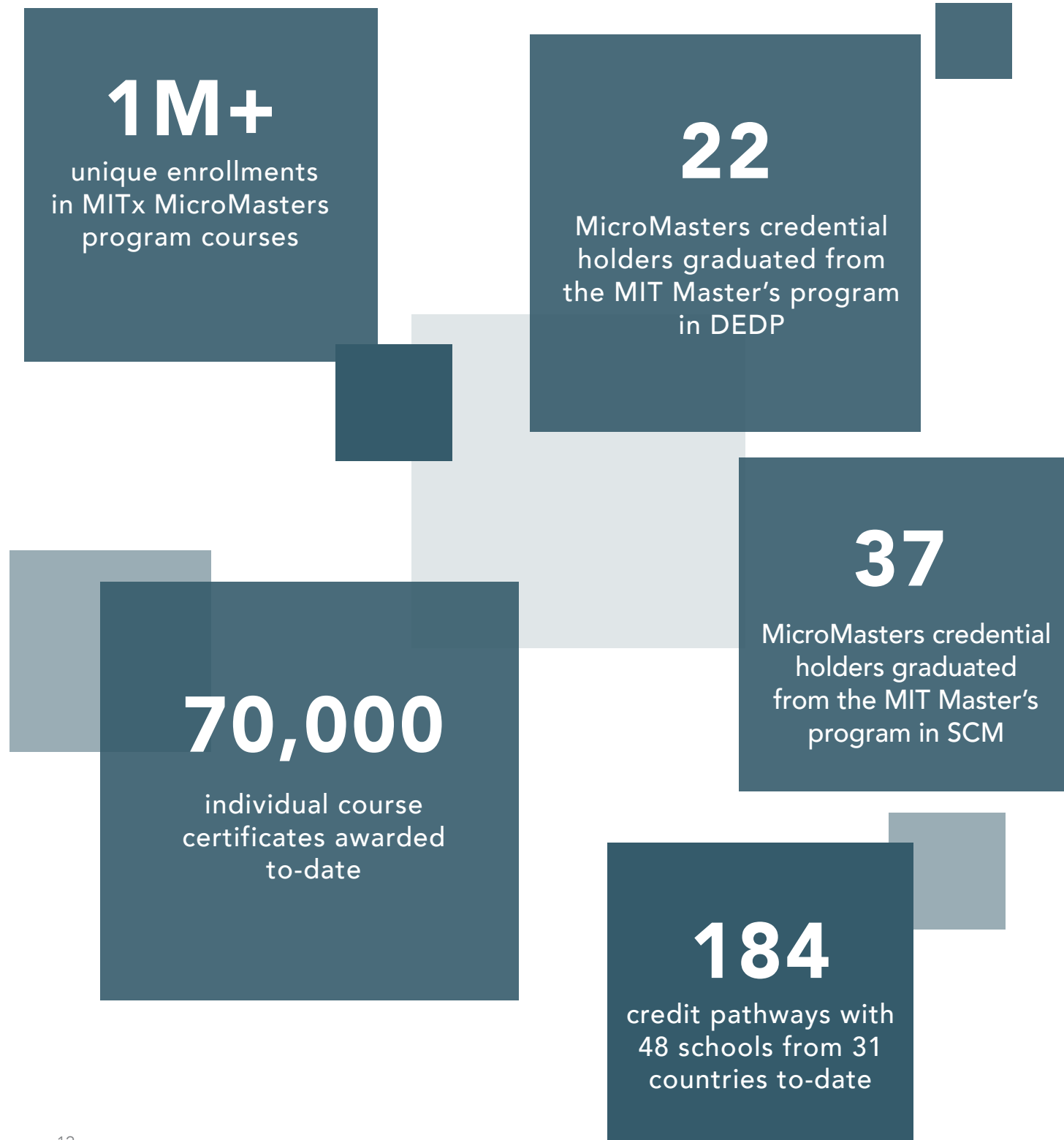
After using OCW to learn the basics of Computer Science, I then applied to and was accepted by a world class university in my area to study the subject for a degree. In my admissions interview I was asked about the resource and questioned about my prior exposure. I have no doubt that it was pivotal in my being accepted. My life is now on a completely different trajectory due to OCW and I'm very grateful.

Jamie, College Student, United Kingdom



Explore the Open Learning Library

The first of its kind, MITx MicroMasters programs offer learners the credentials necessary to apply for an accelerated, on campus, master's degree program at MIT or other top universities. The [MITx MicroMasters](#) launched and added [Finance to their programs](#) that include [Supply Chain Management \(SCM\)](#); [Data, Economics and Development Policy \(DEDP\)](#); [Principles of Manufacturing \(PoM\)](#); [Statistics and Data Science \(SDS\)](#).



Ultimately, there are so many ways that the MicroMasters has enhanced my life. From broadening my horizons, to equipping me with new skills, to providing me with the vocabulary and context to participate in conversations and activities that I am interested in...Having done the MicroMasters, I now have a level of confidence I wouldn't otherwise have had.

Abigael Bamgboye

Mastering Online Learning to Level Up

A number of pervasive myths surround online learning: that it's isolating, that the quality of instruction is innately lower than in an in-person classroom, or that it's only for those who can't succeed in traditional educational settings.

Abigail Bamgboye, an accomplished and highly self-motivated university graduate who just completed the [MITx MicroMasters Data and Economic Development Policy \(DEDP\)](#) program, gives the lie to all these myths.

Instead of feeling isolated, Bamgboye connected with communities of learners around the world. Instead of experiencing a watered-down version of graduate studies, she discovered a challenging and rewarding introduction to masters-level work in a field that interests her deeply, and that will help inform her future career. And far from pursuing online study as an alternative to traditional higher education, this recent graduate of Imperial College London's Materials Science program used her MicroMasters experience to add to her record of high achievement.

The program also helped her reconnect with MIT: Bamgboye spent a semester studying in the Department of Nuclear Science and Engineering in 2019 as part of an academic exchange. Indeed, it was during Bamgboye's time at MIT that the MicroMasters program first drew her interest. While taking an introduction to international development class at the MIT D-Lab, she was introduced to the work of the Abdul Latif Jameel Poverty Action Lab (J-PAL) and was impressed to find a research center of its scope attached to a university. She was also excited to discover that J-PAL, which houses the DEDP MicroMasters program, could offer her opportunities to stay engaged with MIT after her semester-long exchange had ended. "I thought, 'Wow, not only is it a fantastic way for me to expand my learning, but it's something I could potentially do remotely across the school year,'" she says. "Plus, there's the opportunity to come back to campus and do things there."

Once enrolled in the DEDP program, Bamgboye immediately realized she had gone up a step in the intensity of her studies, particularly compared to her undergraduate work. "You're learning so much in a short period of time," she says. "In a [UK] undergraduate degree, you learn a foundational skill set over two years [before specializing in a third or fourth year], while in the MicroMasters, if you take courses concurrently, you're potentially learning the foundational skill set over three to six months."

To Bamgboye's mind, this intensity is all to the good, helping build learners' confidence in the skills they've acquired: "By the time you get to the proctored exams, where you have to consolidate everything you've learned, you surprise yourself. And your understanding is boosted as things fall into place." She was reminded of the "dense and challenging" MIT course content she encountered during her semester abroad, recalling how a high percentage of PhD students in one of her classes in the nuclear science and engineering department kept her studies rigorous.



Read the complete article on [MIT News](#)

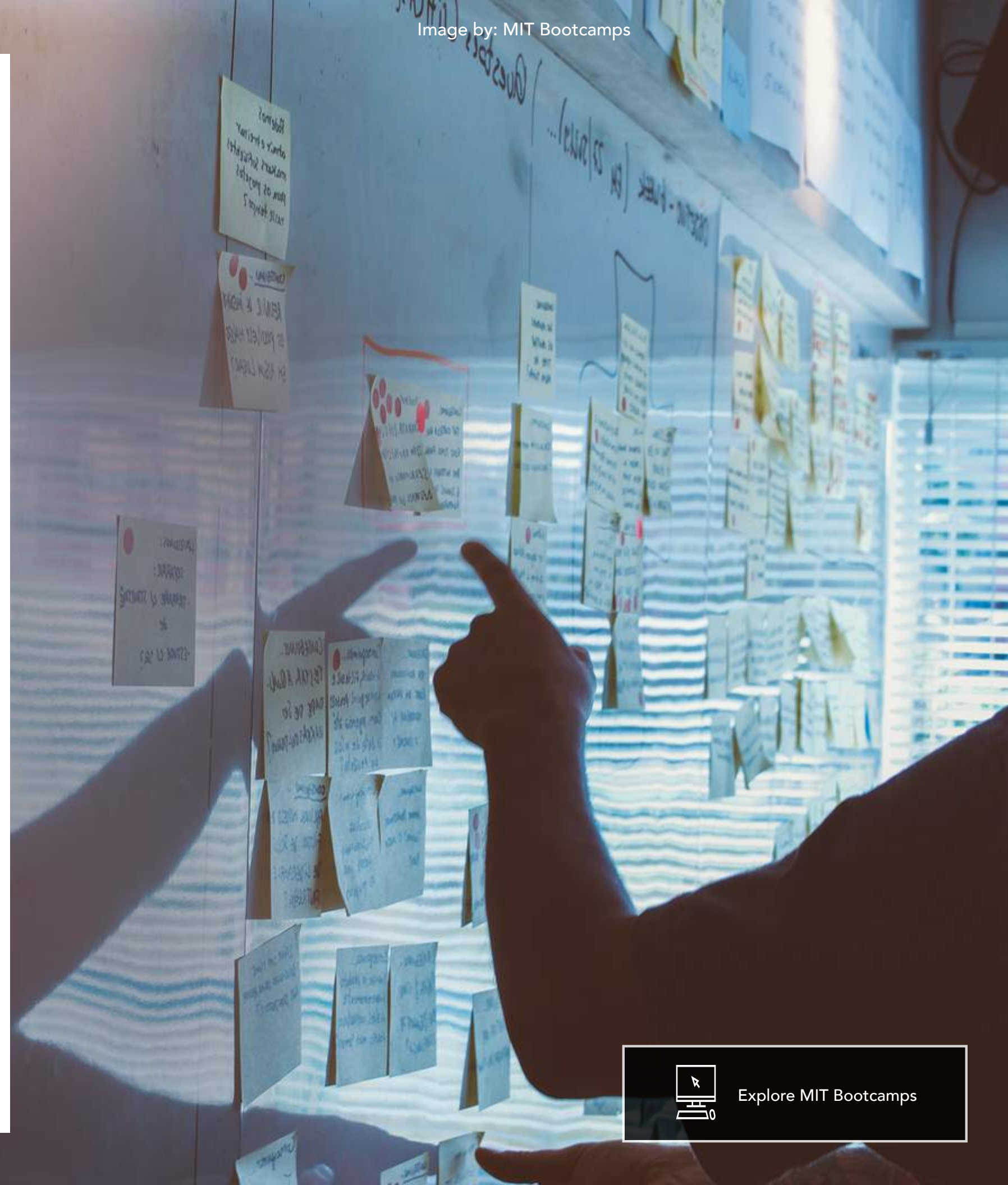
The Benefits of Action-Learning

Action-learning at [MIT Bootcamps](#) takes theory to practice, reinforcing knowledge and skills learned in a mix of MITx MOOCs and live workshops and lectures. A transition to virtual immersion programs allowed MIT Bootcamps to reach more than 500 individual and corporate learners with their transformational team-based innovation programs this year. Learners joined from more than 60 countries and 22 timezones, experiencing different and ever-changing realities even as they built connection across the globe through the rigorous and immersive learning experience that MIT Bootcamps offer.

“ The Bootcamp fully stretched me and came at a time when I was looking to reinvent myself. Erdin’s leadership and commitment were outstanding and the knowledge I gained has made me rethink a lot in how I approach a new venture. It has given me the belief and the desire to go further.

Umer Khan, Founder, Bootcamp Graduate

As the pandemic forced the corporate world to adapt, a new openness to virtual programs allowed the team to co-create and deliver new, online programs with an expanded virtual toolkit that will endure, making more flexible Bootcamps offerings available to more learners worldwide.



Explore MIT Bootcamps

How Does the CURE Work?



Current State

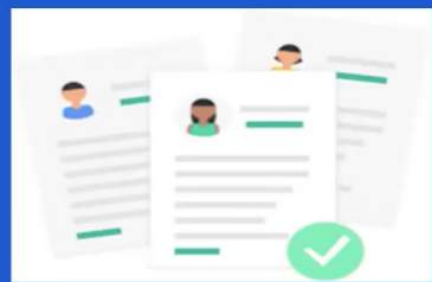


Complete Questionnaire

Future State with The CURE



Play with your teammates



Get Personal Assessment Result



Get personalized cultural assessment result

0:24:41

00:24:18 / 01:39:03

Speed CC

Fostering an Entrepreneurial Spirit

The 2021 class of the [MIT Refugee Action Hub \(ReACT\)](#) completed the intensive, 10-week online MIT Innovation Leadership Bootcamp, collaborating across cultures and time zones to build new entrepreneurial ventures. Integrated within the Bootcamp's larger class of 200 aspiring global entrepreneurs, ReACT learners were meaningfully immersed in wider networks while developing their leadership capacities.

In the final pitch presentations of the MIT Innovation Leadership Bootcamp, two ReACT learners, Zeinab Jammoul and Rund Wadi, young women from Lebanon and Jordan, were on the winning team, earning top honors for their proposed venture for HR solutions to address multi-cultural conflicts and challenges in the workplace.

MIT ReACT Highlights:

- 3rd cohort of the MIT ReACT Certificate Program in Computer and Data Science launched.
- 50 refugee, displaced, and underserved learners from 22 countries enrolled.
- 4 geographic hubs of global collaborators and funders in Jordan, Uganda, Colombia, and United States.
- Organized and facilitated a design workshop with the Whitaker Peace Development Initiative on digital learning pedagogy for refugee community learning centers.
- Launched ReACT advisory council with MIT alumna Hala Fadel MBA '01 serving as Chair.



Serving Professional and Executive Learners

Open Learning [professional education programs](#) provide some of the best workforce training available especially in rapidly changing technology and business disciplines.

From guiding entrepreneurs in their business management and planning to upskilling and training both technical and non-technical personnel in emerging technologies like 5G, artificial intelligence, augmented and virtual reality, and robotics, our programs are designed to ensure learners achieve success.

These programs are an important part of the Open Learning ecosystem because the revenue generated supports the free and open educational materials, programs, and learning research we share with the world.



If I had to borrow one quote to summarize what I gained from this course, it would be the quote by Lou Holtz: “It’s not the load that breaks you down, it’s the way you carry it”. I learned how to “carry” the weight of complex problems effectively by applying “Systems Thinking”. Thank you, MIT for offering this program.

Neena Rajan, Engineering Project Manager,
Siemens - Healthcare

MIT Open Learning also offers a range of professional education programs to support on-the-job upskilling and training for workers, as well as opportunities for aspiring entrepreneurs to tap into MIT expertise.

500+

individual and corporate bootcampers in 60+ countries participate in MIT Bootcamps

100+

Horizon online events and podcasts on topics including artificial intelligence, cybersecurity and blockchain

New

MIT xPRO curriculum on Impact Entrepreneurship piloted

5G

is the newest technology topic module to be added to the Horizon content library

12.4K

enrollments in MIT xPRO programs with 94% certificate completion rate

New

online action-learning educational program Virtual Guided Hackathon

45

CVS Health employees participated in a Virtual Guided Hackathon for CVS Health

22.4K+

registered users access the Horizon platform to learn about emerging technologies

4

new online courses launched on the MIT xPRO platform

Putting Covid into Context

In an effort to offer open, worldwide access to learning that can help us understand and address the pandemic and its global impact, MITx developed four MOOCs that delve into a wide range of topics from the history of disease to the mathematical assessment of Covid-19 spread.

Covid-19 in Slums and Informal Settlements: Guidelines & Responses

Led by Ceasar MacDowell, Professor of the Practice of Civic Design in the Department of Urban Studies and Planning, and a team of graduate and undergraduate students, this course focuses on how Covid-19 has impacted the world's most vulnerable populations across the Global South. The course explores what is happening on the ground in communities that lack adequate resources to manage the pandemic response, and discusses what may work and what doesn't.

Disease, Climate Shocks, and Wellbeing: a Long History of Social Response to Crisis

Societies have battled pandemics and other natural disasters for all of human history. Led by Anne McCants, Professor of History, this course explores the issues of disease and resource constraints through a number of historical cases, to understand their impact on social organization and the standard of living. Through context, learners can put COVID-19 into historical perspective.

Cultivating Entrepreneurship & Antifragility to Thrive in a Fast-Paced World

Covid-19 has ushered in a myriad of healthcare, humanitarian, economic, and societal crises that require new and creative ways of thinking. Hosted by MIT's Martin Trust Center for Entrepreneurship, this course is an integrated, eight-module "How To" speaker series. In each module, world-renowned experts equip learners with practical frameworks, processes, and lessons with the mindset, skills, and ways of operating to cultivate antifragility among individuals, teams, organizations, and society.

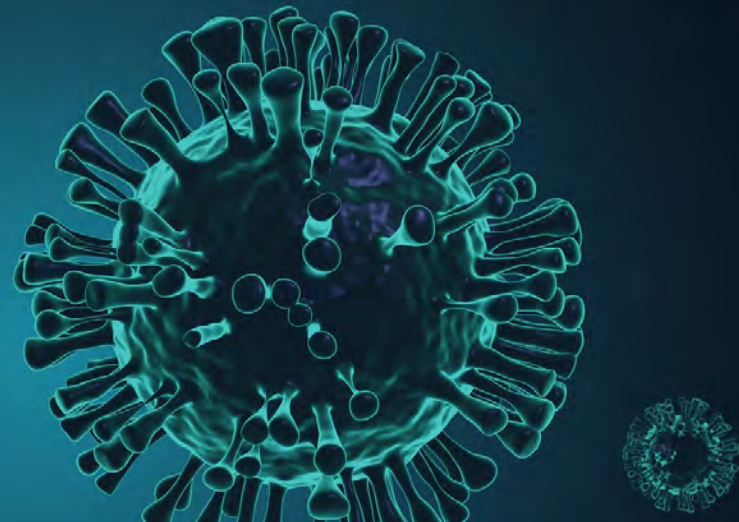
Physics of Covid-19 Transmission

This course shares and explains important new research on Covid-19 transmission from Chemical Engineering Professor Martin Bazant. He outlines what has recently been learned about aerosol transmission and the underlying scientific principles that can be used to assess risk levels in various environments. While some of the calculations offered are advanced, interviews and videos discuss these findings in a way that all learners can understand.



MITx provided the perfect course when I got my first job post Biotech Undergrad degree to help bridge the gap from theoretical to practical. I was able to participate meaningfully despite having no hands-on experience with Industrial Fermentation. Having enjoyed the level and delivery of the course, I have since enrolled in Biochem, Biomol, Methods & Mechanisms to maintain and improve knowledge I don't use at work, but hope to use in my career.

Tara, Working Professional, Australia



2021 MILESTONES

**20
Years**

of MIT
OpenCourseWare
(OCW)

**10
Years**

of MITx

**5
Years**

of the MIT
Integrated Learning
Initiative (MITili)

**5
Years**

of Residential
Education at Open
Learning

**5
Years**

of MIT Refugee Action
Hub (ReACT)

**5
Years**

of the MITx
MicroMasters programs

A photograph of three scientists in a laboratory setting. They are wearing white lab coats and safety glasses. One scientist is using a pipette to transfer liquid into a small vial, while another is holding a test tube. The background shows shelves with various lab equipment and supplies.

COMMUNITY & INNOVATION IN A TIME OF RESILIENCE

Among many things, the COVID-19 pandemic has taught us that science and education are some of the best sources for encouragement and strength against the collective challenges facing humanity. Educators and learners—including some of the youngest learners—were again asked to develop their agility to adapt and persevere amidst immense obstacles and uncertainty.

In response, Open Learning staff, faculty, and learning technologists began studying the longevity of the pedagogical practices that emerged from this unique period in history, analyzing the effects of the pandemic upon today's workforce, and highlighting how the pandemic accelerated urgent innovation that is widening the pathway of opportunity for many. Meanwhile, a global consortium made headway in ensuring learners are able to maintain and protect their academic credentials digitally, a crucial step in advancing learner agency and making education more resilient for the future.

Enabling Verification of Lifelong Learning

Building on earlier work at the MIT Media Lab, in 2018 MIT Open Learning launched an ambitious effort to reimagine digital academic credentials: the [Digital Credentials Consortium \(DCC\)](#). The DCC is a group of 12 leading research universities from the United States, Mexico, Europe, and Canada, who set out to create a trusted standard for digital academic credentials and cultivate an ecosystem that puts learners in control of their own accomplishments.

Digital credentials developed by the DCC can represent full university degrees, professional development certificates, or microcredentials of many types, whether for MOOCs, MicroMasters, or mastery of granular competencies. The goal is to develop the digital foundations for an education landscape that increases learner agency and promotes more equitable learning and career pathways.

The DCC is currently focusing on three areas of activity: development of open standards, deployment of digital credential pilots, and the creation of an open source mobile credential wallet.

The DCC is comprised of 12 higher-education institutes in the United States, Europe, and Canada, representing six different countries:

- MIT (US)
- Tecnológico de Monterrey (México)
- Harvard University (US)
- Hasso Plattner Institute (Germany)
- Technical University of Munich (Germany)
- University of Toronto (Canada)
- McMaster University (Canada)
- Delft University of Technology (the Netherlands)
- Georgia Tech (US)
- UC Berkeley (US)
- UC Irvine (US)
- University of Milano-Bicocca (Italy)

DCC Pilot Projects

DCC members are exploring a variety of digital credential use-cases and applications. MIT is developing verifiable credentials for learners of the xPRO platform, which offers professional education courses by MIT faculty and researchers.

Georgia Tech is prototyping a credential issuer that could be used within the Canvas Learning Management System (building on the Learning Tools Interoperability specification by the IMS Global Learning Consortium). Canvas is used by several thousand institutions and millions of students and teachers.

The Hasso Plattner Institute and Technical University of Munich are designing a national and internationally deployable, DCC-compatible, state-of-the-art credentialing system. McMaster University in Canada is exploring the integration of a digital student ID and on-demand transcripts.

Open Source Wallet Standard and Deployment Project

A key missing piece in the digital infrastructure has been a “wallet” application that enables students to receive, manage, and share their digital credentials. MIT is collaborating with the US Department of Education and Walmart to develop eduWallet, an open source mobile wallet application that can be used by learners to manage their digital academic credentials.

MIT will test the credential wallet with several US educational institutions. Two of these planned partners, San Jose City College and College Unbound, primarily serve adult learners—many of whom are first generation,

underrepresented in higher education, or have faced significant barriers towards fulfilling their academic goals. We see these as compelling use-cases in our efforts to promote more equitable learning and career pathways.

Looking Ahead

Amid the exciting phase of developing and deploying the open source wallet, piloting digital credentialing programs at multiple institutions, and growing our community, the DCC is looking forward to expanding the global community of higher education institutions it works with, and using digital credentials to bridge the “last mile” between learning and employment.



Image by: Aman Shyansukha

Aman Shyamsukha earned his MicroMasters certificate in Supply Chain Management. The DCC is working on an open source wallet that will enable learners to store and manage digital versions of their credentials in the future.

Workforce Education Project Details Education and Training Reforms for Better Jobs

A reformed workforce education system might be the key to reversing growing income inequality, according to a [new report from the MIT Open Learning Workforce Education Project](#).

Led by Vice President for Open Learning Sanjay Sarma and Senior Director of Special Projects William Bonvillian, the Workforce Education Project is a research effort to study the workforce education landscape in the United States. Meghan Perdue from MIT Open Learning and the MIT Sloan School of Management's Jenna Myers co-lead the project, which received foundation support from Schmidt Futures. The preliminary and final reports examine the problems in the current U.S. workforce education system, including disinvestment from the government and employers, as well as a lack of coordination across existing programs, and suggests new models for meeting 21st-century workforce needs. The reports also include working papers that provide backup studies to these findings. The final report was published as a book, [Workforce Education, A New Roadmap](#), by MIT Press in 2021.

The need to train and upskill American workers will only grow as the country and the world continues to grapple with the effects of Covid-19. The pandemic has impacted every aspect of life for individuals and communities across the United States and the world, and will have far-reaching consequences for the economy, education, and work. It has underscored economic inequality, raised new discussions about what defines an essential worker, and—in a very short time—changed what was considered possible for remote learning and work. Key sectors facing critical transformations in the current crisis, including manufacturing, retail, healthcare are a focus of the Workforce Education Report, and the coronavirus has sharply accelerated evolutions already underway in each. New sets of workforce skills will be required as a result of these changes; the authors of the report believe that the post-pandemic world will reinforce the challenges and potential solutions identified by their research.

Reforming workforce education

As cited in the report, the chief factor that has contributed to America's economic inequality is the decline of manufacturing jobs. Between 2000 and 2011, the United States lost a third, or 5.8 million, of its manufacturing jobs. This has closed off a major route to the middle class for those with a high school education or less. "At the same time, the overall workforce is up-skilling as new technologies incrementally enter the economy," the authors add, noting that quality jobs tend to go to those with college educations.

But a strong 21st-century skills training system could close this education divide, giving workers the education and opportunities to move into better paying jobs requiring higher skill levels. While colleges and universities have long been considered "largely divorced from the workforce fray," the Workforce Education Project finds that higher education institutions can, in fact, play a significant role in reforming workforce education. Universities are well-positioned to organize new kinds of delivery mechanisms across secondary schools, community colleges, and other four-year institutions of higher education. They also have the resources to invest in learning science research and develop optimal teaching approaches, making them indispensable to the development of lifelong learning systems.

The Covid-19 pandemic has forced a massive education experiment: nearly all teaching and learning in America, from K-12 through higher ed, shifted online in the space of a few weeks, and for an indefinite period of time. While this unprecedented moment has presented serious challenges, from outdated technology to mediocre material, the simple fact that instruction has been able to continue is a hopeful sign.



Learn more about the project



MassBridge: Advanced Manufacturing Workforce Education Program

American manufacturing has been a troubled sector in recent decades. Between 2000-2010, the manufacturing sector lost close to 6 million jobs and closed 64,000 plants. Between 2010 and 2020, the productivity of U.S. manufacturers declined both in absolute terms and compared to key foreign competitors. The massive U.S. trade deficit in goods rose in 2020 to \$916 billion, including more than \$190 billion in advanced technology goods.

How will U.S. manufacturing compete with lower-wage, lower-cost competitors? Advanced manufacturing, with its potential gains in efficiency and productivity, offers a solution. Although the U.S. formed 16 advanced manufacturing institutes to help bring on new manufacturing technologies, a purely technology-focused approach will not be enough. The institutes are working to develop technologies in areas such as digital production, robotics, additive manufacturing, flexible electronics, photonics, sensor and systems, and biofabrication. However, our workforce education system is not ready to provide the training we need in these new technologies.

Concerned about the strength of the U.S. industrial base, the Department of Defense funded the MassBridge project. In MassBridge, MIT Open Learning is collaborating with agencies from the Commonwealth of Massachusetts to develop advanced manufacturing programs for community colleges and vocational-technical high schools. The program, planned for initial launch in six community colleges, will eventually be available for institutions across the country. As part of this effort, the Open Learning team prepared a highly-regarded advanced manufacturing benchmarking study to inform curriculum development. They also co-hosted a two-day virtual gathering, [Bridging the Education / Workforce Gap: Community College and Beyond](#), which convened experts from across the country. While the MassBridge project focuses on manufacturing, its lessons can inform many other types of vocational education systems around the world.



Read the complete study

OPEN LEARNING RECOGNITIONS FOR EXCELLENCE

Residential Education received **Infinite Mile Award** from IS&T for the support in transitioning 1,925 MIT courses (90% of the total for Fall plus Spring) from Stellar to Canvas.

"In Event of Moon Disaster," produced by the MIT Center for Advanced Virtuality (Prof. D. Fox Harrell, Founding Director), wins **Emmy Award**

FullSTEAM Ahead was awarded Gold in the K-12 category at the **Wharton-QS Reimagine Education Awards**

2021 Influential Paper Award given to Cynthia Breazeal



With over 200 independent judges participating in the evaluation process, our winners have received the unequivocal backing of expert educationalists across the world, and should take exceptional pride in their achievement.

Jack Moran, Reimagine Education
Program Manager

Sharing Lessons Learned and Educational Research

As faculty and instructors discover ways to enhance their teaching and researchers investigate learning science and technology, they come together to share their innovations with the MIT and broader learning communities through a wide range of events hosted by Open Learning.

Through **xTalks**, MIT faculty, researchers, staff, and students share their experiences developing and using digital technologies in the classroom. Recent xTalks have focused on the information economy, fair and equitable classrooms, and approaches to teaching leadership, negotiation, and diplomacy.

Open Learning Talks, a public, online conversation series, was launched this past year by gathering leaders to discuss research-based ideas, technologies, and efforts in education. This year's series began with a conversation on mindfulness, mental health, and learning, led by members of the MIT Integrated Learning Initiative (MITili)'s Mental Wellness Initiative (MWI).



Canvas Quick Start

Online
February 4, 2021



Using MIT's Lightboard for Enhanced Instruction

Online
January 26, 2021



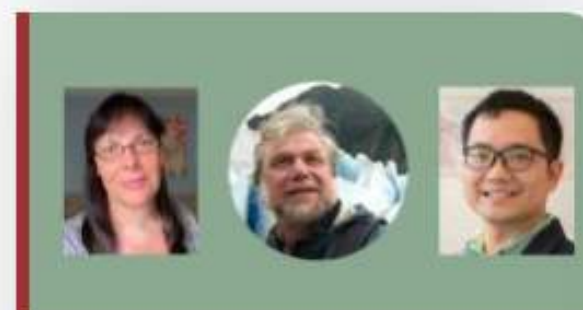
xTalk Panel Discussion: Assessments & Assignments for Remote Learning

Online
January 14, 2021



MOOCs: Curricular Innovations, Modes of Delivery & Student Behavior

Online
January 12, 2021



Building community in a remote classroom

Online
November 19, 2020



Open Learning Talks: Sanjay Sarma & Luke Yoquinto

Online
October 7, 2020

Building Community in the Remote Classroom

Although students became better accustomed to remote learning, and educators adjusted their teaching, one of the remaining barriers in the online educational experience was how educators could create a cohesive classroom community. This was quite important for supporting student learning and well-being in virtual settings.

In an MIT xTalk on [Building Community in the Remote Classroom](#), instructors Simona Socrate, Ari Epstein, and Kang Zhou shared strategies to foster interconnectedness with and among their students.

The instructors recognized that many of their students were continuing to learn in isolation with added levels of anxiety. Sophomores who may have never taken a mechanical engineering class would enter the 2.001 Mechanics and Materials I course with a deep disadvantage. The students would not have the opportunity to get to know their classmates for the required hands-on team projects in MechE's junior and senior courses.

"This class is where the MechE community forms. Students start getting to know each other and working together. With students isolated in their own homes, bringing this sense of community is one of our biggest challenges." —Simona Socrate, Senior Lecturer and MITx Digital Learning Scientist

Simona Socrate, a member of Open Learning's MITx Digital Learning Lab, put several strategies in place to ensure her 120 students could develop a strong sense of community with each other. Some of her strategies included:

- Running hands-on "Discovery Labs," using course kits mailed to all participants, where students worked in small groups, allowing students to get to know each other, as well as their Lab instructors, and develop academic relationships and friendships.
- Organizing a mentorship program, to give struggling students a support system in which they were paired with upperclassmen mentors that had already gone through the "2.001 experience." Students benefited academically and had an opportunity to connect with more "seasoned" students who provided prospective and guidance. Mentorship pairs were then expanded into small groups of 2-3 students and one mentor, who learned to work together and practice a growth mindset.
- Deepening the connection between mechanical engineering and the lives of her students by having them investigate their surroundings and identify examples of every-day objects for which they could apply the insight and techniques learned in the course. The students worked on three "Projects" in which they modeled a system of interest, creating new 2.001-style problems.
- Having students participate in an online forum to ask questions and provide answers in a timely fashion so that no student ever felt alone and could still feel connected.

These and the other strategies presented by the instructors will improve the classroom experience for remote learning today and into the future.



This class is where the MechE community forms. Students start getting to know each other and working together. With students isolated in their own homes, bringing this sense of community is one of our biggest challenges.

Simona Socrate, Senior Lecturer and MITx Digital Learning Lab Scientist



Teaching Practices during the Pandemic: What Will Remain?

MIT's Shigeru Miyagawa, senior associate dean for open learning and professor of linguistics and Meghan Perdue, digital learning scientist in the school of Humanities, Arts and Social Sciences analyzed surveys and conducted interviews with 30 MIT faculty about the pedagogical approaches used during the pandemic. They were curious to understand which practices were effective and could continue as classes shifted back to in-person. This effort was supported by the Michelson 20MM Foundation. The following is an excerpt from their [article in Inside Higher Ed](#).

"...If an award were to be given for the most raves from instructors across disciplines, it is the chat feature in video conferencing platforms. One instructor said that when he first started to use Zoom, he saw a stream of student postings on the chat addressed not only to him but also to each other. He was puzzled by what appeared to be a distraction, but then saw that the students were engaging with the lesson and encouraging others to ask and answer questions.

In a large lecture class, students liked the fact that their questions were promptly answered on the chat by a teaching assistant, which helped to keep their attention on the lesson. Many other faculty members told us that the chat allowed students who weren't comfortable speaking up in class an opportunity to participate in the discussion. They are thinking of how they can recreate the chat experience when they return to in-person teaching.

Creating Convenience and Inclusiveness

Being online allows us to transcend the restrictions that the physical nature of an in-person class impose. Some of these benefits will probably carry over to the post-pandemic era.

Some faculty want to keep teaching at least some courses online for the sheer convenience. Many appreciated the reduction in time spent commuting each day, noting that they were able to devote that time to their families or hobbies.

Others are interested in the possibilities that online teaching could add, observing that they can attend conferences that they would otherwise have missed or potentially participate remotely from distant research or study sites. Online office visits have also worked well for many instructors, especially 10-minute, one-on-one sessions with students. Many faculty members reported that they would continue online office visits going forward, as they were much better attended than the in-person meetings before the pandemic.

Ever since the internet took over our lives, the local and the global have been steadily merging, and this trend has hit a crescendo in the pandemic. Instructors have invited speakers from institutions around the world to join their online classes—often scholars whose work the students have read, offering the chance to engage with them directly. This approach also helps to bring variation; instead of hearing just one instructor, students are exposed to multiple points of view. In one case, a class had 32 outside speakers, each joining for around 20 minutes.

Other instructors have used the opportunity to engage communities they ordinarily wouldn't have access to, such as one faculty member who had her students do a joint project with a middle-school class. And the merging of the local-global has not been limited to teaching. Reading groups and research presentations, an essential component of research, found participants from across the globe. The benefits are so clear that it's hard to imagine that we will want to reverse the merging of the local-global for teaching and research after the pandemic.

Ultimately, the experience of the last year, while certainly a disruption, has transformed the way faculty members interact with students and the community they work in. This attitude shift will carry over to the post-pandemic era. Faculty are now more aware of the "whole student," acknowledging their lives outside the classroom. Also, they have a heightened awareness of the need to create teaching practices that keep the students engaged and to use technology tools that enhance their teaching, from recorded video lectures to real-time chats. Finally, by teaching online, faculty can introduce their students to a larger world of scholars beyond their own campus, thereby substantially broadening their learning opportunities.

In short, there's no going back, and college teaching will simply never be the same."

A complementary article entitled, [Moving Abruptly Online: What It Was Like for Faculty and for Students](#), which details their findings is [available on the MIT Faculty Newsletter](#).

Chronicling MIT's Covid-19 Online Education Transition

In the following [video playlist](#), MIT faculty and instructors describe their approach to teaching and learning practices during the pandemic



SELECTED RESIDENTIAL HIGHLIGHTS

Digital Innovations in Practice

While some digital innovations, like remote learning tools, blossomed out of necessity during the pandemic, others like [Reach Every Reader's literacy apps](#) were created to address pre-existing inequalities in learning. In both cases, these tools and their applications have the potential to transform the future of education.

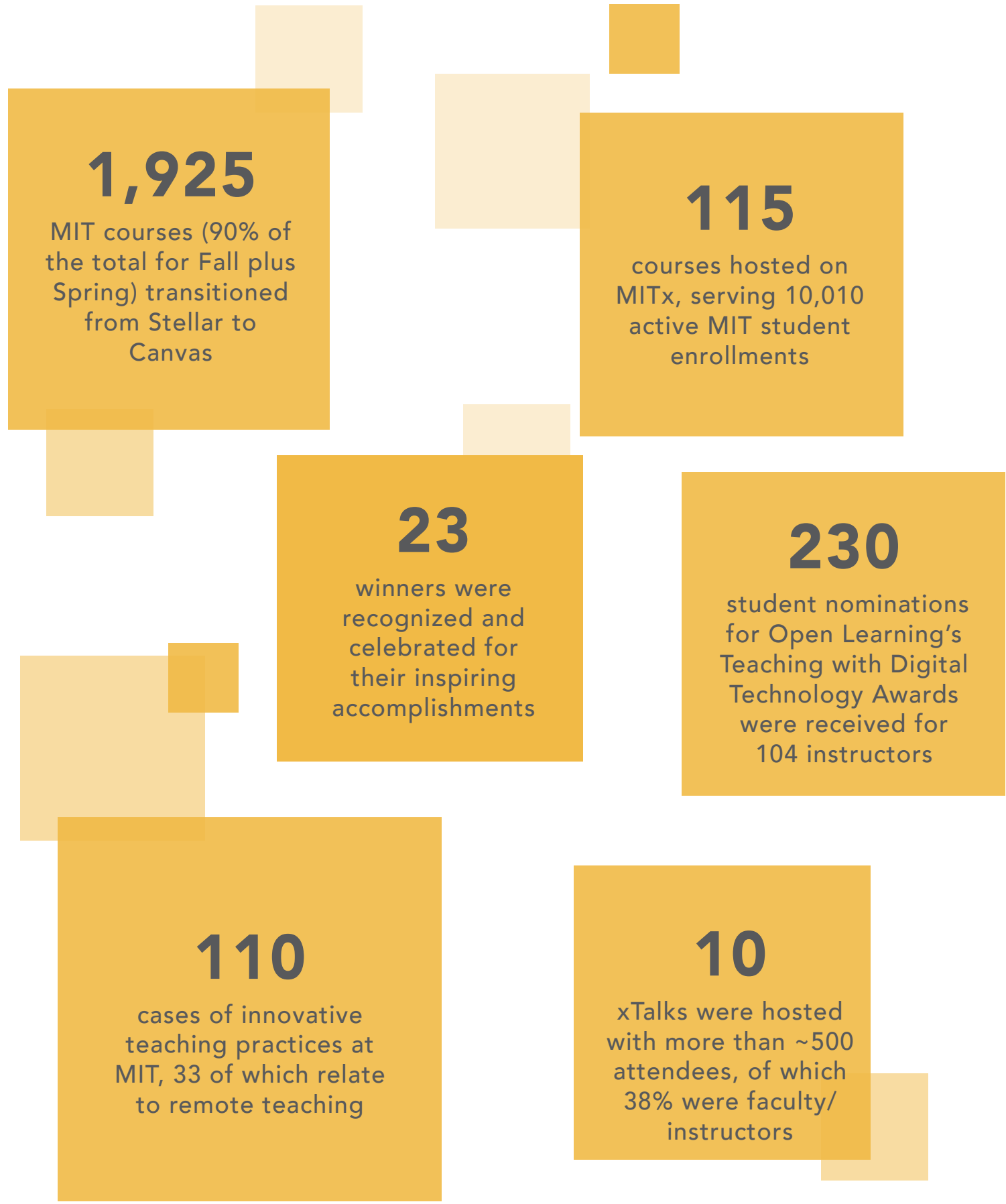
For MIT faculty interested in incorporating digital innovations and tools into their classroom, the Residential Team offers assistance and resources. Canvas is a multi-featured online learning ecosystem that enhances community, collaboration, learning, video, and course content. Implemented during the pandemic, and supported in the transition by the Student Learning Technologist program, Canvas is used by over 90% of MIT courses. In addition, the Residential MITx learning system, based on Open edX, allows faculty to author and distribute online course content. The Residential Team has also [curated 33 digital tools that support remote learning](#). From learning visually online to teaching chemical engineering thermodynamics remotely and how to maintain community and engage students, MIT faculty share the lessons they've learned while navigating the pandemic.

For families and educators working to close the early literacy gap, the literacy apps recently created by members of the Reach Every Reader team transform the phone, a potential distraction, into an opportunity for familial interactions. The apps are free to the public and do not require internet connectivity after installing. The three apps, titled Small Wonders, Photo Play, and Animal Antics, are designed to promote back-and-forth conversational turns between children and parents. [Recent research by MIT's John Gabrieli](#) stresses the importance of these turns over what is described as word dumping, or talking at your children to increase vocabulary, for brain development.

Members of the Reach Every Reader team joined MIT's Eric Klopfer to discuss the literacy apps as part of the [MIT Open Learning Talks series on April 29](#). The [conversation featured](#) an introduction to Reach Every Reader by Executive Director and Harvard professor Liz City. Led by [Harvard Graduate School of Education \(HGSE\)](#) and the [MIT Integrated Learning Initiative \(MITili\)](#), this cross-disciplinary and multi-institutional effort focuses on developing foundational literacy skills, early screening and diagnosis, content-rich intervention, teacher and caregiver support, and reach for sustainable impact.

The app creators, Harvard's Joe Blatt and Rosa Guzman Turco, spoke to the importance of using technology to help facilitate conversation with young learners.

"One of my favorite parts of this whole project was visiting families at their homes and introducing them to the apps and watching as they use them to see if they are engaging in the back-and-forth conversations we were hoping for," said Guzman Turco. She went on to say that through the prompts and the scenarios that were created within the app, families were using the apps in ways that the design team had hoped as they were creating them. For example, with the Animal Antics app, the characters may be in a library or at the doctors office. These scenes provide a launch pad for conversations that would take place in those settings. "We know for a three year-old it's hard to create a story on their own, but the prompts helped parents start conversations that they normally wouldn't have with their child," she said.



Capturing Experiences through Creative Media Services

The Emmy award-winning [MIT Video Productions \(MVP\)](#) team has been a critical collaborator in supporting academic and community needs this year while keeping us connected through the power of storytelling. During the pandemic, MVP has provided online and virtualized services for numerous streaming activities which included course and event captures and managing community-wide celebrations like the Excellence Awards and the Climate Grand Challenge to the MIT School of Engineering. MVP supported 373 projects to 110 unique MIT community clients – with incredible storytelling and creative skill. Here are some of their recent projects.

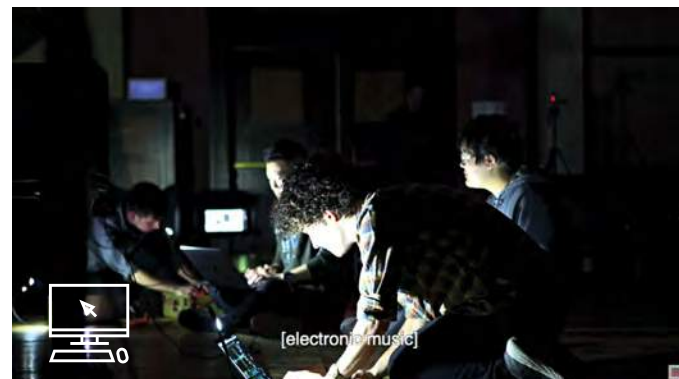
Climate Grand Challenge



7.00 Covid-19 course



Music Theater Arts Virtual Concert



MIT Town Hall Series



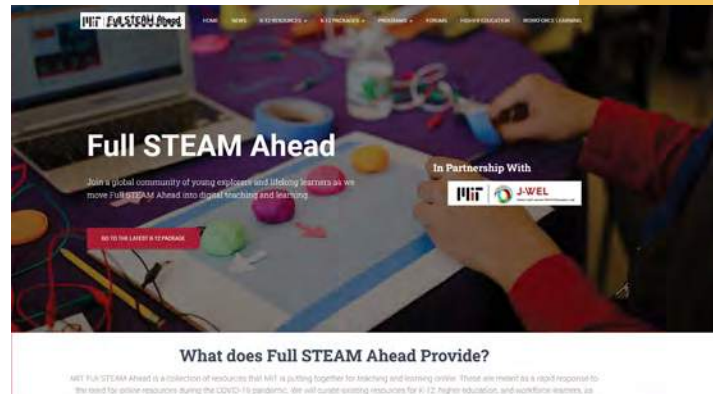
To my mind, your video portraits of the SHASS staff are far and away the most powerful—and delightful—way we've had to convey the excellence, contributions, personalities, and stories of the IMA winners.

Emily Hiestand, Communications Director, Office of the Dean, HASS

New Efforts from Open Learning

The following are new efforts from Open Learning centered on building learning and research communities and amplifying the impact of Open Learning.

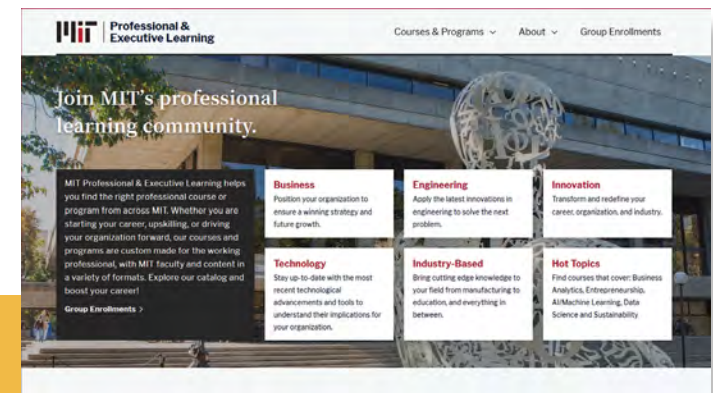
Full STEAM Ahead



Mental Wellness Initiative



Pro-Learn



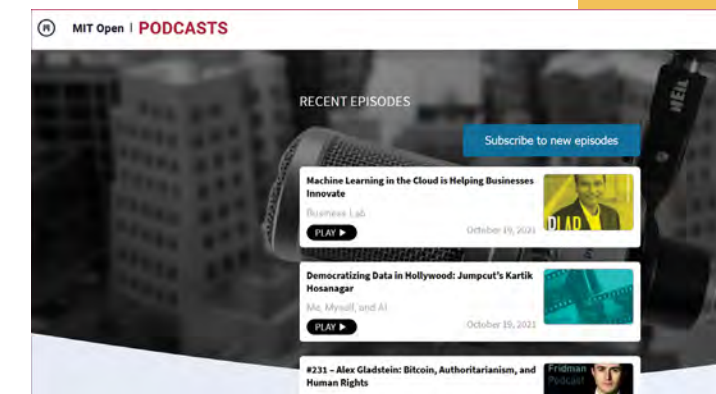
Open Learning on Medium



Open Learning Talks



Podcasts Channel



RAISE





Engineering Technological Infrastructures for Learning

All online learning experiences rely on complex technical infrastructures. These systems must be integratable and support content management systems, multimedia distribution, learning activities such as discussions, assessments and examinations, all while protecting the learners' privacy and progress.

With programs transitioning to being completely online, new virtual experiments, development of the next generation of OCW, and continued fostering of an open online community, the Open Learning Engineering and Technical Operations team met the demand in developing and upgrading the systems that millions of learners and educators rely upon.

Some of the programs and projects the team administers include:

- Building the OCW next generation platform.
- Launched MITx Online, a new option for MIT faculty sharing courses with the world.
- Upgrade of the Residential MITx systems to continue support for remote students and faculty during the pandemic.
- Supporting MIT Open, an online space for learning communities with more than 138,000 registered users.
- Delivering nearly 5,000 certificates to 12,500+ learners on MIT xPRO (xpro.mit.edu), across 39 courses and 9 programs.
- Worked with the Digital Credentials Consortium team to start implementing a prototype of digital credentials for xPRO.
- Supported 8 new online Bootcamp application cycles, including fast-tracking of alumni applications.

CHANGING SYSTEMS FOR SOCIAL IMPACT

Education is a crucial lever for bringing about a fairer and more just world. Openb Learning is deeply committed to creating positive and systematic change through knowledge, critical thinking, and compassion.

Some of our approaches to meeting these challenges include introducing the compassionate systems framework in schools, examining injustice and racial biases through virtual reality games and immersive experiences, and advancing equity through the artificial intelligence ecosystem.

We are furthering efforts through actionable research and work closely with educational institutions, ministries of education, and nonprofit organizations to support local enhancements to curricula and to workforce training



Artificial Intelligence and Learning

Online educational programs, voice activated technology, and social media are examples of services that support information sharing and learning. These complex products that often feature algorithms based on user behavior and activity are all created by people—people who integrate their own values, perceptions, and biases.

With more students and learners turning to virtual platforms, it is paramount to ensure diversity, equity and inclusion are incorporated into the design and content creation of AI-powered technologies, and that content and technology creators should reflect the diverse audiences they serve.

MIT Open Learning, in partnership with the Media Lab and the Schwarzman College of Computing, are collaborating on a new cross-campus initiative called [Responsible AI for Social Empowerment and Education \(RAISE\)](#). Led by Professor Cynthia Breazeal, the effort aims to contribute to the AI ecosystem by seeking to holistically and equitably prepare diverse K-12 students, an inclusive workforce, and lifelong learners to be successful in an increasingly AI-powered society.

By developing and sharing open source curriculum, teacher education and computation tools, RAISE advances equity in learning and teaching, aiming to inspire more young people to see themselves as creative and ethical creators who can harness the power of computational action for social good.

Breazeal presented "[Preparing the Creative, Empathetic and Ethical AI Designers of Tomorrow](#)," in the third annual statewide Massachusetts STEM Week. In an event co-hosted by MIT and Governor Baker's office, Breazeal's talk centered around the efforts needed to develop and teach the next generation of leaders about artificial intelligence, how to use this technology, and their role and responsibility as active users and creators of AI.

AI Curriculum

To date, more than 100 hours of AI curriculum, teacher guides, and project-based activities for middle school, high school and upper elementary students have been developed. All are available under a creative commons license to further share and disseminate these resources.

An example of a learning unit is [PoseBlocks: A Toolkit for Creating \(and Dancing\) with AI](#). This toolkit enables students to create body-tracking and motion-interactive projects while learning about artificial intelligence.

AI systems like Kinect games, Snapchat augmented reality lenses, and Instagram AR filters are some of the most engaging ways students experience AI in their everyday lives. And many students have passions around sports and dance which are helpful entryways to AI concepts.

The PoseBox toolkit introduces a suite of block-based programming tools that students use to conceptualize, design, build, and reflect on interactive physical movement-based projects. The diverse group of developers created a suite of new block-based coding extensions for the online editor, built on top of the open source Scratch programming library.

A new Google teachable machine integration allows students to quickly train their own image, pose the audio classifier models, and bring them into their own coding projects to build interactive AI-powered projects of their own devising.

Inspired outcomes

The culturally diverse creators tested the learning unit in synchronous pilots with 49 students aged 9-14 from Title 1 schools (schools in which children from low-income families make up at least 40% of enrollment). The team were guided by learning principles that included tinkering allowing students to experiment with new ideas incrementally and iteratively, project-based learning, and ensuring that students worked on a project that was meaningful to them so that they are more engaged and invested in the work.

They found that students created a variety of projects from helping a younger brother to learn his letters and encouraging a happier disposition when sadness was detected to projects that would positively affect the world at large.

In one project, the student trained a model to "detect if your mask was good enough," categorizing N95 masks as the best mask, surgical and cloth masks as goodmasks, and bandanas and masks with filter [valves] as badmasks. He researched these recommendations on the web, and used images displayed on his phone shown to the webcam to train a Teachable Machine classifier.

Teachers provided daily feedback on the tools used in addition to advice on pacing and remote classroom management. One teacher shared that "[Students] took on an entire new perspective on how AI is infused with the real world. They also had the opportunity to experience hands-on projects using JavaScript, Scratch, and various machine learning platforms and how integrating these platforms can be used to create something magical."

The team will continue to develop and assess materials utilizing PoseBlocks with plans to incorporate them with other student-friendly AI and robotics tools.

The [RAISE website](#) also shares research pilots and publications, and new learning modules added all the time on a wide variety of AI topics, applications, and societal implications. As the initiative launches publicly this

Recording

Developing Comprehensive K-12 AI Literacy Program

Responsible AI for Computational Action

Computational Thinking

- Decomposition
- Pattern Recognition
- Abstraction

AI Literacy + Ethics

AI4K12

- 1 - PERCEPTION: Computers perceive the world using sensors.
- 2 - REPRESENTATION & REASONING: Agents manipulate representations of the world and use them for reasoning.
- 3 - LEARNING: Computers can learn from data.
- 5 - SOCIETAL IMPACT: AI can impact society in both positive and negative ways.

Human-Centered Design

- empathize
- define
- ideate
- prototype

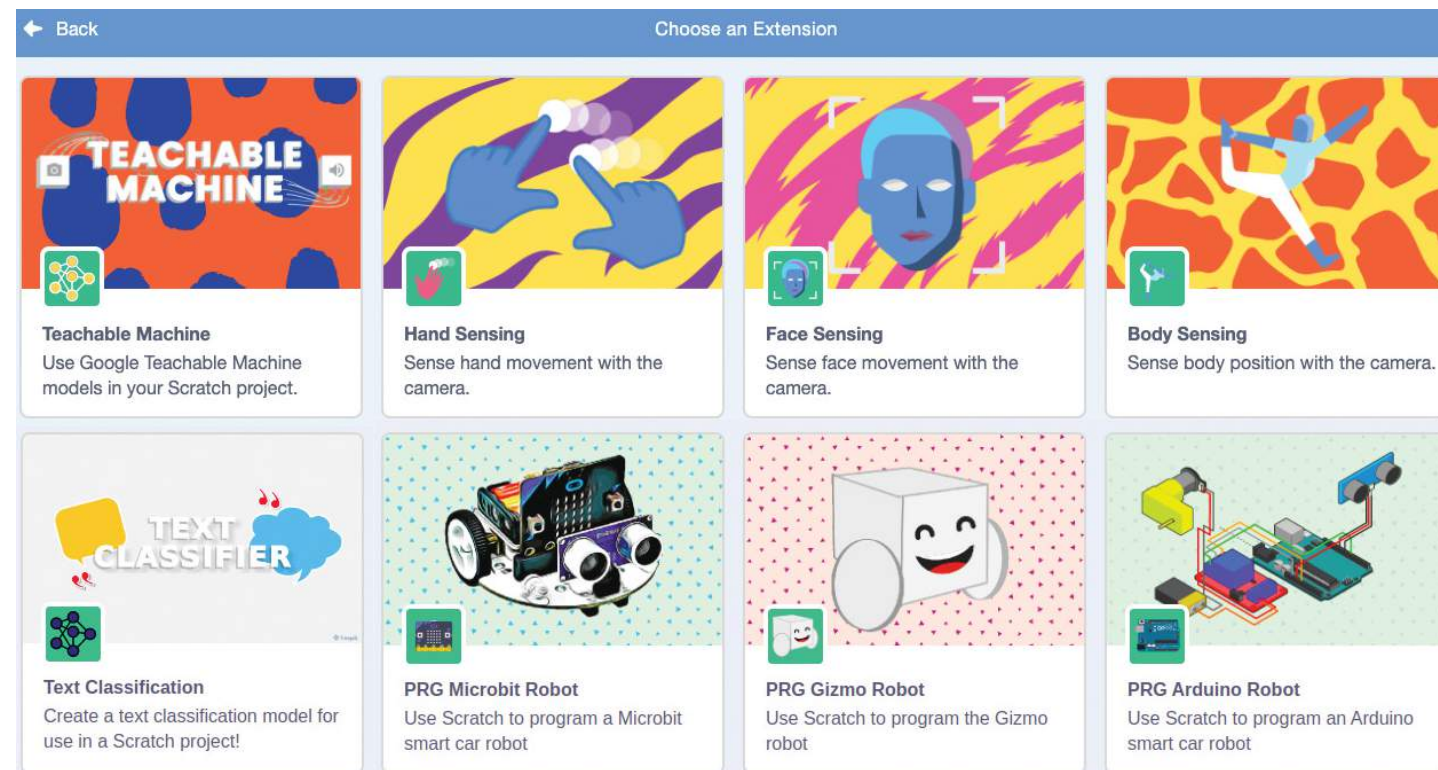
Design Thinking

test

Spring, the team is expanding their outreach efforts, working especially with Title I schools across the United States and working with partners like the MIT Abdul Latif Jameel World Education Lab (J-WEL) to scale their efforts globally.

Selected Highlights:

- Created and published several open AI curriculum modules including AI + Ethics and DAILY curriculum for middle school, hosted on raise.mit.edu.
- Launched and hosted two phases of FutureMakers in spring and summer 2021. The spring workshops trained 64 teachers and mentors and engaged over 300 students across 21 states and territories (plus 7 countries beyond the USA).
- Developed a video series on Careers in AI, available on YouTube, supported by a grant by Amazon Future Engineers.
- RAISE Director Cynthia Breazeal delivered a keynote address at Massachusetts STEM Week hosted at MIT with Governor Baker, Lt. Governor Polito, MA STEM Advisory Council member Jeffrey Leiden and others.



It's no longer enough for kids to be digitally literate, they need to be AI literate... to be able to participate in the democratic process around this technology. We want to prepare a far more diverse and inclusive group of students to have the potential to become the ethical designers of the AI solutions of tomorrow.

Cynthia Breazeal, Senior Associate Dean for Open Learning and Director, MIT RAISE



Examining Racial Attitudes and Issues of Identity Online in Virtual Spaces through Gaming

Race and ethnicity impact people's experiences in the physical world, few of which are effectively algorithmically modeled in virtual worlds. Passage Home VR, produced by the [MIT Center for Advanced Virtuality](#), is an interactive, virtual-reality, narrative game that simulates how people perceive and experience racial discrimination based on their racial and ethnic socialization. The game seeks to meaningfully engage players from a wide range of identity backgrounds in transformational virtual experiences.

In the game, the user assumes the virtual identity of an African-American girl whose high school teacher has accused her of plagiarizing an essay when, in fact, the character is a high-achieving English student who took the assignment very seriously and wrote the essay herself. As users navigate the discriminatory encounter with the teacher, the game acts as a tool both to assess and study users' racial and ethnic socialization and for learning about racial discrimination.

The developers say that this approach simulates how people think about race and applies a theoretical framework informed by sociology, cognitive science, artificial intelligence, and human-computer interaction to develop racial and ethnic identity representations.

"As video game developers, we have the ability within virtual worlds to challenge the biased ideologies that exist in the physical world, rather than continue replicating them."

Danielle Olson, Project Co-Lead and Doctoral Candidate, Computer Science and Artificial Intelligence Laboratory (CSAIL), MIT



Read more about a Passage Home VR on *MIT News*

Selected Research from the Center for Advanced Virtuality

Roleplaying for Social Perspective-Taking

The MIT Center for Advanced Virtuality is designing and studying computer-supported roleplaying for supporting positive perspective transformation via reflection for digital media users. This involves creating tools, techniques, and methods to understand and model social identities and cultural values of users' virtual identities (representations in online gaming, augmented reality, and virtual reality).

Anti-racism

Our system called Passage Home VR models how people are socialized to perceive race; it was deployed for national online studies. It both 1) assesses how people are socialized to think about race (e.g., there are social science-based categories such as colorblind, prepared for bias, appreciating diverse cultural histories, etc.) and 2) acts as an intervention to make people aware of bias.

Combating misinformation and deepfake technologies

The MIT Center for Advanced Virtuality created an online course/module on misinformation and deepfake technologies, <https://deepfakes.virtuality.mit.edu/>, that was supported by a grant from J-WEL Higher Education.

In Event of Moon Disaster, an MIT Center for Advanced Virtuality production (moondisaster.org). An Emmy award-winning project that has been shown at the Tribeca and Cannes film festivals and more, this project educates the public about deepfakes and disinformation. Nearly 1 million people have watched the film in full or in part. 83,000 have actively engaged in the website which includes the film and the contextual materials. The center has created open courseware about the project.



I am involved with the MIT Center for Advanced Virtuality to keep a pulse on the intersection of technology and the arts from a purist's point of view. One that aims to further knowledge focused on the exciting frontier of embodied entertainment and how it informs sociology, humanity, and identity.

Advisory Board Member: Arvel Chappell III Head of Advanced Narratives & Neurotechnology Warner Bros. Entertainment



Watch the full video from this event

The Institute's Celebration of Diversity and Social Commitment

Lana Scott, Assistant Media Development Director/Media Services Manager at MIT Open Learning was the inaugural staff speaker at the 47th Annual MIT Celebration of the Life and Legacy of Dr. Martin Luther King, Jr. Scott spoke on the theme of Black joy and liberation. An excerpt from Lana's address.

"...When I think of feelings of Black joy and liberation, the only person that comes to my mind is my dad, Sam.

...My father passed away last May at the age of 79. I wish he were alive to see the world today. I could imagine him saying, "My second born, little girl, we've been through a lot, beaten, broken but we made it. It's not over, racism will never be over, but look at what we did in spite of it. Look at Obama, a Black president. I grew up where there were segregated bathrooms, restaurants, churches, being spat on, called names. And for 8 years, a Black man was in charge of everything. A black woman is Vice-President. We go through pain, but we persevere. I know it's hard to watch black people dying at the hands of police, to watch injustice, to see how differently you get treated than your white friends and colleagues. Don't be quiet. Make some noise!) You have a voice! The trauma that lives inside of you will not define you. It will inspire you and you'll start to see the joy. Resistance is to choose to enjoy every aspect of your life. Use it to rise."



Now more than ever, it is crucial to work toward a world where educational opportunity is provided to everyone, regardless of ethnicity or economic status, and to use our programs and institutions as engines of equality that power a better world for all. We need to develop educational systems that are more effective, resilient, and equitable than they were before.

MIT Open Learning Team

Serving the World at a Time of Great Need

The Covid-19 pandemic reshaped the [MIT Abdul Latif Jameel World Education Lab's \(J-WEL\)](#) work, from the most practical details of where and how we worked, to far-reaching decisions about how we could best carry out our mission of addressing global opportunities for scalable change in education while serving the world in a rapidly evolving global crisis.

By adapting our signature event, J-WEL Week, into a fully-online event called J-WEL Connections, we were able to welcome more participants and engage in conversations about topics of immediate concern during the Covid-19 crisis. Discussions with our large and diverse global audience centered around timely explorations of pK–12 education, higher education, and workforce learning.

As the pandemic increased in scope, J-WEL swung into action with research-based resources and programming like Full STEAM Ahead that drew on assets and experience from across MIT to address learning gaps caused by school closures and sudden transitions to online learning. Addressing the inequities inherent in these complex and fast-changing situations was especially important, as we know that students already facing disadvantages have borne the brunt of the pandemic's negative impacts on education.

We also implemented new models for cohort-based, online learning developed by J-WEL researchers in two settings: a virtual internship program for college students and a program for refugee learners through the MIT Refugee Action Hub (ReACT).

The eight new Innovations Grants that launched in 2020 show the breadth and depth of creative work we continue to generate through J-WEL. They also demonstrate that previous J-WEL work has set a high bar and is inspiring researchers to take on projects that will change the landscape of education focused research. We were pleased to see the impact of and broad reception to the new research from J-WEL's George Westerman and his colleague Abbie Lundberg on the role of chief learning officers—a topic that took on special resonance in light of the pandemic.

Programs supported include:

Supporting Adolescents' Mental Health and Agency Through a Global Action-Learning Community Anchored in the Compassionate Systems Framework

Dr. Peter Senge, Antoine Béland

J-WEL & Center for Systems Awareness

Designing an Education Program for Newly Sighted Children

Prof. Pawan Sinha

Department of Brain and Cognitive Sciences

Hybrid Design Education for Unaccompanied Refugee Youth in Athens

Martha Thompson, Heewon Lee

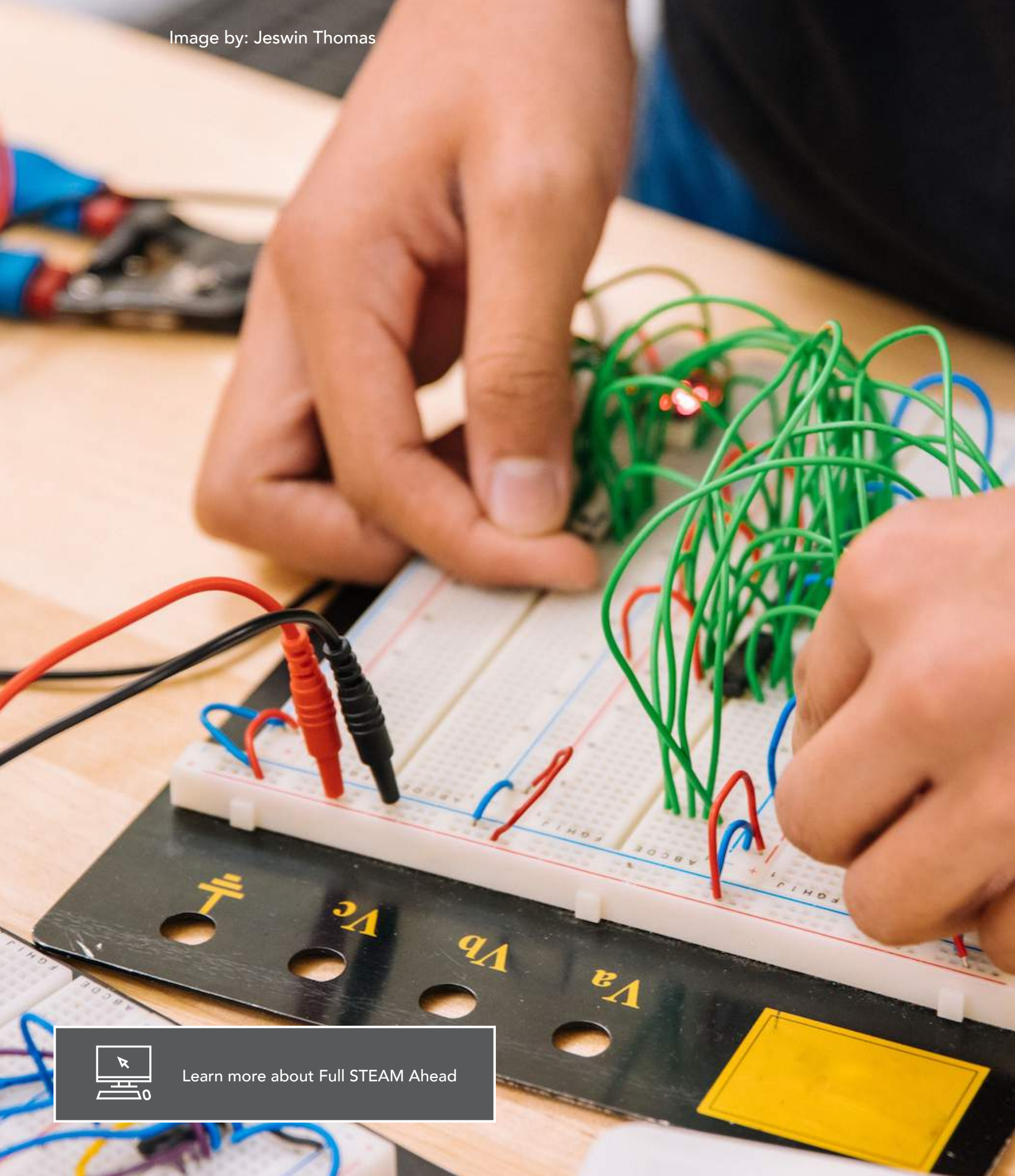
D-Lab

Delivering Creative STEM Learning Programs in Rural and Tribal Public Libraries

Philipp Schmidt, Michelle Hlubinka, Avery Normandin

MIT Media Lab





Adapting pK–12 Education During Covid-19 with Full STEAM Ahead

Shortly after the closure of the MIT campus in March 2020, MIT's pK–12 community began coordinating a response, led by Abdul Latif Jameel World Education Lab (J-WEL) pK–12 Faculty Advisor and Professor Eric Klopfer, and Senior Associate Director Claudia Urrea PhD '07. The result was an online hub of free educational resources called [MIT Full STEAM Ahead \(FSA\)](#), to help teachers, parents, learners, and educational systems adjust to school closures and a sudden shift to online learning.

FSA provided age-specific content for pK–12 students in the form of free weekly "Learning Packages" to fill the gaps of school closings and online learning. Also provided were downloadable activity packets for educators and parents to use with students, or for motivated students to access independently. The packets included guidelines for hands-on learning on topics like living in outer space and artificial intelligence, among others. The FSA website garnered 150,000 views from 53,000 unique viewers in 150 countries.

During the summer of 2020, FSA offered two three-week virtual sessions called Full STEAM Ahead Into Summer. The team worked with partnering Massachusetts public schools to identify students at increased risk of the "Covid slide." More than 290 students participated, receiving free hands-on learning kits and virtual instruction. "This was a phenomenal program," one parent remarked.

FSA also hosted a semester-long virtual STEAM program in English with 600 students from Spain and 50 students from Massachusetts. In 2021, we continued to offer summer and semester-long fall programs for middle school and high school students.

In December 2020, the FSA team received first place in the prestigious Wharton-QS Reimagine Education Awards for innovation in K–12 education around the world. Urrea credited their success to "a shared commitment to leveraging MIT's wide range of existing K–12 resources" and the considerable "talents of our community, especially our student teachers, to create new, engaging activities and experiences."



Learn more about Full STEAM Ahead



We were able to demonstrate that remote learning doesn't have to mean "passive/isolated learning." We learned that with basic access to tech, and by using low-cost, widely available materials, with the support of mentors, and innovative STEAM curriculum, learners can engage in hands-on creative learning, even at distance.

Claudia Urrea PhD '07,
Senior Associate Director, J-WEL

Collaborative Projects that Demonstrate the Value of Blended Learning

MIT Open Learning also collaborates on projects with other universities, foundations and trusts, non-governmental organizations, and national governments in their efforts to advance and transform educational opportunity through digital learning.

The Projects team worked on international programming designed to share MIT's expertise and approach to teaching and learning with university undergraduate and graduate students and faculty.

Through the CoLAB Program in Data Science in Uruguay, students throughout the country pursuing the MITx MicroMasters® Program in Statistics and Data Science received support through synchronous online activities facilitated by Open Learning and J-WEL staff, and on-site workshops run by J-WEL and MIT International Science and Technology Initiatives (MISTI). By July 2021, of the 58 learners that started the program, thus far 71% of the first cohort have successfully earned the MicroMasters program credential.

Graduates have gained the fundamental knowledge to master the essence of data science, develop new lines of business for companies and lead decision-making processes in their teams.

Charting a Path Forward: A Multi-stakeholder Collaboration to Promote Blended Learning in the Arab World

The Projects team and the Al-Ghurair Foundation for Education collaborated on a three-year project that enabled faculty from the American University in Cairo and American University of Beirut to use course materials from sub-licensed MITx courses to support the educational needs of 1,196 learners.

MITx MOOCs used as part of the curriculum:

- 6.00x Introduction to Computer Science and Programming Using Python
- 7.00x Introduction to Biology - The Secret of Life
- 7.28x Molecular Biology (suite of courses)
- 18.03x Differential Equations

In a resulting co-published white paper, [Charting a Path Forward: A Multi-Stakeholder Collaboration to Promote Blended Learning in the Arab World](#) in October 2020 (also [available in Arabic](#)), the teams include timely insights on how online and blended learning offer a range of innovative possibilities to strengthen and extend education — rethinking and reconstructing curriculum, creating flexible delivery options, or introducing data driven formative assessments to meet the needs of different learners. The white paper will also guide policy makers and higher education institutions to offer more sustainable, high-quality and accredited online degree programs and courses.



Learn more about the CoLAB project



Playful Learning and Assessment Practices

Active from 2019–2021, [MIT Playful Journey Lab \(PJL\)](#) explored frontiers in lifelong, lifewide learning with the goal of understanding the ways we can strengthen future-ready skills. With a focus on learner-centered assessment and playful exploration, it designed and investigated new ways to prepare schools, teachers, students, and members of society to thrive in a rapidly-changing world. Through the design of both digital and non-digital tools, design-based research with learners and practitioners, and a community of passionate educators, this work helped map out new pathways for the future of learning.

Highlights of the Lab:

Aquapressure: Together with the Gabrieli Lab at MIT, PJL designed a game-based assessment for executive function skills that is being used in cognitive science research with the goal of improving the experience and relevance of EF skills assessment. PJL also created a set of SEL learning experiences based on Aquapressure to help teachers facilitate conversations with students so they can understand their own executive functioning and how it varies with different levels of stress.

Beyond Rubrics: In collaboration with MakerEd and maker-center educators PJL developed a collection of maker competencies and a set of embedded assessment tools for use in maker centered classrooms in the Beyond Rubrics Toolkit. The team went on to implement some of these tools in makerspaces in Bangalore through our Playful India project. To support educators in using the tools, we also released *Designing for Documentation and Assessment*, a learning guide for professional learning communities to engage with our tools and design principles.

High Meadows Graduate School of Teaching and Learning: PJL was originally created out of our partnership with this competency-based teacher training program. In that time, in collaboration with HMGSTL staff, the team:

- Co-designed playful learning experiences with teacher candidates to support their development as educators.
- Developed The Orchard, a custom learning management system to support the grad school's challenge based curriculum.
- Researched and documented innovations in competency based teacher preparation, including our white paper on Integrating the Science of Learning and Development into Teacher Education.

Learning Dens: PJL partnered with the Mendon-Upton Regional School District to design and pilot an activity series responding to the unique challenges of virtual and hybrid learning during the COVID-19 pandemic. Students came away from the Learning Den activity series with a collection of shared artifacts that capture this moment in their lives, help expand their ideas of what learning is, and bring them closer to their peers.

MetaRubric: PJL designed the playful learning experience MetaRubric to show how complex, and even fun, assessment can be, through exploring what rubrics can do well and what they can't. The team brought this experience to teachers by running MetaRubric sessions on district professional development days and at conferences like SXSW EDU.

Shadowspect: PJL developed a game-based assessment for 3D geometry, along with a set of lesson plans for teaching with Shadowspect. The team also co-designed an assessment dashboard with a wonderful group of math teachers, to develop metrics that align with playful, student-centered learning, and to rethink how data dashboards can be tinkerable and support the constructs we care about.



Learn more about selected completed projects

Investigating Learning Effectiveness and the Science of Learning

The [MIT Integrated Learning Initiative \(MITili\)](#) funds, connects, and shares research investigating learning effectiveness. The research focuses on one or more of three broad demographics—birth through pK-12, higher education, and workforce learning—and ranges from scanning the brains of individual learners in the service of improving assessment and instruction to applying large scale data analytics aimed at guiding education policy decisions. MITili's grant program is helping fund research at the Brain and Cognitive Science department through funding to the GabLab and in the Economics Department through the [School Effectiveness and Inequality Initiative \(SEII\)](#). It is through SEII's work that MITili has explored education equity.

"One of the latest developments I find particularly interesting is the emphasis and research around the effect of school choice. Most districts have centralized school assignment, allowing children to select schools that are not necessarily close to their home. One of the ideas behind school choice is to increase disadvantaged children's access to better schools." - SEII's Clémence Idoux.

As an interdisciplinary, collaborative initiative, MITili drives the external communications and event planning activities for cross-institutional efforts including Reach Every Reader and the MassBridge summit "[Bridging the education / workforce gap: Community college and beyond](#)." Most recently MITili helped facilitate Reach Every Reader's annual "all hands convening" virtually, which included all members as well as funders, the Chan Zuckerberg Initiative. MITili continues to participate in the [Consortium for Advancing Adult Learning & Development](#), a McKinsey-led interdisciplinary network working to reimagine adult learning and workforce education, as well as the IBM-convened [Digital Learning Consortium](#).

With the launch of its Mental Wellness Initiative, MITili has also been driving discussions on and off campus on how to make mindfulness and mental wellness a priority in pK-12 classrooms. Along with the Connected Learning Summit, MITili research scientists presented their work at an [Open Learning Talk in January](#) where hundreds of educators were able to gather to hear from experts as well as ask questions to help improve mental health in all classrooms.

MITili Director, Dr. John Gabrieli, was recently awarded the [Samuel Torrey Orton Award](#) for his contributions to dyslexia research by the International Dyslexia Association.





Improving Well-being and Mental Health

In the midst of an international health crisis, global challenges like climate change, human migration and poverty – and local challenges, like substance abuse, stress, and cliques and bullying in school, continue to persist for students and educator populations. The physical and psychological tolls are affecting every learner’s well-being and mental health.

The new [Systems Awareness Lab](#) and the [Mental Wellness Initiative \(MWI\)](#) are two complementary efforts from Open Learning that aim to provide training and tools for students at MIT and learners and educators at-large to manage and protect their well-being.

What is Systems Awareness?

There is a renewed and urgent call for foundational change in education systems, in light of the devastation of the global pandemic, nation-wide reckonings with racial justice and equity, and renewed attention to the longstanding failures of traditional education systems to serve children and adults, particularly among our most vulnerable communities. Emerging communities of educators and policy makers are leading the response, working together in new ways to design more equitable, just, healthy, sustainable and effective educational systems.

An essential question for the future of education is how to help students understand and respond mindfully and compassionately to the interconnected systemic challenges in our world. Rather than feeling overwhelmed by the complexity, directors Peter Senge, Mette Böll and faculty advisor Eric Klopfer believe that the innovations in systems thinking education, social and emotional learning (SEL) and mindfulness that have occurred over the past two decades can build a cognitive and affective foundation of skills essential for students and educators in today’s world.

The team draws from established SEL models, together with developments in the emerging field of complexity science and the study of systems, to establish a framework—what we call a “compassionate systems” framework—for building a cognitive and affective foundation for global citizenship that can be adopted, taught and implemented in schools and districts.

Through ongoing work across the Department of Education in California, British Columbia Ministry of Education and other locations globally, there is a prime opportunity to now develop and carry out rigorous study of these systems change processes across large education systems. The aim of the new MIT Systems Awareness Lab is to document, measure, and analyze how such change processes appear and grow over time through small local and large-scale change efforts across individuals, small groups, large organizations, and state-wide and global systems.



The world is more interconnected than ever before. And yet with the way our societies have evolved, in many ways we seem to become more and more fragmented. Compassionate Systems is a way to engage with the complexity of life on our planet, without getting emotionally overwhelmed by the challenges we as a global population are facing.

Dr. Mette Böll, co-director, MIT Systems Awareness Lab

The importance of mental wellbeing

The mission of the Mental Wellness Initiative (MWI) is to improve the mental wellbeing of learners. Mental wellbeing sits at the foundation of learner readiness, and together with cognition and mindset, competence, physiological wellbeing, and an appropriate environment, is critical to learner success.

The MWI was founded under Vice President for Open Learning Sanjay Sarma's guidance in January of 2020. Housed within MITili, the effort is led by Rita Sahu with support from Jeff Dieffenbach and Steve Nelson.

The initial focus of MWI was to examine autism, anxiety, and depression because these conditions are chronic and have a rippling effect on the person's immediate family and caregivers and can benefit from early detection and intervention. Professors Pawan Sinha, John Gabrieli, Sanjay Sarma and Dr. Brian Subirana lead these research efforts.

"Lots of research suggests that mindfulness has beneficial effects for reducing anxiety and stress, and enhancing focus. We would expect both of these to improve information uptake, retention and recall. Additionally, I believe that mindfulness may have some even more significant impacts on cognitive function by increasing brain plasticity." - Pawan Sinha, MIT Professor of Vision and Computational Neuroscience.

Since its formation, MWI has connected with others on campus with an interest in mental wellness. On the research side, one group is led by [Satra Ghosh](#) of the MIT McGovern Institute and [Mercedes Balcells](#) of the MIT Institute for Medical Engineering and Science. On the practice side, MWI has expanded its area of interest to support improved outcomes for MIT students, working with [David Randall](#), Senior Associate Dean for Student Support and Wellbeing within the MIT Division of Student Life. Collectively, the group is exploring research projects (and the funding thereof) that will focus on MIT students.

THANK YOU TO OPEN LEARNING SUPPORTERS

Thank you.

Because of you and your generosity, MIT Open Learning is able to continue to provide the educational experiences and materials so many people have needed—especially during another challenging year.

Our teams are inventing and investigating new pedagogical methods, bringing learning science research into practice, and ensuring all of these efforts can serve learners and educators near and at large.

We are grateful for your support and look forward to engaging you with our programs and research so that **together, we open learning** to empower people with the access and tools to improve their lives, communities, and world.