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The future of MIT education looks more global, modular, and flexible

Final report of Institute-wide Task Force offers 16 recommendations to help MIT evolve for a new world.

Steve Bradt | MIT News Office
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[Press Inquiries]

The MIT education of the future is likely to be more global in its orientation and engagement, more modular and flexible in its offerings, and more open to experiments with new modes of learning.

Those are some themes of the 16 recommendations contained in the final report of the Institute-Wide Task Force on the Future of MIT Education, convened 18 months ago by President L. Rafael Reif to envision the MIT of 2020 and beyond.

Reif released the Task Force's final report today with a letter to the MIT community, saying the occasion "marks the beginning of an exciting new period of educational experimentation at MIT." The report's recommendations aim to lay the groundwork for MIT to reinvent education for future generations of learners both on its campus and beyond.

PRESS MENTIONS

Jeffrey R. Young writes for *The Chronicle of Higher Education* about the final report released by the Institute-wide Task Force on the Future of MIT Education. Speaking of the Task Force's recommendation to make education more modular, co-chair Sanjay Sarma says, "we see modularity becoming a key part of on-campus experiences as well."

THE CHRONICLE

"[A]s an educational researcher, I believe that MIT has captured, perhaps uniquely, both the challenges and opportunities that lie ahead for colleges and universities," writes Dan Butin for *The Huffington Post* about a new report

"The past few years have brought mounting evidence that higher education stands at a crossroads," Reif wrote. "As with any disruptive technology, MOOCs have been viewed with enthusiasm in many quarters and skepticism in some. However, the underlying facts are inarguable: that the rising cost of education, combined with the transformative potential of online teaching and learning technologies, presents a long-term challenge that no university can afford to ignore."

"At MIT, we are choosing to meet this challenge directly by assessing the educational model that has served the Institute so well for so long," Reif added. "We are experimenting boldly with ideas to enhance the education we offer our own students and to lower the barriers to access for learners around the world."

Among other priorities, the Task Force's report urges the establishment of an MIT Initiative for Educational Innovation, to foster ongoing experimentation and research in teaching and learning, and recommends that MIT engage with teachers and learners worldwide to broadcast this educational innovation well beyond its own campus.

The report also suggests that MIT consider offering different levels of certification through its online-learning ventures, *MITx* and edX, and recommends that the Institute redouble its commitment to access and affordability — possibly by increasing MIT's undergraduate population, which has remained stable for decades despite increasing demand, or by providing flexibility to allow students to complete a traditional undergraduate degree in less than four years.

Several of these proposals, the report notes, could present new opportunities for revenue. While the report indicates that MIT's income is far better diversified than it was 30 years ago — with five major streams contributing to on-campus revenue of $2.248 billion in 2013 — it also notes that some of these revenue sources are under pressure.

"Historic opportunity"

Saying that the rise of online learning may "offer us the historic opportunity to reinvent the residential campus model and perhaps redefine education altogether," Reif charged the Institute-Wide Task Force on the Future of MIT Education on Feb. 6, 2013. The Task Force's three working groups, each composed of faculty, students, and staff, have been chaired by Karen Willcox, a professor of aeronautics and astronautics; Sanjay Sarma, MIT's director of digital learning and the Fred Fort Flowers and Daniel Fort Flowers Professor of Mechanical Engineering; and Executive Vice President and Treasurer Israel Ruiz.

The Task Force released a preliminary report last November, in which it described the opportunities and challenges facing MIT with the advent of digital educational technology, and presented a range of possibilities for experimentation. It has now distilled these opportunities to a series of actionable steps to help MIT realign its educational offerings to meet the needs of future learners.

" The Task Force has produced outstanding results through a process marked by collaboration, inclusiveness and candor: MIT at its best," Reif wrote. " By reaching out for ideas in many ways — through department meetings, student forums, Institute Faculty Meetings, a Corporation Advisory Group, an Alumni Advisory Group, an idea bank, and surveys sent to all students, instructors and faculty — the 52 members of the Task Force made sure that their report reflected not only their own insights but wisdom and experience drawn from all across MIT. I am grateful to all the members of the Task Force, who devoted to this vital effort a great deal of time, care and creativity."

In its final report, the Task Force organizes its 16 recommendations around four themes:

- laying a foundation for the future, by creating a proposed Initiative for Educational Innovation;

- transforming pedagogy, largely through " bold experiments" sponsored by the proposed new initiative;

- extending MIT' s educational impact, to teachers and learners well beyond its own campus; and

- enabling the future of MIT education, by cultivating new revenue streams and envisioning new spaces to support learning at MIT.

Transforming pedagogy

In proposing the creation of an MIT Initiative for Educational Innovation, the report recommends establishing " an ecosystem that promotes educational connections across the Institute and provides an educational innovation hub, or a ' sandbox,' for conducting the experiments envisioned by the Task Force."

Without endorsing specific experiments, the Task Force suggests the introduction of greater flexibility to the curriculum; a re-examination of MIT' s General Institute Requirements (GIRs); and the offering of summer classes for credit.

" We must engage in bold experiments that will help us learn about both the positive and negative aspects of pedagogical and curricular innovations," the

report says. " This is critical to ensuring MIT's leadership position at a time of disruptive change."

Such experiments, the report notes, may both enhance students' learning and render an MIT education more affordable. Specific areas for investigation might include the expanded use of project-based learning and a blending of traditional and online learning; the addition of greater modularity to the curriculum; and new approaches to the assessment of students.

" I am excited about the opportunities we have to catalyze ongoing research, learning, and innovation about education, and to promote educational connections across campus," Task Force co-chair Karen Willcox says. " In conducting these experiments it is critical that we are bold in reimagining MIT's future, but also connect closely with the faculty governance process."

The Task Force urges that the faculty " seriously re-examine" the GIRs, which form the core of MIT's undergraduate curriculum. " The Task Force makes the specific observation that in the past decades, the world has changed considerably, and these changes have outpaced changes in the MIT GIRs," the report states.

The Task Force's recommendations on pedagogical innovation also suggest that MIT:

- look to its four existing freshman learning communities — the Experimental Study Group, Concourse, Media Arts and Sciences, and Terrascope — as possible models for further experimentation in the value of smaller communities of students in fostering learning;

- use online and blended learning to strengthen teaching of communications, which the Task Force notes is an area in which MIT lags behind peer institutions;

- create an Undergraduate Service Opportunities Program, mirroring the well-established Undergraduate Research Opportunities Program, to encourage students to work on serious issues that challenge society; and

- explore online and blending learning models to improve access to the graduate curriculum — including the availability of online, on-demand modules for students wishing to access discrete areas of knowledge.

Extending MIT's educational impact

The Task Force makes five recommendations that are intended to strengthen MIT's educational impact on the world. Broadly, its report encourages the Institute to share worldwide the results of its own on-campus teaching innovation, " to set the tone for a new generation of learners, teachers, and institutions."

The report recommends that MIT explore more modular approaches to

teaching — both online and on-campus. Data from the first 17 *MITx* and HarvardX courses indicate that only about 5 percent of registrants earn a certificate of completion. This and other edX data, the report says, suggest that "students are focused more on learning certain elements of a class and less on completing what has traditionally been considered a module or unit of learning."

These edX results are in keeping with surveys of MIT's own faculty and students: In a 2013 survey, 25 percent of MIT faculty, and 40 percent of MIT students, indicated that some of the Institute's course offerings might benefit from being broken up into smaller modules.

"The way in which students are accessing material points to the need for modularization of online classes whenever possible," the report says. "The very notion of a 'class' may be outdated. This in many ways mirrors the preferences of students on campus. The unbundling of classes also reflects a larger trend in society — a number of other media offerings have become available in modules, whether it is a song from an album, an article from a newspaper, or a chapter from a textbook."

The Task Force notes that educational modules could be shared not only among MIT's own departments and schools, but also across institutions. For this reason, its report recommends that MIT explore options for developing a "module repository" for storing and sharing these materials. The report also recommends that MIT explore the role that game-based learning can play; partnerships with other institutions to encourage blended learning using *MITx* content; using global problems to foster global engagement between members of the MIT community and others around the world; and developing strategies to increase the diversity of *MITx* registrants, who are primarily male and educated.

As an extension of this focus on modular learning, the Task Force recommends that MIT proceed with consideration of the types of certification that can be supported by *MITx* and edX, developing pricing strategies and revenue-sharing arrangements for these credentials.

"Increasingly, employers are focusing on certifying an employee's or potential employee's competencies rather than relying on his or her formal degree," the report says. "These new ways of thinking about certification tie in with the opportunities created by *MITx*."

The Task Force cites the example of "XSeries," in which *MITx* students can earn certificates for completing short series of courses in a specific subject. Currently, three XSeries are offered, in Aerodynamics; Foundations of Computer Science; and Supply Chain Management. The report "urges each MIT department to think in terms of XSeries instead of individual courses when

developing content for edX. This should be combined with thinking about modules instead of whole courses."

The report recommends that MIT support efforts to create a lasting community and knowledge base for *MITx* learners, leveraging the thousands of local edX communities that have arisen organically around the world. And, to better align this vast network of global learners with the hundreds of MIT students who already travel overseas each year as part of the MIT International Science and Technology Initiatives (MISTI) program — which matches students with global internships and research opportunities — the Task Force recommends the creation of a "MISTIx" program, in which engagement with local *MITx* communities becomes an integral part of MIT students' MISTI experiences. Last summer, 10 MISTI students acted as *MITx* ambassadors in four nations, meeting with local *MITx* learners to provide tutoring and a tangible connection to MIT.

"We have a unique opportunity to harness the knowledge of a worldwide community of learners, and to bring their experiences and perspectives to bear on the world's great challenges," Task Force co-chair Sanjay Sarma says. "There are over 1,000 local edX communities around the world. Just imagine MIT students acting as *MITx* ambassadors in sort of a MISTIx program."

To further bolster engagement beyond campus, the Task Force also recommends that MIT define a K-12 strategy, under the auspices of the Initiative for Educational Innovation, to better coordinate the activities of MIT's more than 80 existing K-12 educational programs, which have developed over time in grassroots fashion.

Enabling the future of MIT education

While MIT's faculty, undergraduate population, and administrative staff have remained stable in size since the early 1980s, the rapid growth of MIT's research enterprise has meant that the numbers of graduate students, postdocs, and laboratory technicians on campus have all grown substantially.

The report notes: "In a market that focuses on excellence, MIT incurs high costs. These costs result from the Institute's need to attract and retain the best faculty and brightest students, to provide premier research and educational facilities, and to perform the unparalleled research that is integral to the research university model. Providing the facilities required for our exceptional faculty, students, and researchers to advance research discovery and innovation is inherently expensive."

But, the Task Force adds: "The investment pays off in terms of educational outcomes. The MIT model produces outstanding students and advances knowledge in remarkable ways. MIT contributes significantly to educating some

of the brightest engineers, scientists, and business people of our time."

The report paints a picture of an institution on a sound financial footing, with on-campus revenues of $2.248 billion in 2013, exceeding expenses of $2.001 billion. But it also notes that two of MIT's five major sources of revenue — research funding, which supplies 29 percent of current income, and tuition, which supplies 14 percent — are under pressure. "Preserving and enhancing MIT's exceptional research and educational environment will require both a strengthening of existing income sources and consideration of new revenue opportunities," the report says.

The Task Force observes that 43,000 students applied for undergraduate and graduate admission to MIT in 2013; only 10 percent were successful. Some 19,000 of these were undergraduate applicants, only 8.2 percent of whom were admitted.

"Clearly there is a vast unmet need for high-quality education," the report says. "The Task Force encourages MIT to evaluate possibilities to achieve increases in undergraduate class size so that more students can experience the rich magic of an MIT residential education. Over time, it is possible that experiments with flexibility in time to degree might present opportunities to relieve housing pressure, which is one of the primary barriers to increasing class size."

"Our model of excellence is centered on people," Task Force co-chair Israel Ruiz says. "We will need to continue to invest in attracting and retaining the most talented faculty and students, and in providing the world-class facilities required to advance discovery and innovation. MIT is fortunate to have many alumni and friends who give generously to make an MIT education affordable for our students, but we need to do more to lower barriers to access and improve affordability. It is thrilling to realize that MIT will be able to reach more people in more places than ever before."

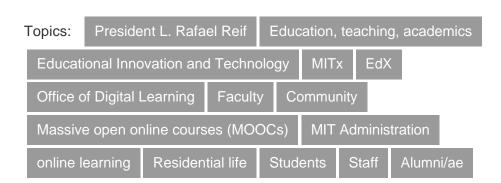To support the future of MIT education, the Task Force also recommends that MIT:

- examine further revenue opportunities in technology licensing and venture funding;

- expand fundraising activities to embrace a broader MIT community, possibly including former postdocs, executive education students, and *MITx* learners;

- establish a working group to bring together members of the community to envision, plan, and create new spaces in support of future MIT education; and

- bolster infrastructure for executive and professional education to engage more faculty and reduce barriers to offering such programs.

Next steps

In releasing the report today, Reif announced a comment period, which will last through the end of September.

" While the release of this report represents an important milestone, our work has just begun," Reif wrote in his letter. " The next challenge: to identify which of the report's recommendations to implement, how and in what order."

A faculty forum and a student forum are being planned for discussion of the Task Force's recommendations. Members of the MIT community who would like to provide input about the final report may also write to the Task Force co-chairs at mitedu-cochairs@mit.edu.

Topics: President L. Rafael Reif | Education, teaching, academics | Educational Innovation and Technology | MITx | EdX | Office of Digital Learning | Faculty | Community | Massive open online courses (MOOCs) | MIT Administration | online learning | Residential life | Students | Staff | Alumni/ae

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