Technology-Enabled Learning: What's Going on at MIT?

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Thank you very much, Vijay, and welcome everybody, all you hardy souls who have come for the last session of this great conference. It's nice to see familiar faces here and also new faces. One of the things I'll say as a start is this is really an exciting time here at MIT. I think that shouldn't come as any surprise to all of you, given all of the discussions in the wider world about MOOCs, and edX, and MITx. But I'll say, in all the years that I've been here at MIT – and I've been here for 30 years, which my grey hair attests to – I have never seen a time when so many faculty were engaged in conversations about teaching.

I also have never seen a time when I've seen such extremes, in terms of people's feelings. Some people are very excited about what's going on and the pace at which it's happening, and other people are very uncomfortable. That goes for staff, it goes for faculty, I think a lot of people here. There's an expression, "the parents of comfort are sameness and familiarity." And we are not in a time of sameness and familiarity here at MIT. So the fact that we feel some discomfort, it's because we are on the cusp of a lot of good changes, and it's very exciting.

Now, Vijay started out his talk by mentioning the DNA of the environment here, in terms of ed tech innovation. And I certainly would not start my talk without acknowledging that as well. We have had an enormous two decades here at MIT in terms of ed tech innovation, and I'm going to start with just one very busy slide that gives you a sampling of some of the incredible projects that our faculty and students have been involved in, and we've been able to accomplish because of the generosity of corporate supporters and foundations and individual donors.

These go back, as you can see, to the early '90s, and there's a lot of things that are left off of here. I thought about putting BLOSSOMS on last night, and then I thought, no, I'll just say something about BLOSSOMS when I'm here. These projects, in many ways, are the foundations for what's going on now. MITx and edX are not being written on a blank slate. You take things like the xTutor, which came out of the Electrical Engineering Department here in the late '90s. A lot of what was in xTutor is the kind of online courses that we are now beginning to build.

Similarly, with the PIVoT project. Dick was the PI on the PIVoT project, which brought Walter Lewin to the screen. Many of the videos that were developed for PIVoT are being used in OpenCourseWare, and have become some of our most popular content. They're being re-purposed now, to some extent, in the MITx physics courses that are being built. So the bottom line is we're building on all of these things. We're not inventing from scratch, and that's the wonderful thing about MIT.

The other thing we're very fortunate to have is an incredibly strong infrastructure for digital learning already in place. This slide, which is a little bit much, I know, shows you organizationally the different groups, starting with the libraries, the Information Systems team, the Dean of Undergraduate Education, various departments, labs, and centers, and now this new Office of Digital Learning that are all involved, in one way or another, in either providing systems or providing services or support to the building and support of the digital learning environment.

The Office of Digital Learning is the newest one which was put together starting in December of last year. It brought together OCW, which until then had been a separate entity. Then we started building a new team MITx, which I'll talk about in a little bit about what they're doing. It brought together the Office of Educational Innovation Technology, which Vijay heads and which Brandon is a key part of, as well as our Media Production Services here at MIT. And this now has built a team of about 100 people that are really committed to the mission of bringing digital learning to this campus and also sharing the fruits of that with the outside world.

With that said, one of the questions that I get asked a lot now, both by faculty at MIT and also by people outside, is how does OCW relate to MITx? And how does MITx relate to edX? I think this is probably clear to people in this audience, because you're so knowledgeable about things that we're talking about now. OpenCourseWare is not online courses. That's first and foremost. OpenCourseWare is a publication. It is about sharing what MIT faculty have developed for use in their classrooms. We provide it under an open license. We want people to reuse the materials, redistribute the materials and, to that end, we distribute it through mirror sites.

I was here for Cliff's talk yesterday about the wider network, and WiderNet is a wonderful partner for OCW. We give them our content. We want it out and as widely-used as possible. There's a global movement behind OCW. A number of the speakers that I heard yesterday mentioned that they had OCW. Their universities were part of it. Korea has an entire country, Korea OCW. So that's OpenCourseWare.

Then we have MITx. MITx is about teaching. MITx is about courses, online courses. It is an interactive kind of experience. The goal is teaching and learning, not sharing materials. We have a new team that, as I said, we put in place to help support faculty in these developments. We use the term MITx in many ways. We use it to refer to the outside courses that we offer on the edX platform, the things known as MOOCs. We also

use MITx to refer to internal things that we're doing for MIT students only. There are courses and modules that are being used this term in MIT classes that are running on the same platform, but an internally private one.

We also use the term MITx to refer to the team. And I see a number of members of our new MITx team here in the audience. This includes instructional design people, video specialists, project managers who are going to help faculty with these projects. MITx is also about research and experimentation. So these are very, very different things.

Now, Sanjay talked about what's the difference between edX and MITx. And I think this picture does a pretty good job of that, where edX is really the global theater for this stuff. It's a platform. Whereas MITx is really the production house, and it's the product. It's the courseware itself. Also, internally within MIT, there's a platform for a local audience, as I mentioned.

OCW's role in all of this is evolving, but I will start by saying MIT is still firmly committed to OCW's mission as it has been, that is open sharing. That continues. But we're also deeply engaged in helping launch the MITx efforts. A number of people on our staff are involved both in technology support as well as support to the faculty projects. OCW is also a source of material for some of the courses that we're building for the MITx initiative. And a number of the courses that have already gone up for a number of the MOOC courses are reusing older OCW videos, et cetera.

I think as we go forward, we're going to continue to publish MIT courses, whether they are very, very classroom-based, traditional courses or some of these online courses. One of the interesting challenges we have is if you have an online course, or a course that's largely online, what does it mean to publish that openly, like OCW does? What part of it do we actually provide?

Now I want to turn and tell you about some of the initiatives that we have underway. That's all kind of background. OCW after – how many years have we been at this now? Since 2002 to 2013 – 11 years – we now have over 2,100 MIT courses represented on our website. That's a lot of content.

In the early years, it was very basic materials, textual. In recent years, as we've done more and more video on campus, we've incorporated that along with rich kinds of media – visualization, simulations. Faculty often write textbooks, which they open source, and where we can, will provide those along with the OCW courses. One of the things that we're turning our attention to more and more is pedagogical materials, that is the voice of the faculty, in terms of how they teach the course in addition to the course materials themselves. I'll talk in a minute about one of our special initiatives along that line.

One of the things people say is, well, what impact have the MOOCs had on OCW usage? Here's the history of visits to the OCW website. This doesn't include use on mirror sites

or other channels, but it gives you a sense of the kind of growth that we've had. And as you can see, between 2011 and 2012, we grew about 25% in terms of our usage. The MOOCs, if anything, have increased interest in the availability of OpenCourseWare materials. They're being used in very synergistic ways. There are some people that a MOOC isn't right for, and they continue to come to OCW. There are others who are enjoying the MOOC experience but use OCW as a supplement. So again, these are very synergistic kinds of offerings.

Over the years, we've enhanced OCW in different ways as different funders have come to us. Look, for the most part it's been funding-based. One of the projects that we initiated is something called OCW Scholar, which is a project we're in the third year of. We're developing a portfolio, a very small portfolio, about 15 engineering and science courses in particular, but there's also a microeconomics course in there. We've asked faculty to develop some additional content to round-out the offering so that it's much more complete for people who might not be able to access a library and get the textbook. We've also tried to include more tutorial materials, and we've reoriented the material into more of a sequenced, self-paced presentation. So those are our OCW Scholar courses, and we're finishing up that project this year.

Another project that we started back in 2007 was what we called Highlights for High School site. The goal of that wasn't to develop new materials for high school but to make the materials at MIT that are most appropriate for an advanced high school audience be more obvious and available to students. We set up this new part of our website called Highlights for High School. This past year we got some funding from the Dow Chemical company to add a substantial amount of new content to that site for chemistry. We worked very closely with the MIT Chemistry Department and the chemistry faculty, to pull a bunch of resources that already existed and put them online. And we also developed some new things. We have a reality TV series that shows MIT freshman going through the freshman chemistry lab course here, which is a lot of fun. The goal of that really is to inspire high school students to study chemistry.

The final initiative at OCW that I'm going to talk about is our Educator Project. I mentioned before that in the last few years we've been putting more attention to pulling pedagogical materials from faculty where they exist and trying to publish those. We've heard comments before from some of our faculty who say, you know, I love the way you've published my materials in OpenCourseWare, but, frankly, I don't think another educator could look at that and figure out how I really teach. And so we said, OK, well, work with us. Help us understand how to explain those kinds of things. And let's add those as supplements to the course publication. We're doing that now. It's in a pilot mode this year. We have the first of some of our offerings there. What we hope to do is make this more of a standard part of our course publication, so that when we put a course up along with it goes some commentary from our faculty about how they're teaching the course. Some of these will be very in-depth. Some of them will be more superficial.

Here's an example of one course where we've done this already. This is a nuclear systems design project course, which is a capstone course for students in nuclear engineering. In addition to providing the basic course materials, what we did is we went back to the faculty and interviewed him about a number of different things having to do with delivery of the course. And as you can see, some of the topics talked about were: How do you develop project assignments? How do you guide students through each phase of the course? How do you teach students to be engineers? And we provide access to this through, in some cases, video interviews, in other cases, simply just a transcript of the conversation. We're looking for feedback on this and we are going to be expanding this program as we go forward.

With the time I have left, I want to talk about some of the MITx initiatives, which, even though I'm the director of OpenCourseWare, I'm very involved in. MITx has both a residential MIT side to it and a global side to it, as I said before. On the residential side, our goal really is to work with faculty to reimagine how learning happens here at MIT. To that end, this year we set up a new system environment within MIT. It's basically edX software. It's the same tools, the same platform that's being used for the MOOCs, but it's a kind of MIT internal system. And that was used last fall by a couple of courses. This spring that expanded to about 10 courses, and there are about 1,200 MIT students who actually were using aspects of what was developed.

I just went through for each course and looked at the kind of things that they're doing, pretty basic stuff at this point. Faculty are using the MITx system to put up materials for students to read, to assign problems that students actually interact with and have to deal with before they go into class. In many cases, I think what you're seeing here is faculty looking at how they can flip the classroom from a lecture mode into one where they're doing different kinds of things with students, typically in small groups, when they come into the classroom. So that's the residential side. Very much a work in progress. And we look to expand that significantly in the coming year.

Now on the global side, I think seven MITx courses were delivered as MOOCs on edX this spring, with a total of about 300,000 learners, unique learners around the world. We've announced six additional courses, new courses that are going to be provided coming this fall, and they're a range of things. These aren't all introductory MIT engineering and science courses. For example, we're going to be offering an Introduction to Philosophy course. We're going to be offering a Global History of Architecture course. And we also have a couple of aerodynamic courses, which are fairly advanced. These are courses taken, I think, by MIT juniors. So the prerequisites for them are fairly significant in terms of mathematics. Some of these are going to appeal to smaller populations. They're not going to be the 50,000 people in a course. But we think MIT has a lot to offer, even for very advanced engineering kinds of topics. So we'll look forward to experimenting with that this fall.

I'm going to end now, before my beeper goes off, but I did want to tell you about one other project we're working on, which is very exciting, and I'm very involved in it. It's another MITx project. It's an edX/MITx collaboration, which we're doing with the city of Chicago. A program there called the Summer of Learning initiative, which is targeted at keeping high school students engaged in learning during the summer. And there are hundreds of organizations in Chicago that are part of this. What we're doing is offering a six-week online course for high school students that's based on the first four weeks of our computer science course that we have on MITx. And so we've kind of tailored it for a high school audience. That course launches next Tuesday, and we're real excited about it.

We don't expect to have thousands of students participating. Because, again, this is MIT-level material. And so we're looking for students, most of whom are going to be in the science tech high schools in Chicago. We are welcoming other people from around the world, but our primary focus is on that audience. So that's going to be a very interesting experiment. As I said, it launches next Tuesday, and we're looking forward to that. So thank you.