

Office of Educational Innovation and Technology

The Office of Educational Innovation and Technology (OEIT) marked the 2012 academic year with several important achievements: The development of strategic theme for [Leveraging Educational Technology](#) in the Office of the Dean of Undergraduate Education (DUE), and the advancement of the MIT Council on Educational Technology (MITCET) projects for online education. Through these and other efforts, OEIT continues to strengthen its role and reputation as an organization that is making valuable contributions towards improving teaching and learning through innovative technology – a fact that is underscored by positive comments from engaged faculty the Chancellor and the DUE Visiting Committee.

Credit for these contributions goes to a talented and committed OEIT staff and DUE management team, and the strategic orientation that OEIT has maintained. Yet staff and resources remain a significant challenge, despite the Dean's support, due to increased engagement with EdX and OEIT's broad role in supporting technology-enabled curriculum development, and shaping the delivery environment for the future.

Accomplishments

DUE Strategic Theme for Educational Technology

The development of the DUE strategic theme for [Leveraging Educational Technology](#) documents Institute recognition that educational technology is central to educational impact and change, and offers a plan for creating a modern delivery environment for MIT education. Several recent online initiatives at MIT, such as MITx, serve as a backdrop for the projects under this strategic theme, whose major goals are as follows:

- Develop applications to enable and support flexible, modular and concept-based approaches for deeper learning and alternative learning pathways: transform 15-20 courses through concept and learning objective mapping within the next five years.
- Develop interactive content, tools and services to promote learning experiences that leverage open and online educational resources: develop a collection of exemplary, interactive content/resources using OCW, STAR, STEM Visualization and other open resources to support 30 subjects by 2015.
- Design and implement Learning Delivery Environments that include configurable, contemporary applications as well as flexible learning spaces: configure 20 spaces to support technology-enabled active and collaborative learning and curriculum innovation initiatives by 2016.

Bridging Research and Learning

OEIT's [Software Tools for Academics and Researchers](#) (STAR) group continues to support and improve its software offerings: StarBiochem, StarMolsim, StarGenetics, and StarORF. Over the

last academic year, significant improvements were made to StarBiochem, StarMolsim, StarGenetics, and StarCellBio. Usage of the STAR software suite remained steady at MIT, while worldwide usage increased dramatically in AY2012, from 28,069 users to 200,697.

Multiple funds were awarded from the National Science Foundation and Howard Hughes Medical Initiative to professor Chris Kaiser, professor Graham Walker, and associate professor Jeffrey Grossman, which allowed the STAR program to develop StarCellBio, a new STAR software product for teaching cell biology; begin work with the NanoHub project; and fund an additional Star Group position.

The Star Group continues to face challenges, however, due to resource limitations: StarBacteria, scheduled for Spring 2012 release, was delayed. StarCluster, giving researchers access to low cost cloud computing, reduced its scope. Most importantly, support and development of StarCellBio is competing with priorities around online MITx Biology courses.

Linking Digital Content and Curriculum

OEIT completed initial development of the [MIT Core Concept Catalog \(MC3\)](#), which enables teachers or learners to navigate open education resources, such as OCW, based on concepts and/or learning objectives. Plans are in place to develop initial user functionality on top of MC3 in direct support of various MIT projects, including but not limited to the Guided Learning Pathways project, led by professor Richard Larson; the Relate project, led by professor David Pritchard; ABET and other accreditation data; the Teaching and Learning Lab's SUTD concept mapping efforts; and replace Crosslinks, led by professor Haynes Miller and professor Karen Willcox.

This year OEIT working with IS&T launched a set of projects called MITConnect, designed to build a set of services that allows meaningful integration of educational applications with MIT data and systems. Initial work focuses on an *educational role service* built on MIT's existing *Roles Database*. Additional services will support content discovery and curricular topic modeling, and various aspects of assessment.

OEIT collaborated with Libraries/AMPS/TechTV to develop a plan for Spoken Media (SM) integration, to provide low-cost transcription services and broad search capabilities, as part of a larger planned TechTV update. OEIT currently runs SM as a pilot sustainable service.

The Artemis (Art for Engineering, Mathematics, and Science) visualization program is in its first year of operation with an expanding portfolio and growing interest among the MIT community. Numerous 3D animations currently support professor Herbert Einstein's Physical Geology Tutor program, and collaboration between OEIT and the University Lyon 1 allows shared content development.

[NB](#) is a browser-based collaborative annotation tool, developed by professor David Karger and his team. With the support of a d'Arbeloff grant, OEIT helped NB to transition to an open-source project, building a developer community for long-term support.

OEIT developed a simple tool, called [CaPRéT](#) (Cut and Paste Reuse Tracking) funded by a grant from JISC in the United Kingdom to help educational content providers, such as OCW, better track how their content is being reused.

iCampus Student Prize

OEIT, on behalf of the Council on Education Technology, awarded the [2012 iCampus Student Prize](#) to Danny Ben-David, class of 2015 for *CourseRoad*, a user-friendly page where students can map out their classes through their undergraduate careers. The 2012 competition saw sixteen submissions and resulted in five first round winners, a grand prize winner, and a runner-up (Dormbase). The iCampus Student Prize is an annual competition, endowed by Microsoft Research and MIT, that recognizes the innovative and creative application of technology to improve living and learning at MIT.

MITCET Planning and Experiments

OEIT continued the significant levels of coordination and support activities for all aspects of the MITCET process for planning technology-enabled transformation in the MIT learning experience. To that end, MITCET sponsored a set of experiments for online education in spring 2012 with particular emphasis on modularity in course delivery to allow greater flexibility in time and geography for student access to courses, while enhancing the student learning process:

- A *Chemistry Bridge* experiment created modules for self-paced learning and review of complex and recurring core concepts.
- An *Aeronautics and Astronautics: 16.20 & 16.90* experiment moved from lectures to interactive class sessions while enabling remote student participation, in order to enable active learning experiences and self-paced completion of the courses.
- A *Mechanical Engineering 2.002* experiment taught a core required class to students at distance by modularizing mechanics and materials into discrete learning experiences.
- An *Anthropology Module* experiment is being launched, to use online modules to teach ethnographic research methods, made available as a general MIT online resource for students.

Workshop on Online and Residential Education OEIT conducted a MITCET sponsored an [Online Education Workshop](#) in May of 2012, which brought together more than 100 MIT faculty and staff to discuss the MIT online initiatives that are underway and their impact and implications for MIT education.

Key themes included the importance of faculty and student engagement, assessments as a rich area for exploration, the need for best practice guidelines around online teaching, interest in using students to better scale online teaching efforts, and various services and infrastructure that would help advance online learning (inexpensive video capture services, an inventory of existing online teaching experiments, and instructional services for working with technology).

Flexible Learning Environments

OEIT's continued its support of spaces and experimental teaching and learning environments in AY2012. Over 250 workstation images were deployed on computers in our physical spaces and on mobile platforms. 16 classes and 25 IAP sessions were hosted in these spaces and supported by our staff.

The first large scale rollout of Desktop Virtual Machines images met with great success in 2012, and will allow the agile deployment of educational resources and computing environments on high-end workstations, mobile devices and thin clients.

We also continue to deploy and evaluate classroom technologies such as: screen capture, mobile devices, remote screen casting, and student response systems for enhanced learning outcomes.

OEIT made major contributions in the formulation of the "MIT 2030 Teaching and Learning Spaces" final report.

Educational Outreach

OEIT's educational outreach efforts in AY2012 included the following:

Social Media

OEIT extended its influence in the social networking arena with an OEIT presence on [Facebook](#) and [Twitter](#), and an active blog that is displayed on OEIT's website, and pushed through RSS to the [MITCET](#) and the [Teaching with Technology](#) websites.

The [Gallery of Educational Innovation](#) added new case studies and stories on innovative educational practices and efforts at MIT.

New Media Consortium (NMC)

OEIT and IS&T hosted the [New Media Consortium Summer Conference](#) for over 450 attendees. The sessions featured initiatives from institutions across the country, sparking vibrant real-time and online discussions. The conference featured several presentations by MIT faculty and staff including director of the Media Lab Joichi Ito, Professor Larson, SRS program officer of the Media Lab Sherry Lassiter, and principal research associate of the program in writing and humanistic studies Kurt Fendt, among others.

Conversations on Quality

OEIT collaborated with the Bill and Melinda Gates Foundation to host [Conversations on Quality: A Symposium on Online Learning in K-12](#) in January 2012, where MIT faculty and over 75 national experts discussed the challenges of online learning environments. The conversations explored shared issues and solutions around quality in online learning for grades K-12, including: learning outcomes, deep learning, accelerated learning, learning access/success of

underrepresented students, more flexible learning, and relevance and quality of learning. OEIT used the opportunity to identify critical areas for MIT to explore.

Independent Activities Period

OEIT sponsored 15 sessions on topics including academic skills and arts, and an innovation session that featured discussion of critical educational values and priorities related to MITCET-led efforts to explore technology-enabled education at MIT.

MIT-Haiti Workshops

OEIT conducted several [workshops](#) in Haiti on March 28-31, 2012 for faculty- and curriculum-development activities in Haiti following the [MIT-Haiti Symposium](#) in October 2010. MIT faculty and staff presented active learning [workshops](#) for Biology and Physics through the Star tools, TEAL (Technology Enhanced Active Learning) and Open Education to over fifty educators from Haitian universities and schools. A general planning session identified the infrastructure, support and other resources needed to implement these workshops on a larger scale. The workshops were regarded as highly useful and led to requests for an ongoing program of engagement.

Additional Outreach Activities

STAR staff participated in workshops for K–12 students and teachers for the Department of Biology, the Whitehead Institute, and high school faculty/student workshops at area high schools. The group received a *JFYNetWorks* Innovation award for their work with area high schools.

OEIT with other DUE colleagues have participated in discussions with the White House Initiative on Historically Black Colleges and Universities on the topics of improving graduation rates and the admission to elite graduate programs and professional schools.

OEIT collaborated with the Open University, Anne Arundel Community College and the University of Maryland University College on Bridge to Success (B2S), which is funded by an Educause Next Generation Learning Challenges, grant, and designed to bring Open University's introductory courses to United States community colleges. OEIT provided expert guidance on open education practices and is using this opportunity to inform MIT initiatives such as OpenCourseWare and MITx.

OEIT collaborated with MIT OpenCourseWare, Tufts University and the University of Massachusetts Boston to host the [2011 OpenCourseWare Consortium Global Conference](#) in May 2011, celebrating the first 10 years of the OpenCourseWare movement.

OEIT continues to explore cooperative activities with select institutions and agencies: MOUs were established with Lyon 1 University; and the Open University of Catalonia and Amrita University in India, for specific educational technology areas.

Staffing

This period was marked by 2 key staff transitions:

Senior strategist for educational outreach Iiyoshi Toru left MIT to join the Center for the Promotion of Excellence in Higher Education at Kyoto University as a Professor.

Andrew McKinney left OEIT to join the Mobile Learning Lab as a senior architect/developer.

OEIT continues to make substantial progress towards developing a financial, staffing and operational strategy for configuring OEIT as an increasingly soft-funded organization through the engagement of OEIT staff in a range of grant funded initiatives such as HHMI, Alumni funds, MITCET, Gates Foundation, Educause, and NGLC.

However, resources for OEIT remain a challenge, in particular base funding for additional staff required to meet the increasing demand for OEIT's engagement in supporting faculty with their online educational technology needs including MITx.

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