

MITCET Workshop on Online and Residential Education

Summary and Key Themes

May 24, 2012

1. Background:

On May 24, 2012, MITCET sponsored a three-hour workshop on MIT Online Learning and Residential Education. The goals for the workshop were to:

- Learn about the progress, costs and benefits from online learning experiments undertaken this academic year.
- Identify specific ways that these experiments can help faculty teach in the MIT residential educational system.
- Identify projects, experiments, and themes that MIT should consider to further the understanding and implementation of online learning in the MIT curriculum, in order to enhance the residential educational experience.

Over 100 faculty along with some academic staff and students participated in the workshop. Presentations and discussions focused on identifying the major considerations for adaptation and diffusion of the innovations that were presented.

2. Agenda:

A. An initial presentation demonstrated what MIT faculty are currently doing online. Examples included:

- MITCET experiments (Christine Ortiz, Ken Kamrin, Pedro Reis, Karen Willcox, John Essigman)
 - o Chemistry Bridge: *Modules for self-paced learning and review of complex and recurring core concepts*
 - o Aeronautics and Astronautics: 16.20 & 16.90: *Moving from lectures to interactive class sessions while enabling remote student participation*
 - o Mechanical Engineering 2.002: *Teaching a core required class to students at any distance*
- STAR Biology Tools: StarBioChem, StarGenetics & StarCellBio: *Virtual lab simulations that change teaching practices by bringing experimental research to the classroom.* (Chris Kaiser, Graham Walker)
- Electrical Engineering and Computer Science, Circuits and Electronics 6.002x: *An experimental on-line adaptation of MIT's first undergraduate analog design course.* (Anant Agarwal)

B. Following the presentations a series of discussion groups addressed the following questions:

- What should we consider to ensure effective student learning in online MIT courses?
- What tools, infrastructure and support should MIT provide to enable effective student learning in online MIT courses?
- What projects, experiments, or themes should MIT consider to further our understanding and implementation of online learning at MIT?

3. Key Themes:

The following key themes emerged from the discussions (as captured from the Back Channel posts and facilitator summaries)

A. **Faculty and student engagement** is a prime consideration when deciding how to use educational technology to enhance teaching and learning:

- Lower-level classes will often involve a greater degree of passive information transfer, so faculty engagement is largely focused on *clarifying key points*.
- Higher-level courses are more focused on faculty modeling critical-thinking or problem-solving skills, which requires deeper levels of interaction.
- As we consider different technology-enabled teaching methods, we should remain aware of different *student learning styles* that can be impacted by these innovations.

B. **Assessments** present a rich area for further exploration:

- Modular, embedded self-assessments in pre-class materials open up opportunities for shifting class time from passive lectures to *targeted classroom instruction* that addresses student gaps in understanding.
- Dynamic assessments offer the possibility of creating customized *learning pathways* that recommend select content for addressing student gaps in understanding.
- Assessments should better address the fact that students often learn from *mistakes*; feedback should be available when you're wrong.

C. The MIT community should begin establishing **guidelines and principles** around what types of teaching works best online:

- Remote participation is broadly viewed as a positive innovation. We should further explore possibilities of *remote guest lecturing* and remote "field trips"
- *Online forums* are positively viewed, with certain qualifications: Moderation, control and direction of discussion is important; Finding means to better ensure

that content can be reused later by others; Considering means to rate how qualified certain participants are to answer questions.

- Online lectures are positively viewed, with certain qualifications: It allows more flexible time management, but *requires self-discipline* to keep up with the course.
- Online office hours and web videoconferencing is worth exploring further.
- Online problem sets and the increased automation of graded exercises are viewed positively.

D. Faculty expressed interest in **using students to better scale** the extra work required for online teaching.

- *Student peer grading, and student peer review* of material prior to grading can increase the efficiency of the grading process.
- Students can help students through online forums. We must consider the motivations of students to answer question, and the desirability of a reward system to *promote engagement*.

E. Deciding **which content to put online** is an important consideration:

- Looking closely at modules that can be useful across multiple classes, and responsive to self-learning, will help build a curriculum level solution, rather than local course solutions.
- The access to primary texts remains difficult in many HASS courses

F. Participants noted the following considerations for **future development**:

- There is strong interest in building innovative tools and models, but how do we *incentivize the broader usage* of these innovations into “steady state.”
- *A shared infrastructure* and more financial support would help expand the existing portfolio of experiments, beyond local pilots.
- We should pay careful attention to measuring the success of these experiments, looking at different modalities, and judging not merely on popularity but also *effectiveness of learning*.

G. Participants suggested the following **services and infrastructure** would help the community advance online learning:

- Reliable and inexpensive *video-capture services*.
- A central resource *summarizing best practices* around online teaching, and the existing courses/communities that are currently experimenting with online teaching on campus
- *A recipe book* for experimenting with online teaching models, along with services for *teaching TAs* how to help faculty with technology.