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TEACHING & LEARNING SUMMIT 2016

Carnegie Mellon University

Dexign Futures: a flipped Open Learning Initiative course

Teach a required design studies course to fifty students
in a technology-enhanced flipped classroom format.
Provide students practice and feedback to prepare for in-class activities.
Transfer "futures thinking" to other design courses and projects.

| 2012	2013	2014	2015	2016	
Peter Scupelli & Arnold Wasserman develop the first Dexign the Future (DTF) class.	Peter Scupelli and Arnold Wasserman co-teach DTF. Judy Brooks conducts semester-long DTF field observations.	Peter Scupelli teaches iDTF. Judy Brooks conducts futures thinking workshop for iDTF.	OLI-DTFS piloted with senior design students.	OLI-DTFS course and DTFS workshop piloted with graduate design students.	Current DF flipped classroom course is developed and taught.

Flipped-Classroom Design

Design for sustainability opportunities reside in bridging between short-term action and long-term strategic thinking. Traditional design pedagogy poorly equips designers for long-term strategic thinking. In the Dexign Futures class described in this poster, students learn to align short-term design with long-term horizons.

Dexign Futures is a required design studies class for all third year undergraduate students in the products, communications, and environments tracks in the School of Design at Carnegie Mellon University.

Flipped courses shift lectures and instruction to the Open Learning Initiative (OLI) course to use class time for hands-on activities. Online homework helps students to prepare for in-class activities. During in-class activities, the course Instructor, and teaching assistants provide students with feedback and answer questions. Likewise, in-class team activities and peer feedback enhance student learning. Research from piloting of the online modules and in-class workshops are promising.

We are measuring student learning in four ways. **(a) futures knowledge** is measured in two ways: pre- and post-tests; OLI activities and assessments; **(b) futures knowledge transfer to other projects** is measured in three ways: student weekly reflections; other studio instructor interviews now and next semester; **(c) student learning experience** is studied with three measures: through an Eberly Center early course feedback student focus group; a mid-term student feedback survey; and the end-of-course Faculty Course Evaluation (FCE); and **(d) class interactions** are video recorded for later coding for content.

- Leverage educational technology to deliver a required lecture-based course using a design studio pedagogy at scale.

- Implement reflective judgement activities so students can critically explore futures thinking in their projects and design practice.

- Contextualize the emerging field of design futures in three design practices: communication, products, environments.
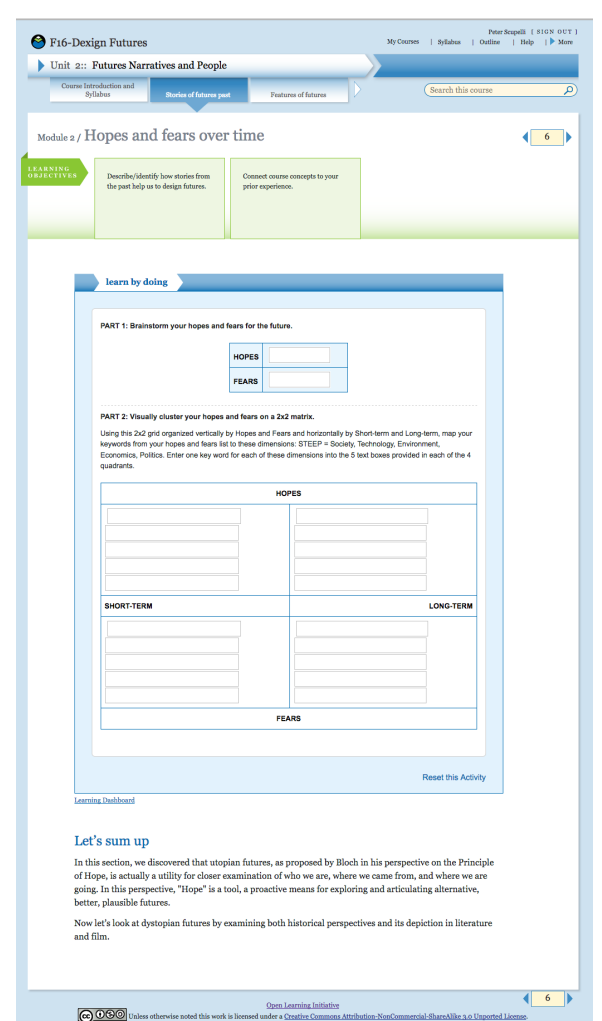
OLI page: students first explored their hopes and fears. Next they mapped hopes and fears according to Social, Techno-logical Environmental, Econo-mic, and Political (STEEP) forces of change along long-term and short-term timescales.

On the first day of class, word-clouds aggregated individual student hopes and fears short-term and long-term timescales. We discussed recurring patterns in class.

Four weeks later, we made a word cloud of professional futurists hopes and fears. We then compared and discussed the students' and professional futurists word clouds in class.

Project Evaluation

- **Student learning** of futures knowledge measured in two ways:
  (a) pre-post tests; (b) OLI practice activity and assessment data.

- **Knowledge transfer** of futures thinking to design projects and practices is measured in three ways:
  (a) student weekly reflections; (b) interviews with studio instructors in current and future classes.

- **Student learning experience** is measured in three ways:
  (a) Eberly Center student focus group; (b) mid-term student survey; and (c) faculty course evaluation.

- **Other measures to evaluate teaching effectiveness:** All interactive class sessions are video recorded for later coding for content, in-class interactions, discussions, and questions.

Lessons Learned

The Dexign Futures course described in this poster sought to address the challenges observed in the Dexign the Future, Introduction to Dexign the Future, and Dexign Futures Seminar courses where students aimed to combine futures thinking with design thinking to create *dexign futures thinking*. The "x" signifies a different type of design that aligns short-term action with long-term sustainability goals.

We observed three challenges in prior courses: First, in traditional studio and seminar courses students struggled to engage with the scope and breadth of information necessary to engage with futures thinking critically. Second, while students could discuss some futures thinking ideas, they struggled to apply them to design projects. Third, students were unable to interpret futures signs, forces of change, and benchmark goals for desirable futures. We designed the Dexign Futures class to help students overcome these challenges. Based on the first seven weeks of the course, we learned that:

- In the beginning of the semester, adjusting to multiple platforms necessary to implement studio pedagogy (i.e., Blackboard, OLI, online student process work on blogs) had a steep learning curve. Thus, we provided multiple ways to complete same tasks, provided instructional videos, and adjusted deadlines to accommodate Blackboard technology barriers.

- We initially thought students would begin and turn in assignments during class and the instructors and TAs would provide one-on-one guidance and feedback. However, we learned that students needed help to link the concepts in the OLI module to the in-class activities. They also benefitted from a group discussion about the in-class activities, even if it meant finishing the in-class activity as homework.

- The physical classroom lecture hall set-up is challenging for group work. Next year, we will seek a classroom that better supports group interaction.

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