Using Screencasts to Enhance Student Learning in a Large Lecture Material Science and Engineering Course

Joanna Mirecki Millunchick, Tershia Pinder-Grover, Crisca Bierwert, Lindsay Shuller

joannamm@umich.edu, tpinder@umich.edu, crisca@umich.edu, lshuller@umich.edu

Abstract

One of the newest technological developments is the availability of screencasts, recordings that capture audio narration along with computer screen images. This study documents the strategic use of screencasts in a Material Science and Engineering (MSE) course, and examines their impact on student learning and satisfaction in the large lecture environment.
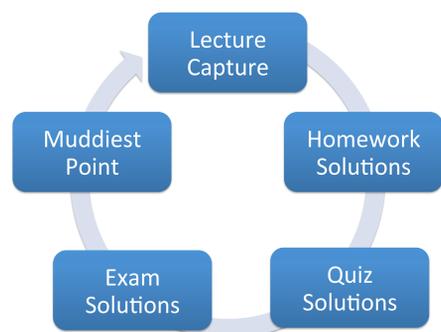
Background

What are screencasts?

- Videos that capture the activity on a computer screen with real time audio commentary.
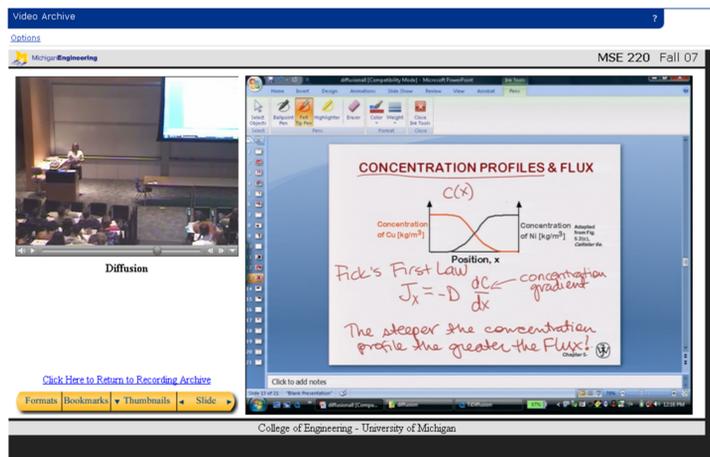
### What types of screencasts are used?

- <u>Lecture Capture</u>: Recordings of in-class lectures, that combine a video recording in synch with slides (see above).
- <u>Homework, Quiz,& Exam Solutions</u>: Screencasts that combine an audio recording of the instructor providing thorough explanations of problems using a Tablet PC.
- <u>Muddiest Point</u>: Screencasts like homework solutions, but are based on topics that students indentified as being unclear.

Experimental Design

- Research Questions
  - How do students use varying kinds of screencasts?
  - Does student use of screencast affect learning, in terms of self-report and/or in terms of exam performance?
  - Can screencasts be used strategically to clarify topics that students identify as being difficult or unclear?
- Methodology
  - During Fall 2007, periodically polled students to determine which topics were troublesome. Developed screencasts based on these results.
  - During Fall 2008, regularly conducted web-based surveys to determine which learning objectives were not clear.
  - During Fall 2007 and Fall 2008, collected data on student screencast usage, course performance, demographics, and student perceptions of screencasts.

MSE 220 Student Demographics

Student demographics were similar in Fall 2007 and Fall 2008. These are figures from Fall 2007.

(N=153)
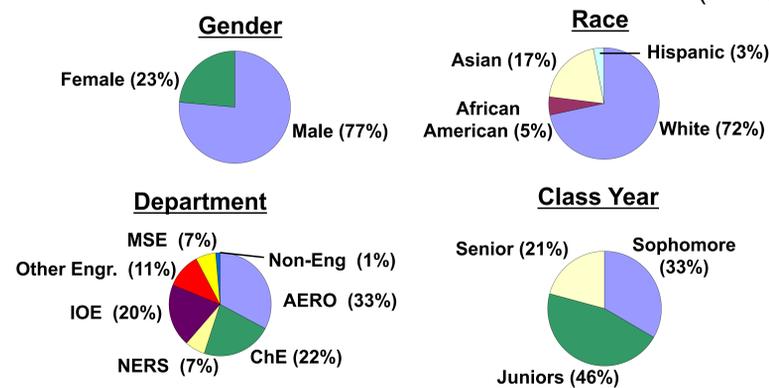
Results

Are the screencasts helpful?

- Out of the 144 students surveyed in Fall 2007, 52-57 students responding to most questions.
  - 30%-50% of students found the muddiest point screencasts "very helpful" or "extremely helpful."
  - 66-76% of students found the explanations in the homework solutions screencasts helpful
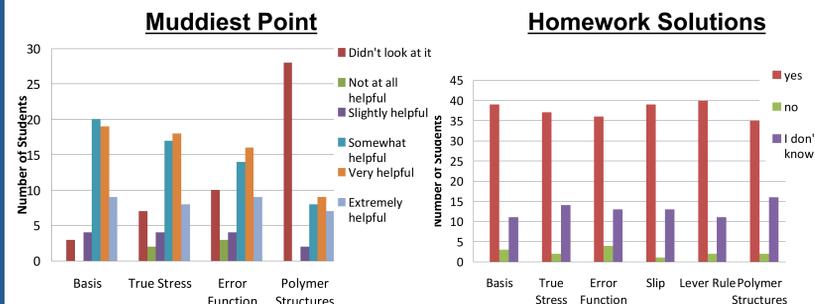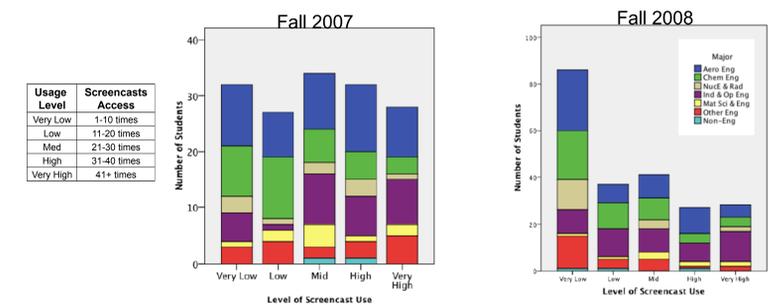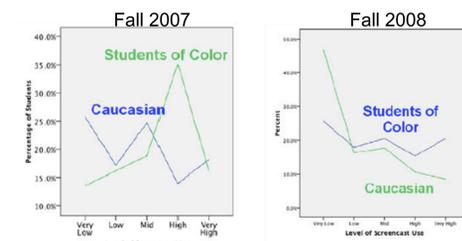

How do students use screencasts?

- Students identified the following uses: to clarify misunderstandings, to supplement the lecture material, and to review for exams.

Who used the screencasts?

- Different majors appear to use the screencasts in different amounts.
  - ChE students, who have a very similar background to MSE, use the screencasts the least.
  - IOE students, who have the least similar background, tend to use the screencasts more.
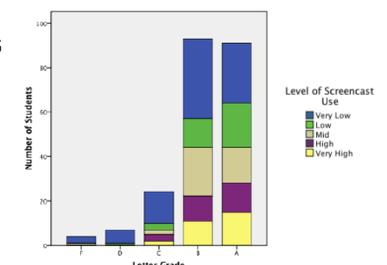

- Students of color tend to use the screencasts more.

How do students perform?

- In Fall 2008, there was a statistically significant correlation between screencast usage and final grade

Future Work

- Identify predictors for academic success relating to the use of specific screencasts.
- Compare results from Fall 2008 with Winter 2009 to determine impact of refinements.

Acknowledgements