

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

Joanna Mirecki Millunchick, Terشيا Pinder-Grover, Crisca Bierwert
 joannamm@umich.edu, tpinder@umich.edu, crisca@umich.edu

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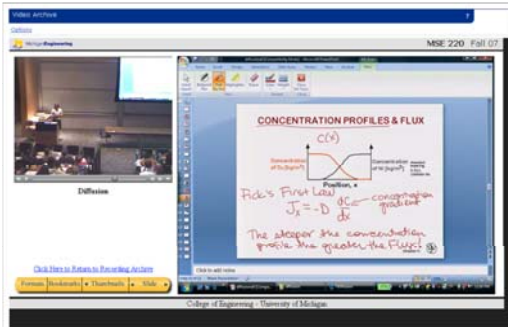
Abstract

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.

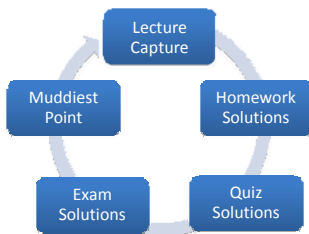
Background

What are screencasts?

- Videos that capture the activity on a computer screen with real time audio commentary.



What types of screencasts are used?

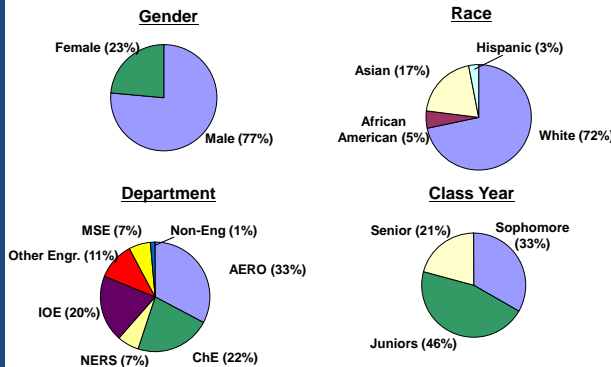


- **Lecture Capture:** Recordings of in-class lectures, that combine a video recording in synch with slides (see above).
- **Homework, Quiz, & Exam Solutions:** Screencasts that combine an audio recording of the instructor providing thorough explanations of problems using a Tablet PC.
- **Muddiest Point:** Screencasts like homework solutions, but are based on topics that students identified 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, collected data on student screencast usage, course performance, demographics, and student perceptions of screencasts.

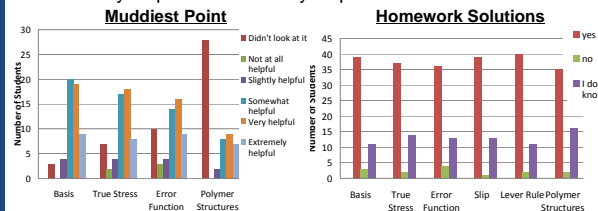
MSE 220 Student Background Characteristics (N=153)



Results

Are the screencasts helpful?

- Out of the 144 students surveyed, 52-57 students responding to most questions.
 - 30%-50% of students found the muddiest point screencasts "very helpful" or "extremely helpful."

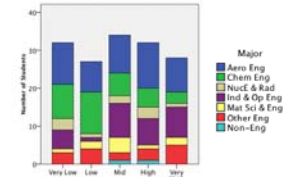


66-76% of students found the explanations in the homework solutions screencasts helpful.

How do students use screencasts?

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

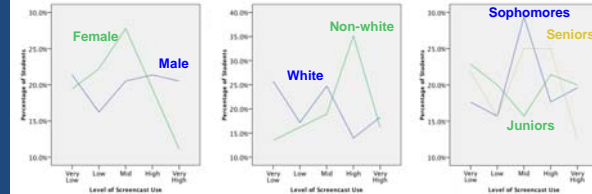
Usage Level	Screencasts Accessed
Very Low	1-10 times
Low	11-20 times
Med	21-30 times
High	31-40 times
Very High	41+ times



Students accessed screencasts equally for all usage levels.

Who used the screencasts?

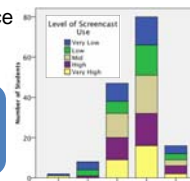
- High usage by males and females in very different distributions.
- Higher percentage of nonwhite students with high usage levels compared to white students (>31 times/semester).
- Correlation between final grade and usage was strongest for sophomores, but not statistically significant.



How do students perform?

- ANOVA showed no significant difference between usage and grade.

Students at all academic performance levels, not just high achievers, used the screencasts.



Future Work

- Identify predictors for academic success relating to the use of specific screencasts.
- Compare results from Fall 2007 with Fall 2008 to determine impact of refinements.

Acknowledgements

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