

# Work in Progress - Effective Engagement of Millennial Students Using Web-based Voice-Over Slides and Screen Demos to Augment Traditional Class Delivery

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**Abstract** - An emerging literature focuses on differences in learning style between the so-called millennial generation and preceding generations of students. Concurrently, a number of intuitions have developed among engineering educators about millennial students, most with the common theme of lowered tolerance for lecture settings. Two current threads addressing the “lower attention span problem” are (a) approaches under the rubric active learning and (b) technology developments such as web-enabled screen movies and pod-casts. The second thread is often aimed at a technology “fix.” Experience shows that any technology fix is of itself minimal value. We focus on possibilities for improved instructional design. Specifically, our research question is the following: What is the effect of augmenting course material with web-based, voice-over slide presentations punctuated with full screen demonstrations and interactive quizzes? We report on our first steps to develop voice-over slide presentations with embedded quiz questions and full motion screen demonstrations in a web-accessible environment. Initial results focus on student attitudes based on data collected in Summer and Fall terms, 2007. Future work will include quantitative evaluation of learning outcomes.

*Index Terms* - millennial student, web-enabled voice-over movies, active learning, hybrid course.

## INTRODUCTION

An increasing number of academics share common perceptions about the so-called millennial students - students who are matriculating to universities in the early years of the twenty-first century. These perceptions encompass a large range of anecdotal observations; many focus on differences between millennials and former generations in their learning style and on differences in effective means of supporting learning of the millennials. Definitive studies demonstrating these putative differences are lacking in the literature, but discussion of the millennials is growing across a broad range of disciplines; e.g., [1-3].

A point that is commonly mentioned by faculty is that the millennials have little patience with standard linear

textbooks, or by extension, with linear text put up on the web as PDF. Experience and immersion in multimedia experiences, usually web-based, are often thought to be the reason for this attitude towards the linear presentation of textbooks. But whatever the reason, there is a need to reexamine knowledge-delivery means with the goal to better meet the needs of millennial students. We do not seek a “tech fix.” Our goal instead is to leverage current technology capabilities while starting from the position that we will embed active learning in our applications of current technology.

## SNAPSHOT OF OUR PROJECT

In the College of Engineering, Michigan State University, we have begun a project to determine best practices in our environment for using voice-over screen movies to augment standard lecture material. Our initial target classes are (a) a high enrollment (200 students per term), early engineering, computer tools and problem solving course: **CSE 131**, and (b) a moderate enrollment (45 students per year), process control class in chemical engineering: **ChE 432**.

CSE 131 is currently a required course for most engineering students at MSU; it is a lecture/lab course in which students meet once per week in a large lecture setting, and twice a week in hands-on laboratory (11 students per lab). Our goal in CSE 131 is to augment the lecture component of the course with voice-over screen movies. ChE 432 is a required course in our chemical engineering curriculum; it is a lecture course meeting three times per week, and with substantial problem sets completed out of class by students and turned in for grade. Our goal in ChE 432 is to provide students with solutions to assigned problem sets that are illuminating for the students, and that effectively allow them to correct their misunderstandings.

A broad goal for both CSE 131 and ChE 432 exploration of screen movies is to enable students to access course material on their timetable; this is key facet in our view underlying learning styles of millennial students. In both cases, our efforts can be understood as leveraging of the voice-over screen movie technology in the hybrid course (part live/part web-based) setting.

**DESCRIPTION OF OUR PRELIMINARY STUDY**

In a preliminary study, we sought to get an initial read on student attitudes towards voice-over screen movies. These are not “talking head” movies; i.e., not a taped lecture put up on the web. Rather for both courses, these are “instructor talk” over Power Point or screen demonstrations. An informal description of our approach is that we design the experience to give a student the feel of 1:1/faculty:student sessions to augment standard course material.

For CSE 131, our goal was to augment standard lectures. We developed voice-over Power Point, and embedded both full motion screen movies and interactive quizzes. Over summer and fall 2007 CSE 131 classes, students used resources of a traditional MATLAB textbook and, for selected topics, an augmenting screen movie put up in Adobe Connect, and developed with Adobe Presenter. After one unit (on 2-D and 3-D plotting) in which students used both textbook and screen movie, we administered a short survey on student attitudes towards the augmenting screen movie.

For ChE 432, we targeted a different use of the same technology: providing the students with a friendly and engaging - and again 1:1/faculty:student feel - to provide solutions to assigned homework problems. After a particularly challenging assigned problem set, a voice over Power Point solution set was made available to students. The set was again developed and hosted by Adobe Presenter/Connect. After students used the voice over Power Point solutions, we administered a short survey on their attitudes towards the augmenting screen movie.

We selected student attitudes as our first experimental target based on the negative attitudes many undergraduate, millennial students hold toward traditional textbooks. There are two core aspects to any deployment of instructional technology: student attitudes towards their experience and objective student learning outcomes. Because the root problem we seek to address is an attitudinal issue, we reasoned that getting an initial read about student attitudes towards voice over screen movies should be our first step.

In CSE 131 and ChE 432 we asked two common questions, and a number of other questions that were aimed at the particular environment of each class. The common questions can be paraphrased as follows:

- Q1: Did you watch the assigned screen movie?
- Q2: Did the screen movie help you understand the material?

**RESULTS OF OUR PRELIMINARY STUDY**

Our preliminary results can be summarized easily: students are overwhelmingly enthusiastic towards voice-over screen movies in the two environments we examined: CSE 131 and ChE 432. Numbers of students in summer 2007 were too small to draw conclusions. We report on fall 2007 results. For Q1, over 80% of students in ChE 432 report watching all of the screen movie at least once, while just under 70% of

students in CSE 131 report watching the screen movie at least once.

Results for Q2 are shown in Figure 1. Just under 90% of ChE 432 students report feeling that the screen movie helped them at least moderately; over 80% of CSE 131 students report feeling they were helped at least moderately. Noting that CSE 131 is a lower division course, while CHE 432 is a senior level course, these very close correspondences are striking.

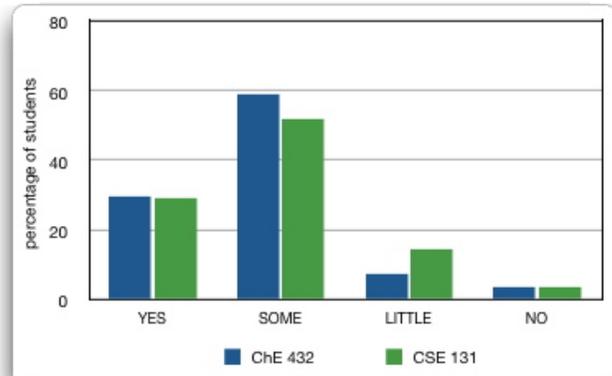


FIGURE 1

“Did the screen movie helped you understand the material?”

While recognizing that CSE 131 and ChE 432 were using screen movies for different goals, the top level comparison indicates that the types of screen movies such as those we have developed to date merits further investigation.

**FUTURE DIRECTIONS**

We are developing plans for an ambitious experiment to be conducted in fall, 2008. In addition to student attitudes, we will also test for learning outcome differences by having side by side sections of CSE 131 which have (a) no required screen movies/standard lecture, (b) required screen movies/standard lecture, and (c) required screen movies/no lecture. We look forward to reporting our results in 2009.

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