

# Instructional Videos – Three Kinds of Video to Meet Different Student Needs



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## Introduction:

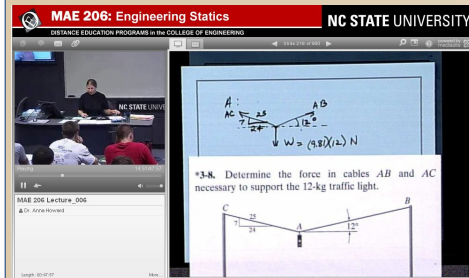
Video-based instruction provides just-in-time learning chances outside the classroom which are more personalized than the textbook. The first video option for many instructors is classroom capture; these videos are excellent for a student who has missed a

lecture or needs to review a specific day of class. LiveScribe pencasts are a better option for recording example problems. Short concept videos introduce specific topics more directly to the student without classroom distractions. A combination of these three video options is used in MAE 206 Engineering Statics.

Student opinion justifies continuing use of all three approaches. Further research is needed to identify which students are using each kind of video and when during the semester they watch. More information, references list, and examples of videos: [http://bit.ly/howard\\_videos](http://bit.ly/howard_videos)



## Classroom Capture with Mediasite



Problem from *Statics*, R.C. Hibbeler, 10<sup>th</sup> edition, Pearson 2004.

### Description:

Mediasite is a lecture-capture system providing video of the lecturer and screen captures of slides or notes.

### Use in MAE 206 Statics:

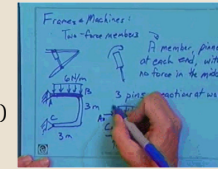
Each fall one section of MAE 206 is recorded and made available for all students taking Statics. Students watch these videos when they have missed an occasional class or are reviewing for exams. Students will occasionally watch a previous semester's lecture to prepare before coming to class.

### Pros:

- Captures entire class including student discussion
- Maintains personal connection to instructor and classmates
- Requires little instructor effort

### Cons:

- Requires classroom with operator (usually)
- Requires expensive hardware & software
- Produces large files (harder to host & share)
- Requires Microsoft Silverlight to watch
- Benefits from frequent re-recording
- Uses top-down camera for capturing notes which are sometimes obstructed by hand (photo above)
- Uses only one video feed: intermittent screen capture for notes
- Organizes by class not topic (harder for students to find a specific item to review)



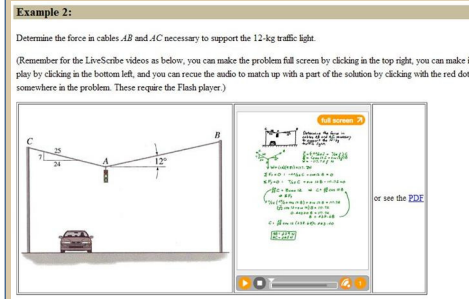
### Results:

- Fourteen percent of students in Fall 2010 and Spring 2011 reported watching more than four videos over the semester.
- Thirty-two percent of students in Spring 2011 and Fall 2011 indicated these videos were somewhat important or very important in their learning.

### Conclusions:

MAE 206 is primarily a face-to-face class yet a sizeable percentage of students use the classroom-capture videos often. Even though students have access to class and are required to come, the captured classroom is rated important by a third of the students.

## Example Problems with LiveScribe



### Description:

LiveScribe captures voice and anything written on a notebook page as short videos called pencasts. Writing appears on a white background with voice overlay.

### Use in MAE 206 Statics:

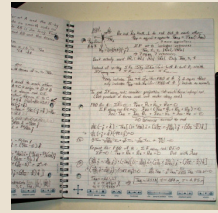
The same problems worked during class are recorded with all the steps shown and explained. Videos are embedded in html class notes in Moodle. Having the problems available outside lecture enables students to listen in class without worrying about copying. Extra example problems are also provided in Moodle.

### Pros:

- Requires little upfront equipment cost and hosts for free
- Produces high quality audio & video (Flash)
- Records without camera operator or computer (photo below)
- Provides easy navigation within a video
- Shows only writing (no "moving hand")
- Accommodates large library of problems
- Provides PDF copies of pages for printing
- Uses thin pen on large page (good for long problems or detailed images)
- Embeds easily in html notes
- Records with minimal preparation

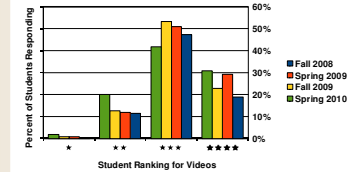
### Cons:

- Prohibits downloading (archiving possible but not easy)
- Hosts off campus on LiveScribe servers



### Results:

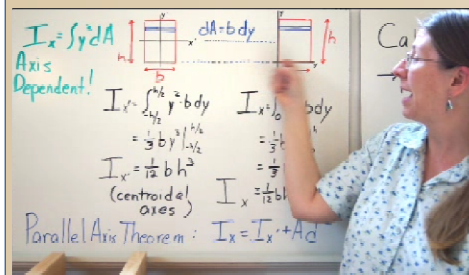
- Fifty-nine percent of students in Fall 2011 listed the online class notes with LiveScribe videos as important or somewhat important in their learning.
- Students give these videos three or four stars. (graph)



### Conclusion:

Teaching engineering requires showing students how to solve problems. LiveScribe is an excellent platform for producing recorded example problems.

## Short Concept Videos on YouTube



### Description:

Short concept videos (less than 8 minutes) hosted at YouTube are designed to teach a single concept. Video production techniques are based on the work of Lodge McCammon at NCSU's Friday Institute.

### Use in MAE 206 Statics:

Students watch the video before coming to class; class time is then used for students to work problems in groups on white boards (photo at right). Students also use these videos to study for exams and as an introduction before reading the textbook.

### Pros:

- Uses standard or HD video cameras (fairly inexpensive)
- Allows instructors to explain the main concept in capsule form where students can watch repeatedly
- Minimizes time out of class to get the point across to students (increasing participation)
- Embeds easily in html notes
- Allows props and hand gestures
- Hosts at YouTube
- Allows different streaming
- Synchronizes captions easily
- Provides platform independence
- Provides analytics for student views

### Cons:

- Preparation time required



### Results:

- Two thirds of the students in Spring 2012 voted to watch a video before coming to class so class time could be spent working problems (flipped).
- Instructor satisfaction is raised by flipping the classroom (helping students rather than lecturing).

### Conclusion:

MAE 206 has been taught in the past as an entirely flipped course, but videos such as this were unavailable. As more and more videos are recorded, more classes can be taught with in-class problem solving and online materials including individual concept videos, LiveScribe examples, textbook readings, online quizzing, and homework.