

The Who, What, When, and Why of Lecture Capture

Chris Brooks, Carrie Demmans Epp, Greg Logan, Jim Greer

Laboratory of Advanced Research in Intelligent Educational Systems (ARIES)
Department of Computer Science
University of Saskatchewan

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Lecture capture quick introduction

A system used for the recording of higher education lectures for asynchronous playback by students at a later date.

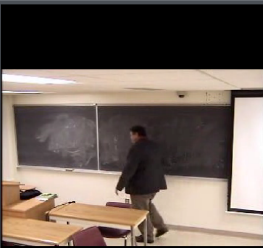
- Could be used for distance education, but doesn't have to be.
- Is not typically real time, but it could be (streamed like this conference).
- Encourages *participation* in class, and *reflection* out of class.

The system we used for this study is a home grown system (...more on that later...)

- Quick demo.
- Capture interactions students have with widgets on screen.
- Record a “heartbeat” every time 30 seconds of video is consumed.

recollect

research disclaimer privacy policy



Interesting Things

- ... not required, just interesting
 - Find and skim Canada criminal code sections 319 (hate crimes), 327 (telcom devices), 342 (credit cards and esp. 342.1), 372 (false messages), 402 & 403 (identity theft), [*while you're there check out 404*], and 430.1.1 [*while you're there check out 432*], on <http://laws.justice.gc.ca/>
 - Watch the video of Frank Abagnale speaking about his life (<http://video.google.com/videoplay?docid=6271800786378394176#>)

search

36:11 / 3:00:02 volume

recollect

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13:42
24:10
20:12
26:04

Chapter-2 Marginal cost, Marginal Revenue ①
Concepts & limits.

(Q) Sp $C(q) = 1000 + 50q + 0.2q^2$,
Selling price $p = \$85$ $90 \leq q \leq 120$
Currently, they are manufacturing 100 units
Want to decide whether to increase production or not?

$C(100) = 1000 + 50 \times 100 + 0.2(100)^2$ ②
 $= \$8000$

Average cost $A = \frac{C(100)}{100} = \frac{8000}{100} = 80$

Since the average cost of producing an item (when 100 units)

my notes
[SCENE 1]
[SCENE 2]
[SCENE 3]
[SCENE 4]
[SCENE 5]

search

ctrl + z ctrl + y

6:13 / 11:05 volume 75

ctrl + alt + t

ctrl + alt + t

Navigation icons: back, forward, search, etc.

Goals of this research

To better understand how students use this kind of system to augment their learning.

- We know usage is highly variable.
- Some love it, some hate it. Why?
- Is it useful as a study aid? For regular consumption of material? For assignments?

Why do we care?

- We want to know how to improve the tools.
- We want to validate the tools.
- Most importantly, we want to move towards validating educational theory (though we're not there yet!).

Experimental methodology and setup

The lecture recording system is in wide deployment, used by thousands of students per academic term. We focused on one course in particular, a second year chemistry course.

- STEM course with high participation rates.
- Qualitative evaluations from students suggested it was prototypical for other courses, but gave us statistically significant results. ($n = 232$)
- Anecdotally, many students in this class are highly motivated students (pre-medicine, vet, and other professional schools)

Caveats:

- Students were not required to view lecture content.
- No motivation was provided for using the lecture recording tools.
- *We only consider students who tried the tool for ten minutes or more.*

Is this class prototypical?

Is it reasonable to just consider this one course? Kind of ...

- Actually collected tracking data from $> 1,000$ students and qualitative data from > 600 students
- Disciplines; chemistry, mathematics, psychology, computer science, nursing, sociology, etc.
- Survey questions showed a few courses were outliers, but that there was a general agreement as to why students were using the system

Course	Unique Visitors (Registered Students)	Total Hours Watched (Average per Visitor)
Biology 120	243 (336, 72%)	1,933 (7.95)
Biomedical Sciences 240	74 (108, 69%)	1,123 (15.18)
Computer Science 100	64 (88, 73%)	207 (3.23)
Computer Science 111	154 (258, 60%)	758 (4.92)
Computer Science 275	25 (40, 63%)	67 (2.68)
Computer Science 352	22 (32, 69%)	84 (3.81)
Computer Science 470	23 (26, 88%)	718 (31.21)
History 120	77 (87, 89%)	424 (5.50)
Math 121	148 (194, 76%)	781 (5.27)
Math 121	154 (178, 87%)	1,715 (11.13)
Psychology 110	242 (403, 60%)	1,162 (4.08)
Sociology 111	42 (71,59%)	364 (8.67)

Hypotheses

- H1: There will be a group of minimal activity learners. These students may have preferred methods of achieving their learning goals and will investigate the tool but not adopt it in any regimented fashion.
- H2: There will be a group of high activity learners. These students may not watch all of each lecture, but will watch some content each week. The key element of this group is that they are embedding video lectures in their learning routine.

Hypotheses

- H3: There will be a group of disillusioned learners. These students will be keen enough to use the tool near the beginning of the course but will stop using it because they found it did not aid in their learning.
- H4: There will be a group of deferred learners. These students will not use the tool at the beginning of the course but began to use the tool closer to the end of the course will exist. This could be because students are leaving learning to the end of the course, or find later course content builds on early content thus requiring more/deeper review.

What did we find?

We used *k-means clustering* and whether students watched data during a given week to try and demonstrate these hypotheses.

Cluster	Week in Academic Term															Total Participants
	0	1	2	3	4	5	7	8	9	10	11	12	13	14	15	
c0'	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	104 (44%)
c1'	n	n	n	n	n	n	y	y	n	n	n	n	n	n	n	11 (5%)
c2'	n	n	n	n	n	n	n	y	n	n	n	n	n	n	n	89 (38%)
c3'	n	n	n	n	n	n	y	y	y	y	y	y	y	n	n	11 (5%)
c4'	y	y	y	y	y	y	y	y	y	y	y	y	y	n	n	9 (4%)
c5'	y	y	y	y	y	n	n	y	n	n	n	n	n	n	n	8 (3%)

- Support for each predicted hypothesis, though sizes of cohorts begins to get small even for this large course.
- A new hypothesis for $c1'$ and $c2'$; there are a group of just-in-time learners who use the tool only for midterm exam review (which may be many weeks).
- Dirty data, or inaccurate hypothesis for $c4'$?
- The lack of access during the last two weeks of class?!?!?

Where do we go from here?

This has skimmed the surface of the data we have, now is time to deepen the questions...

- How does this access data help us identify students at risk of drop-out, failure, or boredom?
- How does use of the system correlate with achievement?
- How do in class students, distance students, and online students use this technology differently?
- What is the effect across disciplines and domains?
- Are master teachers more engaging to re-watch? Or is the authentic environment more important?

Taking this to the next level

Where do we go from here?

- Need to increase data collection from thousands of students to millions (and you can help!).
- Need to add hypotheses about different kinds of students in different kinds of situations with different kinds of challenges.
- We need clear questions, with clear and repeatable results.
- We need a common platform, and a community of inquiry.



Questions?

Contact information

Christopher Brooks (cab938@mail.usask.ca)

Carrie Demmans Epp (c.demmansepp@usask.ca)

Greg Logan (greg.logan@usask.ca)

Jim Greer (jim.greer@usask.ca)



Some interesting qualitative results...

Other results obtained from qualitative surveying:

- Students like flexibility in class attendance, followed by the ability to review.
- Students who didn't use it at all often felt they didn't need it.
 - Interesting outlier; students who actively disliked the benefits this system gave to other learners.
 - "I showed up for class. Student's who don't show up for class should not be rewarded with lecture videos. Lecture podcasts should only be used for off campus education. Showing up for work is a reality of life, and students should get used to showing up for commitments they have made."