

Adapting Just-in-Time Teaching for online environments

JET Symposium on Economics Teaching

August 6, 2022

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Brown University

Motivation

- Question: How to maintain student engagement in a large (100 person) class in an online/remote environment?
 - Unable to ask questions in real time (back and forth)
 - Reduce incentive to passively ingest material
- Considerations:
 1. Easily implementable
 2. Low cognitive burden administratively for students
 3. Easily managed and used by instructor
 4. Observable payoff to instructor while being low cost

My solution

1. Reflective questions at the end of each “lecture” (set of videos), through the LMS
 - What is most important idea?
 - Any questions (or areas of confusion)?
2. Questions asked EVERY “lecture” (e.g. Canvas quiz) = 3x a week
3. Instructor downloads responses in csv file at the end of the week, scans for any themes, and address issues in live Zoom Q&A “discussion section”

Findings: Exposed unexpected student difficulties and learning gaps, which were used to revising presentation of material “in real time.”

Related techniques

- “Minute paper” -- Felder and Brent (2016)
 - At the end of class, in 1-2 minutes, (anonymously) jot down the answers to (1) what was the main point of today’s class and (2) what was the muddiest point (or most confusing point or your most pressing question).
 - Instructor collects sheets of paper, reviews responses, and use as springboard for the following class.
- Just-in –Time Teaching – Simkins and Maier (2010), (2004)
 - Students submit answers to carefully designed assignment on the LMS prior the class meeting.
 - Include an open-ended question, e.g. “what did you find confusing, interesting or surprising in this reading?”
 - Instructor reviews responses and adjusts in-person class structure based on the student responses.
- My strategy = “online minute paper” or bare-bones just-in-time

Evolution of course structure:

Large upper-level economics course, N = 150 students per semester

Pre-pandemic (pre-2020)	Quick pivot: mid-Spring 2020	Pandemic (Fall 2020, Spring 2021)
In-person lecture, with student Q&A, held MWF	Pre-recorded lecture videos (released with a few days prior)	Pre-recorded lecture videos (broken into smaller pieces) + reflective quiz + DUE DATE “MWF” midnight
Undergrad TA (UTA)-run discussion sections	Instructor-run discussion section on Fridays (live on Zoom, recorded)	Instructor-run discussion section on Fridays (live on Zoom, recorded)
UTA two hour drop-in office hours (“clinic”) at the library on Sunday nights	UTA-run online discussion board for asynchronous student questions (i.e. Piazza)	UTA-run online discussion board for asynchronous student questions (i.e. Piazza)

The set up:

- Every lecture set up as a Canvas Quiz (“lecture barometer”); N = 31
 - Series of lecture videos
 - Same set of open-ended questions
 - Q1) Rate effectiveness of videos (scale 1-10)
 - Q2) What was most resonant idea?
 - Q3) Any specific questions or confusing concepts?
 - Q4) Open comment space
- Effort-based grading (0/1) as “participation score”; 10% of final grade
 - Ability to miss 25% of barometers (i.e. 8 of 31) for full credit
- I download responses (3 barometers) as .csv file every Friday morning and review to prepare for live Zoom Q&A.


Intent of the quiz-based design

- For students
 - Pace out the content (discourage cramming) to roughly MWF schedule
 - Give framework to actively process lecture content (lower cognitive burden)
 - “One click stop” – designed with lecture videos embedded in the barometers
 - “Easy” 10% of final grade; able to miss 25% of quizzes.
 - Explain intent is not to be burdensome, commitment device to stay on track
- For instructor
 - Provide just-in-time questions on course material to structure Friday discussion section
 - Democratize the question-asking from “all” students (“pulse of the class”) rather than skewed towards handful of hand-raisers.
 - Seed the discussion for students (“Any questions on this week’s material?”= silence)


ECON1710 Spring21 Investments

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Spring 2021 ECON 1710 > Modules

63 Student View

Collapse AllView Progress+ Module

START HERE -- Before class and the FIRST DAY.

Part I: Background on financial markets

Big Picture: Background on financial markets

Read Chapter 1 (omit financial crisis of 2008)
Jan 20, 2021

Lecture #2: Review of financial concepts (no barometer for Lect #1 which was Meet & Greet)
Jan 21, 2021 | 1 pts

Lecture #2 supplementary materials

Jan 22 FRIDAY S01 11am Q&A with Prof Kuo (link to Zoom page)

Jan 22 FRIDAY S02 1pm Q&A with Prof Kuo (link to Zoom page)

Import Existing Content

Import from Commons

Choose Home Page

View Course Stream

Course Setup Checklist

New Announcement

View Course Analytics

View Course Notifications

Coming Up

Nothing for the next week

Course Feedback Results

ECON1710 Spring21 Investments I-S01
Ended 5/17/2021 11:59 PM

ECON1710 Spring21 Investments I-S02
Ended 5/17/2021 11:59 PM

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Jan 22 FRIDAY S02 1pm Q&A with Prof Kuo (link to Zoom page)

Friday 22Jan 21 Q&A followup materials

Homework #1
Jan 25, 2021 | 2 pts

Homework #1 Solutions

Read Chapter 2
Jan 25, 2021

Lecture #3 Asset classes and financial instruments (Ch 2)
Jan 25, 2021 | 1 pts

Lecture #3 supplemental materials

Read Chapter 3
Jan 27, 2021

Lecture #4 How securities are traded (Ch 3)
Jan 27, 2021 | 1 pts

Lecture #4 supplemental materials

Read Chapter 4
Jan 28, 2021

Lecture #5: Buying on margin & selling short (Ch 3), Define investment companies (Ch

Investments I-S02

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
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Assignment Quizzes

Spring 2021 Midterm 1 (Ch1-7; HW #1-5)


Closed | Due Mar 3, 2021 at 11:59pm | 100 pts | 25 Questions

✓ ⋮

Spring 2021 Midterm 2 (Ch 9, 11, 14 and HW #6, #7)


Closed | Due Mar 24, 2021 at 11:59pm | 100 pts | 25 Questions

✓ ⋮

Spring 2021 Final Exam #1 (CUMULATIVE MATERIAL: CH 1-7, 9,11,14) -- 60 minutes

Closed | Due Apr 20, 2021 at 11:59pm | 50 pts | 25 Questions


✓ ⋮

Spring 2021 Final Exam #2 (NEW MATERIAL: ch 18, 20, 21) -- 90 minutes

Closed | Due Apr 20, 2021 at 11:59pm | 50 pts | 25 Questions


✓ ⋮

Surveys

Lecture #2: Review of financial concepts (no barometer for Lect #1 which was Meet & Greet)


Closed | Due Jan 21, 2021 at 11:59pm | 1 pt | 4 Questions

✓ ⋮

Lecture #3 Asset classes and financial instruments (Ch 2)


Closed | Due Jan 25, 2021 at 11:59pm | 1 pt | 4 Questions

✓ ⋮

Lecture #4 How securities are traded (Ch 3)


Closed | Due Jan 27, 2021 at 11:59pm | 1 pt | 4 Questions

✓ ⋮

Lecture #5: Buying on margin & selling short (Ch 3), Define investment companies (Ch 4)

Closed | Due Jan 28, 2021 at 11:59pm | 1 pt | 4 Questions

✓ ⋮

Lecture #6: Mutual funds (NAV, types of investment companies, index funds, costs)

Closed | Due Jan 29, 2021 at 11:59pm | 1 pt | 4 Questions

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
Survey: Lecture #2: Review of fina


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Spring 2021 ECON 1710 > Quizzes > Lecture #2: Review of financial concep...

63 Student View

Lecture #2: Review of financial concepts (no barometer for Lect #1 which was Meet & Greet)

This is a preview of the published version of the quiz

Started: Aug 4 at 1:35pm

Quiz Instructions

After watching the lecture videos, please fill out this reflection/question/clarification barometer at the bottom of the screen. Because we are not meeting in person, this barometer is intended for you to let me know what questions or issues you are having with this lecture's material while you are watching these videos.

These barometers are given participation points, (1) to keep you all on track so nobody slips too far behind, but also (2) I can gauge what to discuss on the Friday Q&A sessions. Note that the same set of questions will be asked for each lecture.

This BAROMETER is due by Thursday MIDNIGHT (11:59pm) Eastern Time.

You will also only have ONE attempt at this quiz (ONE submission), so wait until you have watched all the videos.

A reminder -- every lecture will have a barometer at the bottom of the page for you to fill out for participation points. They will be due (respectively) at midnight on Mondays, Wednesdays and Thursdays.

LECTURE #2 OUTLINE:

1. Definitions (video 1)

1. brokerage account

Keep Editing This Survey

Questions

Question 1

Question 2

Question 3

Question 4

Time Elapsed: Hide Time

Attempt due: Jan 21, 2021 at 11:59pm

0 Minutes, 7 Seconds

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1. Definitions (video 1)

1. brokerage account

2. going long

3. going short

4. par value

5. stock split

6. capital gain (video 2)

7. capital gains tax versus ordinary income tax

2. Rate of return

3. Review of present value calculations (video 3)

video 1

Sun Sep 06 2020 3:04:24 PM

lect #2 REVIEW OF FINANCIAL CONCEPTS

video 1: Definitions - part 1

Definitions:

(a) brokerage account

(b) "going long"

(c) "going short"

(d) par value

(e) stock split

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video 2

Mon Sep 07 2020 11:44:45 AM

lecture #2: REVIEW OF FINANCIAL CONCEPTS

video 2: Definitions - part 2

concept of rate of return

(1) DEFINITIONS

(f) capital gain

(s) capital gains tax v. ordinary income tax

(2) rate of return

video 3

Mon Sep 07 2020 12:55:03 PM

led #2 REVIEW OF FINANCIAL CONCEPTS

video 3: Present Value Calculations

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Survey: Lecture #2: Review of fin...

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Mon Sep 07 2020 12:55:03 PM

lec #2 REVIEW OF FINANCIAL CONCEPTS

video 3: present value calculations

present value calculations

• simple loan (1 payment)

1 year

2 years

• stream of payments

annuity

general formula

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Question 1

0.25 pts

Rate the videos for this lecture on a scale from 1 to 10 for effectiveness of delivery/scale of comprehension.

Use the closest whole number that best represents average level across the videos. Also, take the content area as given for this rating (although you may add comments in the free space at the end).

[This question helps me figure out which videos are better than others.]


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
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comprehension.

Use the closest whole number that best represents average level across the videos. Also, take the content area as given for this rating (although you may add comments in the free space at the end).

[This question helps me figure out which videos are better than others.]

Question 20.25 pts

What idea or concept resonated the most with you this week (either positively or negatively)?

[This question gives me an idea on what your big takeaways are, and how they compare with what I hope they are.]

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Question 3

0.5 pts

What specific questions do you have (or clarifications that you need) on this week's material?

[These are questions that I can answer directly.]


AND/OR

If articulating a specific question is difficult, what concepts did you find most confusing?

[These are concepts that you would like for me to re-explain in the Friday live session, and have a chance to articulate a question/confusion in real time.]

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Question 4



0 pts




Free space to add any other comments, reactions or additions

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Engagement through student responses

- Democratized question asking
 - Asked across “all” students (not just fast-thinking hand-raisers)
 - Time flexibility (not ask in the few moments after material first presented)
- Students articulated questions in their own words (less passive)
- Better representation of what the class is thinking (“barometer”) rather than a select sample.

Findings were humbling...

- Did have typical historical questions on confusing concepts/methods.
- HOWEVER.. uncovered unexpected misunderstandings:
 1. Ask “why” for definitions/*factual* concepts
 - “Why choose X and not Y” when there is no choice.
 2. Questions that suggested larger conceptual problems with fundamental ideas.
 3. Confusion with a basic concept covered in a prerequisite class
 4. Understood individual concept but had difficulty fitting components into larger structure/theme
 5. Not understanding what a “model” is
 6. Reveal more of student disconnect between what learn in class versus what they do in the real world [came out in live discussions]
- Notice student energy/momentum flagging towards end of the course by the quality of responses.

Lessons to keep in mind for the future:

- How clearly am I defining terms? Is it clear that they are definitions?
- Can I give simple examples to illustrate an idea rather than just a bunch of math with variable names?
- Many students can apply X formula to Y type of problem mechanically but do not understand why they are doing it.
 - Do not retain that knowledge because they have nowhere to “put” it.
 - Not building out their economic intuition (how to think), not reinforcing the branches of the tree or making it fuller.
- Being cognizant that maybe the inarticulate questions are the most precious and represent the greatest opportunity.

Lessons for future

- Caveat: Signals could be imprecise – students could have just written down a throw-away question containing “buzz terms” in order to fill in the textbox for credit.
- Easily implementable low-cost strategy to elicit active engagement and expose learning gaps that better represent the entire body of students.
- Adaptations to an in-person world:
 - Could implement weekly through LMS
 - Could use to identify struggling students very early on (match responses to student identity through LMS)

Appendix: Lecture “barometer” (quiz) text:

Q1) Rate the videos for [lecture #4 \(how assets are traded - Ch 3\)](#) on a scale from 1 to 10 for effectiveness of delivery/scale of comprehension.

Use the closest whole number that best represents average level across the videos. Also, take the content area as given for this rating (although you may add comments in the free space at the end).

[This question helps me figure out which videos are better than others.]

Q2) What idea or concept resonated the most with you this week (either positively or negatively)?

[This question gives me an idea on what your big takeaways are, and how they compare with what I hope they are.]

Appendix: Lecture “barometer” part 2

Q3) What specific questions do you have (or clarifications that you need) on this week's material?

[These are questions that I can answer directly.]

AND/OR

If articulating a specific question is difficult, what concepts did you find most confusing?

[These are concepts that you would like for me to re-explain in the Friday live session, and have a chance to articulate a question/confusion in real time.]

Q4) Free space to add any other comments, reactions or additions.