

Flipped Classroom: Synchronous, Asynchronous... or Both?

Before we get started



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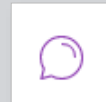


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What do we mean by "flipped" class?

- Some or all material is delivered outside of class
- Students study course material *before* engaging in active learning activities
- The active learning activities often take place during synchronous sessions with the support of the instructor and/or TAs

GOALS

- Build community awareness on decision factors for synchronous and asynchronous delivery options (applying flipped lecture model)
- Identify common challenges to engaging students online with synchronous and asynchronous delivery options
- Explore solutions and applied tips and strategies for engaging students through synchronous and asynchronous delivery options
- Navigate and utilize support resources

AGENDA

1. Introduction
2. Setting the stage
3. Panelists
4. Q&A and Barrier Busting
5. Navigating Support Resources

Introduction

Setting the stage through the design process:

1. Focus on the most important learning outcomes for your students.
2. Align learning outcomes with assessments.
3. Identify activity steps in each week/module to build student skills and support success in assessments.

Activity Options

Be prepared to adapt classroom content and activities to new types of activities that are appropriate to the online environment.

Videos?

Discussions?

Peer
Feedback?

Digital texts?

Interactive
modules?

Group
activities?

Synchronous vs. Asynchronous Activities?

In a face-to-face context, we would refer to moving some activity asynchronously online and synchronous in-class as "flipped." How can we leverage this approach in our current context?

Example:

Asynchronous



Synchronous

Setting the Stage

As we move to fully online/distance teaching some questions instructors are asking include:

- Which course content/activity should take which format?
- What are the kinds of possibilities out there for content – podcasts, videos, learning modules?
- What activity strategies and tools can be used?
- How can these course components be integrated into Quercus?
- How can we maximize synchronous time with our students while supporting their learning asynchronously?

OUR PANELISTS

We have 3 panelists to speak to their experiences with flipped approaches:

Nick Provart, Professor, Cell & Systems Biology

Diane Horton, Professor, Teaching Stream, Computer Science

Melody Neumann, Associate Professor, Teaching Stream, Cell & Systems Biology

Nick Provart - CSB472H1S

- Computational Genomics and Bioinformatics (2 hrs/wk)
- 40 undergraduate and 10 graduate students (taken as CSB1472)
- We want students to have knowledge of foundational papers/concepts, some practical experience in genomic analyses, and have the opportunity to present a recent “systems biology paper” – this is a lot to pack in...

CHALLENGE - CSB472H1S

The challenge was to finesse lectures/labs/student presentations into a 2 hour time-slot in 12 weeks (the 13th week in which we usually did student presentations had been eliminated to harmonize the lengths of fall and winter semesters)

Given the success of Professor Provart's flipped CSB352H1S – Bioinformatic Methods course (short 20 minute lectures online delivered via Coursera.org, labs during class time), could we do something similar with CSB472?

SOLUTION -CSB472H1S

- We decided to deliver the lecture component of CSB472 online, via MyMedia video recordings, initially captured via Camtasia then later via Powerpoint “record” functionality
- We have used the class-time to do some combination of recapping the lectures, having group discussions, doing student presentations and undertaking tutorials/practicals – short quizzes help to ensure that lectures are watched before class

LESSONS LEARNED - CSB472H1S

- **What worked well?** Students have been mostly positive about the recorded lectures: they like being able to listen to material again if they don't understand it. Presentations/tutorials have worked out well.
- **What could use refinement?** We dropped the discussion groups as they seemed forced and were hard to grade in terms of participation. Students have also complained about the amount of time required for the course...
- **Note:** this year there was a student complaint about paying a lot of tuition for pre-recorded lectures 😞

Diane Horton - CSC343H1F

Introduction to Databases

- Mostly 3rd and 4th year students
- Enrolment: 450

Format has been semi-flipped

- Before class: learn basics and complete exercises (worth 1%)
- In class: learn more advanced material and engage in activities (worth 0%)

Learning in class involves discovery wherever possible

- Back-and-forth flow

CHALLENGE - CSC343H1F

How to maintain the benefits of this approach when moving online?

- Discovery → deeper understanding and better retention
- Me knowing where students are → I can adapt the teaching to their learning
- Students knowing where they are → they can get answers when I'm present

Attempting to achieve this with synchronous online

Two meeting times with 225 students each

SOLUTION - CSC343H1F

Prep work: as before

Class time: on Blackboard Collaborate

- Student questions via chat, with TAs helping (and bringing things to my attention)
- Active learning exercises distributed via handouts on Quercus
 - Perhaps some new exercises using TeamUp!
- Helping a student during exercises by putting them into a breakout
- "Reading the room" via polls

REMAINING CONCERNS - CSC343H1F

Will group work be viable?


Will the technology hold up?

Contingency plans:

- Occassional glitchy lecture: record videos to cover the gap
- Revert to streaming via MS Live Events
- Revert to asynchronous

Efficiency of the non-recursive helper functions

mergesort and quicksort each have a non-recursive helper function. We'll begin by analyzing them.

1. Solve questions 1 and 2 on the worksheet [Recursive Sorting Algorithm Efficiency](#) , about quicksort's helper.
2. Watch this video which takes up questions 1 and 2:

[Link](#) 



3. Solve questions 3 and 4 about mergesort's helper.
4. Watch this video which takes up questions 3 and 4:

[Link](#) 



Example from another course, during the emergency move to online

Efficiency of mergesort and quicksort

Now we're ready to analyze the efficiency of the sorting functions themselves.

1. Watch this video about the efficiency of mergesort:

[Link](#) 



Melody Neumann – CSB201H1F

CSB201 Cell & Molecular Biology and You

- Breadth course for non-majors
- Possibly last science course students ever take
- Mostly 3rd and 4th year students

96 students per term; 24 students per tutorial

Student Factors for course success

- Mastery of basic genetics, molecular and cell biology
- Information/scientific literacy
- Inspiring interest and value in cell & molecular biology for life-long learning and societal participation
- Development of online teamwork skills

CHALLENGE – CSB201H1F

Keeping students engaged and on-track....while achieving course outcomes and maintaining academic rigour.

How?

- Strong course structure
- Multiple, regular, small assessments
- Balanced asynchronous and synchronous work
- Individual and group work
- Final proposal assignment incorporating mastery and information literacy
- A f-2-f cumulative final exam

SOLUTION – CSB201H1F

Divided the course into highly-structured Modules

- Pre-made lecture videos using Camtasia (mixture of approaches)
- Quercus Quiz on Module lectures completed before tutorial
- Instructor review in Bb Collaborate tutorial and chance for questions
- Group assessment using Team Up! and breakout rooms in Bb collaborate
- Individual written assessment due a few days later
- **Repeat!**

LESSONS LEARNED – CSB201H1F

What worked well?

- Modules with frequent small assessments

- Tutorials with instructor and peers

- Team Up!

- Small research proposal to apply knowledge and information literacy skills

What could use refinement

- Refined over several years—tried several things that did not work—eg. Discussion board participation, group written problem sets

- Made high-quality videos that students appreciate—update 2-3 each year—wish could update more frequently

- Group work occasionally still has same problems as f-2-f

Completion rates in fully online course went from ~70% to 98-100% & enrolment increased 50%

“I didn't expect the class to be so interactive...enjoyed the Team Up! sessions...it made sure I didn't fall behind on course content and collaborating with classmates always helps reinforce knowledge.”

“The level of engagement during my online course far exceeded my expectations...tutorials allowed students to engage as teams to answer quiz questions. This was something I did not encounter since high school, and was a great learning experience as we solved questions through brainstorming and discussions.”

Specialized Support Resources

[Creating and sharing video lectures](#)

[Running a live webinar session](#)

[Choosing between synchronous and asynchronous video](#)

[Active learning strategies](#)

General Support Resources

CTSI website: <https://teaching.utoronto.ca>

Upcoming events: <https://teaching.utoronto.ca/events>

Quercus Support Resources: <https://uoft.me/qresources>

Divisional Support: <https://uoft.me/qsupportcontacts>

Questions: q.help@utoronto.ca

Questions and Comments



Thank You