

What Do I Do with this Flipping Classroom: Ideas for Effectively Using Class Time in a Flipped Course

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ABSTRACT

Flipping the classroom is an increasingly popular teaching style, but converting a class to a flipped format can be challenging. Apart from creating or finding the external resources that will take the place of traditional lectures, instructors must also find ways to use classroom time. We describe ideas and suggestions for effectively using class time to improve students learning.

KEYWORDS: Flipped classroom, student engagement, mini-lectures, classroom activities

INTRODUCTION

Flipping the classroom (Hamdan, et al 2013) has become a major movement in academia. The flipped classroom (or inverted classroom, Lage et al 2000) has improved learning outcomes in a diversity of fields. Courses in general chemistry (Butzler 2016), communicative language (Spino & Trego 2015), engineering (Mason et al 2013), microeconomics (Roach 2014), and physiology (McLean, et al, 2016) have all shown improvements when flipped. These improvements include a deeper understanding of the material, increased topic-coverage speed, more content covered without reducing course quality, and improved test scores (Hamdan, et al 2013, Yarbrow et al 2014). Flipping is an attractive option for both instructors and students for several reasons. First, it provides scheduling flexibility for both groups (Bergmann & Sams 2012). Second, it allows instructors to incorporate more technology into their teaching. Third, it allows instructors to increase their engagement with their students in class (King 1993 & Silverthorn 2006). Unfortunately, flipping also comes at a cost. Creating a flipped class requires a significant time investment (Spino & Trego 2015). Not only must the instructor create or identify the material students will use outside of class (e.g. video lectures, reading assignments, etc.), but he or she must also determine what will be done in the classroom (Dolan & Collins 2015).

For many instructors, the focus of their flipped course design is on creating or selecting the external resources students will use in place of a traditional in-class lecture. Given the propensity for students' minds to wander (Kane et al 2007), allowing students to read course materials or watch the lectures as series of videos helps retain student attention. Typically, instructors and resources on flipping focus on the time needed to create the videos and reading assignments, but these external sources are only half of the resources needed to successfully implement a flipped classroom. In order to be successful, an instructor must also carefully design the activities that will be done during class time (Spino & Trego 2015). This article attempts to help instructors effectively use their in-class time by discussing various in-class activities and how they can be incorporated into a flipped course. More specifically, we will discuss the use of several specific options for effectively using the scheduled class time: mini-lectures, group activities, active learning, and additional examples.

REMEMBERING THE TIME FACTOR

Before exploring the details of flipping activities, we need to address the “elephant in the room” regarding a flipped classroom: time demands. In designing a course, an instructor must carefully consider the time demands on the students. The tendency for many of us is to see open class time as a chance to add material to the course. Some instructors carefully select or create a set of videos that contain the important lecture information, then add new topics in class. The students in these classes must now watch a set of video lectures, then attend a set of in-class lectures, and still complete the homework and other projects in the course. For example, one of the authors added a new set of assignments to his course when he began flipping his classes. Even though most of the work was done in class, any student who had trouble with the concepts was then required to spend additional time outside of class finishing the new assignment, on top of the other assignments and projects already in the course as well as the video lectures that they were now watching. Another common mistake is re-teaching course material. Some instructors carefully select a set of videos that contain the important lecture information, then re-teach those same topics in

class. Unfortunately, many of us want to use the extra time to reinforce the material with our students, adding to the time demands of our course.

In designing a flipped course, the instructor should remember the basic principle behind flipping a classroom: students get the basic content outside of class where they do not need the instructor's help, then do the assignments and projects inside of class where they can get the additional help they need (Silverthorn 2006). A well designed flipped classroom will not add to a student's workload or time demands. It will instead shift the load so that the more difficult aspects of the course (i.e. actually applying the content) are done in class with the instructor. With that fundamental principle in mind, what activities are best used in class to help students learn more difficult concepts?

USING MINI-LECTURES

Re-teaching course material is not an effective use of time in a flipped classroom, but using a mini-lecture (5-12 minutes) to emphasize and discuss the key points in a set of videos or readings can be effective. The goal of these discussions should be highlighting and emphasizing the most important points in a set of material. These points can be the areas that past students have most struggled with, controversial topics that are worth debating during class, or jumping off points that lead into the rest of the activities for the day. Based on our experience with flipping the classroom, we recommend three options for effectively providing these mini-lectures.

The first options for providing a mini-lecture is to review a concepts or problem that the instructor, from past experience, knows will be challenging for the students. This option is essentially re-teaching one important idea to the students. For example, Figure 1 contains a basic slide about least-squares from a business statistics course. The instructor of this course knows that this concept, probably because of the equations, is difficult for the students to grasp, so he walks back through the equation with the students, asking questions and emphasizing again key ideas and methods before moving on to an example of the concept. Over time, this structure can develop into a strong class discussion as students realize that they can safely ask about this challenging idea and get their questions answered.

Least-Squares Fitting

Least-squares fitting estimates the β s by minimizing:

$$RSS = \sum_{i=1}^n \left(y_i - \beta_0 - \sum_{j=1}^p \beta_j x_{ij} \right)^2$$

y_i - the i th observed value
 β_0 - the y intercept
 β_j - the regression coefficients
 x_{ij} - the predictors

Figure 1 – Example of a Basic Slide for Use in a Mini-Lecture

The second option for providing a mini-lectures is to use a quiz or other small assessment tool to get students thinking about the videos they have watched or readings that they have done. While we expect our students to come

to class ready to go with the material read and videos watched, there are some that will avoid the work in the hopes that they can get the ideas and concepts from the mini-lecture. Using an assessment tool (quiz, group discussion, homework assignment, bonus question, etc.), encourages students to complete the outside activities so that they are ready for what we will do together during our class time. Having a quiz or other activity motivates students to watch the videos or do the readings, but it also creates a chance for discussion with students. Explaining a quiz after it has been submitted and analyzing multiple choice options (why they were wrong, what they mean, their importance as concepts, etc.) provides the perfect opportunity to emphasize key concepts in the material. The instructor is reviewing material, not teaching it, and then using the basic points to jump into additional discussion or activities. The only drawback from this style can be the pushback if students disagree with the answers to the assessment, but even the pushback can be used to emphasize key points and ideas.

The third option for providing a mini-lectures is to post a list of key ideas from the material that that students should have learned on their own. The instructor can then use the Socratic Method to help the class review the importance of the concepts on the list (Wood & Tanner 2012). For example, one of the authors lists key concepts for each chapter like the one in Figure 2. Since each concept asks the students to discuss, explain, or demonstrate an important concept from the recorded lectures, the instructor can ask the students to do those things in class. With the set provided in Figure 2, the instructor typically starts the discussion by asking the students to list the objectives of financial accounting, then moves on to similar questions about the other key concepts. As a side note, these key concepts can be embedded in the course lectures, giving students an additional motivation to watch the videos.

These discussions can branch out as the instructor wishes, covering additional material, walking through practice problems, covering recent events (so that he or she doesn't have to record new videos every semester), and providing emphasis to these important concepts.

Chapters 1 & 2: Key Concepts

1. List the three (3) objectives of financial accounting.
2. Describe who has the authority to set GAAP and who actually does set GAAP.
3. Explain what the ASC is and how it is used.
4. Explain the trade off between relevance and reliability.
5. Discuss IFRS and the convergence process.

Figure 2 – Example Key Concepts for Use in Reviewing Chapter Material

Overall, the most important part of using mini-lectures is to keep them succinct. Remember that the goal is to emphasize and clarify, not expound and re-teach.

USING GROUP ACTIVITIES

One of the most powerful learning tools available is putting students into groups and letting them work together to solve problems, discuss concepts, and identify important ideas or questions. The process of discussing course concepts with each other helps to solidify those concepts and improve student learning.

With the time available in a flipped classroom, you have class time to do more with groups than you can in a traditional classroom. In fact, most of the instructors that we know who have chosen to flip their classrooms list the additional time for group work as one of the greatest benefit of the flipped method.

Group activities can take a number of forms, most of which are already commonly used. Students can work on projects or homework assignment together, can discuss or debate important concepts, can practice using software (or apps) that are important to the course, etc. However, we do have two suggestions for group activities that are especially appropriate for the flipped classroom and that have been very effective in our classes.

First, we give our students a list of questions about the concepts or methods they should have learned before class and let them answer those questions together. While some of these questions are focused on content (especially for students in lower division classes), we typically include more questions that focus on synthesis and evaluation: Why do we use this particular method? Why is this theory important? And why did this current development challenge existing standards? We've provided an example set of questions in Figure 2.



Figure 3 – Example Questions for Use in a Group Discussion

Second, we give groups or partnerships the opportunity to work on course projects during class (Prince, 2004). While most of us already use groups for big projects, there isn't much time in a traditional course for those groups to work together in class. In fact, one prominent student complaint about required group projects is that it is difficult to find a time to work together outside of class. In a flipped classroom, full class sessions can be dedicated for students to work on course projects, especially those that are done with a group. These sessions not only alleviate the challenge of finding time to get together, but it also allows the group to work where the instructor can observe their progress, assess participation, and answer questions.

ACTIVE LEARNING

Learning how to reason through a case (Ernst 2014, Barnes et al 1994), apply course concepts to a project, or use common business applications, such as the Microsoft Office suite, provides some of the most powerful experiences that we can give our students. While it is possible to walk students through cases, projects, and applications, these skills are best learned through active learning activities (Bigelow & Poremba 2014). However, the hands on nature of active learning can be frustrating without direct help from the instructor or teaching assistants.

The flipped classroom is almost tailor made for these kinds of activities. First, without the need to give an in-class lecture, instructors have time to demonstrate the use of a database, computer application or to walk through the methods needed to address a particular case. Second, the group dynamic created by other activities allows students to discuss their ideas and ask questions as they work together to learn the skills or solve the case. Third, the instructor's role as mentor instead of lecturer allows an open discussion of the steps needed to process a scenario of facts into a business decision or to learn a new program.

For example, one of the authors uses class time to walk his students through examples using Microsoft Access®. This hands on experience allows students to more easily understand the concepts in the information systems class, and provides them with skills they can discuss in interviews. Using these hands-on examples from the program helps students learn more rapidly. In addition, letting the students try to use the software on their own for a little while, then showing them the correct methods, improves student retention of the methods demonstrated and avoids the frustrations that students often feel when required to learn a program through trial and error on their own.

Another example is walking students through a complex analysis in a business statistics course. The instructor provides the students with a scenario asking them to select and perform the most appropriate analysis to give the manager the information needed for a business decision. After giving students time to work on each question with their neighbors, the instructor is able to discuss the correct answers with the class, making sure that everyone has selected the correct method before starting the analysis, then ensuring that the analysis is done correctly before they make a recommendation.

Without guided, knowledgeable, hands-on practice, students needlessly experience frustration when learning how to perform required tasks, especially when those tasks are moved from the classroom setting to a more "real world" setting in a case. Providing active learning opportunities in class bridges the chasm of failed comprehension and uninterested participation. Students leave these class sessions confident that they know how to use the tools and process the data into knowledge, and knowledge into better business decisions.

USING ADDITIONAL EXAMPLES

Perhaps the most common use of classroom time in a flipped course is to provide the students with additional examples that they can work on while the instructor is available to provide immediate feedback and answer questions. In fact, this was one of the original goals of the flipped model, because one of the weaknesses of a traditional in-class lecture model is that students are practicing new concepts outside of class with limited access to the instructor.

The most common method for using additional examples is to move the cases, course homework and projects into the classroom, but it is not the only option. One alternative is to create a new set of problems or examples that students can complete during class. These examples can be similar to those used in the readings or video lectures, or they can push students to take the next step in learning the concepts.

One author uses about one class day a week to work with his students on a series of practice problems. These workshop days include both types of examples. The most common examples are from topics that the instructor knows from past experience are challenging for the students. These examples are based on those questions most commonly missed on exams or from the questions most commonly asked during office hours in previous semesters. The other examples, typically one for each workshop, are problems that were discussed conceptually during the video lectures, but not demonstrated. For example, when discussing leases in an accounting class, the videos demonstrate the methods for a lease with a bargain purchase option (i.e. the right to buy the asset at the end of the

lease at a reduced price) and the in-class example will ask students to work through a lease with a guaranteed residual (i.e. the lessee promising to return as asset at a certain value at the end of the lease period or make up the difference in cash) instead.

Another example of pushing students to take the next step would be to walk students through an example in the lectures of how to set up a marketing plan for a brand new product, then to ask students in class to set up a marketing plan for a product that will need to gain market share in a market with several other products. Students are typically frustrated with a homework assignment or exam that pushes them beyond what was covered in the lectures or readings, but doing these problems in class, with a group, and with the instructor providing feedback and help as needed makes it into a learning opportunity. From our experience, the students appreciate the chance to see the alternatives not covered explicitly in the lectures.

Another alternative to traditional homework is the use of bonus questions. One author found that students were putting off watching the videos for a given topic until immediately before the quiz on that topic. To help students spread out the videos, and therefore retain more of the information, he posts a bonus question at the beginning of class based on the concepts from the videos scheduled for that day. Bonus questions can also require students to do a little research on their own, such as reading an additional article, searching the news articles on the topics being discussed, or examining a 10-k or management letter for examples of how real companies are using the methods discussed in the course. These examples can be used as the basis for a discussion, but more importantly they push students to do some additional reading or research on their own. One other benefit to using bonus question is that students are motivated to earn the bonus points, and at the same time grateful for the opportunity, as opposed to being frustrated by one more assignment. Two examples of bonus questions we have used are provided in Figure 4.

Bonus Questions

(Bonus: 1 point) Hecla Mining Company has no bonds payable, but the company does own bonds. According to their 10-k, where do they record their bond investments?

- Cash and Cash Equivalents
- Other, net Receivables
- Non-current Investments
- What bonds? I don't see any mention of bonds in Hecla's 10-k

(Bonus: 1 point) Which of the following steps would come first in the accounting cycle?

- Create a Trial Balance
- Identify Transactions
- Create the Financial Statements
- Make journal entries

Figure 4 – Examples of Bonus Questions for Use as Additional Examples

In adding examples, keep in mind that you don't want to increase student workload significantly beyond what it would have been in a traditional course. Keeping the examples ungraded or making them extra credit will accomplish the same goal of teaching students without adding additional pressure. If students don't take the example seriously without a grade, then we recommend finding a "light" method for offering a grade. For example, one author posts a 3-point participation question after every workshop that he completes with his students. The questions are simple, fill-in-the-blank type questions that ask for one of the numerical answers covered during the workshop discussion. If students have participated in the discussion, then they already have the number in their notes. If they chose not to attend or didn't listen to the discussion, then they won't have the right number, thus providing the necessary incentive to keep students engaged without becoming burdensome.

CONCLUSION

The flipped classroom provides powerful opportunities to interact with our students as mentors when compared to a traditional classroom format. Our class sessions, if used effectively, can become the greatest learning experiences in our courses, because students will be discussing, applying, practicing, and asking questions about the basic content in our readings or video lectures. In addition, they can be rewarding opportunities for instructors to provide the one-on-one teaching moments that allow us to actually connect with both our students and the subjects that we love. The key is to focus on activities that push student learning without increasing stress, thereby providing students with genuine knowledge.

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