Seven Steps to Flipped Learning Design

A Workbook

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Photo by Ashim D'Silva on Unsplash

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Introduction

Who, and what, this workbook is for

This workbook gives a structured framework for designing lessons using the principles of **flipped learning**. It is for any instructor in higher education[1] who wants to use flipped learning in their classes. By following the steps contained here, you will learn a **seven-step workflow for planning a single lesson in a course using flipped learning design**. The idea is that if you can get comfortable with the workflow of planning a *single 50-75 minute class* in *a single course*, then you can replicate that workflow for any number of lessons in any class, semi-automating the process so you can devote your attention to your students, not to lesson planning.

When I started using flipped learning around 2009, I soon discovered that everyday course preparation required a different mindset than a traditional class design, and I had to relearn how to plan a lesson. After a couple of years of trial and error, I arrived at a stable workflow that did what I wanted. In 2015, I wrote the first version of this workbook around this workflow, inspired by Dee Fink's "A self-directed guide to designing courses for significant learning" (Fink, 2003), and gave it away to participants in a flipped learning minicourse I was facilitating. People found it useful, so I've been updating it and giving it away ever since. You can always get the latest version at https://rtalbert.org/seven-steps.

My book *Flipped Learning: A Guide for Higher Education Faculty* (Talbert, 2017) grew out of this workbook. It contains a significantly expanded version along with an extensive treatment of the history, theory, and practice of flipped learning in higher education. You can order it from Stylus' website or on Amazon.

How this workbook is structured

Following this introduction, there is a short section on flipped learning itself -- what it is, why we should use it, and how students and instructors experience it. Even if you are familiar with flipped learning, I'd encourage you to read this, since many faculty start using flipped learning with flawed conceptions of what it is, and end up not understanding what's involved, particularly from the student point of view.

[1] Primary and secondary instructors are welcome too! But throughout, I assume a higher education environment, because that's what I know.

Then there is an overview of the seven-step process for flipped learning design, followed by seven sections, one for each of the seven steps. Each of those sections follows the same structure:

- A summary of *what you'll do* in the step.
- A rationale for *why we're doing* the step.
- Some *notes and background* on that step.
- An *example* of the step in practice using a running example of a lesson on academic integrity.
- *"Now you do it"*: Concrete activities for you to complete that will lead you through the design in that step. **This is the most important part of the workbook.**
- Then there is a set of *frequently asked questions* (FAQs) about the step.

How to use this workbook

The most important thing to know here is that **this workbook is not meant merely to be read. It is a *workbook* meant to be used and interacted with as you plan your lessons**. Eventually you'll internalize everything here, but if you are just starting out with flipped learning, or seeking to hone your craft with this document, you'll be *working through it* and not just reading.

To get the most out of this workbook, I recommend you follow these steps:

1. **Pick a course** that you are teaching or will teach soon, where you're interested in applying flipped learning in a single lesson, a group of lessons, or the whole course.
2. **Pick a single lesson from that course**, that is, a single lesson that would occupy a typical class period for you and that course.
3. **Follow the steps outlined in this workbook,** filling in the blanks and responding to the exercises. You can use a notebook, a computer file, or a PDF version of this document if you want. But remember, it's a *work*book.

Some have found it helpful to read or skim the workbook once, then read it again and get your hands dirty with planning the second time. It's up to you. However you choose to work, if you follow the process and work actively, then you will end with a fully-realized flipped lesson that you could then turn around and deploy in your course, tomorrow if you wanted, and then replicate for other lessons until the process becomes habitual.

Contact me

You are welcome to contact me at any time with comments, questions, suggestions, or corrections. You can reach me at:

- The contact form at https://rtalbert.org/contact
- LinkedIn: https://www.linkedin.com/in/roberttalbert/
- Twitter: @RobertTalbert

What is flipped learning?

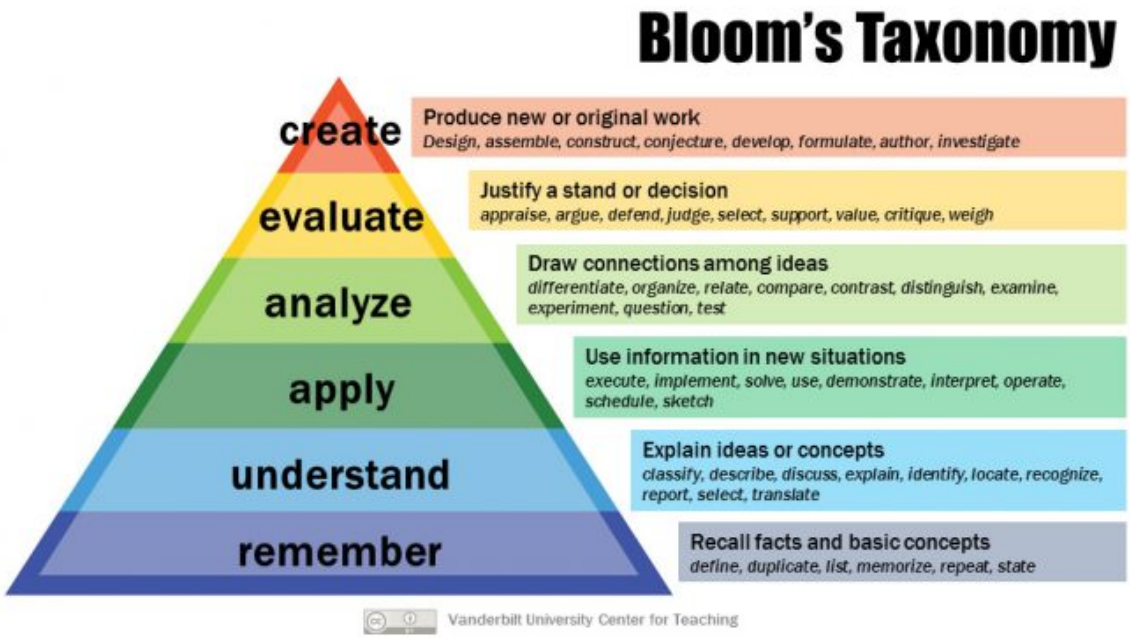
Before we look at flipped learning design, it's helpful to review just what exactly is flipped learning in the first place and why anybody would want to consider using it.

Traditional class design and Bloom's Taxonomy

The traditional model for designing and running a lesson for a college-level class goes like this:

- Students are assumed to have **zero knowledge** of the new concepts to be learned, and get their **first contact with those concepts in the class meeting**, usually through a lecture.
- That **group space** is used to convey basic information and ideas, and to examine simple examples. The "group space" is often a class meeting in a classroom, but it can also be a synchronous online group meeting, asynchronous all-class contributions to a discussion board, or any other context that is oriented toward the entire class.
- Then, students are given tasks to do in their **individual spaces** where they work with higher-level applications, analysis, and creative work.

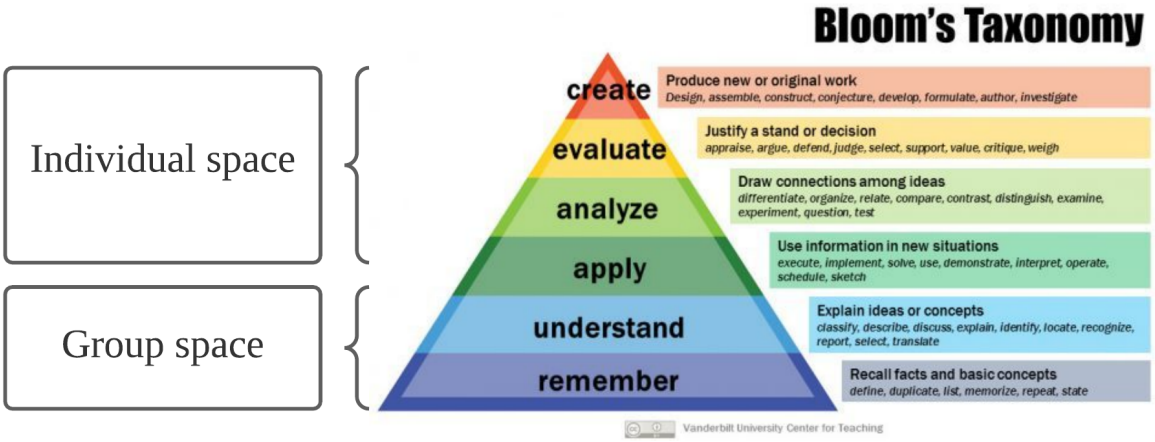
A helpful framework for understanding the traditional model and its alternatives is **Bloom's Taxonomy** (Bloom, 1956).



Bloom's Taxonomy is a framework for categorizing cognitive tasks by complexity, with *Remember* tasks at the lowest level of complexity and *Create* tasks at the top. Verbs that describe sample activities in each level are shown in the image.

The traditional model maps time and space onto Bloom's Taxonomy in a distinctive way:

- Group space is focused on the **lower third** of the taxonomy (*Remember* and *Understand*).
- Individual space is focused on the **upper two-thirds** of the taxonomy (*Apply*, *Analyze*, *Evaluate*, and *Create*).



We all know, and some of us love, the traditional model. But in recent years, we've come to see that it poses at least three significant issues for learners and instructors:

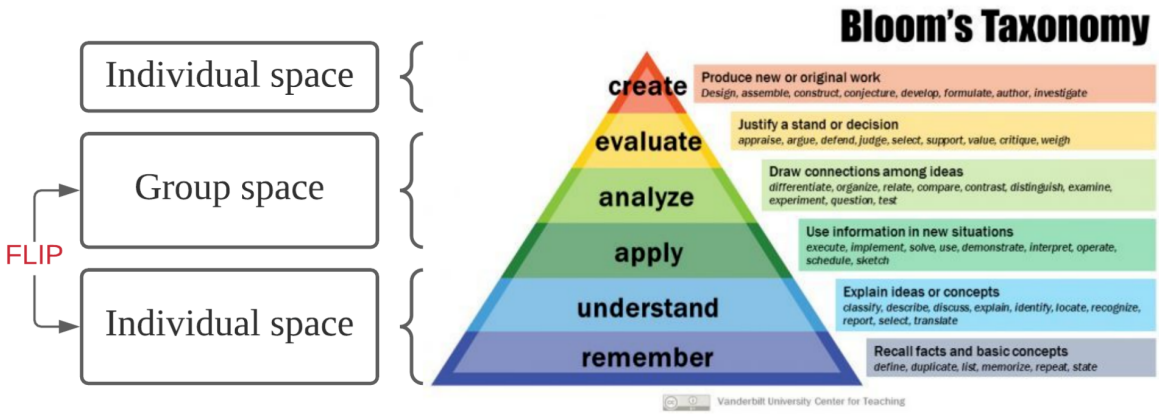
1. The traditional model **creates an inverse relationship between learners' *access* to help from peers and the instructor on the one hand, and the *need* for help on the other**. The simplest concepts, where learners typically need help the least, are being learned in the group space where access to help is greatest, and the hardest concepts are being learned in the individual space where access to help is least. This often leads to frustration, disengagement, and failure.
2. The traditional model **minimizes the amount of time that can be spent on active learning in the group space**. That time is crowded out by instructor-focused lectures on informational content and other basic parts of the lesson. Given the strong positive benefits of active learning (for example Freeman et al. 2014), *minimizing* active learning is not a great move for students.
3. The traditional model **typically does not present opportunities for learners to exercise self-regulation and self-teaching skills** that are vital for lifelong learning and productive careers. Instead, it assumes that learners have zero knowledge and cannot, or will not, learn basic concepts.

Given what we know about how learners often struggle with advanced concepts in college classes, what we know about the positive effects of active learning, and what we know about the centrality of self-regulated learning for the future of students, the traditional model puts today's learners at a disadvantage.

Flipped learning: A definition

The **flipped learning model** addresses these issues by performing one simple inversion of the traditional model's mapping of time/space onto tasks:

- In flipped learning, the **lower third of Bloom's Taxonomy** (*Remember* and *Understand*) is addressed by learners in their **individual space**, **before class**, through structured self-learning activities.
- Then, **group space is focused on the middle third** of the taxonomy (*Apply* and *Analyze*) through collaborative active learning tasks.
- Finally, **individual space, after class, is used again for the upper third** of the taxonomy (*Evaluate* and *Create*) with tasks that require extended time and effort.



The definition of flipped learning we will use throughout this workbook is based on this idea:

Flipped Learning is a pedagogical approach in which first contact with new concepts moves from the group learning space to the individual learning space in the form of structured activity, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter.

(This is a fork of the definition given by the Flipped Learning Network.)

By "flipping" the use of group and individual space in this way, we address the three big issues of the traditional classroom:

- Students have access to attention and help in *direct* (rather than inverse) *proportion* to the difficulty of the tasks they are working on.
- Instructors have *significantly more time for active learning* during group sessions thanks to the lower third of Bloom's Taxonomy, especially introductory lectures, being outsourced to pre-class activities.
- Students receive *practical experience with self-teaching and self-regulated learning* by completing the pre-class activities on a regular basis and receiving feedback on them.

What flipped learning is, and what it isn't

Our definition of flipped learning doesn't give many --- or any! --- specifics about what the teaching and learning environment should look like. It can look like many different things. In practice, different instructors implement flipped learning in many

different ways in different disciplines, and between subjects within a discipline. Flipped learning is a platform for teaching methods, not a specific instructional technique like inquiry-based learning, POGIL, the Oxford tutorial method, etc., and regardless of your preferred teaching method, as long as it's not nonstop lecturing, flipped learning will work with it.

You can think of flipped learning like an operating system on a computer or phone. A device's OS is distinct from the applications that run on it; the OS is not an app, rather it's a framework of foundation-level software that allows all your apps to work together and with the device itself. Likewise, flipped learning is not a teaching method; it's a framework that you "install" in your teaching and then "run apps" --- specific teaching techniques --- in that framework. And just like how on our phones and computers, some apps work better than others on a given OS, some teaching methods "run" better in flipped learning environments. Specifically, **any teaching method that centers on active learning will thrive in a flipped environment because of the pride of place flipped learning gives to active learning**.

That's what flipped learning *is*. There are also some things that flipped learning *is not*:

- **Flipped learning is not "videos before class, homework during class"**. This is an oversimplification that is perpetuated by the popular media. Video is not necessary for flipped learning, and homework in class isn't either.
- **Flipped learning is not just "assign readings before class, discuss the readings in class"**. Simply assigning readings often fails because students do not know how to structure time or how to read a text analytically. Unstructured pre-class activities usually fail for all but the most expert learners. Flipped learning, by contrast, insists on *structured activities before class*. We want active learning everywhere, in and out of class. For novices like our students, this is hard to achieve through an unstructured assignment.
- **Flipped learning is not "videos before class, more lectures during class"**. Using flipped learning simply to cover more material is abusing the model. Instead, we use the time liberated by moving direct instruction and other structured learning experiences out of the class to reinvest it in deep learning activities that involve students and activity.

Seven steps

Designing a flipped learning experience for students isn't magic! Anyone can do it. But you have to have the proper mindset and a systematic approach. In this workbook, we will use the following seven-step approach:

1. **Write a list of clear, measurable learning objectives for your lesson.**
2. **Remix the learning objectives so that they appear in increasing order of cognitive complexity.**
3. **Do a rough design of the in-class/group space activity.**
4. **Go back to the learning objectives list, and split it into "Basic" objectives and "Advanced" objectives.**
5. **Finish the design of the in-class/group space activity around the Advanced objectives.**
6. **Design and construct the pre-class activity around the Basic objectives.**
7. **Design and construct any post-class activities you intended students to do.**

You may notice that these steps are not in chronological order, so the planning process doesn't happen in the same order that's experienced by students or the instructor. This takes practice to understand, and that's what this workbook is for.

With that: Pick a course, pick a lesson, and grab a notebook --- and let's begin.

Step 1: Write the learning objectives for the lesson

In this step, you will:

...write a list of clear, measurable objectives that state what your students should be able to do once the lesson you've selected is complete.

We are doing this step because:

Clear, measurable objectives are the backbone and central nervous system of every effective course and lesson. All other pieces of the lesson --- activities, assessments, the tools you use, and more --- should be directly traceable to one or more of the

learning objectives. It's very difficult to hit a target you can't see. Without a list of clear, measurable learning objectives, you and your students will have no way of knowing what students are supposed to do with the concepts they encounter. So starting with a list of these will make things much simpler for you later and much easier for your students.

Notes on Step 1

What do we mean by "clear" and "measurable"?

- "**Clear**" means that the learning objective is understandable from the student's point of view. Technical jargon is minimal; the action described in the objective is concrete and familiar to the student; and the outcome is unambiguous.
- "**Measurable**" means that the performance of the action in the objective results in some form of product that can be assessed (by the instructor, by peer review, or by the student themselves); and it's possible to measure the performance of the student on that action relative to a standard and then give feedback on how to improve. Note well that *measurable* does not always mean *quantifiable*. It just means that students' attempts at the learning objective can be evaluated relative to a standard.

We are not saying here that every possible desired outcome of a course can or should be reduced to items on a checklist. For example, I want students in my upper-level mathematics courses to become comfortable with the concept of abstraction. This is a significant and desirable outcome, and it makes for a good objective on the *course* level, but since I cannot tell if students are "comfortable with the concept of abstraction" just by looking at them, I need to define some *tasks* for students to do that give evidence of that "comfort level", whatever I want this to mean.

This is also why it's important to pick the right verbs here. You want to avoid verbs that indicate internal states of mind --- like "know", "appreciate", "understand", "be comfortable with", etc. --- because these are neither clear nor inherently measurable. I want my students to "be comfortable with abstraction" --- great. But what will my students ***do*** to show me that they have this comfort level? What do I even mean by "comfortable"? Will they give an explanation of what abstraction means? Engage in a computational thinking activity where they generate an abstract rule from a set of observations? Write a proof of a theorem? Or what? The action verb that answers the question of "What do students need to do", is the *real* learning objective.

Example

Throughout this workbook, we'll use the following running example. Let's suppose we are tasked with **designing a lesson to teach students about academic integrity and plagiarism.** Maybe this is a lesson within a course, or perhaps we're teaching a freshman seminar where this comes up. What should students be able to do once the lesson is over? A quick brainstorm might yield the following:

- Define the terms *academic integrity* and *plagiarism*.
- Explain the importance of academic integrity in a liberal education.
- Give specific examples of forms of academic dishonesty and explain the differences between them.
- Understand the process for how faculty and the university deal with cases of academic dishonesty, and the consequences for violating academic honesty policies.
- Know where the university's official policy on academic integrity is located.

This is a solid start. In particular, the first two objectives are clear from the students' point of view (some of the terminology may be new, but the actions are concrete and unambiguous) and measurable (they are tied to actions that students can do, and that you will assess).

There are some issues though:

- The third objective is "double barrelled": It's actually two different objectives packaged as one thing --- *give examples* and *explain the differences between them*. It's OK to ask students to do both of these; but as cognitive tasks, they are different, and it's possible that a student could do good work on one and not on the other, and we might assess these separately. So consider unbundling them.
- The last two objectives, while important, are not clear or measurable. How will you know whether students "understand the process" of academic dishonesty? And how will you know if students "know" where the policy is located? There are different ways to do these things, and we need to be more specific.

After some editing, we might come up with this second version of the objectives. Additions are **<u>underlined and in bold</u>**; deleted text is ~~struck through~~.

- Define the terms *academic integrity* and *plagiarism*.
- Explain the importance of academic integrity in a liberal education.

- **List** specific examples of forms of academic dishonesty ~~and explain the differences between them~~.
- **Describe** the process for how faculty and the university deal with cases of academic dishonesty, and the consequences for violating academic honesty policies.
- **Locate** the university's official policy on academic integrity **online**.
- **Determine whether a specific situation involving academic integrity violates university policy or not.**

We're now clear on what we mean by "understand" and "know". We will ask students to *describe* the process of academic dishonesty in their own words to check for "understanding"; we will ask them to *locate* the academic honesty policy to see if they "know" where it is (i.e. we will ask them to navigate to it on a website, as opposed to something else like reciting the URL or telling us what page it's on). Also, the third objective has been split into two, with the former second half ("explain the differences") turned into a more interesting objective that is listed at the end that elaborates on the "explaining" we want students to do. Finally, while we were at it, the verb "Give" from the third example seemed a little ambiguous; so we changed it to "List".

Now you do it

Decide on a list of 3--8 learning objectives that meet the above criteria, and write them out. Remember to use action verbs; write clearly (because the student is the audience here); and make them comprehensive and yet minimal. You may need to make choices about what material to cover and what to leave out. Write your objectives in a list, for example in the space below. Just list these in the order in which they appear, or the order in which they occurred to you.

1. Objective:
2. Objective:
3. Objective:
4. Objective:
5. Objective:
6. Objective:

7. Objective:

8. Objective:

FAQs

Q: How do I decide on the learning objectives for my lesson?

A: Use your own judgment as a professional as to what students should be able to do, with skill and fluency, once the lesson is over. If you are having difficulty coming up with these, you can look at your textbook and other course materials. Ask yourself: *What seem to be the most common tasks that the textbook seems to highlight, in the examples and exercises and so on?* Textbooks aren't perfect but you can often reverse-engineer learning objectives from them if they are reasonably well-written.

Q: How many learning objectives should a lesson have? What if I only have one? What if I have over a dozen?

A: Typically, a 50-minute lesson should have between three and eight learning objectives. If you go through the process above and have only one or two objectives, you might be "double-barrelling" some of them by taking several separate objectives and bundling them together. This is what happened in our example. In this case, consider separating them out into independent statements. On the other hand, if you end up with more than 10, it's possible that your list is too fine-grained, and two or more learning objectives can be reasonably packaged together. For example, if your lesson includes a lot of terminology to define, you might have listed each term as a separate objective --- "State the definition of Concept A", "State the definition of Concept B", etc. It might make more sense to have *one* objective focused on defining terms generally speaking --- "State the definitions of the following concepts: Concept A, Concept B, ..." Or, you might simply be expecting to cover too many concepts in your lesson, in which case you may need to revisit your plans and scale things down.

Step 2: Put the learning objectives in order

In this step, you will:

...reorder the list of learning objectives from Step 1 so that it moves from simplest to most complex, mirroring the progression of tasks in Bloom's Taxonomy.

We are doing this step because:

We want students not only to be clear on what they will be doing, but also on how those tasks move from simple to complex. This will give them a scaffolding to use as they learn. It also sets us up for the remaining steps of the lesson design process.

Notes on Step 2

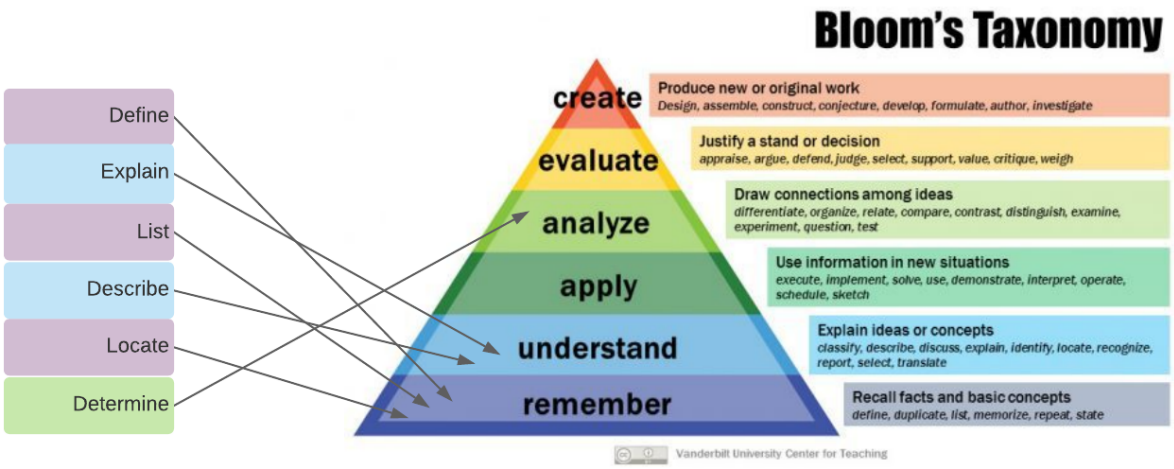
Bloom's Taxonomy is an extremely useful tool for organizing learning objectives in this step. You can just set your learning objectives on the left and the Bloom's Taxonomy diagram on the right, and then map one to the other. You have to be smart and make intelligent adjustments --- for example the word "differentiate", listed as an *Analyze* task in the pyramid, has a different meaning in Calculus, and is definitely more of an *Apply* task. But in most cases, using the Bloom pyramid as a sorting mechanism will yield the ordered list of objectives we're after.

Example

Back to the lesson on academic integrity, here is the list of learning objectives before sorting:

- Define the terms *academic integrity* and *plagiarism*.
- Explain the importance of academic integrity in a liberal education.
- **List** specific examples of forms of academic dishonesty ~~and explain the differences between them~~.
- **Describe** the process for how faculty and the university deal with cases of academic dishonesty, and the consequences for violating academic honesty policies.
- **Locate** the university's official policy on academic integrity **online**.
- **Determine whether a specific situation involving academic integrity violates university policy or not.**

This is the order in which those objectives occurred to me, but it's not completely in increasing order of complexity, since for example locating a website (fifth objective) is by most estimations a less complex task than describing a process (fourth objective). Here's how I might map the verbs in each of those, onto Bloom's Taxonomy:



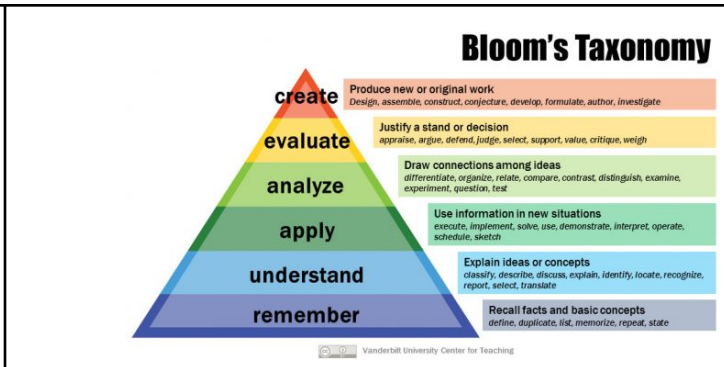
The resulting ordered list of learning objectives is:

- Define the terms *academic integrity* and *plagiarism*.
- Locate the university's official policy on academic integrity online.
- List specific examples of forms of academic dishonesty.
- Explain the importance of academic integrity in a liberal education.
- Describe the process for how faculty and the university deal with cases of academic dishonesty, and the consequences for violating academic honesty policies.
- Determine whether a specific situation involving academic integrity violates university policy or not.

You might map these tasks differently --- for example, the "Explain" objective could reasonably be considered an *Evaluate*-level task rather than *Understand* --- and that's OK. Use your judgment.

Now you do it

First, list the verbs from your learning objectives on the left and draw arrows to map them onto Bloom's Taxonomy on the right:

Now rewrite the list in order:

1. Objective:
2. Objective:
3. Objective:
4. Objective:
5. Objective:
6. Objective:
7. Objective:
8. Objective:

FAQs

Q: Does every lesson I plan need to have an instance from each of the six levels of the pyramid? For example, is it OK to have a lesson made entirely of "Knowledge" tasks?

A: It's not always that case that every level of Bloom needs to be populated. For example, there are courses in the health sciences that are entirely focused on medical terminology, and you might expect to see a lot of *Remember* tasks in such a course and not too many *Evaluate* tasks. Conversely some courses, for example capstone courses in a major or service-learning courses, may have very few low-level tasks and focus instead mostly on higher-level tasks. However, also beware of making your lessons too bottom-heavy with a preponderance of basic tasks with few higher-level

activities; or too top-heavy with lots of high-level tasks without enough low-level tasks to support them. If you find yourself giving only low-level tasks, consider ways to introduce higher-level tasks in your course design, and vice versa.

Step 3: Outline the in-class activities

In this step, you will:

...outline the active learning tasks students will do in class.

We are doing this step because:

Group space is the most scarce, therefore the most valuable, resource we have in teaching. We don't want to waste it on activities that are insignificant or which could be done with equal or greater effectiveness outside of class. So with the learning objectives in hand, we'll plan the activities we want students to experience, then work backwards to build the rest of the lesson.

Notes on Step 3

Although conversations about flipped learning often focus on what students do before class and the videos they watch (more on that later), **the real focus of flipped learning is on what students do during class** (in their group space). We want to focus valuable class time --- when students and instructors are together and can help each other --- on tasks that are rigorous, creative, and challenging and therefore benefit the most from being together. **Those activities usually involve the items in the middle third of Bloom's Taxonomy (*Apply* and *Analyze*) and therefore are probably in the bottom half of your remixed list of learning objectives from Step 2.**

Very importantly: We should not plan on spending significant time in the group space on objectives from the bottom third of Bloom's Taxonomy. In flipped learning, those objectives will be the focus of student *pre-class* work. It's OK to give some attention to the lower-level objectives; for example you might have time for questions over those objectives and the students' pre-class work, or have students take a quiz over them to start the class meeting, etc. But **do not reteach this material and do not plan on extensive lecture over it**. Focus instead on the middle third of Bloom's Taxonomy. (More on this later.)

These activities in the middle third of the taxonomy almost always work best if done using **active learning**. A classic definition of active learning is due to Bonwell and Eison (Bonwell & Eison, 1991, p. 19): "**Anything that involves students in doing things and thinking about the things they are doing**". The best research we have on student learning is unequivocal that active learning is best for students. We won't go into all the details here. We will merely take, as an axiom, that active learning should be at the core of all significant learning experiences; and the purpose of flipped learning is both to optimize and maximize active learning in the group space. (And in the individual space, as we'll see.)

So, in this step you need to think about activities that your students can do in class that address the hardest elements of your learning objective list. Target those objectives in the middle third of Bloom. This may be just a single objective! But if that one objective is so problematic that your students need to spend 45-50 minutes of laser-like focus on it in class, then so be it.

Example

Look back at the learning objectives for the lesson on academic integrity. After sorting the list in Step 2, we see that most of the objectives live in the bottom third of Bloom (*Remember* and *Understand*) with only one objective in the middle third:

Determine whether a specific situation involving academic integrity violates university policy or not.

A good plan for the class meeting is therefore to **focus on this one objective**. (I'm not assuming any particular length of time for the class meeting, although it might make a difference in what I plan.) So here's my very basic outline for a 50-minute class session:

- The first 5 minutes of class will be spent fielding questions from the pre-class work (which we will design later).
- The next 40 minutes will be spent on a case study activity where students are given some situations involving student work, then they are to work in small groups to apply the university policy on academic integrity and discuss as a class whether the situations violate those policies, and if so, what should happen next.
- Then the last 5 minutes will be spent wrapping up and asking students to write a one-minute paper on what they learned.

Notice that **the activity in the class is a direct instance of the learning objective**. If the objective is to "determine whether a specific situation violates university policy", then the objective basically tells me what to do in class: Have students practice with determining whether a specific situation violates university policy. There's no need to overthink it; look at the learning objective and let it do the work.

Now you do it

Answer each of the following:

1. **What are the main objectives to address from your list of learning objectives during in-class work?** Remember to focus on the middle third of Bloom's Taxonomy (which will be toward the end of the list).

2. Generally speaking, **what are you going to have students do** in class to show you how well they are mastering those learning objectives you just listed?

3. In your best professional judgment, **how long will this take**? (Recommendation: If your in-class activity is taking up more than 80% of your contact time (e.g. 40 out of 50 minutes), it needs to be shortened. Can some of it be done prior to class? Can some of it be moved to post-class? Can you give a simpler activity that still engages students at a high level?)

4. What other activities do you want students to do in class? How long will they take? When are they going to happen during the meeting? (Also: Are all of these necessary or useful enough to justify spending class time on them?)

FAQs

Q: What if students show up to class unprepared for the group space activity that I am designing?

A: This is an important question. We'll get to that later. For now, assume that they will be prepared.

Q: What are some ways I can free up even more time in my class for active learning?

A: Suggestions:

- **Don't give course announcements in class.** Make class announcements via email, on your LMS, or in a slide or a handout. This can free up more time than you might suspect. Insist to students that it is their responsibility to handle information flow.
- **Don't hand back papers in class**. Handing back a single graded quiz to a class of 30 students might take up 5 minutes of time simply moving paper from one place to another. That's not a good use of group space. Have students get papers during office hours instead. Or better yet, don't use paper at all, but rather electronic documents graded and returned through the LMS or a single-purpose GMail account.
- **Don't reteach material students were supposed to learn in pre-class**. To do flipped learning effectively, the no-reteaching rule must become an immutable law and an integral part of the culture of the course. Helping students navigate this, is something we'll take up shortly.

Step 4: Split the list of Learning Objectives in two

In this step, you will:

...determine which of the learning objectives will be learned before class and which ones will be learned during and after class, and separate your Learning Objective list into two parts.

We are doing this step because:

Two reasons:

1. Students need to know what's expected of them in their pre-class work, and also what isn't expected of them. Giving them a single monolithic lists of objectives adds confusion to the system because students won't have a sense of how to prioritize their pre-class work. It will appear that you want them to learn *everything* about the lesson before class, or *nothing* about it before class.

2. You, the instructor, need to know how to focus the in-class work and the pre-class work so that you're not taking spending/wasting time on objectives during class that ought to be relegated to pre-class work; or vice versa, making the pre-class work too difficult by including objectives that we don't really expect students to learn on their own.

Splitting up the objectives as described below will help on both counts.

Notes on Step 4

We now have a list of learning objectives that's ordered by cognitive complexity, and a sense of what is going to happen in class. The list of learning objectives shows all the tasks that students should be able to do in order to provide evidence of mastery -- *eventually*. The *timing* of student work on these matters, however. We don't need or expect students to show they've mastered every learning objective prior to coming to class; that's unrealistic, and if it were the case then there wouldn't be much of a need for a class. Likewise, the time we have for in-class work is scarce, and we don't want to take time away from middle-third objectives by spending it on simple objectives that can and should be learned before class.

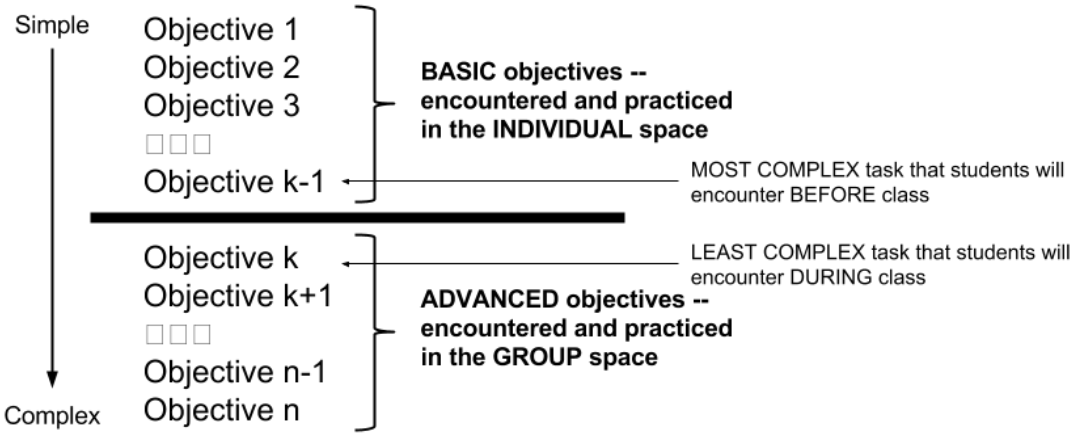
So in this step we are going to specify what students need to be able to do *before* arriving at class, and what they will focus on doing *during* and *after* class. We do this by simply **splitting the list of learning objectives in two** -- drawing a line that separates the pre-class objectives from the in-class objectives.

Where this line is to be drawn is a function of your experience and judgment. Look at your ordered list of learning objectives and ask two questions:

1. What single item on my learning objectives list is the *most advanced task* I can reasonably expect a student to be fluent with, *before class* through independent structured self-teaching?
2. What single item on my learning objectives list is the *least advanced task* that I plan on having students address through their active work *in class*?

By answering these questions, you'll discover a line of demarcation. On one side of the line are learning objectives that are simple enough that students can gain basic fluency on their own through structured self-teaching activity. On the other side of the line are learning objectives that are advanced enough that students might be able to pick up basic fluency on their own, but they will need to do active work with other students in class to really begin to "get it". We will refer to the objectives before this

line, the ones to be done before class, as the **Basic Objectives;** and the ones after this line, the ones to be done during and after class, we'll call the **Advanced Objectives.**



Step 4 simply consists of finding that line and using it to separate the one ordered list of learning objectives into two ordered lists as above.

Example

Here is the single ordered list of learning objectives from our academic integrity lesson:

- Define the terms *academic integrity* and *plagiarism*.
- Locate the university's official policy on academic integrity online.
- List specific examples of forms of academic dishonesty.
- Explain the importance of academic integrity in a liberal education.
- Describe the process for how faculty and the university deal with cases of academic dishonesty, and the consequences for violating academic honesty policies.
- Determine whether a specific situation involving academic integrity violates university policy or not.

As the instructor, I'd ask myself: *What is the most complex objective here that I can expect students in the class to learn on their own before class through a structured activity?* And, *what is the least complex task that I would like to focus on during class time?* The answer depends on many variables we haven't discussed such as the level and experience of the students, the overall goals for the course, and so on. Assuming the course is a

first-year seminar, or a module within a first-year course, I think I'd draw the line here:

- Define the terms *academic integrity* and *plagiarism*.
- Locate the university's official policy on academic integrity online.
- List specific examples of forms of academic dishonesty.
- Explain the importance of academic integrity in a liberal education.

---------- ← ***Line of separation***

- Describe the process for how faculty and the university deal with cases of academic dishonesty, and the consequences for violating academic honesty policies.
- Determine whether a specific situation involving academic integrity violates university policy or not.

I think I can trust first-year students to perform the first four objectives on their own prior to class through an appropriately-designed pre-class activity. The first three are definitely something students can learn through simple reading or video-watching activities and therefore can and should be farmed out to pre-class work rather than in-class lecturing; the fourth one is a little harder, but I think students can still do it well enough on a pre-class activity, and asking them to make this explanation would be a good way to put the informational-type objectives to work. The other two seem better suited for in-class group work, like I outlined in Step 3.

So I end up with these two lists:

BASIC objectives (to be learned prior to class):

- Define the terms *academic integrity* and *plagiarism*.
- Locate the university's official policy on academic integrity online.
- List specific examples of forms of academic dishonesty.
- Explain the importance of academic integrity in a liberal education.

ADVANCED objectives (to be learned during and after class):

- Describe the process for how faculty and the university deal with cases of academic dishonesty, and the consequences for violating academic honesty policies.
- Determine whether a specific situation involving academic integrity violates university policy or not.

Now you do it

Copy your ordered list of learning objectives from Step 2 and draw a line that demarcates Basic Objectives from Advanced Objectives. Ask yourself: Why am I drawing the line here?

1. Objective:
2. Objective:
3. Objective:
4. Objective:
5. Objective:
6. Objective:
7. Objective:
8. Objective:

FAQs

Q: How do I decide what's Basic and what's Advanced?

A: Use your experience and judgment as a professional. If you've taught the class before, think back to past students: What did they find boring to cover in class because the topics were so basic? Those are prime candidates for basic objectives. What did they struggle with during class, and would have benefitted from having more time and attention? Those are candidates for advanced objectives. If you've not taught the class before, seek out someone who has and ask them. And just realize, you might get this wrong and that's OK --- just be ready to listen to your students.

Q: What if my line is at the very bottom of the list --- that is, ALL of my objectives are simple enough to leave to students prior to class?

A: Then one of two things is likely to be happening. You might be focusing your learning objectives too low, and need some upper-half-of-Bloom objectives to round them out. Or, you might be overestimating what your students can do in their individual spaces. In the first case, think a little more about Step 2 and whether

students can and should be doing higher-level work in the lesson --- maybe not, maybe so. Use your experience and judgment and be creative, then adjust your list. In the latter case, watch out. While we don't want to underestimate students' abilities, it's also easy to overestimate them, and assign them work that they don't have the time or head-space to complete. Remember your lecturing (if there is any) is being moved mostly out of the class meeting so you will have lots more time for more advanced objectives in class. Try to keep things simple for students!

Q: What if my line is at the very top of the list --- that is, NONE of my objectives are simple enough to leave to students prior to class?

A: Then it's likely that you need to break down your learning objectives further and identify low-level tasks that you are taking for granted. For example, in the academic integrity lesson, suppose I only wrote down the last two objectives (which I moved into the "Advanced" list). Thinking carefully about those objectives, I may realize that in order to accomplish those objectives, students will need to do a lot of simpler things first that I might not have thought of, such as defining the terms correctly and being able to find the university's policy. Whatever those dependencies are, they should go on the list somewhere, usually in the Basic Objectives.

Another possibility is that you may be underestimating your students' abilities to learn things on their own, or assuming they won't do the pre-class work. This is understandable, but it's a soft form of bias and becomes a self-fulfilling prophecy in a hurry. Try not to go down that road.

Step 5: Finish the in-class activities

In this step, you will:

...complete the set of in-class materials that you can give out to students.

We are doing this step because:

Obviously it's because we haven't actually finished the group space activity yet. The goal here is to end this step with a finished product, ready to be deployed in class (or online if you are teaching an online or hybrid course). Whether that's a handout, a lab setup, discussion, etc. is up to you.

Notes on Step 5 / Example

We'll give both an example and some commentary at the same time here. The commentary is that **you don't necessarily need to make your own materials for group space activities all the time.** It's quite easy in some cases to just borrow/co-opt/steal from someone else who's been generous enough to create materials and then put them online for all to use.

For example, this website has nine separate case studies on academic integrity any one of which would be good for discussion, and any 3-4 of which would be an outstanding activity for a whole class focused on the Advanced learning objectives we picked out earlier --- especially the last one on the list, of which these case studies are direct instantiations. If I were the instructor, I'd read through all these, curate my favorites, and then just give out the URL to students in class (or a handout) along with instructions for the activity.

Also remember that the group space is also a time for reviewing the pre-class assignment and for doing metacognition on the lesson. So you might want to create an opening activity and a closing activity, respectively, for these. We mentioned potential opening activities in Step 3; here are some ideas for closing activities.

Now you do it

Write out answers to the following:

1. Is the main activity aligned with the Advanced Learning Objectives?

2. Are there parts of the main in-class activity that seem too simple (i.e. would fit better in pre-class activities), too advanced (i.e. would be better done after class), or redundant in a non-productive way?

3. Are the activities in your main activity substantive, challenging, appropriately pitched to the audience?

4. How will you assess student progress as they learn during this activity?

5. Do the other activities for your class session (entrance quizzes, exit tickets, etc.) make sense in the overall context of the class session? Do they take up too much time?

After answering the questions above, make out a rough timetable for what will happen and when during your class session below.

FAQs

Q: Does every Advanced objective need to be covered in my group space activity?

A: Not necessarily. Sometimes there are Advanced objectives that are so Advanced that only a reasonable start on them can possibly be done in class. For example, an objective that requires creating something (a model, project, poster, novella, etc.) requires more time and space than a typical class meeting allows. In that case, the objective is best suited for post-class activity (Step 7). But, you can often get students started on those objectives through group space work. In fact most very-high-level objectives are rooted in lower-level (but also Advanced) objectives, which can be the focus of group space.

Step 6: Write the pre-class activities

In this step, you will:

...write up the activity that students will do in their individual space to prepare for the group space activity.

We are doing this step because:

Although the heart of flipped learning is its focus on the group space, its distinguishing characteristic is its use of the individual space, before class. Many instructors *say* they want students to get meaningful work done prior to class, but flipped learning environments *insist* on it --- indeed they *depend* on it. So clearly we need to design the individual space or pre-class activity so that the likelihood of students completing it and learning from it is as high as possible.

Although the pre-class activities are the first thing that students encounter in a flipped lesson, writing those activities out is one of the *last* things instructors do in the planning process. That may seem counterintuitive, but it makes sense when you think about it: Before you can write good pre-class assignments, you have to have a sense of what students need to know and when they need to know it (Steps 1, 2, and 4) and also what we are building toward (Steps 3 and 5). The pre-class activity should be just enough to set students up for success in the group space. Now that we have a group space activity, we're ready to go.

Notes on Step 6

You have probably asked at some point in this process, *What if students don't come prepared for class?* Let's counter that with another question: *Why **wouldn't** a student prepare for class?* There are many answers to this question but they all hinge on a single idea: **motivation**. Simply put, if students *want* to prepare for class, then for the most part, they'll do it. So, what makes students *want* to complete an activity? It's usually a combination of the following:

- **The activity is simple.** The activity has an easily-understood structure, and the student work required is straightforward and perceived as "doable".
- **The activity is minimal.** The activity does not ask students to do more than is necessary and keeps extraneous cognitive load to a minimum.
- **The activity is engaging.** The work students are asked to do should spark their interest and encourage them to complete it.
- **The activity has clear value.** The activity is not just busy work but is perceived as being essential for further understanding.
- **The activity is failure-tolerant.** The activity should be relatively forgiving, even welcoming, of initial mistakes. Mistakes and errors should not be a source of stress. Rather, they should be collected and used as learning data.

Here is a framework, or template, that you can use for creating pre-class activities that fit these points. I've used this template with various modifications over the years, and it seems to generate consistently good results. It's gone by various names ("Guided Practice", "Preview Activities", "Daily Preparation", etc.) but whatever you call it, it's providing students with practice on the Basic learning objectives --- the "structured activity" that is a key part of the definition of flipped learning. Students are learning on their own, but not being thrown into the deep end of the pool, left to their own devices to learn difficult material without help.

The template consists of five parts:

1. **Overview**. This is a short, one-paragraph overview of the material students are about to encounter, with an emphasis on how it connects to other things they have learned.
2. **Learning objectives**. Here we simply reproduce the split list of learning objectives, clearly labeled "Basic" and "Advanced" that we created in Step 4. This way, students will know exactly what is expected of them in the activity (by reading the Basic list) and in the lesson as a whole (by reading the Advanced list).
3. **Resources for learning**. This consists of a recommended "playlist" of items that will help students engage with the basic learning objectives productively and set themselves up for success in the exercises that are coming up. Here we list any text, video, multimedia, or other resources that would be helpful for these tasks. **NOTE WELL: It doesn't have to be just video**.
4. **Exercises**. This section is the main area of activity for students. It consists of a small list of exercises that will instantiate the Basic learning objectives.
5. **Instructions for submitting work**. In the final section we give clear instructions on how to submit work.

Notice that pre-class activities are very simple to make up using this framework if you have been following the steps in this workbook. In fact, you already have the Learning Objectives lists written out; and it should be straightforward to write an Overview for the lesson. The work yet to be done is to generate a list of learning resources, write the exercises, and decide how you want students to turn in their work. Some thoughts on these tasks:

- Ideally, learning resources should be a mix of media --- video *and* text *and* websites, etc. and students should be allowed to use whatever they want that will help them learn. There is no need to "make sure students have watched the videos". Just give resources, perhaps mark a few as ones that all students should use, and then let students choose.
- **IMPORTANT: *Videos are not necessary for a successful flipped learning experience.*** A common misconception is that video is an essential part of flipping, but this is neither historically the case nor is it true today. The first instances of flipped learning in the university were in the early 2000's, predating YouTube by at least five years, and videos were either not made at all or else only recommended and not required[2]. I've written more about this on my blog.
- In many ways the exercises are the most important part --- not the videos or other resources. Take care to write a *small* number of *good* ones that collect good learning data, rather than a large number that are redundant or poorly made.

[2] More on the interesting history of flipped learning in my book *Flipped Learning: A Guide for Higher Education Faculty* (Stylus Publishing 2017).

- You don't need to "make sure students watch the videos" because the only thing that matters in the end is whether they have gained fluency with the Basic objectives and prepared for in-class work, and this template already has a means for determining this: The exercises. The means by which students learn how to work the exercises is secondary.
- Don't make pre-class assignments too long. A good rule of thumb is to think of your pre-class activities as replacing an in-class traditional lecture and making the estimated completion time no more than 1.5 times the length of the class. For example, a pre-class assignment for a single 50-minute lesson ought to be doable by an average student in 75 minutes or less, including time needed to watch videos. The first few times you do this, make sure to ask students how long it took them; shorten subsequent assignments down if it's too long.
- Student work on pre-class assignments should be collected before class if possible so that the instructor knows what students know before the in-class activities begin. Electronic methods of submission are probably the best way to do this.

Finally, a word about grading:. I recommend that **pre-class assignments should be graded on a Pass/Fail rubric, on the basis of completeness, effort, and timeliness only.** In my examples above, assignments are graded "Satisfactory" or "Unsatisfactory", with "Satisfactory" given if if the work is turned in on time (11:59pm of the evening before the class meeting) and each exercise on the assignment shows evidence of a good-faith effort to be right. "Unsatisfactory" is given if the work is late, if there is a question left blank, or if a response is an obvious random guess. This makes the assignment more failure-tolerant because students just have to *complete* the assignment to get full credit. And it's a lot easier to grade.

Examples

Below are links to some actual pre-class assignments I have given in two of my own courses. There are technical terms in these that you can simply ignore, and focus on the structure:

- Additive and multiplicative counting principles
- Propositional logic and truth tables
- Proof by mathematical induction
- Spanning trees for weighted graphs

And here's a full mock-up of a pre-class assignment for our lesson on academic integrity: https://bit.ly/academicintegrity-preclass-home

Now you do it

Do all these in a separate document that you will eventually give to students as an assignment.

1. Write out an overview for your lesson; or give a mind map or similar means of introducing the new material and connecting it to previously-learned materials.
2. Copy the split lists of learning objects you made in Step 4.
3. Gather any text, video, or other resources for learning that you can find or make and include this as a list in your document. Remember not to make this too long; and encourage students to add resources that they find and exercise choice in what resources they use.
4. Write up a short list of exercises -- "low hanging fruit" that students can do that will lead them through successful engagement with the Basic learning objectives.
5. Determine how students will submit their work, and give clear instructions on how to do this. If you have time, actually make up the form for submitting work and include a link to it.

FAQs

Q: OK, *now* can we talk about what happens if students don't do their pre-class work?

A: Sure, but there are really two questions here: (1) What do I do if students don't do their pre-class work? And (2) How do I prevent this from happening?

For this workbook we'll only briefly address the second of these questions. The first one is also important, but we don't want to lose focus on *course design*, and course design is a very important way to answer the question about how to prevent unpreparedness. It is something under our control and is a more positive and proactive stance to take. For a complete set of recommendations on both the *first* question, please see my book *Flipped Learning: A Guide for Higher Education Faculty*, especially Chapter 6.

Let's go back to *motivation* to answer the second question first. If students *want* to complete the pre-class assignment, generally speaking they will. So our goal is to create an assignment they want to finish. How do we do that?

The *structure* of the pre-class activity is the key. If the activity is minimal, simple, engaging, valuable, and failure-tolerant, then students are more likely to complete it than otherwise. The model introduced here is built with all those characteristics in mind. The overview and split list of Learning Objectives provides simplicity and clarity. The list of resources provides handholds for students to use, so it's engaging

and doable. The exercises (if well made) are valuable, engaging, and simple. And the grading process I mentioned --- Pass/Fail on the basis of completeness and effort --- makes it failure-tolerant.

Since I started structuring pre-class assignments in this way, I have typically seen 85% to 95% of my students earn a Pass grade on every pre-class assignment. Getting students to do the pre-class work simply has not been a major problem. This doesn't mean that every student masters the Basic learning objectives or is totally prepared for in-class work. Some students, a small number, consistently don't do the work. But the students who complete the work, which again is consistently almost all of them, know enough to be able to at least work productively with others who may understand more. I truly believe that, even if you do not adopt the template, if you structure the pre-class activity well and make it something students *want* to complete, then they will complete it.

On the other hand, if you give students pre-class assignments that are too long, too difficult, unfocused, unstructured, of questionable value for the in-class work, or just plain boring, then you can expect bad things to happen when class convenes.

But beware: Creating good pre-class assignments is only a *necessary* condition for students doing the work --- not a *sufficient* one. You can do everything you're supposed to, and still might have students who don't do the pre-class work, or who do it but didn't get fluent on the Basic objectives. For what to do in that situation, again please see my book. We need to take great care in writing pre-class activities to avoid getting ourselves into a mess; we need to also actually listen to and support students in case this isn't enough.

Step 7: Write the post-class activities

In this step, you will:

...design activities that are intended to take place after the group space activity from Steps 3 and 5 is over.

We are doing this step because:

The work of learning the material in your lesson isn't done just because class time is over. There could be learning objectives that take significant time and space to master --- more time and space than are available in a class meeting. It's completely within

the definition of flipped learning to have students doing extended work, to reach the uppermost levels of Bloom's Taxonomy, through post-class work, such as:

- Students might be tasked with completing a formal write-up of their in-class work to submit later as homework.
- Students might be given a post-class project that expands further upon the objectives done in class.
- Students might be given a lab or service-learning assignment that applies the advanced objectives to something even higher up Bloom's Taxonomy.
- Alternatively, students might be given more practice work that focuses on drill and mastery of the lower-level tasks on Bloom's Taxonomy.

Notes on Step 7

As indicated above, post-class activities typically range into the upper one-third of Bloom's Taxonomy --- the *Evaluate* and *Create* tasks. But really, post-class time is used for just that: Tasks that can't be done, or didn't get done, during class. Those tasks could occupy part of the group meeting as well as post-class time, for example an activity where students begin a creative process (essay, artwork, presentation, etc.) while together and then take their time to complete it later.

As instructors, though, we want to be mindful of time requirements for the work we give students outside of class. Remember that you're already having students do significant structured work outside of class in the pre-class activities. Try to use as much of the group space time during class as possible and take it easy when assigning post-class work.

Example

Our example of the academic integrity lesson might conceivably have no post-class activities if it's just a one-time module embedded in a larger course. But there are plenty of good options for post-class extended work as well, such as:

- Having students write an analysis of another real-world academic integrity case, using the tools and methods learned in the group space, to show they have independent fluency in that last learning objective.
- Perhaps more fun, students create their own case studies, then trade with another student and analyze.
  Students could conduct an interview with a professor about the professor's experience with academic honesty.

- Students could write their own syllabus language for academic integrity, which will be shared and evaluated by the whole class on a discussion board.

Again, don't overdo the workload, but use your creativity to have students engage with the upper levels of Bloom here.

Now you do it

- What advanced learning objectives from your list will need further attention after the in-class activity has been completed?

- What other learning objectives (Basic or Advanced) would benefit from further practice?

- What activities outside of class would provide continued engagement with the Advanced learning objectives?

- What activities outside of class would provide further depth and breadth with Basic learning objectives?

- Now make a list of activities to assign for post-class work. Estimate the time required for the average student to complete these activities.

- Write up the assignments you intend to give for post-class activity.
- Looking at the time estimates for the post-class activities and the time estimates for the pre-class activities, determine whether your total time requirements for out-of-class work average out to 2-3 times the amount of time spent in class. If it's more, then think of ways to trim back the size or extent of some of your activities.

FAQs

Q: ***So, Step 7 seems no different than a traditionally structured course.***

A: In some ways that's right. Every course regardless of structure has these extended activities that take time and space not available to us in class. The big difference here

in flipped learning is that we have devoted significant class time to drilling deeply into the Advanced learning objectives, so every student has a reference point for those objectives as they move forward.

The End: What to do next

Congratulations! Once you have completed the seven steps, you will have a complete lesson that uses the best instructional design practices we have, that conforms to the ideals of flipped learning. And once you have done this process for several lessons, it will begin to feel like a *habit* --- something that you don't have to think so much about as you do it again. That's the goal here: To have a scalable, semi-automated workflow that takes the guesswork and repetition out of the flipped course preparation process.

But this is far from the end! To go deeper, there are three things you can do.

1. **Connect with a community**. Look for communities of practice within your institution; a good place to start is to ask your institution's teaching and learning center --- or your Dean, if you don't have a teaching and learning center --- if they know of anyone else using flipped learning, and then meet with those folks either electronically or physically to trade ideas and stories. You can also look for online communities that extend across institutions to discuss flipped learning or teaching and learning issues in general; many professional organizations for specific disciplines, such as the Mathematical Association of America, maintain such communities. Or start your own!
2. **Keep learning**. As you use this process and implement flipped learning, you won't get everything to your or your students' satisfaction. That's to be expected. Make sure to solicit feedback from your students, not just at the end of the semester (when it does nobody any good) but often, during the course. *What's working with the way we have set up class? What could be improved? What questions do you have?* Gather feedback, analyze what isn't working well enough, and iterate rapidly.
3. **Share your work**. Changing up the way that you do your classes is interesting. Write about it! Put it on a blog. Give a talk to your department or professional organization. Or do a full research project where you collect data about a question of interest in your course and then publish it. But as part of the feedback loop needed for learning, get your efforts out there and show other people what you're doing.

Postscript: Questions we didn’t answer

There are many things not addressed in this workbook, but which you should think about and plan for. Some of those are addressed by the questions below. Many of these are addressed in *Flipped Learning: A Guide for Higher Education Faculty*.

- How are you going to deploy your materials? Through a LMS, a website, paper handouts, etc.?
- How will you handle issues involving access to technology? (For example, will you require all students to have 24/7 access to a high speed internet connection -- and what if a student doesn't have that?)
- What plan do you have in place if a student complains of having to "teach themselves the material"?
- What plan do you have in place if a student complains that you "aren't teaching"? (Or, that the student is "paying tuition to have a teacher" and you are not delivering?)
- Are you going to contact your department head and/or academic dean prior to running a flipped learning environment?
- Are you going to "flip" an entire class, or just part of one? If just a part, which parts -- and why not the others? Also, if you are only partially flipping, then how will you help students to adapt to the two different teaching modalities in your course?
- Are you going to make your own content for the course? If so, will you be doing your own video, your own text, or both of these? What tools will you use? What is your plan for completing the content in a timely way?
- If you are *not* creating your own content, where will you look for curated content, and what will be the basis on which you decide to give a resource to students?
- What plan do you have in place for making your flipped learning materials usable in the long term, so you don't have to rewrite them all the next time you teach the course?
- What plan do you have for sharing your work with others, either in your department or online?

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