

Flipping the College Classroom:

Practical Advice from Faculty

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How Universal Design for Learning Supports the Flipped Classroom

by Thomas J. Tobin, PhD

The concept of Universal Design for Learning (UDL) was initially developed in order to provide equal access to learning opportunities for all students, regardless of how courses are offered or the challenges faced by learners. However, there is still a widespread perception that UDL is appropriate only for learners with disabilities. Faculty members are usually not clear about what UDL is, why it benefits students and instructors, and how to integrate UDL principles. Especially for designers and faculty members who want to flip their classroom interactions, UDL is a key approach that facilitates student engagement.

What is UDL?

Before we can address how to integrate UDL principles into our flipped classrooms, we should ground ourselves in a few core definitions. UDL began in the disability-advocacy community as a way of creating a more inclusive society, generally. “Recognition of disability as a civil right entails making sure that a person with a disability has access to the buildings, classrooms, and courts where those rights are learned and adjudicated” (Davidson 2006, 126). UDL is an outgrowth of universal-design ideas in the built environment—such as allocating parking spaces for drivers with disabilities.

The research scientists at the Center for Applied Special Technology (CAST) came up with the concept of UDL based on the various ways in which our brains process learning tasks:

“Universal design for learning (UDL) is one part of the overall movement toward universal design. . . . While providing access to information or

to materials is often essential to learning, it is not sufficient. UDL requires that we not only design accessible information, but also an accessible pedagogy. . . . The framework for UDL is based in findings from cognitive neuroscience that tell us about the needs of individual learners. It embeds accessible pedagogy into three specific and central considerations in teaching: the means of representing information, the means for students' expression of knowledge, and the means of engagement in learning" (Rose et al. 2006).

We could see UDL through the lens of a medical model that perceives disability as a health issue, where disabilities are deficits that are inherent parts of individuals. This helps to explain why many people unconsciously associate negative emotions with their interactions with people who have disabilities (Stodden, Brown, and Roberts 2011): the "otherness" is associated with the people with whom we interact. Contrast this with a social model of disability, one in which disabling factors are in the environment. If a student in a wheelchair encounters a library building with no ramp, the disability is not part of the student—the disability is the poorly designed building itself. One way to move from the medical model to the social model is to think about designing the interactions in your flipped course for your learners who are using mobile devices like tablets and smartphones. How does UDL address "flippable moments"?

In the flipped classroom model, learners encounter new ideas outside of class time—and 85 percent of them today are using their smartphones to do so (Chen, Bennett, and Barber 2015). Students understand those new ideas best when they are presented in ways in which the learners take in information most smoothly. But how do professors and course designers know how each student learns best? Well, we don't. That's why UDL counsels us to present each piece of new information in more than one way: a "plus one" thought process.

With the flipped classroom model, it is best not to try to flip everything in a whole course. It's best to start by identifying "flippable moments" or places where active learning will add value to content mastery (Honeycutt 2013). Start by looking for places within the course where students are confused, bored, or where there's information they absolutely must know before moving on to the next part of the course. These moments are the places to invest the most time and energy in when flipping, and they can provide a good starting point for figuring out where to integrate UDL principles.

Imagine a single mother—call her Melissa—who is taking business management courses at her local community college. She has a job in order to be able to support her family, and she takes courses in the evenings and

on weekends. She does her homework, engages with the course readings, and completes her course projects after 10:00 p.m., when the kids are finally in bed. Her statistics professor has posted video clips in the learning management system as study aids toward the midterm and final exams, but Melissa cannot take advantage of the videos because she doesn't want to wake her children and she doesn't want to tune her kids out all together by using headphones. Melissa does not have a disability, but she does have a challenge: time.

Now, imagine if Melissa's professor provided transcripts of the audio in the video clips, or, better yet, captions. Melissa can turn down the sound, turn on the captions, and study for her course examinations, while remaining available in case her children need her. Adopting good UDL practices lets Melissa's professor reach out to her—and to all of her classmates—with options that allows her to choose how she experiences the materials that the professor has posted. This is a double win: the professor's work in creating the videos, plus one alternative version, is rewarded with more students actually using the resources, and the professor's students are rewarded with more flexibility in how they study for the course and learn its materials, concepts, and processes.

Where should I focus my UDL efforts in my flipped course?

Does this mean that UDL requires us to create all possible alternative formats for our content? If that were the case, when we create videos of ourselves explaining course concepts, for example, we'd have to create captions, a separate text transcript, an audio-only version, and so on. If we think of how many separate files we want to create in order to support the class flip in the first place, having to make five times that number of files seem like an insurmountable obstacle.

But UDL doesn't work like that. It's all about providing learners with choices and control about how they move through the interactions in our courses. To maximize the utility of out-of-class content without multiplying the workload, ask three questions about the course content as it's taught in a traditional fashion:

- Which concepts do learners traditionally find challenging?
- Where do they always get things wrong on tests and assignments?
- Where do they benefit from different approaches to the content?

These “pain points” in the course are the focus points to start creating your “plus one” alternative versions of existing content files. Select one primary and one secondary format for all course materials. For most of us, our text-based course materials—that we already have—comprise our primary

format, such as lecture notes, study guides, and practice quizzes, are the primary format. Then, by selecting a secondary format, such as audio-only, we are better able to do a whole course application of UDL within a narrowly defined scope.

UDL doesn't ask us to create materials to anticipate every possible use (e.g., students with visual disabilities, learners with poor Internet connections when they are going home on the bus), just to "design for the extremes," and add more ways of representing information later on, if and when new learner needs get expressed. CAST has created an Educator Worksheet to help professors and designers to work through this decision-making process (2011).

By offering instructional choices, students can select the learning pathways that work best for them—this is what differentiated instruction (DI) is all about (Livingston 2006). Just having more than one pathway through learning content and interactions opens up the benefits of differentiation; it is not necessary to plan for and execute every possible media approach in order to have a positive effect on student learning and persistence. A great place to start applying differentiated "plus one" design in the flipped classroom is with the use of media content. When you use videos to flip your classroom,

- consider alternative formats,
- integrate existing resources,
- segment them into smaller chunks, and
- design your videos to enhance or support specific learning outcomes.

This approach is more effective and engaging than recording every one-hour lecture for every class throughout the whole semester. The use of videos allows students to "pause and rewind the professor" (Ehlers 2014), but relying on videos alone to deliver the message does not address the needs of all learners.

Imagine a student on the football team at a large university in the southeastern United States: call him Jamaal. Jamaal is often on a bus or train, traveling to away games with his teammates. He already has a special arrangement that allows him to miss a certain number of in-person course meetings in his chemistry course, and he realizes that he's missing out on an opportunity for learning. He wants to keep up with his professor's narrated lecture slides, but his Internet connection is spotty when he is traveling. Jamaal has to wait until he is back on campus to be able to download and open his professor's PowerPoint slides from the course web-resources page, since his mobile phone doesn't have Microsoft Office on it. Jamaal does not have a disability, but he does have a challenge: resource availability.

Now, imagine if Jamaal's chemistry professor took the same narrated PowerPoint slides and created a screen-capture video version that the professor then uploaded to YouTube. Jamaal—and all of his classmates—could then stream the video, even under challenging bandwidth conditions, and he would not need any specific software title in order to experience the lecture slides.

How does UDL encourage active learning in the flipped classroom?

A final UDL strategy is to offer learners choices about how they demonstrate their skills. Many of us already know that it is a good idea to offer content to learners in more than way. The opposite is also true: when learners can choose how they show their knowledge, they tend to do better on assessments, projects, and quizzes.

For example, allow students to write a three-page essay or submit a four-minute audio or video clip. So long as the outcomes of the assignment are the same across all ways of doing it, you can grade an essay, an audio clip, and a video using the same criteria. A word of caution: If part of an assignment is the format itself (such as the margins, font attributes, and special sections of a business memo), then don't offer learners choices for those assignments—but do offer choices everywhere else.

Imagine a student—call her Amanda—whose National Guard unit is called up for an active-duty military tour of duty, right in the middle of her studies toward her nursing degree. Amanda's professor in her anatomy and physiology course requires all students to pass a two-part final examination in which the professor and student meet one-on-one and the professor quizzes the student in person on the names and locations of various parts of the human body. Amanda suspects that she will need to drop the course, since she will not be present to complete the final examination, and there are no options for demonstrating her knowledge in a different way. Amanda thought she could buy her own anatomical model, but a quick look online showed her that the model used by her professor costs more than six thousand dollars. Amanda does not have a disability, but she does have a challenge: distance.

Now, imagine that Amanda's professor offered students two different ways to take the final examination: in person (as above) or by Skype or other video-call software, using unlabeled diagrams provided by the professor ahead of time. The professor asks students to pan their cameras around themselves to show that there are no open books or study sheets being used; students can schedule the one-on-one time when and where it is most convenient to conduct the exam. Amanda uses the "private calls to home" area

where she is deployed in order to do her live session for the final exam, and is able to continue her studies.

Conclusion

All of the examples in this chapter highlight professors adopting UDL techniques in order to reach out to their students who are using mobile devices in order to overcome distance, time, and resource limitations—challenges to which we can all relate. These stories about designing course interactions for mobile learners provide all of us with motivation to put in the effort up front to design experiences that intentionally enhance student engagement, increase learning, and decrease potential barriers.

To get started, follow these five best practices for implementing UDL into your flipped course design:

1. Start new design processes with text

You probably already have a text-based version of a lot of your course materials. Use it (or create it) as a “base layer” of materials that can support alternatives like audio and video.

2. Create alternatives for all multimedia

Remember that you don’t have to create all alternatives—just one per element. Focus on creating alternatives first for the three “pain points” in your course where students have questions, get things wrong on tests, and ask for other explanations.

3. Design alternate ways for learners to demonstrate each course objective

This is a powerful approach. Give learners choices about how they show their skills, and they will tend to do better. Offer learners options like a written and spoken format, and be sure to use the same grading criteria and outcomes across all submission formats.

4. Break up tasks into separate components

Follow the mental rule of “ten and two.” Give learners information for about ten minutes, and then ask them to take some action for at least two minutes. In the flipped classroom, it is especially important to chunk up content and ask learners to take regular breaks to perform application tasks like posting ideas to an online discussion, going on an Internet scavenger hunt to find resources, or just to take time with pen and paper for reflection about what they’ve just read.

5. Expand, document, and share interactions in online courses using free or low-cost tools

Like the example of the professor who converted narrated slideshows into movie clips to which any student could get access, you should determine which resources in your course require special software to see or use—and then convert them to more accessible formats.

Adapted from the Magna Online Seminar presentation, *Using Universal Design to Support All Online Students*.

CHAPTER 3 REFLECTION AND DISCUSSION QUESTIONS

Use these questions for reflection, discussion, and application as you consider how to organize and plan successful flipped classroom learning experiences.

Reflection and Discussion:

1. Why it is important to integrate reflective strategies into your flipped classroom?
2. What are some ways you can learn more about your students, how they process information, and how they learn best?
3. How can the principles of UDL enhance the flipped classroom?

Application:

1. Review your lesson plan ideas from Chapters 1 and 2. How are you designing the lesson to address a variety of learners? Where do you see opportunities to make changes or modify your approach to reach more students and connect them to the course material?
2. Choose one activity or assignment for this lesson. Brainstorm three different approaches or alternatives. Consider all the ways students learn and process information.
3. Choose one of the alternatives you brainstormed in question 2. Now outline it in more detail. What is the purpose? Where does it fit into the lesson? When and how will students complete it? How will you know they completed it? What tools or resources do you need to design this idea? What tools or resources will you need to provide for students? Plan the specifics.

How Universal Design for Learning Supports Concept Mastery in the Flipped Classroom

by Thomas J. Tobin, PhD

Universal Design for Learning (UDL) aims to give all individuals equal opportunities to learn by creating interactions that work for everyone—not a single, one-size-fits-all solution, but rather flexible approaches that can be customized and adjusted for individual needs (CAST 2013). UDL helps with two aspects of the flipped classroom approach, specifically: 1) deep student engagement with first-exposure concepts, processes, and ideas; and 2) meaningful student expression during in-person group interactions.

UDL works best when learners receive feedback and encouragement about their progress in as close to real time as possible (CAST 2014). Especially since learners encounter new topics on their own, it's up to faculty members and course designers to structure the materials they are using in order to help keep learners engaged and interacting with the course concepts and with each other. This is one of the benefits of the flipped classroom model, as well. When students are engaging in activities and experiences during class, the instructor can immediately see their progress, identify areas of confusion, and provide resources and support to clarify misunderstanding and confusion. Students and instructors don't have to wait until a midterm or a final exam to make adjustments. This characteristic highlights the power of combining both the flipped model and UDL principles.

Because learners in the flipped classroom encounter new ideas outside of classroom-based or collective class time, it can be easy to misunderstand

the flipped classroom model to require only that learners read the textbook or watch the lecture or review course materials during time spent on their own. Under such a misunderstanding we would thus expect students to master key concepts without any guidance from the instructor at all (Plotnikoff 2013).

Such a scenario is, in fact, identical to the old “chalk and talk” traditional classroom model where students study their notes on their own or prepare individually before in-class sessions. The flipped classroom model does ask learners to collaborate most closely and immediately when they are in the classroom together. However, not only does this not preclude the possibility of interaction and collaboration during out-of-class activities, but the level of learner engagement in out-of-class activities correlates strongly to how active they are as participants during in-class activities. Thinking about out-of-class interactions through the lens of UDL helps us to design activities that keep learners engaged, focused, and on task—even (perhaps, especially) when they are encountering new concepts and materials.

The importance of clear expectations

When it doesn’t work well the first time, many instructors who try the flipped classroom model want to abandon it. In many such scenarios, neither the prof nor the students are clear about their roles and expectations. For example, if students are required to watch a video of a lecture, the instructor should say what they are supposed to do with that information. How do students know what information is important? How will they know what information will be applied during the upcoming in-person class session? This is why instructor presence and engagement are part of the out-of-class portion of the flip: We have to tell students explicitly what they should experience in their out-of-class encounters with new ideas. We have to be guides for their learning, even though we are not present to them in the classroom or via a live connection.

If instructors don’t clearly design a path towards success, from the perspective of the novice, then students will disengage and resist. Students who are truly beginners may get lost without some structure and guidance, and more advanced students may feel that they are “going through the motions” of easier work. This ambiguity causes frustration and can lead to apathy, which can be interpreted by instructors as “it didn’t seem to matter to the students.” Students and faculty members may revert back to the more traditional roles of lecturing and taking notes during class time rather than engaging in the higher domains of critical thinking and analysis.

When writing directions for assignments, for instance, adopt a “cooking

show” approach. Rather than list the steps for completing the assignment right away, talk to students about what they will accomplish, what the end result will look like, and what elements will earn points or credit for the assignment. Directions for assignments are also great places to include engagement messages from the instructor, like “In previous classes, students have said that this assignment is tricky; watch out for the shift in emphasis from earlier theories to later ones when you are creating your presentation,” or “I am confident that you all have the core skills to do well with this assignment, and I want to give you permission up front to make changes to this assignment to meet your personal course goals. Email me if you want to make a change in your response to this assignment.” Anything that allows learners to have a clear path and a sense of choice or control is both good universal design for learning and a good flipped class strategy for keeping learners on track and engaged outside of student-and-professor time.

Expressing concept mastery

This part of UDL for the flipped classroom model can be challenging to implement, but is also the most freeing for professors and students alike. Where possible, provide students with multiple ways to demonstrate their skills and learning. This does not necessarily mean having to create separate alternative assignments. Rather, look at the objectives for assignments and think of whether students must use a particular format in order to demonstrate those objectives, or if they can accomplish the same tasks in different ways. Also, figure out how much students need to do before they should take a moment to be reflective or take an action.

For example, break up tasks into information and engagement. Students might watch a five-minute video, read the first part of a textbook chapter for five minutes, and then take two minutes to reflect on the commonalities between the two resources. These reflection notes then feed forward into the next break for taking action, and create a foundation for richer in-class “flipped” conversation, as well.

Allowing learners to express their skills in multiple ways is often a new exercise for faculty members and course designers: if we ask learners to write a three-page essay, we can also allow them to choose to create an audio podcast or video report, so long as all of the alternatives provide students with the means to meet the required assignment objectives. Choice is a powerful motivational strategy. Not only is learner choice part of UDL, but it can be helpful in addressing some of the challenges of the flipped classroom model as well. Student motivation is often one of the top concerns for faculty members who flip their courses. If we can build in choice as an option for

completing assignments, then we are addressing this challenge through the application of the principles of UDL.

For some assignments, such as learning how to write a business memo, the format is an integral part of the assignment; learners who created videos in response to such an assignment would not demonstrate good memo format. However, there are many kinds of assignments where the format is not integral to the skill set being demonstrated. In those situations, offer students the chance to create their responses to the assignment in any format that meets the objectives, or provide a list of possible formats, such as a written response, a short video report, an audio podcast, or a hand-drawn diagram that students then photograph and submit.

Not only does allowing multiple means of expression free up learners to select their best skill sets, but it also makes grading less of a repetitive chore. Many faculty members would rather see varied and creative responses to an assignment than have to grade dozens of five-page essays. However, if varied assignments are used, then the instructor needs to be prepared with several assessment strategies to accommodate the variety of assignments. This is not meant as a deterrent to inviting students to submit assignments in other formats. Actually, it can open up the potential for more feedback and less grading if designed carefully.

For example, one way to address this challenge is to integrate both formative and summative assessment processes. Formative assessments—such as classroom assessment techniques—are designed for practice and allow students to test their skills and knowledge and receive feedback without the high stakes involved in grading (Angelo and Cross 1993). Formative assessment tasks may be graded, but the percentage toward the overall course grade should be low. These “practice” assessments allow students to test their knowledge and correct their mistakes while giving the instructor valuable feedback about how to proceed, based on learner performance and feedback.

Formative assessment activities provide ideal opportunities to try alternative assignment formats. In the business memo example, a flipped strategy would be for students to write a summary or record a one-minute video explaining in their own words how a memo is formatted and why it matters. Or, in another flipped strategy, students could be given a poorly formatted memo and asked to correct it by circling the errors and explaining how to make corrections. These activities would be completed during class time to allow students to practice analyzing, evaluating, and creating skills before they are given a summative evaluation such as a test, project, or final exam where the students would demonstrate mastery.

Conclusion

Here are some summary ideas about using UDL to foster concept mastery in a flipped class:

- **Look at interactions in the course from the perspective of a novice learner.** Don't just think like a beginning in the subject matter, but also think like a beginner who is using the tools or techniques, as well. Just writing "I know that the flipped classroom might be new to you; here are some hints about what to do when you read these articles" helps students to feel that it's okay not to be an expert at the mores and rules of the space in which they are interacting.
- **Set clear expectations for both learners and instructor behavior.** Faculty members and developers are typically very good at telling students what to do, and when, and how many points it will be worth. We can be less forthcoming about our own behaviors. Student anxiety and uncertainty goes way down when we tell them, for instance, how long they should expect to wait for a response during out-of-class communication sessions—and put that note right into the discussion forum or communication venue so they will see it when and where they need to see it.
- **Build in choices and paths for the interactions in the course.** Especially for moments when students encounter new ideas on their own, make sure they are not completely alone. Put in explanatory and encouraging notes from the instructor, video snippets with advice and ideas about how the student should approach and think about the content—anything that increases the instructor's presence for students while they are moving through content and interactions on their own. Offer them choices, too, about how they demonstrate their skills, especially on projects and tests.

By introducing multiple ways for students to demonstrate mastery and test their knowledge, your students will become more engaged and prepared for their in-person class time. And by modeling different approaches and formats to the students, you can motivate your students to do the same when they complete their assignments.