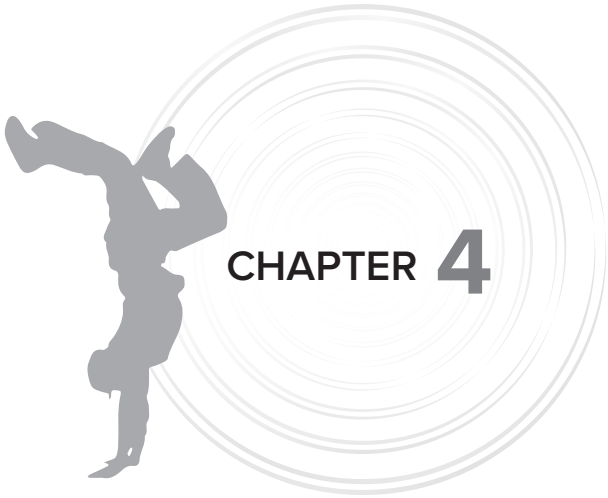

CHAPTER 4

how to implement the flipped classroom

When we talk to teachers about flipping their classrooms—even enthusiastic, motivated teachers—we hear the same two questions over and over: "Where will the videos come from?" and "How will I fill my in-class time?" In this chapter, we address the logistics of implementing a flipped classroom. We'll help you decide whether making your own videos or finding high-quality videos is your best approach, as well as offer a few tips on both. Finally, we share suggestions from teachers in multiple content areas on how to make the most of the extra time your gain in your flipped classroom.

Homework: The Videos

A temptation for teachers new to the flipped classroom is to create a video for everything. When we began this journey in 2007, we really did not have a choice except to create our own content. Needless to say, there is now plenty of high-quality instructional video content available. There is also some not-so-great content out there, however, so buyer (or viewer) beware.

Before jumping into video production, carefully consider whether or not a video is the appropriate instructional tool for your desired educational outcome. If a video is appropriate, then proceed with planning and creating (or finding) one. If a video is not appropriate, then do not make one just for the sake of making a video. Doing so would be a disservice to your students and would be a prime example of "technology for technology's sake." Only employ the technology if it is an appropriate tool for the task at hand. Use your professional judgment, ask your peers and mentors, and even ask your students.

Probably the single most daunting task teachers face when trying to flip their classrooms is accessing or producing high-quality videos. When we make our videos, we sit in our classroom and talk to the computer and each other. This is much more difficult than teaching in front of a live audience. Students are not present, and thus we have to bring a somewhat artificial dynamic presence. We don't want to bore our students with dry videos, so we try to make them interesting. Sometimes it takes a number of tries and a lot of time. If you don't have the time to create your own videos, struggle with technology, or are not comfortable speaking in front of a computer screen, we encourage you to think about using somebody else's videos as you implement a flipped classroom. (If you are already very comfortable both with technology and with recording, on the other hand, you may want to skip ahead to the "Making Your Own Videos" section.)

Using Other Teachers' Videos

Video Playlist

Using videos produced by other teachers rather than recording your own may be your best option as you begin flipping your classroom. If you find a gifted teacher who has already made videos in your subject, by all means, feel free to use them. Some time ago we made our chemistry videos available online. Many chemistry teachers who wanted to flip their classrooms simply used our videos and did not produce their own. Others used our videos for some of the flipped lessons but created their own videos for the rest. (Scan the QR code to check out some of Jonathan's recent videos.) With the explosion of YouTube and other video sharing sites, the number of videos is exponentially growing. Many of these videos can be used in a flipped classroom. It is important to note that you need to exercise care when using others' created resources to avoid copyright violations. Always link to videos rather than downloading and distributing them. Also, if you use any video content that resides behind a paywall, be sure that you have the permission to share them with your students. Always give credit where credit is due, and never distribute videos without the appropriate authority to do so.

The key is to find quality videos regardless of your subject matter. Where do you find good-quality videos? There's not an easy answer. Depending on your subject, you may have to look far and wide. However, the exponential growth of free online video resources is making the search increasingly easier. That said, finding videos that are also aligned to your state and local standards, or even in your language, sometimes may be more difficult than creating your own. There are some amazing YouTube channels with educational video content you can use, but digging through the entirety of YouTube or Vimeo to find just the right fit could be overwhelming. Fortunately, if you don't want to mine those massive video repositories, smaller education-oriented options are available. Table 4.1 offers a few good starting points for teachers to begin their video curation journey.

TABLE 4.1 Recommended Sources for Education Videos

Video Source	Description	QR Code
PBS Learning Media	Resources from PBS, searchable by grade level	
National Geographic Education	Searchable by grade level or topic	
Annenberg Learner	Repository of programming on many topics for education use	
Teachertube	Teacher-created videos for classrooms	
Math TV	Math videos from basic math through calculus	
Schooltube	Teacher-created videos	
Jonathan's YouTube Channel	Jonathan's YouTube channel with science content and flipped learning videos	

Video Source	Description	QR Code
Mr. Wootube Channel	Eddie Woo's (Australian Educator and friend) YouTube channel, a great source of math videos	
Crash Course History	Hank Green's YouTube channel for all things history-related	

Making Your Own Videos

When we talk about recording a video, most teachers think of a video camera on them while they teach their class. Although this might be effective in some cases, we believe there are better ways to make videos for use in the flipped classroom. We have used a variety of methods to create instructional videos, with the most common being screencasting programs, such as Camtasia and Screencastify. Screencasting applications capture anything on your screen, your voice, a small webcam feed of your face, and any digital pen annotations you make. The pen feature is especially useful for lessons that involve mathematical problem-solving. Creating slides ahead of time with a bunch of numbers appearing on a PowerPoint slideshow is not as dynamic as sharing, in real time, what you write with a pen and describing your thought process as you explain a problem. Other features, such as picture-in-picture, video clips, and many other post-production items can be added to improve the quality of the videos.

For more information and tips on video creation, please see the appendix, "Best Practices for Making Quality Educational Videos."

ISTE STANDARD IN ACTION

Designer (2.4.a)

You certainly can't do it all on your own, and it can be overwhelming trying to create video segments for key areas of your content. Flipping provides you with an excellent opportunity to collaborate with your teaching team or other content teachers.

Getting together with colleagues, reviewing how they approached the same content, and trading resources really expanded my thinking and helped me to realize I was not in this by myself! Over time, I collaborated with other content teachers via social media and found another level of approaches and resources to draw from!

—JOHN PADULA, TECHNOLOGY INTEGRATION SPECIALIST, HOPKINTON, MA

Class Time

Once you've set up your flipped class and made (or chosen) your videos, you will find yourself with extra time, a luxury you probably have never had in your career as a teacher. Many years ago, while we presented at a conference in British Columbia, one young teacher asked what all teachers who flip inevitably ask: "If I use your model, what will I do with my kids each day in class?" She realized that most of her time in class was spent standing in front of the room and talking to her students. If her "talking" was prerecorded, what would she do each day? This led to a great conversation about what kinds of activities would truly engage her students.

Despite the attention that the videos get, the greatest value added to any flipped classroom is the in-class time that every teacher must evaluate and redesign. Because we shifted our direct instruction outside of our classroom, our students over the years have been able to conduct higher quality and more engaging activities. Teachers who adopt the flipped model

use the extra time in myriad ways depending on their subject matter, location, and style of teaching. We asked some of our colleagues to share how they have changed their class time. Following are some examples, but we would encourage you to check out our series of subject-specific books for more information (see iste.org/books).

Foreign Language Classes

In foreign language classes, teachers are recording grammar lessons and conversational starters so as to create time in class to use the language more practically. This includes engaging in more conversation, reading literature, and writing stories, all in the target language. We visited one of these classes, a level 1 class, and observed students actively speaking Spanish. They were responding and gesturing in ways that corresponded to the teacher's instructions, which were entirely in Spanish. He would then ask students questions, and they would respond in Spanish. He reported to us how the videos had freed him to do more of these engaging activities in his classroom.

> *"I was shocked at how much better my students who spoke little to no English did in my classes. I teach a lot of technical concepts in the engineering technology department, and when I started using flipped learning the English learner's grades skyrocketed."*
>
> —Jason Hlavacs Ed. D., College Adjunct Professor, Triton College, Melrose Park, IL

Math Classes

Math teachers are finding the time to really help their students engage with deep analysis of mathematical concepts. Others are embracing math manipulatives and emerging technologies where students are engaged not just in learning the algorithmic computation, but also in deeply wrestling with the intricacies

of the math concepts. Flipped math classes are becoming laboratories of computational thinking, inquiry, and connectedness with other areas of science, technology, engineering, and mathematics.

Science Classes

POGIL

One concern about the flipped classroom that has been recently posed is whether flipping is compatible with an inquiry approach to teaching science. We and others have responded with a resounding yes. Flipping a science class creates more time and more opportunities to include inquiry learning. In science classes, teachers who flip have time for students to engage in more inquiry-based activities and to conduct more in-depth experiments. In the chemistry education community, POGIL (Process Oriented Guided Inquiry Learning) has become a powerful tool for students to create conceptual understanding without direct instruction (scan the QR code to learn more). The flipped classroom is ideally set up for this type of learning, and we have incorporated many POGIL activities into our classroom. When a well-written POGIL activity is conducted, the students learn all they need to learn via guided inquiry, and there is no need to teach the material with a video. In cases such as this, we use the POGIL activity as the instructional tool in lieu of a video. However, we've found that some students still use our instructional videos as a secondary resource for remediation.

Social Science/Language Arts/Humanities Classes

Social science instructors report using their extra time to discuss current events in light of the previous night's instructional video. Others are finding time to delve deeply into original document analysis. There is more time to debate, give speeches, conduct *pro se* court, and discuss what students are learning more deeply—without having to worry about a robust conversation being interrupted by a bell. There's plenty of time

to write, write, write, and even more time to analyze and discuss each other's writing through peer review.

Physical Education Classes

We were surprised to hear that some of the teachers most excited about flipped classrooms were physical education teachers. This dynamic team of teachers realized the flipped class had great potential in their courses. They told us that the most important aspect of the physical education class is for their students to be moving. Physical education teachers reported that they spent too much time teaching students such topics as the rules of games and necessary techniques. By making videos of rules and technique demonstrations, the teachers enabled students to more quickly get moving and participating in the important physical education activities when they arrived at class.

> *Flipped learning was for me like 'opening a window in a dark room.' When I learned about this approach, I was already giving up on my career as an educator, because I saw that my students were not learning. By using flipped learning I achieved my goals as an educator and my students achieved their learning objectives."*
>
> —Jonathan Da Rocha Silva, Neuroeducator, Higher Education, Group Sura, Colombia

Project-Based Learning

Another concern is whether or not a flipped class is compatible with project-based learning. Again, we cheer yes. We love the idea of discovery-based learning driven by student interest. Most of us do not operate in an environment that allows for this, but educationally speaking, it is enticing and has great benefit. Picture a class driven by student-identified problems or interests: Students are exploring a real-world problem and

developing solutions, and then suddenly realize that they need to know how to perform a particular mathematical function in order to execute their solution.

The teacher now faces a decision. Does she spend valuable class time teaching the entire class how to perform the appropriate math and risk boring the advanced student and losing the student who struggles? Or does she create an instructional video (or perhaps access an archived one) to give the students what they need, without sacrificing class time for direct instruction? Marrying the technological tools and asynchronous content delivery used in a flipped classroom with a student-directed approach to deciding what is learned can create an environment in which curiosity thrives. There is no need to spend time reintroducing concepts that are well established and just need to be quickly presented and learned, or to use valuable class time to deliver new content.

Student-Created Content

Flipped classrooms can give students more time to create their own content. Students today have a broad range of ways to create content to demonstrate their understanding of various topics. They can create blogs, videos, podcasts, or many other educational products that help them build on their knowledge. We see great value in student-created content, and these can also be used in subsequent academic years as instructional content.