

THINGS YOU SHOULD KNOW ABOUT...™  
FLIPPED CLASSROOMS

## Scenario

For the past two weeks, Kyle has been taking a flipped course in designing food gardens. Before he attends each class, he watches videos of short lectures recorded or recommended by his instructor. Each lecture comes with a brief online quiz that offers him immediate feedback on whether he missed any essential points. Today as he enters class, he glances at the schedule on the whiteboard. For the first half hour, teams will discuss how the content of the video lectures on microclimates, insect predation, and disease control will inform their team projects. Professor Dalton circulates among the tables to see if anyone has questions.

Kyle's team will be repurposing an area the size of an urban backyard into a visually appealing garden that is also a functional food source. It's part of the larger class project to reclaim a strip of city land by building a demonstration food garden. "I think we should bring in disease-resistant blueberries, grapes, and pome fruits," says Coleen, looking at the rough drawings they have made so far. Dalton stops to look over their design. "Check the nursery catalogs on the front table," he suggests. "Disease-resistant strains are clearly marked in their listings." As they search the catalog and discuss which diseases might be a problem in dwarf apples, pears, blueberries, and grapes, Kyle enters their cultivar choices in their Google Docs space. They are turning to a discussion of microclimates and plant placement when a chime signals discussion is over.

In the second half of the class, team monitors each retrieve two flat boxes from the front of the class. One box contains a stack of pins and various leaves preserved in plastic. The second box has a foam insert topped by a paper grid; each square is labeled with a nutritional deficiency or a disease common to food plants. During the next half hour, each team is to identify the disease or nutritional deficiency and pin the correct leaf in the right spot on the grid. Dalton is on hand, directing attention to clues and sometimes challenging their choices.

As he leaves, Kyle reflects that the hands-on activities have given him a far better grasp of the information and more confidence in what he has learned than he could have gotten from an in-class lecture.

## 1 What is it?

**The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed.**

Short video lectures are viewed by students at home before the class session, while in-class time is devoted to exercises, projects, or discussions. The video lecture is often seen as the key ingredient in the flipped approach, such lectures being either created by the instructor and posted online or selected from an online repository. While a prerecorded lecture could certainly be a podcast or other audio format, the ease with which video can be accessed and viewed today has made it so ubiquitous that the flipped model has come to be identified with it.

The notion of a flipped classroom draws on such concepts as active learning, student engagement, hybrid course design, and course podcasting. The value of a flipped class is in the repurposing of class time into a workshop where students can inquire about lecture content, test their skills in applying knowledge, and interact with one another in hands-on activities. During class sessions, instructors function as coaches or advisors, encouraging students in individual inquiry and collaborative effort.

## 2 How does it work?

**There is no single model for the flipped classroom—the term is widely used to describe almost any class structure that provides prerecorded lectures followed by in-class exercises.**

In one common model, students might view multiple lectures of five to seven minutes each. Online quizzes or activities can be interspersed to test what students have learned. Immediate quiz feedback and the ability to rerun lecture segments may help clarify points of confusion. Instructors might lead in-class discussions or turn the classroom into a studio where students create, collaborate, and put into practice what they learned from the lectures they view outside class. As on-site experts, instructors suggest various approaches, clarify content, and monitor progress. They might organize students into an ad hoc workgroup to solve a problem that several are struggling to understand. Because this approach represents a comprehensive change in the class dynamic, some instructors have chosen to implement only a few elements of the flipped model or to flip only a few selected class sessions during a term.

## 3 Who's doing it?

**A growing number of higher education individual faculty have begun using the flipped model in their courses.**

At Algonquin College, a video production class has been using this model to explain the workings of editing software, a procedure that is notoriously difficult to explain in a standard lecture. Short tutorial video lectures let students move at their own pace, rewind to review portions, and skip through sections they already understand,

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meaning students come to class able to use the software and prepared to do creative projects with their peers. A particularly successful example of a blended and flipped class in accounting at Penn State accommodates 1,300 students. In-class time is used for open discussion, a featured guest speaker, or hands-on problem solving where instructor support is supplemented by student assistants. At Harvard University, one physics professor not only employs the flipped model but has also developed a correlative site, Learning Catalytics, that provides instructors with free interactive software enabling students to discuss, apply, and get feedback from what they hear in lecture.

#### 4 Why is it significant?

In a traditional lecture, students often try to capture what is being said at the instant the speaker says it. They cannot stop to reflect upon what is being said, and they may miss significant points because they are trying to transcribe the instructor's words. By contrast, the use of video and other prerecorded media puts lectures under the control of the students: they can watch, rewind, and fast-forward as needed. This ability may be of particular value to students with accessibility concerns, especially where captions are provided for those with hearing impairments. Lectures that can be viewed more than once may also help those for whom English is not their first language. **Devoting class time to application of concepts might give instructors a better opportunity to detect errors in thinking**, particularly those that are widespread in a class. At the same time, collaborative projects can encourage social interaction among students, making it easier for them to learn from one another and for those of varying skill levels to support their peers.

#### 5 What are the downsides?

The flipped classroom is an easy model to get wrong. Although the idea is straightforward, **an effective flip requires careful preparation**. Recording lectures requires effort and time on the part of faculty, and out-of-class and in-class elements must be carefully integrated for students to understand the model and be motivated to prepare for class. As a result, introducing a flip can mean additional work and may require new skills for the instructor, although this learning curve could be mitigated by entering the model slowly.

Students, for their part, have been known to complain about the loss of face-to-face lectures, particularly if they feel the assigned video lectures are available to anyone online. Students with this perspective may not immediately appreciate the value of the hands-on portion of the model, wondering what their tuition brings them that they could not have gotten by surfing the web. Those who see themselves as attending class to hear lectures may feel it is safe to skip a class that focuses on activities and might miss the real value of the flip. Finally, even where students embrace the model, their equipment and access might not always support rapid delivery of video.

#### 6 Where is it going?

As the flipped class becomes more popular, **new tools may emerge to support the out-of-class portion of the curriculum**. In particular, the ongoing development of powerful mobile devices will put a wider range of rich, educational resources into the hands of students, at times and places that are most convenient for them. Greater numbers of courses will likely employ elements of the flipped classroom, supplementing traditional out-of-class work with video presentations and supporting project-based and lab-style efforts during regular class times. At a certain level of adoption, colleges and universities may need to take a hard look at class spaces to ensure they support the kinds of active and collaborative work common in flipped classes.

#### 7 What are the implications for teaching and learning?

The flipped classroom constitutes a role change for instructors, who give up their front-of-the-class position in favor of a more collaborative and cooperative contribution to the teaching process. There is a concomitant change in the role of students, many of whom are used to being cast as passive participants in the education process, where instruction is served to them. **The flipped model puts more of the responsibility for learning on the shoulders of students while giving them greater impetus to experiment**. Activities can be student-led, and communication among students can become the determining dynamic of a session devoted to learning through hands-on work. What the flip does particularly well is to bring about a distinctive shift in priorities—from merely covering material to working toward mastery of it.

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