The Flipped Classroom

Online instruction at home frees class time for learning

By BILL TUCKER

Four years ago, in the shadow of Colorado's Pike's Peak, veteran Woodland Park High School chemistry teachers Jonathan Bergmann and Aaron Sams stumbled onto an idea. Struggling to find the time to reteach lessons for absent students, they plunked down $50, bought software that allowed them to record and annotate lessons, and posted them online. Absent students appreciated the opportunity to see what they missed. But, surprisingly, so did students who hadn't missed class. They, too, used the online material, mostly to review and reinforce classroom lessons. And, soon, Bergmann and Sams realized they had the opportunity to radically rethink how they used class time.

It's called "the flipped classroom." While there is no one model, the core idea is to flip the common instructional approach: With teacher-created videos and interactive lessons, instruction that used to occur in class is now accessed at home, in advance of class. Class becomes the place to work through problems, advance concepts, and engage in collaborative learning. Most importantly, all aspects of instruction can be rethought to best maximize the scarcest learning resource—time.

Flipped classroom teachers almost universally agree that it's not the instructional videos on their own, but how they are integrated into an overall approach, that makes the difference. In his classes, Bergmann says, students can't just "watch the video and be done with it." He checks their notes and requires each student to come to class with a question. And, while he says it takes a little while for students to get used to the system, as the year progresses he sees them asking better questions and thinking more deeply about the content. After flipping his classroom, Bergmann says he can more easily query individual students, probe for misconceptions around scientific concepts, and clear up incorrect notions.

Counterintuitively, Bergmann says the most important benefits of the video lessons are profoundly human: "I now have time to work individually with students. I talk to every student in every classroom every day." Traditional classroom interactions are also flipped. Typically, the most outgoing and engaged students ask questions, while struggling students may act out. Bergmann notes that he now spends more time with struggling students, who no longer give up on homework, but work through challenging problems in class. Advanced students have more freedom to learn independently. And, while high-school students still occasionally lapse on homework assignments, Bergmann credits the new arrangement with fostering better relationships, greater student engagement, and higher levels of motivation.

Once Bergmann's and Sams's lessons were posted online, it wasn't long before other students and teachers across the country were using the lessons, and making their own. Across the country in Washington, D.C., Andrea Smith, a 6th-grade math teacher at E. L. Haynes, a high-performing public charter school, shares Bergmann's enthusiasm, but focuses on a different aspect of the flipped classroom. Smith, who has taught for more than a decade in both D.C.'s public charter and traditional district schools, immediately saw the benefit for students, but says she was most captivated by the opportunity to elevate teaching practice and the profession as a whole. As Smith explains, crafting a great four- to six-minute video lesson poses a tremendous instructional challenge: how to explain a concept in a clear, concise, bite-sized chunk. Creating her own videos forces her to pay attention to the details and nuances of instruction—the pace, the examples used, the visual representation, and the development of aligned assessment practices. In a video lesson on dividing fractions, for example, Smith is careful not to just teach the procedure—multiply by the inverse—but also to represent the important underlying conceptual ideas. Like Bergmann, she makes it clear that the videos are just one component of instruction. She's keen on the equivalent of a motion picture's "director's cut," where a video creator might explain the reasoning behind the examples chosen and how she would extend those activities into class time.

"Flipping" is rapidly moving into the mainstream. Bergmann and Sams have completed a book, are in high demand across the country at educator conferences, and even host their own "Flipped Class Conference" to train teachers. The chief academic officer at Smith's school, Eric Westendorf, is taking the tools he has piloted at the school and building them into a platform for teachers everywhere to create and share videos. Most notable, though, is the emergence of the Khan Academy, an online repository of thousands of instructional videos that has been touted by Bill Gates and featured prominently in the national media.

Given education's long history of fascination with new instructional approaches that are later abandoned, there's a real danger that flipping, a seemingly simple idea that is profound in practice, may be reduced into the latest educational fad. And, in today's highly polarized political environment, it also runs the risk of being falsely pigeonholed into one of education's many false dichotomies, such as the age-old pedagogical debate between content knowledge and skills acquisition.

But the ideas behind flipping are not brand new. For over a decade, led by the National Center for Academic Transformation (NCAT), dozens of colleges have successfully experimented with similar ideas across math, science, English, and many other disciplines. NCAT's increasingly impressive body of practice shows that thoughtful course redesigns lead to improved learning. Carol Twigg, NCAT's president and CEO, says there is no magic: course redesign is "a hard job." She's not assuming students love homework. But redesign offers an opportunity to reengage students and improve their motivation, while setting proper expectations and monitoring to "push school to the top of the list." And while many course redesigns focus on incorporating more project-based learning opportunities, Twigg's experience leads her to quickly dismiss pedagogical extremes: "If you don't have basic math skills, you can't do an interesting physics project."

There is also some danger that the flipped classroom could be seen as another front in a false battle between teachers and technology. Yet Bergmann and Sams emphasize that the "only magic bullet is the recruiting, training, and supporting of quality teachers." And while Khan Academy's prominence engenders fear of standardization and deprofessionalization among some critics, Bergmann, Sams, and Smith see instructional videos as powerful tools for teachers to create content, share resources, and improve practice. Smith admits that if such tools were available when she first started out, she "would have run to this every week when planning."

It seems almost certain that instructional videos, interactive simulations, and yet-to-be-dreamed-up online tools will continue to multiply. But who will control these tools and whether they will fulfill their potential remains to be seen. As Scott McLeod, one of the nation's leading thinkers on educational technology and the director of the UCEA Center for the Advanced Study of Technology Leadership in Education, observes, the "reason Sal Khan is so visible right now is that nobody did this instead. It would have been great if the National Council of Teachers of Mathematics had been doing this, but someone from the outside had to fill the vacuum." His guidance to educators: "Start making!"

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"With so little free time, you have to learn to multi-task your TV watching, iPod listening, and texting with your homework."