Virtual lessons ‘flip’ classes

Technology offers students independence and less stress

By Greg Toppo
USA TODAY

POTOMAC, Md. — Step into Stacey Roshan’s Advanced Placement calculus class some morning and two things become apparent: The students don’t seem stressed out, as AP students often do, and the teacher is barely teaching.

Sitting in pairs, students poke at their iPads waiting for class to begin. But in place of a long-winded lecture there’s Roshan, a petite brunette with a broad smile, moving through the room, urging students to take out their homework.

In a word, Roshan has “flipped” her class.

Pressed for time and struggling to reach a generation raised on YouTube, Roshan, like a growing number of teachers, digitally records her lessons with a tablet computer as a virtual blackboard, then uploads them to iTunes and assigns them as homework. In class the following day, she helps students work out exercises and answer knotty questions.

It’s the latest way that technology is changing teachers’ jobs — in this case it’s literally turning their workday upside-down. But teachers say flipped, or upside-down, classes offer greater control of material and more face time with students.

In many cases, software allows students to chat online while watching the videos. Tegrity, a Silicon Valley firm that specializes in flipped instruction, allows students to time-stamp lecture notes. It boasts more than 1 million student users, many of them in higher education.

Flipped classrooms have even attracted the attention of funders such as the Bill & Melinda Gates Foundation, which has become a major backer of Khan Academy, a non-profit repository of nearly 2,400 free instructional videos that teachers now use to teach everything from pre-algebra to

**Homework is now the classroom:** Stacey Roshan, a math teacher at Bullis School, helps AP calculus students Jordan Friedlander, 17, left, and Kourash Kalachi, 16, with their work.

**Reviewing class:** Tony Scott, 16, watches a lesson on an iPad.

Augusto Pinochet’s Chile.

“It’s about changing the dynamic of how you deliver the instruction,” says Roshan, who teaches at the private Bullis School near Washington, D.C. She began flipping her AP calculus classes last fall after finding she couldn’t cover all of the required material. Even topics she covered “didn’t really all sink in.”

Roshan now finishes the course a month in advance and uses the extra time for review. The number of students scoring a perfect “5” has risen, she says. Students watch lessons at home, sometimes two or three times, and replay confusing sections. If they’re still confused, they query a friend. If that doesn’t work, they ask Roshan the following day.

“I always tell them, ‘The first, best option is to solve the problem on your own. But if you can’t, ask your partner. And then you should ask me third, because by asking your partner, at least you’re going to have to work through the problem because neither of you is an expert in it yet. Neither of you is going to know the answer right off the bat.’”

On a recent morning, she weaved between desks, chatting quietly with students, then strode to the whiteboard, popped the top off a black marker and wrote the capital letters “IVT.”

“I have a request to go over the intermediate value theorem,” Roshan said. “It’s a really complicated name for something really simple. You guys want to go over it right now?” No one protested, so she launched into the lesson.

She talked, she drew, she took students’ questions. She drew some more. Start to finish, the lesson lasted three minutes and 25 seconds. Back to homework.

Lisa Nielsen, author of the new book *Teaching Generation Tech,* says flipped classrooms show potential, but she says she worries that many low-income students don’t have reliable Internet or computer access at home. She also says lectures are rarely the best way to teach. Flipped classrooms “could lead us down the path of doing more of something that doesn’t work because it gives us more time to do it.”

Frank Noschese, a physics teacher at John Jay High School in Cross River, N.Y., says anything that gives teachers more face time with students is “a good thing.” But he says lecturing, even at a leisurely pace, is still bad pedagogy. “It’s just kind of ‘Lecture 2.0.’”

Roshan would disagree. She says it’s all about helping students understand difficult material. Flipping the classroom, she says, has made her students more independent, less-stressed learners, since for many the hardest part is applying the lesson to problem sets.

“In an English class, you send the kids home to read a passage, and then in class you discuss that passage,” she says. “Why in math class am I more or less having them read the passage in class?”