Transcript

[00:00] [background music]

Derek Bruff: [00:09] Welcome to "Leading Lines," a podcast from Vanderbilt University. I am you host Derek Bruff, the Director of Vanderbilt Center for Teaching. In this episode, we're going in a slightly different direction.

[00:16] Since we're here on the podcast to explore the future of educational technology in higher education, I thought it would be interesting to talk with someone who is currently teaching our future students.

[00:25] I've been following the work of high school math teacher Stacey Roshan for several years now, and I found her to be one of the most thoughtful and innovative high school teachers I know. She teaches at the Bullis School, an independent K-12 school outside of Washington, DC, where she is also the Upper School Technology Coordinator.

[00:41] She is well known for flipping her math classroom -- introducing students to new material before class through online explanatory videos she creates, and spending class time helping students learn math by working problems on their own, and in small groups.

[00:53] She uses a variety of technologies in her teaching, all in very intentional ways to help students learn math and learn how to learn.

[01:01] The students we see in our college classrooms don't come in as blank slates. They have a variety of prior learning experiences. I hope this conversation with Stacey Roshan will provide the Leading Lines audience with a little insight into the kinds of experiences and expectations our future students will have, particularly about the use of technology in learning.

[01:18] [background music]

Derek: [01:21] I think I first heard about you and your work as you were getting some attention for flipping your classroom. Can you tell us a little bit about…let's start with your teaching context. Where do you teach, what kind of school is it, and then what led you to flip your classroom, and what did that look like for you?

Stacey Roshan: [01:37] I am a high school math teacher, and also the Technology Coordinator at my school. I work with all the different high school teachers in integrating technology into the classroom. We are a private K-12 school outside of DC. I work at Bullis School.

[02:00] My journey through this has been…technology being a solution to a problem that I had is really how I got interested in all of this in the first place. I was teaching AP calculus AB. I had fantastic students.

[02:20] One of our missions is to connect with our students every day on a very deep level. When I was teaching AP calculus, I felt like I was spending so much time at the board doing these lectures and students had so many questions. I felt a lot of anxiety in the classroom. That was probably the biggest thing that prompted me to change.

[02:45] I always felt anxious in math class also, even though math was always my favorite subject. I think of the nature of a lot of math classes is that you sit and you get lectured for a long time, and then you go home and you have to do all these problems that you didn't have a chance to tackle on your own in the classroom.

[03:05] Yet, then you come into class the next day with questions, get lectured on more stuff. Sometimes it can feel overwhelming because of that format. I went to this technology conference this summer after I was feeling like I needed a change in my classroom.

[03:22] When I was there, I just learned about screen casting in general and it's like, "You know what? That is the solution to my problem. I'm going to just make a bunch of videos and see how the class goes with it." I started just there. Flipping wasn't getting the hype yet. It was just a problem that I had and I was looking for a solution.

[03:47] I said, "Hey, for chapter two, it's a review unit anyway, we're going to just start with

the video and then in class, we're going to do a bunch of problems together." Everybody loved it. We just did the whole year like that. I never stood at the board to introduce a lesson.

[04:01] I don't want to say…I think a lot of people get confused. My philosophy at least is every day we do stuff at the board. I really value that time, but now we get into the discussion, the deeper stuff because they've already previewed the video once before.

[04:19] That was my journey to it, and then in AP Calculus, it was very, very successful from the beginning. When I rolled it down to 9th and 10th grade, I wasn't initially probably as careful as I needed to be about communicating to parents what this meant.

[04:34] That's a really, really important part of teaching K-12, especially the lower grades. 11th and 12th grade, I wasn't having much, but 9th and 10th grade, it was very important to explain to parents what was happening.

[04:49] Now, there's obviously greater awareness about what the flipped classroom means, but just very careful to explain that it's not about students learning all this material on their own and that's it, and then maybe me helping them with problems in the classroom.

[05:06] To me, the most important learning happens in the classroom. Now, it's better learning that happens in the classroom because it's really coming from them and a much more student-centered approach.

Derek: [05:16] I've heard you talk about this in the past. I recall that one of the things that you really liked about this approach was that it gave you more time during class to actually interact with students one-on-one in small groups. Did the students find that valuable?

Stacey: [05:33] Yeah, definitely. First of all, I think that the first year that I flipped my classroom, or the first couple of years, I remember that one of the things that they were saying to me was, "I forgot, you know, how to like do math homework with my friends because I wasn't having as much time doing that."

[05:57] A lot of math classes have shifted in these last eight years or so, since I started flipping, and we have here too. I don't think that I would get that same exact reaction from students now, but that was what they said to me at that time, like, "Wow, I forgot what it was like doing homework with classmates."

[06:18] It's oftentimes hard to do that homework over the phone. Other homework is easier, maybe they're chatting out brainstorming on a paper, it's a little bit easier to do over the phone than some math homework.

[06:35] Students really wanted to work together and ask each other questions. While I thought that it was going to be about me, [laughs] about them asking me a bunch of questions and me being there for them, I realized quickly that when I gave them a bunch of time, they were asking each other questions.

[06:53] They were waiting to ask me the questions, because you know what? They would rather ask their friend a question than ask me.

[07:00] But if given five minutes at the end of class, they're obviously going to ask me because they want a quick answer, they want to make sure they get that question answered before class was over. If I give them half an hour of that time, they're going to ask somebody else first.

[07:14] I found that instead of running around the room answering individual questions, I was really going around the room and listening to what groups were saying. There were a lot of incorrect things that people were saying to their peers. They were all learning together.

[07:28] I was there to pick up on those things immediately instead of them working a bunch of problems incorrectly then coming into class the next day and figuring out they got that problem wrong and needing to revise it. There was much more immediate feedback, I would say.

Derek: [07:45] I would agree. It's the same approach that I take for my class. I've been flipping my math classes for a while now. I usually ask my students just to read the textbook before class as their first exposure to the material.

[08:04] A couple of years ago, I wasn't able to do that. The department had selected the textbook for me, for my linear algebra class, and I really didn't think it was a good choice. It was really hard for students to make sense of it as a first exposure. I un-flipped my classroom that semester and I tried to go back to the traditional way.

[08:22] It's interesting you mention the anxiety. When I un-flipped my classroom, students

would come in not knowing what to expect for the day and they would leave class frustrated that they didn't understand it. I tried to give them my office hours and help them as much as I could.

[08:39] With the flipped model, I think they come in a little frustrated because they're not quite sure. They didn't understand the videos or they didn't understand the reading fully. Then you work with them, and that feedback loop gets shortened so much that they leave class feeling like they know something.

[08:53] The whole vibe in the classroom is very different. Much better. They saw me as really more of a coach than as the guy at the front of the room confusing them all the time. [laughs]

Stacey: [09:09] When you talk about the preparation from high school to college, I think that knowing how to read a textbook is really, really difficult for students in high school. It's a big jump in college because lot of colleges…You're expected to either read the textbook or if you don't understand something from the lecture, that's going to be your resource.

[09:32] When I make my videos, I actually use whatever's in the textbook as my basis. I'm trying to help them read the textbook and expose them to how that goes. Some of them, actually they watch the videos when they get confused. They do look back in the textbook because there's detailed reading information there.

[09:55] Some people are very auditory, some people, they do better by reading it. They are referencing that back and forth. I do think that's an important skill, still now. I know there's debate on whether teaching from a textbook is a good thing or a bad thing, but I think especially in the AP world, there's a textbook and do you have to get that textbook audited.

[10:24] It's good textbook. The one that I use, I really like it. I think there's a lot of value there to teaching kids how to use that as a resource. I think that's one of the things that, as high school teachers, we really need to do is teach students how to be resourceful.

[10:38] In an independent school environment where they have class sizes of 15 students on average, they need to teach them how to carry the good stuff versus the bad stuff, what to focus on, and how to help themselves, which is a big skill.

[11:00] Something that we're able to work on when I have that time in the classroom, and be able to help them know what to focus on. What is petty, what's not because that's hard for them to decipher. Everything to them, the first time they're doing it feels equally important.

[11:13] I can guide them to help them understand, "You know what, this is a nitty-gritty topic" versus, "you know what, this is a big picture topic." For us to delve into those much more fun discussions than, "Did you write a plus sign or a minus sign on the board?" Those types of questions. [laughs]

Derek: [11:33] I'm curious to know if you've seen this. One of the things that I like about the flipped model is that if I have students coming in with different levels of background, I feel like they all get a little something before class. I find it equalizes the playing field just a little bit. Have you seen that in your own teaching?

Stacey: [12:00] Yeah. I think that it differentiates in a lot of ways. First of all, I think just allowing them to play that back at a speed that works best for them, pause when they need to pause. Kids actually have found watch it at very different speeds. I collect some of the analytics on when they start the video, when they stop the video.

[12:24] I learn a lot about their learning through that. We also have a number of students who are learning accommodations here. That is…I find very helpful to them as well when students miss class. It is just so, so helpful to have the video to go back to.

[12:44] In class, I find that especially when I was teaching a class like Honors Algebra II with 9th and 10th graders where I did have some kids who by 12th grade or 11th grade, were going to be taking basic calculus.

[12:58] Then I had other kids by 12th grade who were not going to be ready to take AP calculus. There was a broader range. When I teach AP calculus, it is less differentiated. In those scenarios, in class, yes, I could get different assignments. Different students would do different things.

[13:19] My strategy was just using either there would be a group of challenge problems there because of the class environment, because students were doing it together, there was an incentive to do those challenge problems. That group was hyped about getting those problems.

[13:35] Honestly, I know that some people can't believe it when I say it, but just the environment of the class, it usually worked that I didn't provide — they didn't get any extra credit points for doing that.

[13:46] They didn't get anything extra for doing that. It was just they were team working and they got excited about it. They got into almost that sports mentality, that they wanted to just outdo themselves, one-up themselves or one-up the person that was in their group.

[14:02] The kids who could get there were doing that. There were other groups. We would sit in different pods depending on what students needed. Some of them would never get to those challenge problems, and there's no problem with that whatsoever.

[14:16] It just allowed for that to happen just fluidly versus if those challenge problems were extra homework, a lot of students would just stop because it's like, "I could finish my homework in 20 minutes or I could spend 40 minutes on my homework. I might stop after 20 minutes."

[14:34] That's always helpful. Also, just by giving the video lectures ahead of time, so I do embed some quiz questions into the videos — I use Edpuzzle to do that. By doing that, I see ahead of time what kids are getting right, what kids are getting incorrectly.

[14:51] I can use that information to help seat them at the beginning of class and put them in different groups. I change up those because sometimes I want kids working on the challenge problems. Sometimes, I want them to just be helpful and help other people, and to be like my class helpers, my class tutors.

[15:13] Sometimes, we just have a model of sitting like that where there'll be somebody who really just was really getting the lecture, and then some people who needed some help with it, and then they were able to help out.

[15:26] I think there's no better way to learn than through teaching. I really try and set up an environment for that in my classes also.

Derek: [15:37] You mentioned that it's been several years since you started flipping your classrooms. To some degree, students are starting to expect this. I have an eighth grader at an independent school. Since last year, her classes have had this flipped model. She's used to

watching the video at night in preparation for class the next day.

[15:57] I guess my question for you is, knowing what you know about the K-12 environment, particularly the independent school environment, how common is it for a math class to be flipped? Is this something that's pretty routine? If I've got a class full of freshmen next fall, could I expect that most of them would have experienced this?

Stacey: [16:17] I think it totally depends on where they are, what the school's philosophy is, and also what the teacher's philosophy is. I would say that…I've met with some teachers and some even principals who wanted everything flipped, or the teacher who the administrator said that they must flip.

[16:43] Sometimes I -- not sometimes -- I do worry about that. I worry about that approach in terms of it not being a natural fit for the teacher. I've definitely seen it go much worse in a flipped setting than it would have if that teacher was just at the front of the room.

[17:04] To me, technology should always be treated as not just like, "I need to be using technology," but really "I found so much success with it because it was a solution to a problem that I was having." I think we need to really look at things that way.

[17:24] Why do you want to flip the classroom? Because it's the latest buzzword? That's not going to work well. That's not going to be an effective flip. If you're just using videos that your last minute finding from YouTube and then assigning those and then in class just having kids work on problems, and that's it, I don't think that's a really good approach at all, to be honest.

[17:47] I think kids really still need that discussion part. If you're not building that into your classroom, especially with the younger kids, you're losing out a lot. Just having kids, a lot of people think, "Flip, OK. I'm gonna come to class and kids will start the homework, and that's going to be my class."

[18:05] A class has to have a beginning, middle, and end. It's got to flow. I think teachers are really different. There are some teachers who are fantastic at the front of the room, who really do an inquiry-based classroom, and don't do any video.

[18:20] They're fantastic teachers. I think that they should stick with that. Even though I love it

and I would never go back, and I would recommend it. If I'm coaching somebody, I would explain to them what I'm doing, why I'm doing it, and I would hope that they would infuse some of this into their class.

[18:43] I don't think it's a full thing that everybody should be flipping their math class. That's just my opinion on that.

Derek: [18:45] I would support that. I work with a lot of faculty here in consultation settings, in coaching settings, in small group settings. The instructional practices, they have to be lined up with your goals.

[18:57] They also have to fit your experience and your own approach. There's always room for change and improvement within that, for doing things a little better next semester, but if it's a really bad fit, it's not going to work, actually. Small changes are usually better than massive changes.

Stacey: [19:15] Yeah, and that's another thing. I see it as really a progression. I always say that, if you look at my flipped classroom now and you're an administrator, and you say, "I want my teacher to have a full classroom like this," this has taken me years to get to.

[19:33] My first year, all I did was focus on making the videos. I was still giving the same textbook problems that I used to give for homework, and I just made them in class. I started with the discussion at the board, and that was it.

[19:45] I noticed that the assignments I was giving in class really needed to shift a bit. It was a different format now that we were doing it in. The second year, I worked on what we're doing in class, and that was just me working on one class.

[19:58] The third year, I started working on Honors Algebra II. While I was making the videos, I started thinking about how I could really embed questions, get that data to do something with. That was my goal the third year.

[20:09] Each year, I have built on to this. Now, I'm really focused on the activities that we do. I'm also focused on how I can assign less problems for them to do, but let them go deeper into some of those problems.

[20:26] A variety of modes of them answering some questions. I have them answer some questions through video. They make a little Flipgrid video so that they can explain the process and dig really deep into that. Maybe write some stuff so that they're better at verbalizing why they did what they're doing, and they're better at writing for math class.

[20:48] It's been a complete progression, and I would not take on too much at once. I think it's really important to see what the kids are doing, how they're reacting to it and adjust based on that. Kids want to know that they're heard, and I think that's been part of it.

[21:07] I ask for feedback along the way. I don't take everything that they say and change it, because not all the ideas that they have might actually help, but I listen to their ideas and I think about why they're asking that.

[21:22] I do make changes based on that. I try and be flexible to what different kids need. Not to take on too much at once. Don't flip three classes at the same time.

[21:34] [laughter]

Derek: [21:34] You mentioned Flipgrid, which we actually talked about in a previous episode. Can you say a little bit more about what Flipgrid is and how you use it? Maybe also, are there other technologies that you're experimenting with or tinkering with as you continue to refine your approach?

Stacey: [21:49] Flipgrid is like a discussion board through video. I use that with my students for a couple things. One of them, that's my favorite, is just to have them explain a problem. Say, I need 10 review problems done, and I don't want to make a video for that. I want students to learn from each other.

[22:13] They'll work that problem. Depending on the type of assignment, if I want it to be a review thing, I might have them submit the problem ahead of time. I'll check that problem. Once I do, I have them create, then, a video using Flipgrid.

[22:28] They use their phone, and the reason they use their phone and the Flipgrid app is because there's two sides of a camera on your phone. They usually talk into the front-facing camera and do a little introduction about what problem they're solving and some background behind it.

[22:44] Then they just hover the other side of the camera over their piece of paper. It's really low-tech, really easy, right? They explain why they went from one step to the next step, to the next step. They're explaining their process of going through that problem.

[23:00] There's just a grid, that there's no uploading required. There's actually no student accounts required because they just take a little selfie at the end and that's how they identify who they are. We have a grid of all these different problems.

[23:14] It's just something that they can then study for. I also use it sometimes when we're doing an assignment and this is not something that other people, other students study from, but just I want to hear their process through the problem. It's one thing to get them doing like a bunch of book work.

[23:29] I don't get into the nitty-gritty of what's going on inside their head. I just have them create a Flipgrid solution to a problem. Again, it's like such a simple idea, but I just get to hear what's going on in their brain, how they're thinking about it, and how they're processing the problem.

[23:47] Sometimes, we just do things like reflections. I just want them to talk out "What went well on your last test? What goals do you have?" A lot of goal-setting will do through that. They'll just chat it out with me for a set of one-minute video.

[24:03] We just chat things out that way, instead of having to have private sessions. It's good for that. That's one that I really enjoy using. Another one of my favorite EdTech tools is Pear Deck. That's how I do my introduction to class. That's how we start off the discussion.

[24:26] Pear Deck, now they've made a Google slides add-on. Any Google slide presentation that you make, you use the Pear Deck add-on, and so you can make your presentation interactive. I don't use it as…I'm not doing a presentation at the front of the room.

[24:44] I really use it as a warm-up activity. I ask a series of questions in there. We have drawing questions. We have text questions. You can have a variety of different response types. You can even have draggables — you could drag a dot on a map, or drag it on a temperature chart how you're feeling.

[25:07] I'm lucky to have a class set of Wacom tablets. Those little tablets where students can

write with the pen. I have them do a warm-up there, and I can see through Pear Deck in the dashboard, I can see them writing in real time. I can see the whole class, what they're doing, and how they're working through problems.

[25:26] It's really cool, it's paperless. Also, after the session, I publish something called the takeaways in Pear Deck. When I publish that, it generates a Google doc to their account, just shared between me and them.

[25:41] Each individual student gets their own, with their own answers in there, and then they can make corrections to that. They can reflect on that depending on what activity I do.

[25:52] A lot of times, as a review for the test, before the tests, I'll have them turn in all their corrections because, obviously, I asked those Pear Deck questions for a reason, and I want them to think through, "Why were those questions the ones that I highlighted at the beginning of class? How do you understand that first one that you did from the unit? How do you understand it now?" because their understanding will have shifted greatly by the end of the unit. That's definitely one of my favorite tools to use.

Derek: [26:24] That's great. At Vanderbilt, we have a system that we've adopted called Top Hat which does some of that. It's a classroom response system.

[26:35] Back in the day, we used clickers. You could ask multiple-choice questions, and that was about it. Now, that it's so easy for students to use some device to either submit a free text response, or to draw something, or to write something freehand.

[26:47] I love the idea of the tablets -- the Wacom tablets -- as a way to have them actually do a math problem, and then have that submitted electronically for you to look at and makes sense of.

Stacey: [26:57] Yeah, and I'm so excited about EquatIO, which recently is coming out with so many new features. Students can literally now…If you integrate it with Google forms, if you ask a Google form, you ask the math question, they can literally, on their phone, draw with their finger and answer.

[27:20] They can then convert it to text or keep it as a picture. Then it all goes into your spreadsheet of results with either the equation or the drawing depending on how they've

submitted it. I just think that's just so amazing.

Derek: [27:39] What advice would you give, particularly for maybe math faculty at the college level, but any faculty in general, given what you know about today's high school students, what advice would you give a faculty member about ways to approach their teaching ways, to approach their students, ways to incorporate technology?

Stacey: [27:57] I would say that one of our largest goals here, as a school, and one of my biggest goals as a technology coordinator is to really shift the classroom space to a much more student-centered space, for students to be doing a lot more creating. I think they're getting more used to that.

[28:21] By creating, by doing, that's where the learning happens. I think they're getting more used to that. I think that a lot of them when they come back, because I'm lucky to have students, they actually come back. They come back their first break, and they come in and they report.

[28:40] I think one of the things that I hear very oftentimes is it's so different in terms of like, "I'm sitting in a lecture. I'm being talked at for a really long period of time. I'm not doing the same type of assignments anymore."

[28:59] I look forward to seeing them come back, and talking about how there's a lot of similarities in terms of some of these goals that we're trying to do in terms of shifting the instruction. I think that, in part, we're trying to ship the instruction to help them be prepared because we want them to be more resourceful, know how to use all those resources they're getting in college.

[29:20] We're also empowering them to create and be creators. I think that they're going to be more ready for that as they get — are freshmen in college. I would say that's the biggest thing. It's just making more activities that allow them to create, maybe, in the classroom. I'm not sure how that works in a college environment.

[29:44] I haven't been in college for a long time, and if I think back to that, there wasn't room or space [laughs] for that in the typical classroom, just the setup of the classroom, because so many of them were a lecture…you're sitting in seating that with the teacher on a stage…

Derek: [30:05] It's hard to do group work in a movie theater. It just is, but our movie theaters are changing. [laughs] We have these movie theaters that have like, you can have dinner there, you've got recliners. I think maybe our classrooms can change, too.

Stacey: [30:19] Yeah. Spaces.

Derek: [30:20] I've got one last question for you. I know you've got to run. We ask all of our guests this one final question. We focus a lot on digital educational technology in this podcast, but I want to know, what is one of your favorite analog educational technologies?

Stacey: [30:41] Would it count as just writing on paper still…because [laughs] I got to say… even when we're talking about Flipgrid. Why I like it is because the kids are writing on a piece of paper and then talking over it.

[30:55] I don't care that kids are…I don't actually want them to be typing their math response. I want them to be writing it out. I think that they think through it as they're writing through it. It's one of my excitements about EquatIO, is that we get it from the handwritten to the computer.

[31:16] Something even like the Rocketbook where you have the Rocketbook app and you write on either a sheet of paper or you buy their notebook, whatever you're doing. You just hover your phone over it, and it automatically uploads to Google Drive or whatever you've synced it with, and then us to have sharing capabilities there.

[31:36] I think that's the beauty of the digital world. It's so shareable, so accessible. It's searchable in many ways. It's more collaborative.But I think that there are still…I like handwriting a lot of things, especially for math. I don't know if that's a fair answer because [laughs] it combines the two.

Derek: [32:00] It's a great answer. I think sometimes…especially when you're figuring something out. You need a pencil and paper. You just need to scribble for a while, and just express it that way.

[32:09] [background music]

Derek: [32:09] Thank you so much, Stacey. This has been a lot of fun. I appreciate you taking

some time to talk with me today.

Stacey: [32:15] Thank you. This has been great.

Derek: [32:18] That was Stacey Roshan, math teacher and Upper School Technology Coordinator at the Bullis School. Every time I see what Stacey is up to, I find out about new tools I might want to try in my own teaching. That interview was no exception.

[32:30] I have learned about Flipgrid from our guest Enoch Hale back in episode 19, but Pear Deck and EquatIO were new to me. For information on these tools, as well as more info on Stacey her work, check out our show notes.

[32:43] Stacey is very active on Twitter and her blog. I recommend you follow her for ideas for your own teaching and to get a sense on the kinds of learning experiences high school students are having. These are our future students.

[32:54] Every year, my first year students surprise me with the kinds of technologies they have experience with. Following Stacey helps me be just a little bit more prepared to teach my students well.

[33:04] You can find this episode show notes, as well as past and future episodes of Leading Lines on our website leadinglinespod.com. You'll also find transcripts for all our episodes there that are searchable and tagged by keyword.

[33:16] You can follow us on Twitter at @leadinglinespod. You can send us a voicemail with your thoughts on this episode at leadinglinespod@vanderbilt.edu. We're also on Facebook. Just search for Leading Lines. We'd love to hear from you via any of those methods.

[33:31] Leading Lines is produced by the Center for Teaching, the Vanderbilt Institute for Digital Learning, the Office of Scholarly Communications at the Library, and the Associate Provost for Digital Learning. This episode was edited by Rhett McDaniel. Look for new episodes the first and third Monday of each month.

[33:44] [background music]

Derek: [33:45] I'm your host, Derek Bruff. Thanks for listening.