

Ben Kahn: Welcome to UP Tech Talk. I'm the instructional design and technology specialist at the University of Portland. Today I'm joined by my co-host Maria.

Maria Erb: Hey Ben.

Ben Kahn: How's it going Maria?

Maria Erb: Great.

Ben Kahn: Good. And today we're happy to have with us in the studio, Shaz Vijlee, who's an assistant professor in our Shiley School of Engineering. How's it going Shaz?

Shaz Vijlee: I'm doing alright. Thank you very much for having me.

Ben Kahn: We're happy to have you in here today. So in addition to being a professor in Shiley, you also are a member of our Academic Technology Ambassador Program and you're participating in our new Untethered Lecture Capture initiative, which is bringing wireless projection into the classroom, along with lecture capture into one package, which is a pretty cool initiative that we're excited to have here at the University of Portland. Obviously you have some tech bonafides. But I said that wrong right? Bonafides.

Maria Erb: Sounds like a bad word.

Speaker 4: Bonafides.

Ben Kahn: [crosstalk 00:01:15] We'll just edit that part out. Shaz you tech good, so we're happy to have you in the studio today. And I'll throw it over to Maria to ask about your projects and why we have you here.

Maria Erb: Yeah, Shaz it was great talking with you a little bit before we started the show here about what you've been doing in the classroom. But for our listeners who haven't heard yet, tell us a little bit about the way that you're introducing making videos and how it's benefiting your students.

Shaz Vijlee: Great. Well the idea is, how can we get hands-on, technical skills to ... in kind of a uniform way, to all of the students. Imagine you're starting engineering day one, and they're going to ask you to build a little widget. How do you build a widget? I thought what if I make a video on how to build a widget.

So I started with very, very basic, in this particular case we start with circuits. So engineering circuits, how do you measure the voltage in a battery? Use a tool called the multimeter, I made a video on how to measure the voltage in the battery. So each one is maybe three minutes. Some of them are up to 10 minutes at the end when they get a little more complicated, and for some students, they've done this since they were 10 years old.

Some students have never thought about what's actually going on inside a battery. So how do you present this to students so that it can be self-paced, but also those who haven't done it before will get the chance to do it?

Ben Kahn: So these were the baseline skills you wanted students to have on day one is what you're saying?

Shaz Vijlee: Yes and no. Maybe at the end of first semester. This is what we want them to get. If they go through the series of videos, it's a handful of skills that will help them to be a little more hands-on in their future classes, which is one of the big themes we hear a lot is, want more hands-on. We want more access to hands-on, and you can't do hands-on until you have some base skills. So how do you get them all the base skills?

Maria Erb: So, you said you created a series of 10 or so?

Shaz Vijlee: There's nine videos in the first lab, and six videos in the second lab, so I've made 15 so far.

Maria Erb: And how did you bridge the skills gap with your students? You've got some that are more advanced and some that are brand new with these ideas, so what did you do?

Shaz Vijlee: The way we run the course is, we have lab time built into the course, and the students come, hopefully they've watched the videos beforehand, but we know that doesn't always happen. So they show up. I ask them to bring laptops. We give them the hardware and they start watching the first video. Some of the students in my section this last week, we had students who had done the first five tasks five years ago in high school, or three years ago in high school, so they breezed through and they got to the more challenging tasks by the end of the session.

The other teams weren't even able to get past ... some of the teams weren't even able to get past video six, for example. So they ended up self-pacing. What that ends up meaning is the teams that don't complete the series will have to do it on their own time, or we have open sessions later in the semester for them to come in and do them on their own as well.

Maria Erb: So I guess we'll have to see how that works out, since this is your first time with this new practice, right?

Shaz Vijlee: Yeah, this is the first time we're doing it on this kind of a scale. I made a handful of videos previously for other courses, and they were really low-production value. I look back at them now, and I think I could do those better, so maybe in the future I will. But this is the first time with this kind of intentional effort.

Maria Erb: Now just out of curiosity, do you feel that your students ... I don't want to say, can learn from videos, but that learning from videos would be their first choice? Do you feel that your students watch a lot of YouTube, are used to consuming new knowledge in that format?

Shaz Vijlee: I think so. Yeah, I really do. I think the hard part is reaching every student, right? Some students want to read a list of instructions.

Maria Erb: What? They do?

Shaz Vijlee: You know I'm not sure. That's what it seems like. I think ... we made these videos, and I was thinking as we were watching the students do it the first time, what could be the next thing to do with this project? I'd love to go back and put notes on top of the videos where I saw students stumbling or force them to pause and do it themselves, before moving on. But one thing I thought of was, what if I almost had a piece of paper, and on that piece of paper was time stamps of here's what you're doing at this time.

So when they get stuck on something, they don't have to go back and watch the whole video to where they were stuck on. They can jump to that kind of point in the template. And there might be a way to automate that.

Ben Kahn: So, like a chapter of contents, table of contents.

Shaz Vijlee: Yeah, table of contents for a video of sorts.

Maria Erb: Yes, those are all excellent ideas, and I like the annotations on top of the videos and highlighting the stumbling points, and making them pause by putting in some, I don't know, free screen or something like that for a minute, or whatever it is. There's a lot you can do.

Shaz Vijlee: Yeah. That was something I noticed in the class when we were doing it the other day, is they were following along. They were all on task and following along, which was amazing, but some of them weren't stopping to think about what they were doing. They were just doing what I was showing them to do, and a few of the teams were stopping and saying, oh let's draw this out. Why didn't this work? Why did this work?

Some of the teams were, well this didn't work. Did we do it exactly how he wants us to? And then they did that, but that's not actually getting them to think about what's working and why it's not working. They're just mimicking me. And that was a little bit of a drawback, but that would happen in any case.

Ben Kahn: Right, so taking a step back. Before you had made the videos for this, what did the class look like? In terms of, were you demonstrating and having everyone kind of follow along at the same pace?

Shaz Vijlee: The way the labs used to run was, it was mostly handout, so on a piece of paper. The students would follow the steps, but it was a two-dimensional image of a three-dimensional thing or a static image of a dynamic thing. So that was one way it worked, and it was also an instructor having the students trying to, monitor the students while they were doing what was on the piece of paper. And it wasn't small chunks. It was like, here's a four-page handout. Continue through it, whereas the video kind of naturally ... three minutes in, you've finished one task, and now, okay, let's move on to the next task.

I found that to be a really helpful thing, is kind of modularizing it. I think that's a way to put it.

Ben Kahn: I think so. So the format didn't really, or how the lab was taught, didn't really dramatically change. It was just the media that you're using to deliver the instruction-

Shaz Vijlee: Absolutely-

Ben Kahn: Was a better fit.

Shaz Vijlee: Yeah, it was a better fit.

Ben Kahn: [crosstalk 00:09:04] float and help the stragglers and thing like that.

Shaz Vijlee: Yeah, I'm helping, I'm making sure they're doing it right. I'm asking them questions to make sure ... I'm trying to keep the whole team engaged. That's a little bit of a challenge. There's four people per team watching a video together, performing a task together. If we could get it ... because the videos are available, one person could do it by themselves in the dorm room. That was a common thing that I saw, but you're right. The medium was really the only thing that changed. And I think the big thing is there's uniformity. So they're all watching the same videos, so it's not like I forgot to say something in this class and I remembered to say it in this class. They're all getting-

Maria Erb: Did you say there are seven sections?

Shaz Vijlee: Seven sections of this course.

Ben Kahn: And you said like 60 students per? Is that right?

Shaz Vijlee: 30 students per section, so the way we have it set up is, seven sections of the course. Eight teams per section, so that's about 60 teams total.

Ben Kahn: Oh okay, so it's a pretty huge scale. It would be pretty daunting to try to have that kind of consistency to delivery in person?

Shaz Vijlee: I think so. The consistency was the major motivation, and also a little bit of faculty burden right? So the videos can be prepared once. The videos can be prepared once, and then it's all delivered, so then faculty can be responsible for helping the students along instead of delivering it from scratch every time.

Maria Erb: Right, so when do you think you'll start getting some feedback from your students?

Shaz Vijlee: You know I was thinking about that the other day. The hard part is, the current students don't know how it was done before, so I don't know how to really get that. I can say my feeling as an instructor, which isn't always enough information, but I saw them really getting it, this year relative to what I've seen in the past. And it helped a lot. In the other class I teach, where we put in a few videos, it's a senior course, and when they're seniors, you let them watch a video. You're there to ask questions and you kind of force them to do it on their own, and that really, really has worked really well.

Maria Erb: Well I guess one measure will be how they do on exams or quality of their projects that they turn in. That would be one measure.

Shaz Vijlee: That would be one measure. This course, the freshman course doesn't have any exams, but it has a course project. Each of these, so there's nine videos in the circuits module. Six videos in the software module. I don't think I'm going to making as many videos for the other ones. Those are going to probably stay on paper, just the semester's already started, and it's hard to change things during the semester.

But they end up with four modules, and those four modules turn into their course project, so hopefully they've gotten the skills to take it one step further to the course project. I think the biggest metric would be how many questions we get relative to last year. It was static; that was one of the inspirations was, we're getting so many questions on how to do things, for the course project, that I thought, is there a better way to send out this information?

I mean it's not dynamic, as in they can't ask the video a question and get a response, depending on their question, but it's more dynamic than the piece of paper, and it's kind of shorter, more digestible parts, so they've watched a video and I think they got it. Hopefully. They did the task that they were asked.

Ben Kahn: Okay, so we've learned a bit about the course and how the students are interacting with the material that you're creating. Can we dive a little bit into your process and how you're creating these videos, because when I was in your office looking at your [inaudible 00:13:22], and your roll cage that you had built and stuff. It was pretty cool, so let's see if we can share some of that with users.

Shaz Vijlee: It's actually just been a lot of fun. I started with just a tripod on my desk, facing my desk at an angle, with my hands doing a task, and again, sorry to interrupt

again, but to back up a little bit. So you're needing to show both a circuit board that you're wiring together, and also a programming console on a computer screen where you're typing in commands and things like that.

Ben Kahn: Exactly. To give a little background. For one of the examples, we take a little circuit board and a little mini computer called an Arduino. A classic first example is use an LED and some wires, and then you program our Arduino to make the LED blink in some predefined pattern, you can pick. For example, you'll turn it on for a second, turn it off for two seconds, turn it on for a second, two it off for two sections.

Shaz Vijlee: So, it involves as little bit of hardware, so the video shows me setting up the circuit, plugging things in the right way, explaining where you plug them in and the differences, and then you would switch over to a computer screen kind of thing, and you write the code and you explain why what you wrote in here corresponds to what you plugged it into over there on the board, something like that.

So that's kind of the way the video would go, and the way I made the videos, initially, was I had a tripod facing my desk, did the hardware, and then I switched over to the computer screen cast. I've become obsessed with this YouTube channel called Tasty, in which they make instructional videos on cooking, short little 30-minute videos set to cheesy music, very unhealthy food it seems. They always filmed overhead, so directly down, and my wife one day was like, "Well why don't you make an overhead camera rig for your thing." Or she said initially, "Wouldn't an overhead camera rig be a good idea?" and then she just looked online, overhead camera rig, to see if you can buy one on Amazon for \$50, and we found ideas on, I could probably make one myself.

So I went to Ace, bought two eight foot length of PVC pipe, some PVC corner connectors, and I made just basically a PVC cube, that's roughly three feet by three feet by three feet, and I took one of those old gorilla pods. I had one at my house, that just kind of wraps around one of the legs and could hold a camera right where I wanted to. It has two degrees of motion. I can move it left and right and I can move it front and back. I can't really move it up and down, but the zoom function on the camera does it for me.

That's been pretty cool. I do all the screen casting with [inaudible 00:16:39], which is available. I guess I didn't know that it was until recently, until I started doing this, but it's available at UP. There's a license I guess, I don't know ...

Ben Kahn: Any faculty can get it on their work computer.

Shaz Vijlee: So I've been just doing that on my surface, my UP on computer. It seems to do okay with it when it's plugged into its stock. It's not computationally too intense or anything. It doesn't seem to be.

The editing has been ... so I'll make a video. At first I was ... oh, I think this is a good tip. At first I was obsessed with ... when I was making the videos, doing them perfectly. At first I would stop and redo it if I coughed or if something didn't work right, and then slowly I figured out that I can just edit anything out. So now the post-processing, the time for that has gone up, but the overall time has gone down.

You know, the first minute of the video was perfect, but I messed up in the middle. Let me just delete that and make a new section. The latest thing I've been doing is I said the wrong thing. I said, oh the value should be 200, when the value should actually be 400, because I was trying to do mental math real quick. So I just go in and record my voice saying the number 200, and I just overlay it, so I don't have to do any extra work that way.

It sounds funny, because the volumes don't match up.

Ben Kahn: Like one of those phone trees or whatever.

Shaz Vijlee: But yeah, it's been fun.

Ben Kahn: Awesome. And then so the product of that, I know one thing that you were talking about, was because you have a software piece that's happening on a computer screen, and an IRL physical piece, that's actually getting your hands-on with a piece of circuit board, you're able to show those at the same time. They can actually see the cause and effect happen in real time. Do you think that's something that enhances the learning?

Shaz Vijlee: Absolutely. Just for a little context, for example that blinking project we were just talking about. I write the code, and I set it up so that the main screen is the code, the interface with the program, and a small sub-screen. So kind of a like a split screen is just the overhead camera just watching the circuit board. So essentially you hit upload or run or whatever, and then it sends the program to the board. And all of a sudden you see the LED, in the video you see the LED flashing with the pattern you told it to, and it definitely, that immediate oh yes, it does work. It's going to work if I do it right. It's really neat for the students to see.

They haven't done those videos yet, the ones where that kind of stuff is going to happen. But what I've seen in the previous videos is, they really like to see that things actually do, what it's supposed to do. It's really easy when something's kind of a black box, oh it works. But when you start getting into the black box, and you can manipulate it, and then it responds the way you intended it to respond, it kind of opens up, oh I have some power here. I can maybe do these things. I can get it to do what I want it to do. And that is really satisfying for students, is I'm actually learning the skill to do something with this.

So what can I do with it next?

Ben Kahn: Okay. Super cool. Okay, Shaz, well thank you for coming on and sharing a little bit about your project with us. While we have you here, we're going to have you do our tech pick of the week, which is a fun segment where we go around and talk about mobile phone app or piece of software, a piece of hardware, gadget whatever, that's kinda been fun for us to play around with in the last couple weeks or months.

Maria do you have a pick today that you wanted to do?

Maria Erb: I do. I'm just going to say plus one for the Southwest Airlines app.

Ben Kahn: Really? Wild card pick.

Maria Erb: Yes, because I am flying to Phoenix tomorrow at 7:15 p.m., so my 24-hour check in will be 7:15 p.m. tonight, but I'll be in Dr. Green's class, and fortunately I'll have my phone ready to go, with my confirmation number and everything, so all I'll have to do is look down and hide my phone, and press confirm, and get my boarding pass all ready to go for tomorrow.

So I'm going to say, I'm really glad that I have that on my phone right now.

Ben Kahn: Well that's a cool one. I think I used the United one the last time I traveled and it was a life saver, because I ended up having my flight diverted and having to stay overnight in a suburb of Toronto on my way to Salzburg, so yeah, I was in that app, because literally all I had was my phone and the clothes on my back.

Cool. Shaz, do you have one to share?

Shaz Vijlee: When we were talking about this before, I thought of One Note, which I do all of my lecture notes in One Note now, and the ability to move things around digitally without having to ... because I do it all with a pen in one note. I hand-write my math equations and stuff like that, so doing that on paper was not pleasant when you want to move sections around.

But then the one other one I thought of really quickly while we were talking was, we just moved and the house we moved into has a nest thermostat, one of those fancy thermostats. Our world is different, I've gotta tell you. When you can control your thermostat from your phone, no need to get up from the couch ever, it's pretty cool.

Ben Kahn: Yeah, wow. Total aside, I went to a lecture from Professor Tu, who's teaching an elective in engineering on earthquake resiliency. They had a guest lecturer come in, who was talking about Japan and their resiliency efforts after the tsunami in 2011. Basically, they're trying to scale down their nuclear energy use in that country. So their solution basically was to smart home everything, so that's actually saved them something like 20 percent in their electricity just from these initiatives. So pretty cool stuff.



Well for my pick, I want to go with sort of a random one, but that saved me the other day, and it's called Amphetamine, and it's something that can run on your Mac. All it does is keep your Mac from going to sleep, so if you're giving a lecture, a talk or anything like that, there are settings where you can do that in the Mac from the System Preferences, but it can be hard to get to; it's not super easy to find that setting and turn it on, and then if you forget to turn it off forget about it. So this is just a little thing that sits in your task bar and you can just toggle it on and off. So it's super easy. It's a good tip.

Okay, well thanks again to Maria and to Shaz and thanks for tuning in and we'll see you next time.

- Maria Erb: UP Tech Talk is a bimonthly podcast, with cohost Ben Kahn and Maria Erb of academic technology services and innovation, that explores the use of technology in the classroom.
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