

Dan Reeve Hi and welcome to another Applied Learning podcast. I'm your host, Dan Reeve. This time I sit down with Imtehaze Heerah of Mechanical Engineering. Imtehaze is doing amazing things with Applied Learning in the class and the things he talks about failing and failure positive attitudes is incredible. I hope you'll enjoy.

Imtehaze H.: I'm Imtehaze Heerah. I'm a faculty member in the department of Mechanical Engineering Technology. You know in the School of Trades and Technology, Camosun.

Dan Reeve Awesome. And what was it about when did you first start thinking about bringing an Applied Learning model, just generally, to what you teach?

Imtehaze H.:

practice, before you, if you're studying the course or tweaking the course, what's your intention, what's your hope?

Imtehaze H.:

Well, I don't know if you're aware of this, but I'm fairly well connected with industry, so I work very closely with industry in a number of ways. I've done



Dan Reeve

Okay. Can you talk a little bit about so I'm sure in your field because it's such a lab-centric and technology-centric field, can you just sort of walk through your thought process when it comes to logistics? You know, when you're prepping either a new lab or even a new string of labs, how do you consider the planning, the timing, the equipment, logistics, what's your, and not maybe the details but just sort of your thought process?

Imtehaze H.:

Well I mean, I think as anything engineering, you always work backwards. You know exactly what you want to accomplish, and then you try to find a pathway to that goal. So "What are the steps that I need to go through?" So often times you know, if I'm developing a new lab, then I know exactly what I want to do with that lab, and then what I'll do is well, what sort of hardware do I need, what sort of software do I need, what sort of background information do the students need to have to be able to get to where I want them to get to. So I need to think about that up front. And then, even though I'm in the Mechanical Engineering department, we work very closely with other departments as well. So we have an Electronics department, Electronics Engineering department upstairs, and there's a lot of commonality between the kind of things that we do.

ImtehazeH.: Yeah. So one thing that I always ask them beginning class, and I do that for





an existing puzzle, sometimes there's new puzzles that I have to bring to the table. And there's nothing wrong with it, in fact it's quite exciting. I'm really looking forward to that, because otherwise you know, what I do becomes quite mundane. And boring. So I will know first about the need for this new activity, because it's been driven somehow. And then what I'll do is I'll just kind of try it out.

Imtehaze H.: I'll you know, search time as to "Are there things that are being done in this sort of field, in this area? What have been the successes and you know, the failures?" if you will. And how can I take that and adapt it to something that will be of use and will be proper for our learners. And just get started and just go for it. And if you plan early ahead then you have enough time to fail a few times, before you fine tune it, and that's part of it. I think that's a complete side, but I think one of the biggest problems that I find a lot of times with you know, colleagues or even students is the fear of failure. This is a perfect environment. The educational institution is the perfect environment for you to fail and to be able to learn from those mistakes. And failure is fine, you know, you're learning from it because in real life and industry in general, not as forgiving.

Dan Reeve Right. I know as an aside, I think at Facebook one of their mottos is "Fail fast."

Imtehaze H.: Yeah, yeah. Because I mean, you know what's very much involved in research in general, and this is part of it, because we don't know what the end goal, or what the activity's going to be. So we're going to try a bunch of things. The faster I found out what's not working, the faster I get to that point that would be eventually working.

Dan Reeve Right.

Imtehaze H.: And it's totally normal. And I think a lot of people have a hard time embracing that whole concept. No, no, it's got to work. If it doesn't work it doesn't matter, we'll move onto the next thing.

Dan Reeve Right. How do you connect the why we're doing this, to the how we're doing this with your students?

Imtehaze H.: So one thing you know, when I bring up a new topic in class, and I do that fairly often, pro.7(e)-1.217 TD tn dfh.7( )10.evd ng u2 4.652a le a-0.7(a)n.6( o)-7.9( 4.652 0 [(I,



they work on primarily industry based projects, and they design and build and test and then they showcase to the public.

Imtehaze H.: So they need the tools to be able to get to that. So this is one of the reasons why you need to do that. And the other reason is because that thing that we're going to be talk about, and the way that we're going to be talking about what is being used in the outside world nowadays. So when you go into the industry, there might be like ten different software to do drawings, but these are top two, top three, pieces of software that are being used. So it would just make sense for you to be familiar with these.

Dan Reeve Right.

Imtehaze H.: So you know. It's informed by many ways, what they should have as a skillset at the end of the program, and also you know, what's going to be of use to them when they go out in the outside world, in the industry.

Dan Reeve Okay. Recognizing, now we're going to talk a little, and this follows the theme of reflection and failure, which I would love to talk a little more at the end. Recognizing that sometimes activities don't always go as planned, sometimes for better and sometimes worse, how do you assess student experience in light of your learning goal was this, but either it went another way and we achieved something different, or it didn't go the way, you know, you didn't get to achieve your learning goal?

Imtehaze H.: Well going back to success versus failure. So you get involved in an activity, in a lab or a project. And then we know that we have some goals. And some things that we're hoping to achieve, and sometimes things work. The question is not that "oh it didn't work out" but rather "why did it not work out?" Because even in trying to understand what did not work, and why did it not work, there's a lot of learning that happens right there. The topic doesn't change. But then the avenue to getting to the end result is well, we're going to try something, and by failing through this activity, we'll be able to reinforce something that you should have known by succeeding through the activity, we'll be able to enforce the same thing. So there's two ways to look at exactly the same topic or every idea.

Dan Reeve Yeah, there's something to be said that sometimes students, if something works out but they don't understand why, that's not really learning. Whereas if something doesn't work, but they learn the why, then that's actually learning.

Imtehaze H.: Completely. You know what if I may dwell for two minutes on this. So, one thing. In the robotics lab, we have a robot. And I get students that's part of the lab to program the robot. And I tell them from the get go, in the lab I say you know what, many of you guys will crash the robot. Because when you're moving it around, you will run it into something. And that's okay. But I can guarantee you that you will only do that one time and you will never ever do it again. And

you will remember for life. So that's learning. The fact that you fail, I mean when you look at the big picture, this is probably the best sort of learning moment for you guys, compared to we did all the things and they were seamless. And on a side note again, yesterday I was having a similar conversation with a colleague of mine, who's retired now.

I think a problem that we have, and it's just more of a philosophical approach here, is that when we tend to teach people, whether it's students here or we're talking about topics in our areas to other people, is we have experienced a bunch of things, and at the end we figured out what works. So what we present to whoever's learning, we're presenting the model that works. So what they gain is that experience without experiencing the 20 different times that I failed. But the reason I know what I know now is because I've failed so many times before. And because we miss that, then people just think, so if I just follow step one, two, three, four, it's going to work. And then all of a sudden, there's something which is completely unknown that comes up. And they don't know how to react to it. Because, oh, I don't know, but this is not part of the four steps that I'm used to."

So it is important to say, well, you know what, we're going to try something. See what happens. And often times I'll tell them to do that. Well you know what, you've got to connect this little sensor to your controller, see what happens. And then they'll say, "well, it's giving me bizarre numbers. Why do you think that is? And that's us getting you know, the thinking going, and I think that's more important. Because otherwise people end up becoming very afraid to try things. And when presented with new problems that they haven't seen, or heard of before, they don't have in their mind like a structured way of solving, then they tend to freeze, because I don't know what to do now.

Dan Reeve

So there's so many themes, I'm going to riff on this for just a bit because I think it's great. I want to talk about resilience a little bit. And I share your passion for failure positive approach to teaching and learning. I think maybe you can discuss a little bit the idea that failure's not the worst thing, and in fact failure is something normal, both here and even in workplaces, and there's a certain kind of resilience it takes to say, "it didn't go well. But that's okay, we can learn from it."

Imtehaze H.:

That's right, yeah. Well you know, I'm not quite sure how to

knowledge, and then becomes a bit more open ended. This is what you need to do, lets try to see how you get there”

Imtehaze H.:

And then there's different people, different students, they'll approach it a bit differently, and as they do that they will run into issues, but I want them to run into those issues. And it's important because then they get comfortable with the thought that well, something not working is not the end of the world. It's part of the whole problem solving approach. If it doesn't work, we'll have to







achieve the same goal without having that experience be too plain and you know, and I'm all about having fun.

Dan Reeve

Yeah. Okay, let's end it there, thank you very much for your time, that was great.