Ms. Deborah Quail-Blier- The Cubes in Space Experiment: Protecting Teeth in Space

Chiraz: Hello and welcome to CDA Oasis. My name is Chiraz Guessaier and today I am joined by my colleague, Dr. Aaron Burry here from CDA. Today I welcome Ms. Deborah Quail-Blier. She is the teacher at St Brother Andre here in Ottawa and the lead behind the Cubes in Space and mouthguard project that you just heard about from her young talented students. Due to the importance of enticing youth to create, innovate and develop their out-of-the box ideas, we wanted to ask her about her own experience working with these bright talents. So, Deborah, thank you very much for accepting our invitation to do the interview and welcome to this CDA Oasis conversation.

Ms. Quail-Blier: Thank you very much. That's very exciting for all of us.

Chiraz: So, we are most curious to know how it all started. What is the motivation behind encouraging students to pursue this project?

Ms. Quail-Blier: So, our school is a part of the Ottawa Catholic School Board and part of their strategic commitment is, you know, within a faith-filled environment, we're committed to be a community, be well, and to be innovative. And so, when I'm thinking of that, when I'm planning my lessons and I'm thinking of all of those things within a deep-learning framework, I try and plan everything around the six global competency skills that we focus on. And those are building in the students' creativity, collaboration, communication, critical thinking, character and citizenship. So, together with my teaching partner, Jackie Mason, at the other PGL site (Program for Gifted Learners), we're always looking for ways to engage the students in developing these skills while doing our best to introduce them to real-world issues because they have a real interest in it. And, we want to entice them to start thinking about solving problems for real-world issues. It's an interest of theirs and it kind of hooks their attention. So, within the projects we work on developing those skills. And, when I found Cubes in Space, I kind of thought this fits perfectly. So, that was my motivation behind bringing the project to their attention.

Chiraz: They are definitely talented. We enjoyed very much talking with them earlier. How do you as a teacher spot talent and potential, and when you do find this talent, what do you do with them? How did you approach them?

Ms. Quail-Blier: I fully recognize that all of my students are talented. I think all students are talented and they all have different gifts to bring to the table. My students are here because they are a part of the program for gifted learners. And, so I think part of my job is really to encourage them to set their own goals, to find out what they're interested in and to know that they have potential and to focus on the things that they're interested in and to work towards it.

Ms. Quail-Blier: So, part of my day is referring to a growth mindset. The students will not roll their eyes, but they virtually, when we touch on anything, they'll kind of go, yes, that's the growth mindset. So, we talk a lot about not giving up, embracing challenges. I bring them problems of the world or issues they, the students talked about the United Nations Sustainable Development Goals for the 2030 agenda. We talk about those a lot too. And we, I just encourage them and we work towards embracing challenges, persisting in the face of setbacks and just finding lessons in inspirational quotes and whatnot that we give. So, I think, what do I do? I just try and encourage them to keep going and to reach for their goals and not give up.

Dr. Burry: Could you tell us a little bit more about this particular experiment? and, particularly what your role was in the experiment?

Ms. Quail-Blier: So, Cubes in Space is a competition actually for 11 to 18-year-olds around the world. It's open to anybody to design and propose an experiment that requires space to test it. And, they award 80 cubes for the rocket platform, a sounding rocket, and about 120 for their zero-pressure research balloon.

Ms. Quail-Blier: For me, I'm looking for something that they're going to be exposed to stem challenges. And this sort of hits the mark on it. It requires a lot of scientific research and it connects to the real-world issues that I'm always looking for and it ignites the student's curiosity and their imagination and all while developing those six global competency skills that I talked about earlier. So, for me like how many people in the world can actually say they flown an experiment to space on a NASA rocket? I would think very few. And I'm always saying to them, you know, you've got an opportunity to put on a resume anywhere to get into university or anything that you've actually done exploration in space and launched your own experiment and did your own testing with space science.

Dr. Burry: You just started to talk about what were some of the lessons that you actually learned out of this project?

Ms. Quail-Blier: The biggest lesson that the students learned probably is that they can make a difference. Their investigation and by the way, like their first foray into studying teeth was two years ago when we just weren't sure if teeth would be affected by radiation in space. So, they started launching into, you know, into questioning it. Do teeth actually weaken? And then we'd start talking about how we could discover whether they weaken and how we would lay that out. And so, like my role would be sort of to hook them with little videos. I would find videos, I do research in the background first, I bring it to them and ask questions that sort of lead them to ask more questions. So, with an endpoint in my mind of where I want them to get, I ask the questions and they start leading with the questions. So, I think that the biggest lesson for them is they can make a

change. They can make a difference in the world, if they just keep going with it, just keep asking the questions and working towards it.

Ms. Quail-Blier: For me the biggest lesson is probably to never stop looking for things that really are of interest to them because they can make a difference. So, if we give them the opportunity and I find things for them, they can roll with it.

Dr. Burry: So, what's next? Another cube? Another project?

Ms. Quail-Blier: Yeah, in the short term, what's next is that we are looking into patenting the idea and we're speaking right now with Space Maintainers Laboratories. It's sort of in its infancy talking about it, but we're also developing, we're doing a validation of our findings from last year as the students mentioned. So, we do have more teeth going up on both platforms, the sounding rocket and the balloon. And we're also working with, I'm always trying to find community partners. So, we've hooked up with MindBridge AI here in Ottawa and we're working with a wonderful man named Robyn [inaudible], who's helping us learn how to code for artificial intelligence. And, we will be joining other scientists around the world who are wondering, will artificial intelligence be affected by radiation in space because with the fourth industrial revolution on its way, or we're in the beginning of it, it's a matter of time. So, we'll be testing some AI also. In the long term in terms of what's next, we're going to keep plugging away at finding things for the kids to do because I really believe that who they are tomorrow begins with what they're doing today. And, I pray that they are faith filled and happy and pursuing whatever goals they have with passion.

Dr. Burry: Well, this was wonderful you very much for inviting us into your class today and to be able to talk with your students and to talk with you.

Ms. Quail-Blier: Thank you.

Chiraz: Before we close Deborah, I am inching to ask you this question. Where did you get the teeth from?

Ms. Quail-Blier: Oh, this is a good question. So, you know, it wasn't easy. We were shut down quite a bit and it's really hard to make a cold call and say, just give me two minutes when I talked to you about my kids who are nine, 10 and 11 years old. And, but Dr. Johnson is an oral surgeon here in Ottawa, and he works hard to get us teeth that are of similar size from the same mouth that haven't been broken when they've been extracted and clean those all up and sterilize those for us. So, we're very thankful to him for partnering with us on this.

Chiraz: And, we're very thankful to you for opening your class, just like Aaron mentioned and giving us the opportunity to speak with your students; we really appreciate it, and we're very proud of them. We're very proud of the work that

you do. Thank you so much for this beautiful, beautiful conversation and to good luck or the remainder of the project.

Ms. Quail-Blier: Thank you, well, I'm always proud of them and we thank you for listening to the special things that they're doing