On Computational Thinking: A Perspective From Rural Saskatchewan

**Episode 6: Dean Elliott Interview Script And Transcript** 

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## Voices

SH: Stephen Hadden DE: Dean Elliott

SH: The Saskatchewan Computer Science 20 and 30 curricula were revised not too long ago. Not too long after their release there was a request put out by the Ministry of Education looking for writers for a grade 10, 11 and 12 robotics and automation curriculum. I jumped at the chance to take part in the creation of this document. One of the important aspects in the development of this curriculum was ensuring that there were outcomes and activities that could be included in grades 7, 8 and 9 Practical and Applied Arts Survey courses. The robotics and automation curriculum purposefully provides students with a variety of branching opportunities to mess around with physical, hands-on applications of coding, fabrication, circuitry, automation and RC control. There are over 100 outcomes, with a number of great outcome pathways included.

The person behind the science curricular renewal, and the robotics and automation development is Dean Elliott, who I had the pleasure to talk with for this project. A wealth of knowledge on all things science instruction in the province, Dean walks us through some of his story, and the story of SaskCode - a Saskatoon based organization that is helping to provide tools, lessons, and professional development for coding, robotics, and computational thinking instruction in the province. In a moment we will meet Dean, but first let's get the episode details out of the way. This is the penultimate episode in this series on computational thinking, I'm Stephen Hadden.

DE: Yeah, for sure. Dean Elliott, originally a science teacher in Saskatoon for a dozen years. And then spent 18 years at the Ministry of Education as the science curriculum consultant, so I wrote all K to 12 science curriculum that are currently active in Saskatchewan, then moved into writing some of the PAA. Specifically, robotics and automation, and then helped out with a bunch of trades related courses.

SH: Dean retired from the Ministry a few years ago but has had a number of consulting jobs, including time with Sun West School Division and he works part time with SaskCode as the Provincial Outreach Coordinator.

I reached out to Dean for the interview because I've always appreciated his thinking and direction on science and technology education. Dean has been a constant advocate to increase adoption and interest in computational thinking and computer science education in the province. He has been working on a framework style document related to computational thinking for quite awhile, but things like global pandemics, and different initiatives sometimes cause things to get left on the shelf for a better time.

DE: And they're sort of one of my side projects, which ends up relating to what we're talking about today is two of us at the ministry, Joanna and myself, both wrote a framework for, not, I guess, not really a framework for computational thinking and coding. It was more of an action plan to sort of say how the government, mostly through the Ministry of Ed, school divisions, outreach groups would work together to bring computational thinking and coding to the province, so that never got released. So it's, It's sitting there.

SH: But Dean hasn't been sitting waiting.

DE: In my role at the ministry, still, I helped Saskatoon Industry Education Council, which runs the provincial SaskCode robotics program, run a computational thinking and coding symposium. It's what we call it. It's not really all about CT&C, but it's bringing together the contacts in the school division, so they could be a consultant, coordinator, or Superintendent. Just sort of depends on the size of the division. And we've been meeting once or twice a year for four years, for sure. I think we're up to about our sixth meeting already. The first couple, again I was still at the ministry but helped facilitate it. And we had full day meetings in Saskatoon and Regina for North and South half of the province brought in a lot of the other outreach groups that had CanCode Funding and we just talked about where we at with computational thinking and coding.

SH: As we continued our conversation, Dean shared various insights on computational thinking, it's place in our classrooms, why we need it, and a bit more about things like SaskCode. We jumped around from topic to topic a little bit, but I think for this episode we will focus on Dean's words about the reasons and events that lead to the development of SaskCode.

DE: So in Saskatchewan, the group called Sask. Tech got formed, so they're the they're the lobby association for the tech sector. Lot of the small companies, I mean most people know Skip The Dishes. If you're in the restaurant business, you know 7Shifts, the scheduling software. You might not know Push, but if you use the Co-op web app or the rider web web app, they do those. This is about 40 companies, most of them at the on the U of S somewhere. A lot of them have five or six people, and then there's a couple of big, you know, zoo.com has a fairly big amount. Then there's Vendasta, downtown Saskatoon that has a few 100 employees. And then there is Solido, which is now Siemens graphics. Which that company alone can hire all the Masters and PhD computer science grads from U of S and U of R, just for

them. And they can't get enough out of that pool. So, that industry was going to the government and talking about this shortage of computer science grads. So, then they didn't come to education initially, but they thought, well, if education did more on programming that and coding that would help.

SH: Economics is a key driver for computational thinking and coding education (Vegas et al., 2021; Wood, 2022). Technology companies need people that are highly skilled, and very well educated. Many non-technology companies also need people with these related computational thinking skills, often including coding. When we focus on careers, and industries in Saskatchewan - it may be important to ensure we are thinking about the many technology options that are available in our province. Let us continue.

DE: At the same time, unbeknownst to all of us, the feds put together the CanCode program and announced 50 million or whatever it was, for organizations to do digital literacy related to coding skills. So, the SIEC developed SaskCode program and I helped write it even though I wasn't working there. And we just chose to do a robotics as the focus. Whereas a lot of the others, you know if you are in most of the other provinces, you see some regional groups, and then the national groups like Let's Talk Science, Kids Code Jeunesse, Canada learning code. Most of those groups are coding based, whether it's sort of scratch type tools at lower levels or up at Python.

SH: Just want to make a little point here. I have been part of a number of in-person and online coding opportunities from organizations like Kids Code Jeunesse and Canada learning code. Their lesson plans and tools are very good, and highly effective - I would recommend you check out their websites.

DE: So we decided to go with robotics and focus on Saskatchewan K to 12 curriculum. We've got the five different robots. And every robot has the crews developed 30 or 40 activities that are online now in English and French right from K to about 9. And so, we saw those who worked at SaskCode and those at the ministry a chance to start developing coding skills. That was the first push.

SH: The robotics application has been a great focus in my opinion. The hands-on nature of the robots, and the ability to collaborate with others, often makes for a great time - and allows for even the smallest students to have something they are able to do. A recent article by Kurt et al. (2020), shows that coding with robotics is even more effective than strictly block-based coding like scratch. It's only one study, but I thought the results were at least worth mentioning.

Dean will continue about how SaskCode has been able to expand to provide support across the province. It's slow going, but they are making it work with the funding that they have. I know that they have provided some kits through our tech coaches, and they recently attended our Local association convention day with a fun workshop using the little mouse robots for grades K-2. Here's Dean:

DE: So, the first funding and they picked the name SaskCode because it is actually the Saskatoon Industry Education Council. So that's the partnership with Saskatoon Public, Saskatoon Catholic, Prairie Spirit and Saskatoon Tribal Council, so they each throw money in to fund SIEC. And most of what SIEC does has nothing to do with code. This is just one of, most of the projects are around career development. But Jenna put the proposal in for this and they got the one point one \$1.2 million of funding. And so, the initial project was to develop these robotic kits and provide PD either half day or full day face to face in Saskatoon for those three divisions and the tribal council. And so, SaskCode was in a way Saskatoon code, but it's also Saskatchewan code. So we're kind of lucky that the cities work that way, right? The city and the province name. So the goal was to engage kids in computational thinking and coding using robotics. So, we have the purple robot mouse that's K-2, the Ozobot that looks like a Sphero for grade 3/4. For grade 5-6 is the Edison and the Micro:bit and Grade 7-8-9 is the Arduino. And then originally, we did 10 or 12 was the Raspberry pie and it turned out that was just too complicated for most of the people we worked with. So, we just do Arduino all the way through from grade 7. And so, then the deal was that we would develop the robot kits. And provide them free, because when you're federally funded, all this has to be provided free. But to get the kits, teachers have to complete the PD and at the PD you get a code and then you can go in and into the booking system and book out a kit for free. And then if you need some help, Bill and Curtis and Megan are available. Phone, zoom, whatever, or they go out to classrooms because everything is within, you know, an hour of Saskatoon in the office and help teachers.

With our CanCode 2 we put in for \$5 million to cover the whole province, there with seven regional centers, and the five million turned into 1.1 million again. So we didn't do quite that and we focused on, we have a Regina center. So out of here in Regina, we service Regina Public, Regina Catholic, and Prairie Valley. And so all the kits are stored in one place here, but the kits are still put together by our tech in Saskatoon. And then we just bring them down. So those teachers have access to the same PD, all of which shifted during COVID to online PD. So unfortunately, we're down, you know, now it's mostly an hour and a half after school. But it was fascinating when we, when we shifted to the to the PD during COVID. A year or bit ago November, we thought if we could get 200 teachers to sign up in the next 5 months. We'd be ecstatic. When we hit 1100, we had to just shut the doors and say we can't take anymore. It was bizarre. 1100 teachers signed up to do PD after a full day of school during COVID on their own time, and we'd send these robot kits out so that if they didn't have a kit. They would, they

would have just an individual kit for the PD. And so then other divisions sort of can go through us, have just bought the kits. From us and then. They are supposed to have their teachers do the PD, but that's up to them. We can't really control that, and they control how they do the distribution, but it's usually still a three-week period. So we've expanded to where pretty well that whole map behind me, right, with all 27 school divisions, there's only a couple that aren't really involved and they're, you know, like Creighton with one school, but for the most part everyone's on board and lots of the First Nations.

And now this year we've also got NSERC funding. So National Sciences Council. And so we've we're launching a new program called, Excuse Me, Green Tech. And so it's still going to be coding based, mostly using Micro:Bit, and it's all about solving problems related to climate change, environmental stewardship using technologies. So we're going to launch three projects a year. So right now they have the garbage car slash recycle racer, the smart water pump. Another one I've forgotten, and so the idea is we'll launch these projects and the same thing it's kits that they can get from us and we'll offer the PD. So that that model, because what we think the success we've had is having all this PD. Our resources are all curriculum correlated well To the outcomes in Saskatchewan curriculum. So I think that's what's made the school divisions want to work so closely with SaskCode. I mean, free stuff helps. But the curriculum alignment, like teachers these days if you can't show the curriculum alignment, they're just sorry, don't have time. You have to show us where that is.

SH: Resources, lessons and Professional Development are very important to a teacher to feel more comfortable with these activities. As a computer nerd, I love this stuff, and if I had the chance I would mess around with building fun little robots all day. But for teachers that are not as comfortable with technology - it can be intimidating. It can be loud, messy, and beyond our skillsets. At the very least SaskCode works to align tasks with Saskatchewan curriculum, they have curated tools that are effective for teacher and student, and they will help show how to use them. It's nice having something like this available to us in our own backyard.

So that will wrap it up for now. I want to thank Dean for his time and his knowledge. Dean has so much to say and has lots of insight into how to make industry, education, and society sync together. Join me one more time, I will be sharing some of my favourite tools. Thanks for listening!

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