Future of Food & Farming brings together students, business and farm

When we think of STEM (Science, Technology, Engineering and Math) we often think of students learning the skills they need for the high-tech jobs of tomorrow ? and we're not necessarily wrong.

But a new partnership between an Aurora business and a King Township farm is shining a light on how STEM can not only advance traditional farming methods and jobs but feed communities in innovative ways.

The Future of Food & Farming: Innovations in Horticultural and Indoor Agriculture is the brainchild of Aurora's STEM Minds and King's Boreal Farms.

Supported this past spring by a grant of nearly $300,000 from the Provincial Government, the innovative collaboration is now in full swing at Boreal, located on the northeast corner of King and Weston Roads.

The aim of the program is to provide immersive learning experiences in the field, highlight how STEM technology can be used to innovate agriculture on large and small scales (both indoors or outdoors), and highlight in-demand jobs in agri-tech.

The partnership between STEM Minds and Boreal Farms was borne out of an innovation summit where STEM Minds owner Anu Bidani and Boreal's Brandon Hebor struck up a conversation and had what Bidani describes as an ?ah-ha!? moment.

?Teaching STEM with purpose is more impactful than just teaching it in general, so this became a platform to teach with purpose,? says Bidani.

With the grant from Ontario's Skills Development Fund, the partnership has been working to raise awareness amongst young people that there is a ?huge talent pipeline issue? in the agri-tech sector and, in doing so, they have underlined the art of just what can be possible in a variety of spaces.

On a rainy Friday afternoon last week, Bidani and Hebor welcomed us to the farm, planted just behind a repurposed school building. The former school yard in which generations of children played is now a fertile oasis that boasts more than 300 tomato plants in four different varieties, cucumber, kale, watermelon, cantaloupe, Korean melon, squash, a variety of peppers, greens and herbs, along with zucchini and garlic.

It's a fitting setting where past meets present and future as Bidani and Hebor aim to bring this type of agricultural knowledge into schools across York Region and South Simcoe where they believe on-site greenhouses and gardens can highlight the intersection of environment and technology.

Just north of the field is a farm building where STEM Minds students showcase several innovations they have spearheaded as part of the program, including a robot they describe as a farm ?Roomba,? virtual rendition of nearby fields created by drones which can monitor both the health of plants and the soils in which they are planted, and deceptively simple-looking seed-growing kits devised by the students that require no tools or glue to build, but still come equipped with LED lights to help seedlings get off the proverbial ground.

Here, the students demonstrate how the drone work can provide real-time data on the state of the crops while the robot can be programmed for deployment in the fields overnight to pull weeds and a number of other tasks, boosting efficiency and reducing labour.

?On this journey, we have realized how little people actually understand small-scale farming opportunities,? says Bidani.

Adds Hebor: ?Agricultural education helps them also become informed consumers ? buying food, understanding the value of local food is not necessarily the dollar value of the produce; it's how it was grown, who is growing it, and is that money staying in the local economy? Working with kids and having the hook of technology in this day and age, we can also use that hook of technology to understand the land, what regenerative farming is, what local food is, and then when they get to come to the farm and taste the food, it makes a huge difference.

?I have had hundreds of students for whom it is their first time ever picking produce from a farm. They have gone to farms, but it's usually pumpkin farms or hay fields, so picking tomatoes, cucumbers, or peppers right off the vine is an experience that leaves a memory. In everything we teach them, there is this underlying theme of supporting our needs of today while thinking about resilience for tomorrow.?

Recent statistics have shown Canada needs approximately 30,000 more permanent agricultural workers in the next 15 years and a goal of the program is to teach and train the up-and-coming generation how to become involved and find success in the sector while also challenging notions of farming.

Farming isn't something limited to the types of fields we see dotting the edges of country roads. Instead, indoor farming under the right conditions, they stress, can take place in warehouses, storage containers, and, of course, outdoor locations like school yards and parks.

?A school is a place where families congregate and those families could subscribe to a student food basket and build an economic model for something like that even better,? says Hebor.

?What if some of those school portables were converted to indoor farms and greenhouses?? muses Bidani, pointing to the student hard at work on their innovations. ?Just imagine the live lab we have happening here right inside schools. To us, that is the big value of this proposition. Unlike [a commercial farm field], when people walk in here it is not overwhelming. When you walk onto a big 200-acre farm, you think, ?I can't do this,' but this I can do. When you start putting technology with it, the impact is huge and the fear factor just kind of goes away.?

An added bonus, she says, is teachers who have come to see the program happen see applications in just about every subject.

?Everything we're teaching here is in the curriculum; it's just not taught through the lens of agriculture (at school), whether it is biology, lighting systems, plant physiology, even irrigation and plumbing,? says Hebor. ?It is taught in a very different lens, perhaps, because teachers don't know enough about agriculture to be able to deliver that to students. If we're able to be a hub and create

knowledge-sharing for students, similar to Anu when she started up with STEM Minds, and have a hub where teachers would come in, then that knowledge could be spread out.?

Schools, notes Bidani, study data analysis but it is often just in ?theoretical models.? If such places of learning had indoor farms, greenhouses, or other forms of agriculture, it will offer students live data to study right from their school yard.

?That's the beauty of what we can do when we start to think about it,? she says.

In the meantime, for the balance of summer, participants in The Future of Food & Farming: Innovations in Horticultural and Indoor Agriculture program will continue to tweak and further their innovations for the future and the idea is that once these designs are finished and perfected they will serve as an Open Source-type of file that can be shared with any student, classroom or teacher going forward.

?It starts building community,? says Bidani. ?We're sharing, learning, and collaborating and that's the intent of this ? showing the intent of what you can do with simple design-building. I think this collaboration between farming knowledge and technical knowledge is where the power is. The more we marry the two, the more innovation we will see in small-scale farming and have kids in school innovating before they even graduate and having an impact in many different ways.?

To see for yourself, Boreal and STEM Minds will host a Community Night at the farm at 13175 Weston Road in King, the theme of which is Growing Mushrooms, which will feature a hands-on project on how to inoculate mushroom logs for home cultivation. For more, visit www.stemminds.com/boreal-farms-partnership. For further information on their upcoming workshops, visit www.stemminds.com/skills-development-fund-the-future-of-food-and-farming-innovations-in-horticulture-and-indoor-agriculture/ to register.

By Brock Weir