ENTREVESTOR INTELLIGENCE

OUR BACK-TO-SCHOOL ISSUE

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WHAT'S INSIDE

Entrevestor Intelligence

Entrevestor publishes its Intelligence reports to provide a deeper analysis of the Atlantic Canadian startup world than can be delivered in a daily news report. This is the third of four reports we're putting out this year. The photo on the cover shows Phil Romkey, ACEnet HPS Systems Administrator, in the Data Cave at St. Mary's University.

To receive daily reports on startups in Atlantic Canada, leave your email address at the bottom of our home page, www.entrevestor.com.

Backbone of the Ecosystem

Atlantic Canada's universities and colleges provide startups with a precious commodity – talent.

Matthew Fanning

To begin to understand the impact post-secondary institutions have on the Atlantic Canadian startup system, it might be best to start with Matthew Fanning.

Fanning was a St. Mary's University grad working as a salesman of medical devices in 2013, but he wanted to start his own business. While taking his Bachelor of Commerce at the Sobey School of Business, he'd noticed that professors had problems teaching oral communications skills – one of the key talents demanded by employers. With large class sizes, profs can't listen to presentations from every student, and the students rarely get a chance to practise oral delivery.

So Fanning set out to develop a Software-as-a-Service solution to the problem. He worked with computer science graduate students at Dalhousie University, Nilofer Mehta and Anuj Shun to develop the technology, and other students joined as the project grew.

The result was an eLearing platform called Presenter's Podium that lets professors assign subjects that must be researched, and allows students to practise and record a verbal presentation on a subject. The assignment, practice and submission are all done on a computer, cellphone, or device, using the Presenter's Podium built-in media server.

"Recruiting top talent at both Saint Mary's University and Dalhousie University, I was able to use local resources to refine our product and build a solid team at an affordable price before launching to the rest of North America," said Fanning.

The example of Presenter's Podium serves as a starting point to understanding these institutions' contributions to the Atlantic Canadian startup community. The idea grew out of a university. The development required collaboration by students at different schools. And post-secondary institutions formed the market for the product.

But it is only the starting point. We hope the pages of this publication – our third Entrevestor Intelligence report of 2014 – will flesh out the many and profound ways that schools foster innovation and entrepreneurship. Their research sparks companies with world-beating technologies. In the last two years, regional schools have focused on training lean entrepreneurship. They are spread across the region and in some small communities are the only generators of startups. They are magnets for startups' most precious resource – people, especially young, highly educated people.

In fact, universities and colleges are gold mines for two facets of a successful startup community that Atlantic Canada needs – R&D and talent.

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Mining Young People's PASSION

UNB's Summer Institute uses an unconventional approach to teach entrepreneurship to some unconventional businesspeople.

Entering the austere halls of the J. Herbert Smith Centre for Technology, Management & Entrepreneurship at the University of New Brunswick, with its arched entrance and paneled halls, it's easy to suppose the school's summer institute will be a serious affair.

The Centre is the epicenter of entrepreneurship education at the University of New Brunswick, the institution that Startup Canada named the Most Entrepreneurial Post-Secondary Institution of the Year for 2014. What's special about UNB? Well, for one thing the Herbert Smith Centre, the entrepreneurship education facility, is embedded right in the heart of the Engineering faculty, which helps when the university spins off the technology it develops into startups.

So there was a bit of apprehension on entering the class where the Summer Institute, the university's program for entrepreneurs, is running during the holiday. Walking into the sunlit classroom, I saw the five teams working away, with the encouragement of mentors Entrepreneur-in-Residence Jordan Smith and Philip LeBlanc, head of the Fredericton Makerspace.

The faces all shine with enthusiasm, but that's not what you notice first. The thing that catches your eye is the materials these entrepreneurs of tomorrow are using for their projects: Play-Doh; pipe-cleaners; scraps of old felt.

There are lean canvases and laptops in the room as well, as there are at all entrepreneurship methodology clinics. But in the Summer Institute for aspiring entrepreneurs at UNB, all the participants have to remove themselves from the fail-fast-fail-often seriousness of the startup world. They have to embrace design, meaning and a liberal dose of fun. Above all, says the program leader, Dhirendra Shukla, the students participating in the program have to embrace their greatest passion.

"Young people are passionate about the world and we have to harness this passion," Shukla, the Dr. J. Herbert Smith ACOA Chair of the centre, said in an interview. "Our attitude is, 'The most important thing about this is you and your passion,' and now let's turn this into a business."

The organizers of the Summer Institute all stress that they didn't want the program to replicate some of the great accelerators in the region, like Planet Hatch's ACcelr8 or PropelICT's Launch36. They wanted to incubate a class of entrepreneurs that might not be eligible for such innovation- or technology-based accelerators.

"We wanted to create a system of support for people who want to start businesses but need mentorship that has not been available before,"

Program leader Dhirendra Shukla

said Gracen Johnson, an administrator with the Summer Institute. They advertised for the program to run from May 5 to July 31for people who want to turn their passion into a business. From the 40 applications they received, they chose five teams.

The winners were eclectic:

- Wear Your Label, founded by Kayley Reed and Kyle MacNevin – the company is developing a line of "conscious clothing" aimed at 13 to 29 year olds. The clothing bears labels referencing mental health, and the wearer can choose how prominent the label is. The aim is subtlety, so people can ask the wearers what the label means and they can reveal as much as they like.
- Ploome, founded by Anna Mathis – Mathis is a fibre artist whose company sells kits that teach people fibre art, ranging from spinning to weaving. She plans to study education at UNB this winter and develop a business around teaching her craft, holding workshops and selling the kits.

Wear Your Label co-founders by Kyle MacNevin and Kayley Reed

Anna Mathis of Ploome

- Waygood Mobile Therapy, founded by Kati Waygood – this business provides a range of therapies, from massage therapy to exercise training to nutrition education, all in the client's home. Waygood, a registered massage therapist with a BSc in kinesiology, has found the reason many people, such as new mothers and the elderly, skip their therapy sessions is they can't get to the clinics. So she goes to them.
- Oasis Farmery, founded by Andrew Mathis and Jake Wildman-Sisk – this is an aquaponics venture – that is, its system grows crops of herbs and vegetables, such as kale, cilantro, basil, tomatoes or pea shoots, out of a vessel of water containing fish. The fish and plants provide nutrients for each other. Oasis Farmery has set up its first system and is running tests on their model.
- Beyond Saigon, founded by Danny Nguyen – this company delivers Bánh mì (Vietnamese meat and spices in a baguette) to locations around Fredericton. The goal is to provide nutritious, tasty food to lunchtime crowds. Nguyen said he started the company to provide employment for his immigrant family.

Shukla said the organizers chose people who were passionate about their chosen fields with the goal of teaching them how to make money from their passions. They also wanted companies that were helping the community or environment in some way, such as drawing attention to mental health or improving the processes of growing food.

Mentor Philip LeBlanc, right, goes over a business proposal with Jake Wildman-Sisk, left, and Andrew Mathis, the co-founders of Oasis Farmery.

The Summer Institute does what other mentorship programs do by instructing the students to seek out market pain and apply lean methodology to assess the viability of a business. But Shukla's teaching methods do more. Take the exercise with the Play-Doh and pipe-cleaners. All the teams were given the description of a potential client (a twenty-something woman living in New York) and instructed to design and build a product for her. They could only use the craft materials available on a table in the centre of the room.

The exercise had three goals. First, it encouraged the participants to remember they are building products for people, real people with likes and dislikes and emotions and quirks. The entrepreneurs need to make products that speak to their clients' human qualities.

The second goal is to make the entrepreneur focus on design – in all aspects of what they do. And finally, they have to consider their supply chain when building their product.

"What's really impressive is people's ability to be receptive to almost every type of learning process we throw at them," said Philip LeBlanc of Fredericton Makerspace, one of the mentors at the institute. "They are actually taking advantage of the mentors that are available to them."

The Summer Institute is a place where unconventional startups are subjected to an unconventional learning experience. And the result is that they worked hard, they collaborated and they began to act like business people.

"We pushed them to go make money, never really expecting it to happen," said Shukla. "But now they are making money, and they're doing it as a consequence of doing good."

In fact, all five teams had booked revenue by early July, and were planning to carry on with their businesses after the course ended. When Beyond Saigon, for example, took its wares to North Market in Fredericton, it sold out of Bánh mì and had to turn some customers away.

The Summer Institute proved that students could develop a business by following their passion.

"If we could only do all this times 150, this province would be a special place," said Rivers Corbett, a UNB entrepreneur-in-residence. "This program allows people to build on their dreams. And yes, they do make money doing it." *

STARTING UP?
START HERE.

Braden Murphy's start-up thinking began at Dalhousie. The engineering student explored the idea of developing a durable, more efficient and easier to maintain motor. Supported by professors and backed by investors, he built prototypes, developed the technology and filed for patents. Now a graduate, Murphy has created Atlantic Motor Labs, a Halifax-based company whose unique technology holds real promise—in the form of cost savings, reduced waste and greater reliability—for the oil, gas and mining industries.

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Mastering the Lean Canvas

The lean canvas has become a standard tool in entrepreneurship courses, but experts say it's not a silver bullet.

When Claire Ciel Zimmerman entered the Summ'er Up entrepreneurship program at Dalhousie University this summer, she hadn't even heard of a lean canvas.

The co-founder of the magazine publishing startup Bootstrap had to learn how to use the nine panels of the canvas to test theories on developing a business.

"As my colleagues and I moved through the program we began to see the value of the lean canvas as a set of guiding principles, which became very useful in considering how to establish a viable business with a sustainable revenue model," said Zimmerman.

She has now joined the growing list of entrepreneurs who have come to understand the value of the canvas in plotting out what works – and more importantly, what doesn't work – in a new business.

The canvas is a single sheet with nine panels where entrepreneurs write in their theories about how their business will work. They then go out and interview potential clients and/or partners about those theories, and adjust the business plan as needed. The idea is to make all your mistakes before you've built your product, saving time and money and getting customers more quickly.

"For students, it's really a starting place," said Mary Kilfoil, the professor who oversees the Starting Lean and Summ'er Up programs at Dalhousie. "It provides an immersive experience. It meshes the theory with practical, hands-on experience when students are really at the idea stage and they're bumping up against whether an idea has any traction at all."

The lean canvas is now a standard tool at entrepreneurship programs, and its acceptance has come about remarkably fast given that it dates back only to the writings of Alexander Osterwalder in 2008. It has two huge strengths: first, it presents all the main components of a business on a single sheet, so a team can view it instantly; and second, it forces a team to make mistakes early, so they save time and money.

"It helps the entrepreneurs to really understand the market in which they operate and understand their competitors," said Kilfoil. "They're finding out what's out there in the market. And that gets them thinking about the strengths and weaknesses of their own business model."

She added that the practitioners of the canvas also must be adept at tailoring their questions for each group they meet, so they discover the most pertinent information possible. The idea is not to get a set of unified data (as you would with a survey) but to return with information that will help you develop a product the market wants.

But educators and mentors also warn that the lean canvas is not the silver bullet for every startup, and company founders have to be careful to look beyond the canvas for other components of their business.

"The big shortfall is people are integrating their business with the lean canvas ... [and] are expecting miracles within a six-week to eight-week program," said Dhirendra Shukla, who teaches the Management & Entrepreneurship program at the University of New Brunswick. "It's how it's used that creates the problems."

The lean canvas offers entrepreneurs nine panels on which they can plot their business model.

> *"We tend to fall in love with our solutions rather than acknowledge that we are beginning with a series of guesses. Testing these things and willing to be wrong demands some courage."*
>
> – Alastair Jarvis

Kilfoil, Shukla and others say the big problem with using a lean canvas is that entrepreneurs – especially those with little experience – often fall in love with their proposal and don't listen closely enough to what people tell them. That means they're reluctant to pivot or adjust their business as needed.

"We tend to fall in love with our solutions rather than acknowledge that we are beginning with a series of guesses," said Alastair Jarvis, an entrepreneur and game producer from Lunenburg, N.S. "Testing these things and willing to be wrong demands some courage. That's a big piece for me. It's something we struggle with as humans."

Different experts find various shortfalls in a lean canvas. For example, some believe it doesn't deal enough with the financial aspects of starting a company. Others believe potential clients might not understand a truly revolutionary product, so customer feedback would be muted until people can see, test and understand a product.

"One of the good elements of Lean Methodology is the inclusion of early customer validation," said Toon Nagtegaal, the founder of THENEXTPHASE mentoring program. "But the customer validation is not necessarily true validation because you only know if a customer will buy your product if you say, 'Here's the product, give me your money.'" *

Mining Data to Improve Crop Yields

At Acadia University, the Entrepreneurship Centre is using data analytics to help farmers get more produce to market.

Melons are big, heavy fruits. They are also fragile. Their growth is influenced by variable, hard-to-predict weather factors and farmers depend on retailers selling their product before it goes bad.

That's why one Nova Scotia melon grower has turned to the Acadia Institute for Data Analytics (AIDA) at Wolfville's Acadia University to help him optimize his yield of cantaloupes.

AIDA got started in January under Director Danny Silver, as part of the Acadia Entrepreneurship Centre's Incubation and Innovation Services unit -- a group that works hard to promote entrepreneurship in rural communities.

The melon farmer approached Silver after attending AIDA's inaugural event in March. Speakers at the event, titled Data Analytics for the Wine and Fruit Growing Industries, discussed how to use data to combat issues such as climate change's impact on Ontario's wine industry and plant cancer on Nova Scotia grapes.

"Data analytics is good business," explained Silver as he sat in the airy, newly renovated attic of Acadia's Patterson Hall. "It allows you to put up your periscope and look ahead."

> "Data analytics is good business. It allows you to put up your periscope and look ahead."
>
> – Danny Silver, Director, Acadia Institute for Data Analytics

The fledgling institute will work with many academic and industry partners and is already partnering with Scotia Weather Services; a private meteorological company that provides micro forecasting down to 15 minute intervals and four square kilometres.

Such detailed forecasting is very valuable to the melon grower, who last year missed the market after changing weather meant he only harvested 50 per cent of his crop.

"We have to be specific to create prediction models for precision agriculture, which is the combination of data analytics with agriculture," said Silver, who grew up in the Annapolis Valley, working in the fields as a youngster.

Other techniques that can improve crop analysis include placing cameras in fields to record activities such as spraying, and using drones to reveal where in a field a crop might be failing.

Silver said he is pleased that after less than a year of operation, AIDA already has five active projects and seven potential.

AIDA's objectives include stimulating technology transfer, commercialization and the development of new startups, and Silver said, "It would be great" to see analytic companies working in this space.

Silver is also a professor at Acadia's Jodrey School of Computer Science and he is working with the computer science and math departments on establishing a certificate in data analytics.

In the fall, several big events will be held to make sure the academic and agricultural communities understand AIDA and the business potential of data analytics.

"We'll be offering a data analysis 101 primer for people on campus and then we'll take it to the public, to those in industry who want to learn about it, such as agriculturalists, environmentalists and conservationists," said Silver.

"The population is growing, we have less land available and we need to grow more on smaller parcels of land," he added. "We need to do this kind of data analytics across the planet or we're not going to feed us all." *

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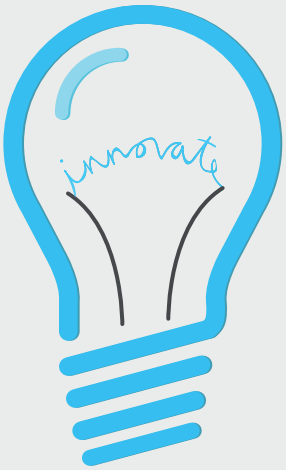

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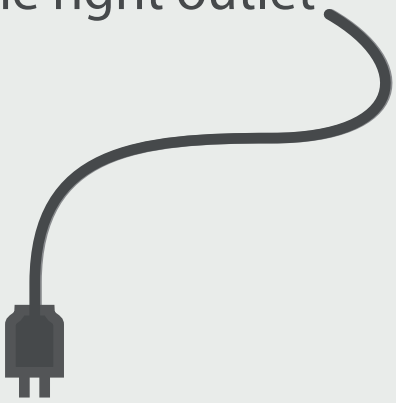

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Living in your Product

The St. Mary's University Data Cave lets you stand inside your product before it's even built.

Phil Romkey can stand in the sun-lit top floor of Halifax's new library without leaving his workplace at St. Mary's University.

Well, he can virtually stand in the new library in the Data Cave he oversees at the ACEnet headquarters at the Halifax university.

Positioned in the darkened Data Cave, wearing sophisticated 3-D glasses, Romkey can tour all of the new building, get a keen perception of how it interacts with surrounding buildings and assess pedestrian traffic inside and outside the compelling new edifice.

The Data Cave is a three-dimensional immersive environment designed for visualizing complex simulations. It is essentially a series of 3-D projectors that throw images on to three walls and the floor, so viewers have the impression they are standing within a structure, whether it's a new library, a space station or a molecule. The viewer can tour through the field or structure, and the image can change depending on where the viewer is standing in the room, which holds up to four people.

"This is now used mainly for science and research," said Romkey, the Lead Systems Administrator at ACEnet, the group that oversees the Data Cave. "It's easier for young people to visualize a molecule when they're standing inside it."

ACEnet and others want the potential of the Data Cave to spread beyond the single city block that is St. Mary's University and are collaborating with NSCAD University and other groups on using its immersive powers to aid with design, education and research.

NSCAD has installed a similar 3-D immersive platform in its Harbour Campus a mile away, so ACEnet is able to simultaneously create virtual environments on two campuses. Though the NSCAD facility is less complex than that of SMU, it is a larger space, allowing the participation of up to 20 people.

Gregor Ash, Director at the Institute of Applied Creativity at NSCAD, can even see a day when participants could do a roadshow with the facility using 3-D projectors or other technology.

The educational benefits of such collaboration are obvious, but Romkey and Ash stressed that there are opportunities for startups to work with the universities on perfecting their designs and prototypes using the Data Cave technology.

They are already in discussions with a few startups. The Data Cave allows developers of a physical product an intricate examination of the prototype because they can walk around inside it and inspect it.

"We absolutely see the commercialization potential," said Ash. "To be able to experience your content in full life-size scale, to be able to manipulate and move through and around data and objects, it helps immeasurably."

This sort of immersive technology can assist with the development of products, and also help key partners – whether they are potential investors, customers or collaborators – to understand the intricacies of the project.

Said Ash: "It's all about creating an ecosystem for experimentation and prototyping by having the tools available that we didn't have before." *

Rock Star Mentors

A St. John's entrepreneur gets marketing advice from one of the shrewdest minds in the entertainment business.

By Jason Janes

One of my objectives as co-founder of Startup Newfoundland and Labrador is to grow our mentor network and connect as many entrepreneurs and mentors as possible. How do we make that happen? Sometimes, we just have to ask.

Recently, on behalf of StartupNL, I had the opportunity to attend 48 Hours in the Valley, the two-day mentoring event hosted by C100, the Canadian support network in Silicon Valley. While in San Francisco, I attended many fireside chats and several private events, such as Happy Hour with Don Mattrick, CEO of Zynga, and dinner at the home of Don Listwin, former executive VP of Cisco.

What an amazing opportunity to meet such influential and driven individuals while surrounded by the positive energy of other motivated entrepreneurs and mentors from Canada. I'd name some, but there are simply too many to mention.

When C100 wrapped up, I decided to relax on Venice Beach in Los Angeles for a few days. Considering that I had traveled all this way, I thought I may as well look up a few friends from Newfoundland and Labrador, so I made a phone call or two. Sure enough, as is the case from every other Newfoundlander, the answer was, "Sure b'y, come on over." (Not exactly those words, but you get the point.)

A few hours later, I was having coffee with Shannon Tweed at her beautiful Beverly Hills home.

We were chatting about all things Newfoundland, such as the success of Republic Of Doyle and her appearances on the show. The Newfoundland-born model, actor and former Playmate also shared her successes and aspirations for her latest project, Shannon & Sophie, a show for W Network she has undertaken with her daughter. I shared our goals for the StartupNL entrepreneurial community.

Shannon then asked if I'd like to see the famous Gene Simmons office and of course I jumped at the opportunity to visit the sanctum of the KISS bass player. She said, "One sec." She hit speed-dial on her phone and said, "Hubby, I have a friend here that would like to see your office."

Two minutes later, we were in the famous office taking selfies and exploring everything KISS. You'd think this would be enough excitement, but not when you're at the Tweed/Simmons home. Minutes later, who should appear but Mr. Gene Simmons himself. For the next 30 minutes or so, I had the chance to talk to the Marketing and Finance Wizard himself about all sorts of things such as his new book, upcoming TV shows, and everything else that I could think of. Platform boots and makeup aside, he is a shrewd businessman.

What's important about all of this? Of course it was an experience that I'll never forget. But more importantly, if you desire to learn from a mentor, just ask. Don, Don, Gene, and Shannon are indeed influential but they are all reachable if you try hard enough.

Sometimes we just have to ask! *

Jason Janes is a co-founder of StartupNL. (www.startupnl.ca)

Jason Janes took a few selfies with Newfoundland-born Shannon Tweed in the memorabilia-packed office of her husband, Gene Simmons of the rock group KISS.

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THE FINE ART OF

Academic Publishing

UNB's Bruce Balcom knows what to put in, what to leave out and when to publish.

When Bruce Balcom gives advice on the strategies to follow when publishing academic papers, history suggests it's worth listening.

Balcom is the Canada Research Chair and the Director of the University of New Brunswick's Magnetic Resonance Imaging Centre, and he's been the author or co-author of more than 150 peer-reviewed publications. And he is a strong advocate of employing strategy when publishing academic papers.

"As a university laboratory, academic credibility is the most important thing you have, so it stands to reason that a healthy and prolific publication stream from the lab is also important," said Balcom in an interview. He admitted seeking patents and grants to fund a lab are also important, but they all flow from the credibility that comes with peer-reviewed publications.

"It means the lab is internationally known and that means we get funding from others and it means that we can attract key talent," said Balcom. "And if publishing is the most important thing, then you should figure out how to do it right."

The evidence suggests that Balcom figured out how to publish properly shortly after he began his academic research in the 1990s, because his lab has produced a series of successes.

The UNB MRI Centre has invented a family of new methods that use MRI – a branch of science usually used for medical purposes – for the visualization of a range of materials, including concrete, polymers, composites, food materials and microporous solids. At any given time, the lab employs 20 to 25 people, and is now working on a four-year project, financed by the Atlantic Canada Opportunities Agency's Atlantic Innovation Fund, to develop new and more sensitive tools for imaging rock core and petroleum samples.

In 2006, entrepreneurs Derrick and Jill Green commercialized some of the lab's published research and the result was Fredericton-based Green Imaging Technologies, one of the region's leading startups. Green Imaging used the technology to make it easier, faster and more economical for petroleum companies to study rock core samples extracted during the exploration process. The company continues to work with Balcom's lab on new techniques and products.

As he did with the initial Green Imaging technology, Balcom often publishes research knowing it will be the basis of a patent, and could be commercialized. "It gives you a good text to use as the basis of a patent," he said. "And the solid description helps with the patent process."

But he is also wary of what he puts in the paper, making sure not to publish too early or to reveal too much to competing labs or companies.

"We would write a paper and we would describe what we were doing and we don't explicitly say how we would think of using it," he said. "We don't describe any possible business applications. We wouldn't even describe the scientific implications – we're not telling other research labs what we're going to use it for."

Balcom emphasizes that he is not a shareholder in Green Imaging, and the company and lab operate independently of each other. But by publishing a steady stream of material and delivering papers regularly, he is able to inform key industry partners about the work the company is doing.

That helps both the lab and the company. And given that UNB is a shareholder in the company, the university benefits when the company does well – and when it pays a dividend.

In fact, Green Imaging did pay its first dividend last winter. So, in a nice piece of mutual benefit, the company was able to reward the university whose lab gave the startup its start. *

Bruce Balcom

Computer Science Enrolment Swelling

The lack of prospects in other fields is driving under-graduates and graduates to plan careers in programming.

A few years ago, Jeremy Tupper realized there was no discipline that would allow him as much opportunity, fulfillment and earning potential as a career in computer science.

As he wrapped up his degree in computer science at Dalhousie University this summer, he reflected on the vast horizons that are open to him now that he's a card-carrying coder.

"There's no other industry where someone can put in a little money, a lot of time and come up with something which has value," said Tupper, lounging in the halls of the university.

Tupper is by no means alone. In Atlantic Canada and across the continent, more and more students are entering computer science, both at the under-graduate and graduate levels. They are being drawn by the boundless opportunity offered by large corporations or organizations, and by the chance to develop their own technology in a startup.

While the rising number of students in computer science is great for their own personal achievement, it also meets a growing need in Atlantic Canadian economy. Startups have become one of the true growth engines of the Atlantic Canadian economy, and many – possibly most – of the startups need employees, especially on the tech side. When Entrevestor surveyed 162 startups earlier this year, the responding companies said in total they expected openings by the end of 2014 equal to 52 percent of their current staff. To fill those openings, the region will need trained computer programmers.

The good news in the number of people going into and coming out of the university faculties has been increasing each year since the economic meltdown.

A survey of a few of the major computer science faculties in the region shows just how powerful the growth has been.

The Dalhousie University faculty of computer science – which has the most recent data -- has experienced a 43 percent increase in undergraduates in two years to 421 in the 2013-14 school year. Part-time under-grads have risen 38 percent to 69 in the same period.

The faculty at Acadia University in Wolfville also witnessed 43 percent growth in under-graduate enrolment to 83 students in the two years to 2012.

In New Brunswick, the computer science faculty at the University of New Brunswick had an under-grad enrolment in a range of 237 to 248 in the four years up to 2010, then it began to soar. In the ensuing three years, the number of CS students rose a total of 75 percent to 428.

The UNB faculty underwent even stronger growth in its graduate students. The number of people taking masters and PhD degrees rose 78 percent over three years to 127.

(We had hoped to provide a standardized table on enrolment across the region, but the universities have different criteria in reporting their enrolment. It proved difficult to present an accurate, unified data set.)

This swelling of the computer science classrooms is part of a global trend. In the U.S., total undergraduate enrollment in computing majors among U.S. computer science departments rose 13.4 percent in 2013, according to the Computer Research Association Taulbee Survey. It was the sixth straight year of increasing undergraduate enrollment.

Experts in the field say students fled computer science early in the century in the wake of the dotcom crash. However, following the recession that began in 2008 the job market has tightened and students like Jeremy Tupper believe it is one of the few chances to plot a career.

Tupper, who won five awards in the Apps4Halifax competition this year, has gone through Dal's Starting Lean course and other entrepreneurial programs and is now working on his own startup.

"Software is eating a lot of jobs in a lot of industries," he said. "Being able to develop your own software gives you an edge in a lot of industries. " *

Dalhousie University
Computer Science Enrolment

	11-12	12-13	13-14
Undergrad			
Full-time	295	364	421
Part-time	50	62	69
Grad			
Full-time	138	145	148
Part-time	10	7	5

**as of March in each school year*

University of New Brunswick
Computer Science Enrolment

	2010	2011	2012	2013
Undergrad	244	304	342	428
Grad	71	84	119	127

**as of December of each calendar year.*

The enrolment numbers provided by the computer science faculties at Dalhousie and University of New Brunswick show the growing interest in the discipline.

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38% of the Region's Startups have University Affiliation

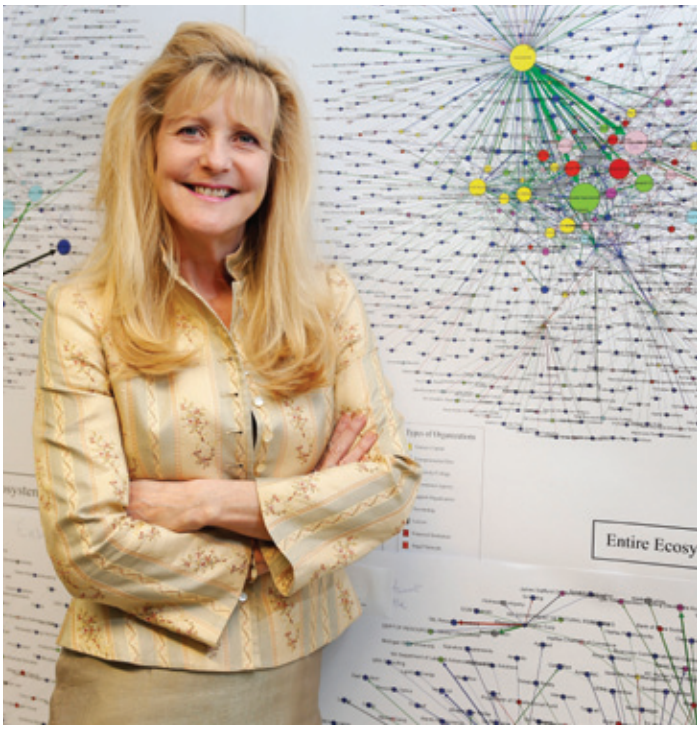
Continued from page 3

These schools account for roughly 60 percent of the research and development in the region, some of which has been spun off into successful startups, like Smart Skin Technologies of Fredericton, Verafin of St. John's, and BlueLight Analytics of Halifax. In total, the institutions have spent more than $1 billion on R&D in the past three years, half of which has been spent on Atlantic Canadian salaries and a further quarter of which was spent in the regional economy.

"Research faculty are in fact among the greatest risk takers we have in the region," said Chris Mathis, President and CEO of Springboard Atlantic, an organization dedicated to commercializing research at these institutions. "They see big problems like health, the environment, energy waste, social problems – and they actually try to engage in finding new ways to address these problems. This requires study, observation and experimentation – all of which few if any companies would ever consider tackling."

The creation and development of startups resulting from such R&D activity is only part of Springboard's mandate, as it also works at linking corporations and institutions to commercialize research. For example, in the past three years, Springboard has witnessed 18 startups created by intellectual property created at universities. The network of schools has also been involved in 716 technology and/or knowledge transfer agreements.

In addition to supplying technology as the foundation of new startups, colleges and universities often act as the maternity ward for startups in the region. Of the 290 Atlantic Canadian startups Entrevestor identified at the end of 2013, at least 48 (or 17 percent) were founded by students or faculty at these institutions, often incubating over several years. The same number of startups were developed from intellectual property developed at the universities. And at least 72 startups have used the resources, such as laboratory space, supplied by colleges and universities as they grew.



Ellen Farrell of the Sobey School of Business at St. Mary's University

There is some overlap in these groups, and in total some 109 startups in Atlantic Canada – 38 percent of the total – have benefited directly from the presence of Atlantic Canadian universities throughout their development. These companies employed more than 900 people at the end of 2013 -- almost one-third of the direct employment in the startup industry.

These affiliations could take the form of being spun out of university research, being founded by faculty or students, being incubated in an entrepreneurship program, or lending the company lab space or other resources. Whatever they do, the universities back some great companies.

Last year, these companies attracted at least $22.8 million of equity funding – 44 percent of the total for Atlantic Canadian startups. In the previous two years, startups affiliated with these universities raised $17.7 million and $21.6 million.

There's evidence that the companies affiliated with universities also prize their intellectual property more than other companies. Some 39 percent have filed patent applications, compared with 17 percent for the overall startup community.

If anything, this contribution to the startup community is only going to increase. As the pages of this report show, the colleges and universities are increasing their teaching of entrepreneurship at an accelerating pace. Several universities in the region offer entrepreneurial programs, most based on lean methodology.

The University of New Brunswick's Technology Management & Entrepreneurship program continues to teach entrepreneurship from within the Engineering faculty. Dalhousie University's Starting Lean Initiative is expanding, and the university is involved in two of the four "Sandboxes" (spaces where students can collaborate on startups) recently announced by the province of Nova Scotia. St. Mary's University's Masters of Technology, Entrepreneurship and Innovation will quadruple its intake (to 28 students) in its second year. Memorial University of Newfoundland continues to roll out startups through the Genesis Centre and the Enactus and Launchpad programs. Acadia University's Centre for Entrepreneurship is developing the startup ethos in rural settings, in its home base of Wolfville and other communities.

Young entrepreneurs like Matthew Fanning, who credits business professor Ellen Farrell of St. Mary's and Michael Hobeck of Nova Scotia Community College with helping with his success, are finding more support than ever before at the colleges and universities of the region.

"The university community has been paramount in the development of my business," he said. "We live in a region with some of the best institutions in the country, and because of this, I was able to recruit top talent, at an affordable price from both Saint Mary's University and Dalhousie University. " *

THE DEAN'S LIST

We set out to capture the best Atlantic Canadian companies coming out of our universities. Here is a sample of the best, based on their financial achievements and what they do for society.

Startup	Product	University Affiliation	Business Highlight	The Greater Good
ABK Biomedical Halifax	OccluRad, tiny bio-compatible beads used to treat benign tumours in the uterus.	OccluRad IP originated at Dalhousie	Funded by First Angel Network, other angels. Received AIF funding.	Will improve efficiency in treating women for benign tumours.
Analyze Re Halifax	SaaS product helps reinsurers assess risk.	Mentored by Dalhousie Starting Lean	Landed $1.4M in funding in 2013.	Help re-insurers avoid losses, improve pricing.
Ara Labs Fredericton	Cloud-based software that detects and battles malware in real time.	Developed by UNB Students, Faculty	Received $500K in funding from NBIF, Technology Venture.	Will help to thwart cyber-crime.
BlueLight Analytics Halifax	checkMARC, which tests the light and protocols used to cure resin in dental fillings.	IP originated at Dalhousie	Signed distribution deal with Henry Schein; in talks with other partners.	Enables dentists to avoid problems associated with most dental fillings.
DeCell Technologies Halifax	DermGen, a patch made from human skin to treat chronic foot ulcers.	IP orignated with Dalhousie	Winner at AVF; funding from Innovacorp.	Greatly cut the costs of treating a painful ailment for diabetes patients.
DeNovaMed Halifax	Compounds to treat infections caused by superbugs.	Dalhousie Profs helped develop IP	Hired new CEO in 2013; improved commercialization plan.	Could battle future outbreaks of new influenza strains.
Green Imaging Fredericton	Helps petroleum companies to study rock core samples.	IP from UNB; UNB continues to aid research	Paid its first dividend in the past year.	Allows greater efficiency in oil exploration.
Health Outcomes Worldwide New Waterford, NS	how2trak, a data tool that helps nurses to improve patient care and cut costs.	Uses facilities of UCB, Dal	With a major deal in Alberta, expects sales of $5M in 2014.	Allows more patients better treatment at lower costs.
Neurodyn Charlottetown	Drugs to treat brain diseases like Parkinson's and Alzheimer's.	IP from UPEI	Bought Alzheimer's drug Memogain, which it is commercializing.	Should improve quality of life for sufferers of these diseases.
Sequence Bioinformatics St. John's	Genetics-based test to determine people's risk of certain diseases.	Licensed data from Memorial University.	Formed company and struck deal with major partner in past year.	Screening for diseases like cancer will be more efficient.
Smart Skin Technologies Fredericton	Quantifeel, a pressure-sensitive device that aids beverage manufacturing.	IP from UNB	Received $3.9M in funding from VC backers. Making sales in Europe.	Reduce down time in production lines and improve profitability.
Spring Loaded Halifax	A knee brace that strengthens as well as stabilizes the joint.	Product of Dalhousie Starting Lean	Won BioInnovation Challenge; received funding from FAN.	Improve mobility for elderly and handicapped.
TotalPave Fredericton	Smartphone app that helps cities test road surfaces efficiently.	Developed by UNB Students	Won 2013 Breakthru competition; will launch in 2014.	Greater efficiency in repairing civic infrastructure.
Verafin St. John's	Software that helps banks fight money laundering and fraud.	IP and incubation from Memorial	Secured $60M in private equity funding in 2014	Thwart criminals' use of the financial system.

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How Universities Can Lead in Social Entrepreneurship

Does the world really need another gadget?

By Karina LeBlanc

Let's be frank: we aren't going to improve the world with new wearable technology, the latest website, or 3D television. But social ventures have the ability to do both well financially and produce social good, driving wealth across multiple stakeholders, not just company owners.

That's why post-secondary institutions must play a pivotal role in improving life on this planet by teaching and supporting social entrepreneurship. The support could be research, education, financial support or all of the above.

We are striving for a model for nurturing social enterprises at the University of New Brunswick, and we hope we're establishing a model that other institutions could follow. The keys lie in establishing an inter-disciplinary educational environment in which entrepreneurs can learn about such ventures, and in applying the supports – like finance and mentorship – needed to build any venture.

UNB is in the early stages of creating a Social Innovation Zone on its campuses. Led by the Pond-Deshpande Centre, the university aims to provide a comprehensive learning, research and practice environment for students, faculty and others to tackle perplexing social challenges. These zones are built on principles of collaboration, incorporating best practices in teaching and research for early stage social innovators and entrepreneurs. We will work with the Montreal-based McConnell Foundation to connect into a national network.

Given that innovation tends to occur at the juncture of disciplines, post-secondary institutions must break down the barriers between faculties and departments. UNB has two great examples of inter-disciplinary programming: the Activator program within the Faculty of Business; and the Technology, Management and Entrepreneurship diploma program at the Faculty of Engineering. Both offer experiential learning environments that pair students with entrepreneurs, and boast student enrollment from business, engineering, computer science, science, and the arts.

Beyond teaching, social ventures need access to seed capital, mentorship and the entrepreneurial ecosystem.

The PDC has established a Social Innovation Fund to cost three funding levels for early-stage social innovators: play and experimentation; idea and market validation; and business model/market readiness. Applicants must demonstrate a passion for the subject matter, the tenacity to handle the highs and lows of entrepreneurship and open-mindedness about the journey. In the first two years, the PDC has awarded over $100,000 in seed grants to over 25 social innovation initiatives.

Mentorship and key skills transfer are also critical components of a strong social innovation ecosystem, which is why the PDC operates an open accelerator called B 4 Change. The difference between this accelerator and other cohort- based models is that innovators at all stages can participate.

Karina LeBlanc

As with the Social Innovation Fund, skill acquisition and mentorship are available for entrepreneurs who want to play and experiment; however, more intensive curriculum and support is available once ideas are validated and market opportunities are identified. Through a series of seminars, workshops and experiential learning opportunities, emerging social ventures can access the advice, coaching and skills they need at the right time.

Post-secondary institutions are ripe environments for the revolutionary thinking we need to address society's problems, be they our outdated health care systems and educational models or the growing gap between the rich and the poor. By focusing on collaboration, access to capital, mentorship and skill development, these campus-based Social Innovation Zones are poised to produce scalable, high impact social ventures that are going to change the game. *

Karina LeBlanc is the Executive Director of the Pond-Deshpande Centre at the University of New Brunswick.

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