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INCUBATING
NEXTGEN
INNOVATORS



CANADAWEST
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CENTRE FOR
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CAPITAL
POLICY

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The Canada West Foundation focuses on the policies that shape the West. Through our evidence-based research and commentary, we provide practical solutions to tough public policy challenges. For more than 40 years, we have been a passionate advocate for western Canada.

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EXECUTIVE SUMMARY

Canada lags behind its peers in commercializing new processes, products and services – in driving innovation. Consequently, the country is losing competitiveness. One reason for this is that many firms have trouble hiring people with the capacity to innovate.

Furthermore, firms need to adapt in a world where new technologies are being brought on stream at an increasing pace and young people must learn how to find, create and keep work as traditional jobs are being eliminated.

To address these challenges, Canada needs more innovators, entrepreneurial employees and entrepreneurs. This paper focuses on how we can help to develop them.

Fortunately, we have educational options to help our youth develop both innovation and entrepreneurial mindsets and competencies. These competencies include the ability to generate ideas, solve problems, work with others, cope with ambiguity, be tenacious, be creative, take risks, fail and try again, and more.

Canada's post-secondary entrepreneurship education programs are booming. They have moved beyond the business school and are incorporating students and curricula from other faculties, including arts, science and engineering. The interdisciplinary approach and diversity of learners in these programs helps to build innovation and teamwork competencies. Teaching methods have moved beyond traditional classroom models. Opportunities to problem-solve and do real work in innovative and entrepreneurial settings are often a fundamental aspect of these programs. Some

programs are offered on a co-op basis, so students may take a whole semester to start their own business or work in an innovation incubator or accelerator.

Entrepreneurship education is not only for post-secondary students. Governments across the country have recognized that more is needed to encourage the entrepreneurial mindset in K-12 students. Secondary students have opportunities to learn entrepreneurial competencies through third-party experiential learning programs. Two of these programs, SHAD and Junior Achievement, are highlighted in the paper.

Entrepreneurial competencies are being recognized as skills for the 21st century. The paper recommends that we incubate more next generation innovators by:

- Giving high school students, through classroom and co-curricular experiences, the opportunity to develop an innovation and entrepreneurial mindset, and
- Making development of innovation and entrepreneurial competencies a priority for post-secondary institutions.

Traditional classroom approaches are not enough. Developing innovation and entrepreneurial competencies requires policy and funding changes that will enable opportunities for students, including:

- Exposure to and engagement with entrepreneurs
- Cross-disciplinary learning
- Experiential learning within the complete innovation cycle
- Co-op and internship work experiences.

INCUBATING INNOVATORS

SECONDARY EDUCATION

Give high school students the opportunity to develop an innovation and entrepreneurial mindset

POST-SECONDARY EDUCATION

Make development of innovation and entrepreneurial competencies a priority

DEVELOP INNOVATION & ENTREPRENEURIAL COMPETENCIES

beyond the classroom

Connect with entrepreneurs

Cross-disciplinary learning

Experiential learning

Co-op and internships

INNOVATION-DRIVEN ECONOMY

*Innovation is not
synonymous with invention*

.....
although
.....

*the spark of invention
or creativity is a necessary precedent
for innovation*

– *Innovation Canada: A Call to Action* –

INTRODUCTION

If Canada wants to become more competitive in the global economy, then it needs more innovation, more successful new businesses and more innovative established firms. A significant barrier for most Canadian companies investing in innovation is finding the right employees for an entrepreneurial culture. This paper focuses on how we develop people capable of meeting this challenge, and in particular on our future innovators and entrepreneurs – Canada's young people.

Business innovation is a driver of productivity growth in the economy and, correspondingly, of economic prosperity for Canadians. But innovation that will drive the economy is not just about doing and making new things. An independent panel advising the federal government on research and development produced *Innovation Canada: A Call to Action*. It states:

Innovation is not synonymous with invention, although the spark of invention or creativity is a necessary precedent for innovation. Business innovation occurs when a new or improved “something” – a good, a service, a process, a business model, a marketing tool or an organizational initiative – is put into practice in a commercially significant way.¹

Entrepreneurial employee activity – intrapreneurship – is crucial for continued success in business, and is a priority for businesses large and small.² But it

is also where Canada struggles most, lagging far behind top performers, such as the United States and Australia. Canadian companies' weak within-firm innovation strategy is a major part of Canada's relatively poor innovation performance.^{3,4}

All businesses must adapt to the innovations coming on stream around them if they are to succeed in a competitive world. Consulting firm Deloitte recently conducted a major study on how prepared Canadian businesses are for the radical and unavoidable disruptions that are coming to Canada's business landscape.⁵ Results were grim. Only 13 per cent of firms are highly prepared for disruption, while 64 per cent are struggling to take any steps at all.

Businesses and governments at all levels are searching for ways to improve business innovation in Canada. Innovation brings together invention or problem-solving with entrepreneurship to create value from the invention. Innovation policy needs to be focused on supporting more firms, people and programs that can lead the creation, application and diffusion of new ideas in the market. The Conference Board of Canada emphasizes a focus on firms as the key to a more innovative economy – because firms are the actors that need to commercialize innovation for it to make a difference.⁶

The following sections look at how we educate Canada's future innovators and entrepreneurs.

Only 13 per cent of firms are highly prepared for disruption, while

64%

are struggling to take any steps at all.

¹ Independent Panel on Federal Support to Research and Development, *Innovation Canada: A Call to Action*, (Ottawa: Government of Canada, 2011), 2-1.

² Beth Altringer, “A New Model for Innovation in Big Companies,” *Harvard Business Review*, November 19, 2013, accessed August 4, 2016, <https://hbr.org/2013/11/a-new-model-for-innovation-in-big-companies/>.

³ Cooper H. Langford and Peter Josty, *2014 GEM Canada National Report* (Global Entrepreneurship Monitor, 2014).

⁴ Hans Balmaekers, *The State of Intrapreneurship in Canada 2016*, (Intrapreneurship Conference, 2016). www.intrapreneurshipconference.com/state-intrapreneurship-canada-2016/

⁵ Deloitte Global, *The 2016 Deloitte Millennial Survey: Winning over the Next Generation of Leaders*, 2016, <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/gx-millennial-survey-2016-exec-summary.pdf>.

⁶ Sorin Cohn, “To Better Compete, Canadian Firms Pursue Innovations of All Kinds,” *Conference Board of Canada*, <http://www.conferenceboard.ca/cbi/research/bettercompete.aspx>

INCUBATING INNOVATORS

Our educational system is arguably good at developing inventors of all types who can solve problems (and not just in the sciences). The challenge is in creating value from these solutions – which requires a different mindset and competencies.

In practice, many educational programs use the terms “innovation and entrepreneurship” together without distinguishing between them. While not all entrepreneurs would be considered innovators, the most successful entrepreneurs inevitably innovate as they “search for change, respond to it and exploit the opportunity.”⁷ For the purposes of this work, we consider innovation and entrepreneurship to be opposite sides of the same coin.

This paper provides a brief overview of entrepreneurship education at the post-secondary level and to a lesser degree in the secondary system. It provides two case studies of entrepreneurship education undertaken by organizations that collaborate with the formal education systems.

An OECD study shows that most entrepreneurs are not young, but a disproportionate number of the greatest entrepreneurial successes come from young people. While businesses founded by young entrepreneurs are less likely to survive, research in Europe showed that among businesses that survive

at least three years, those with founders under 30 years of age had employment growth rates almost double that of businesses founded by people over 40.⁸ Further, many young entrepreneurs develop businesses with the intention of selling them to larger companies, and doing so repeatedly as “serial entrepreneurs.”

The Canadian innovation ecosystem (including investors, lenders, accelerators, incubators, programs and policies) is designed to support activities that are inherently risky, and it is well established that risk-taking decreases with age.⁹ Further U.K. research has shown that younger entrepreneurs are more open to risk-taking with new markets and technologies.¹⁰

Researchers in the U.K. found that:

“The younger the entrepreneurs, the more likely they will demonstrate a tendency and willingness in risk taking through investing in new emerging technologies, entering new markets, developing new material... and forming strategic alliances.”¹¹
– Wang and Poutziouris

So, there is significant potential upside to developing the competencies required for innovation and entrepreneurship in youth.

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⁷ Peter Drucker, *Innovation and Entrepreneurship* (New York: Harper Collins, 2006).

⁸ Organization for Economic Cooperation and Development and European Commission, *Policy Brief on Youth Entrepreneurship: Entrepreneurial Activities in Europe* (Brussels: European Commission, 2012), 9.

⁹ Jason Clemens, Joel Emes, and Niels Veldhuis, *Entrepreneurship, Demographics, and Capital Gains Tax Reform*, (Vancouver: Fraser Institute, 2015), 1.

¹⁰ Yong Wang and Panikkos Poutziouris, “Entrepreneurial Risk Taking: Empirical Evidence from U.K. Family Firms,” *International Journal of Entrepreneurial Behavior & Research* 16, no. 5 (2010): 380, doi:10.1108/13552551011071841.

¹¹ Ibid.

There are two main desired outcomes of entrepreneurship education:

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01 ENTREPRENEURIAL MINDSET

Orients human conduct towards entrepreneurial activities and outcomes. Individuals with entrepreneurial mindsets are often drawn to opportunities, innovation and value creation. Those with an entrepreneurial mindset see problems as opportunities, and want to be the ones to provide solutions. An entrepreneurial mindset also allows these individuals to see how solutions can be commercialized. Although innovation and entrepreneurship are not always hand-in-hand, many entrepreneurs are drawn to the idea of providing innovative solutions and products in a way that allows them to be commercialized.

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02 ENTREPRENEURIAL COMPETENCIES

The development of core skills that incline youth to pursue an entrepreneurial pathway and succeed.

The competencies required for successful entrepreneurship – entrepreneurial competencies – are focused on idea generation and the ability to achieve a challenging goal over the long term. In the European Commission's EntreComp conceptual model, entrepreneurial competencies are divided into three categories:

- ideas and opportunities – including things like creativity, vision and valuing opportunities
- resources – including perseverance, motivation and mobilizing resources, and
- “into action” – coping with ambiguity, working with others, learning from experience.¹²

Entrepreneurial competencies are more likely to be non-cognitive, non-credentialed competencies that are learned by doing, and that are more challenging to teach and evaluate.¹³ As such, successful strategies to develop entrepreneurial competencies are likely to look significantly different from traditional education approaches.

Patti Derbyshire, Chair of Entrepreneurship, Marketing & Social Innovation at Calgary's Mount Royal University and founder of Torch Motorcycles, puts it another way:

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*Salesmanship, tenacity, belief in your ability to succeed, thinking outside the box, risk taking, doing what at first blush might seem impossible, all while aiming products at the right consumer group that will eventually pay the bills, are essential tools of any entrepreneur.*¹⁴

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¹² Margherita Bacigalupo et al., *EntreComp: The Entrepreneurship Competence Framework* (Brussels: European Commission, 2016), 5.

¹³ Martin Lackeus, *Entrepreneurship Education: What, Why, When, How* (Paris: European Commission and Organization for Economic Cooperation and Development, 2015), 12.

¹⁴ Don Pittis, “What young innovators can learn from Elon Musk,” CBC News, October 11 2016, <http://www.cbc.ca/news/business/canada-innovation-elon-musk-1.3790529>

Salesmanship

Tenacity

Belief in your ability to succeed

Thinking outside the box

Risk taking

*Doing what at first blush
might seem impossible,*

*all while aiming products at the right consumer group
that will eventually pay the bills,
are essential tools of any entrepreneur.¹⁴*

– Patti Derbyshire –

An overhead photograph of five young adults sitting in a circle on red leather chairs with wooden frames. They are in a room with a light-colored wooden floor. The students are engaged in a collaborative activity: one person on the left is using a tablet, another on the top right is holding a large open book, and others are looking at papers or books. The text 'Post-secondary ENTREPRENEURSHIP EDUCATION' is overlaid in the center of the image.

Post-secondary
**ENTREPRENEURSHIP
EDUCATION**

There are many ways to successfully incorporate entrepreneurship education into universities, polytechnics and colleges. Fortunately, Canada's entrepreneurship programs are booming. Entrepreneurship has typically been kept within business departments and mostly, if not exclusively, studied by business students. Other models are emerging. Social innovation, arts entrepreneurship

courses and activities are flourishing, in addition to programs in business, science and engineering.

Typically, these programs involve classroom work, team projects, interaction with “real entrepreneurs” and in some cases involvement with a real startup, either the student's own or others. Another feature involves bringing together students who can provide the “hipster, hacker and hustler” attributes.

HIPSTERS, HACKERS AND HUSTLERS

In 2012, entrepreneur Rei Inamoto suggested that efficient teams only need three people: a Hipster, a Hacker, and a Hustler. Their respective strengths cover for each other's weaknesses. The Hipsters are responsible for the creative aspect of the team, ensuring the team's product/service is cutting-edge and original. Hackers represent the technological or specific skill set that answer how new ideas and initiatives can become real. Hackers would be most commonly associated with the programmers and tech wizards behind technological breakthroughs. Finally, Hustlers are the financial pragmatists of the team, ultimately concerned with how a team's product or service would be received by the people who are paying the bills (such as customers, partners).

In an optimal team, Inamoto sees these three members helping each other through the full cycle of bringing a good or service to market, from the first breakthrough idea to selling to the market. According to a group focused on promoting entrepreneurship and supporting entrepreneurs,

“When the Hipster brings the creative design and cool factor, the Hacker brings their utility belt of technology solutions, and the Hustler finds the right way to package it all up and take it to the masses in the form of sales and partnerships, it is a combination that is tough to beat.”¹⁵

¹⁵ “About”, Hipsters, Hackers & Hustlers, 2016, <http://www.hipsters-hackers-hustlers.com/about/>

INNOVATIVE ENGINEERS?

Engineers need to be a larger part of the discussion when politicians and commentators talk about innovation policy. Often, engineers are the ones who turn a novel idea into reality (i.e., innovate), and yet they are often not recognized as key contributors to innovation. In the media, innovation is most often attributed to “the scientists” and the visionary business leaders. But the roles of engineers and scientists are not at all the same according to Sean Maw, Acting Coordinator of the Engineering Entrepreneurship Program and Huff Chair in Innovative Teaching at the University of Saskatchewan. Maw also suggests that many engineering programs in Canada do not do a good enough job of encouraging innovation: “If you want technological innovation, you need engineers, but not just any engineers. You need innovative engineers. Unfortunately, Canada is generally doing a very poor job of training innovative engineers.”

Maw goes on to say that it starts with how we teach engineers. Around the world, engineering students are asked to solve set problems. A better way for engineering schools to encourage innovation would be to allow students to see and find design problems and opportunities themselves, instead of being given the problems from the start. By encouraging and teaching students to seek out design problems and opportunities during their education, they are empowered and better suited to identify problems in the real world and create innovative ways of solving these problems in a way that makes commercial sense, especially if their education is augmented with some entrepreneurial business skills.

Although post-secondary entrepreneurship education in Canada and worldwide has grown tremendously, there is still much that institutions can do to develop entrepreneurial competencies in all students and make entrepreneurship a more viable option.

Business students are still much more likely to study entrepreneurship than other students, but many schools promote entrepreneurship courses or certificates as a useful component of a degree from any faculty. There is an increasing push for commercialization training for science students, so that the advanced training and knowledge acquired by researchers can be more easily applied in the private sector. An extensive network of university-affiliated incubators provides support for the final step of entrepreneurship and crucial experience for later initiatives.

For Sarah Lubik, Director of Entrepreneurship Programs at Simon Fraser University, these programs aren't just nice to have. She believes universities are morally required to teach entrepreneurship. The opportunities and mindset change such exposure offers can send students down radically different paths, she says, and educators need to make sure students know their options.¹⁶

As the problems facing the world and the business community have become more and more complex, it has become harder to solve them with the tools of a single discipline. A major hallmark of entrepreneurship education is teaching students to apply multiple perspectives and to learn to talk to people from diverse fields.¹⁷

¹⁶ Sarah Lubik, Personal communication, June 2016.

¹⁷ Tony Wagner and Robert A Compton, *Creating Innovators: The Making of Young People Who Will Change the World* (New York: Scribner, 2014), 173.

Post-secondary schools are beginning to apply this approach, and in great numbers.¹⁸ The Charles Chang Certificate in Innovation and Entrepreneurship at Simon Fraser University is open to students of all faculties, incorporating project based teamwork, opportunity recognition, strategies for venture financing, and expertise in an innovation-driven sector, such as health care or mechatronics design. Only 30 per cent of students enrolled in the certificate are business students. McGill University has taken similar steps, and offers students from a wide range of disciplines (including arts and music) access to entrepreneurship courses from the Desautels Faculty of Management. This year alone, about 20 music undergraduates are taking entrepreneurship courses through this program. Further, most institutions (notably University of Waterloo, University of British Columbia, and Wilfrid Laurier University) promote experiential courses and minors in entrepreneurship to students in all faculties.

More than just ensuring that students from diverse backgrounds get exposure to entrepreneurship, interdisciplinary learning helps students work better together. Another of SFU's programs, Tech Entrepreneurship@SFU, brings together mechatronics and business students to create a venture while requiring them to take a class in the other discipline. Even without the entrepreneurship aspect, more interdisciplinary approaches can be seen in programs like UBC's Integrated Engineering or the University of Toronto's Health Studies, which train students to see the bigger picture of whatever problem they're facing.

There is some debate about how much entrepreneurship can be taught. There is, however, consensus that the best way to learn entrepreneurship, as with any competency, is to do it. Post-secondary schools are working to make sure that students get experience doing entrepreneurial work before they graduate.

Waterloo's co-op program, the oldest in Canada and largest in the world, is a crucial pillar of both the university and the community, producing effective graduates and feeding talent-hungry businesses.¹⁹ Combined with programs like the Enterprise Co-op, where students can take a work term to start a business, and the enthusiasm of many new startups to hire co-op students, Waterloo graduates finish school knowing what opportunities are available and what innovation means in a professional context. These kinds of integrated learning experiences offer great opportunities for students to be exposed to the types of ideas that can be commercialized, and how this is done in practice.

Incubators and accelerators for startups exist at universities and colleges across the country. While they are usually highly selective, they are often open to all applicants and not just to students of the organizing school. They are generally understood to provide support to businesses in the earliest stages of formation and expansion with office space, mentorship, networking and/or other benefits, such as access to legal experts, marketing advice and funding.

The purpose of a campus incubator is not to make every business succeed. It is also a profound educational experience. A startup in a university incubator is a safer, more supportive way for young entrepreneurs to learn how to fail and to learn from their mistakes. Incubators actually do more than foster start up businesses – they incubate the innovators and entrepreneurs who develop them. Entrepreneurs themselves list their past successes and failures as the second most important factor in their current success, following only industry experience.²⁰

¹⁸ Creso Sa, Andrew Kretz, and Kristjan Sigurdson, *The State of Entrepreneurship Education in Ontario's Colleges and Universities* (Toronto: Higher Education Quality Council of Ontario, 2014), 11.

¹⁹ Rosanna Tamburri, "Co-op Programs Are Popular and Growing at Canadian Universities," *University Affairs*, 2016, <http://www.universityaffairs.ca/news/news-article/co-op-programs-are-popular-and-growing-at-canadian-universities/>.

²⁰ Vivek Wadhwa et al., *The Anatomy of an Entrepreneur: Making of a Successful Entrepreneur* (Kansas City, Kauffman Foundation, 2009), 9.

The e@UBC program offers UBC-associated teams with venture ideas many of those same benefits, getting teams ready to set about building the company and becoming a real startup. In their own words:

This is not a theory or textbook course. You'll conduct dozens of interviews in your industry ecosystem, pursuing the customer discovery and validation process. You'll create a network of valuable contacts in your industry, and develop a defensible business model you can take to potential customers, business partners and investors... You and your team will be "getting out of the building" and interviewing potential customers, partners, and other relevant players in your ecosystem, to test your business hypotheses.

Fewer than
40%
of Canada's PhDs
are employed in
the post-secondary
education sector.

Canada does well in university research in comparison to the world, not least because of generous public support. But there aren't enough academic jobs for all the PhD graduates every year. Fewer than 40 per cent of Canada's PhDs are employed in the post-secondary education sector; for SFU science and engineering PhDs, the figure is 20 per cent.^{21,22} Few will ever want to start a company, but all need to know that entrepreneurship is a serious option, so that when it would be appropriate, they could commercialize their discoveries. Programs such as SFU's Graduate Certificate in Science and Technology Commercialization and the Conrad Centre at Waterloo are designed to develop an entrepreneurial mindset where the ultimate goal is not peer-reviewed publication, but commercialization.

Not everything happens in formal entrepreneurship programs. There are other ways for students to engage. Enactus, for example, is a post-secondary student leadership development organization in Canada with more than 2,700 students participating in their programs every year. Enactus challenges students to use business as a way to advance the economic, social and environmental health of Canada. Guided by academic advisers and business experts, the student leaders of Enactus Canada create and implement community empowerment projects and business ventures in communities from coast to coast. An annual series of regional, national and global competitions provide an incentive to refine and improve ventures, and to build a network of other socially oriented leaders. Programs like Enactus give students a chance to apply what they have learned in the classroom to the social causes they care about.

Entrepreneurship education has itself innovated into a different type of education despite a lack of commensurate innovation in governance (multi-disciplinary programs are notoriously difficult to manage) and funding.

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²¹ "Where Are Canada's PhDs Employed?" Conference Board of Canada, January 6, 2015, accessed August 5, 2016, http://www.conferenceboard.ca/topics/education/commentaries/15-01-06/where_are_canada_s_phds_employed.aspx

²² Sarah Lubik, Personal communication, 2016.

ENTREPRENEURSHIP EDUCATION IN THE PALM OF YOUR HAND

Entrepreneurship education is moving into the app world. One example of this is Discover Entrepreneurship! by GoRobos, a joint venture between the GoForth Institute and Robots and Pencils Inc. Based on the premise of running a classic lemonade stand, users are offered a gamified entrepreneurship education that is hands-on, interactive – and convenient. Players (students) learn aspects of running a business at their own pace, acquiring more knowledge and skills directly related to entrepreneurship. Assessment is also immediate: Students get instant feedback from in-app assessments, side-stepping the usual delays in assessment and feedback from traditional education mediums. With a series of small, incremental successes, students build higher morale and confidence levels, and are encouraged to continue their education even when they hit a roadblock. To progress through the game, users must acquire accounting skills before getting bank loan approvals and complete the marketing module before they can build their marketing plans. As the game continues, they move on to more advanced entrepreneurial competencies.

The app was based on an online course written by Dr. Leslie McGeough of the GoForth Institute. While the material was rich, students had a difficult time completing the program, which was based as a series of non-interactive videos and documents. Robots and Pencils saw the value in the material, but wanted to present it in a more accessible way with more incentives for progression. While some parents might see apps as toys or time-wasters, consider this: 94 per cent of enrolled students finished the “course,” and 78 per cent of them can now see entrepreneurship as a viable career path. Clearly, apps like this one expose the world of entrepreneurship to youth who might never have thought they could make their own careers.

78%

*of students now see
entrepreneurship as
a viable career path.*

94%

*of students enrolled in
Discover Entrepreneurship!
finished the ‘course’.*

Secondary
**ENTREPRENEURSHIP
EDUCATION**

Although most of the public interest in entrepreneurship education is focused at the post-secondary level, there is no reason to wait until students graduate from high school to introduce these concepts. If the entrepreneurship education programs being started at post-secondary institutions are going to be filled, students need to be thinking about entrepreneurship before they leave high school.

“Entrepreneurs in Vancouver (and elsewhere) agreed that by the time a young person reaches post-secondary education, it is often too late to sow the seeds of entrepreneurship. The importance of education, as early as elementary and secondary school, in nurturing entrepreneurship in young people is critical, they said. There is a feeling amongst entrepreneurs that schools are failing students by focusing on career options where they are employees, rather than employers. Young people need to be exposed to entrepreneurs as early as possible so they know that there are other options for them when they complete their education. Vancouver roundtable participants suggested that bringing entrepreneurs into classrooms, building entrepreneurship into elementary and secondary school curricula as well as mentorship programs would go a long way in addressing this issue.”²³

In his book *Creating Innovators*, Tony Wagner details the types of programs that help young people become successful innovators. Wagner focuses not just on

how innovation is being introduced in secondary schools, but also on how young people in college and the workforce are being exposed to what it takes to become successful innovators. Each program departs significantly from educational orthodoxy, emphasizing multi-disciplinary connections, hands-on and problem-based learning, and significant freedom for students in how they choose to learn.

Having said all of the above, better data on the long-term value and return on investment from entrepreneurship education is needed.

SCHOOL PROGRAMS

Over time, Canadian governments have taken many steps towards making entrepreneurship education a key component of the education system. A recent example is Ontario's 2014 High School Entrepreneurship Outreach Program, a \$5-million component of its broader \$295-million Youth Jobs Strategy. Local organizations were funded to run youth entrepreneurship outreach activities for high school students, intended to promote entrepreneurship as a career option and increase participation in other entrepreneurship programming. Best practices, such as the inclusion of a successful young entrepreneur in programming, were expected. Funding went both to organizations hosting one-off events and to longer-term projects, such as various local Junior Achievement organizations.

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²³ The Canadian Chamber of Commerce, *A Path Forward for Entrepreneurship in Canada*, September 2014, http://www.chamber.ca/media/blog/140917-a-path-forward-for-entrepreneurship-in-canada/140917_A_Path_Forward_for_Entrepreneurship_in_Canada.pdf

CO-CURRICULAR ENTREPRENEURIAL PROGRAMS *Two case studies*

Third-party education providers have stepped up to give secondary school students the experience and exposure that provincial systems have not yet fully incorporated. These programs challenge their participants to innovate to solve large-scale problems. They also give youth opportunities to understand how to commercialize their innovations. Two examples of such programs in Canada are Junior Achievement (JA), the largest, and SHAD, a shorter term, but more intensive program.

These programs, while fostering innovative youth, should not be seen as having a deterministic impact on whether participants become entrepreneurs and innovators. In other words, attending SHAD or JA does not guarantee a student will become an entrepreneur or an innovator. What these programs excel at, however, is in giving youth an environment where they can discover and employ their entrepreneurial and innovative traits. By providing such an opportunity, participants of these programs become confident in their ability to pursue an entrepreneurial and/or innovative future.



SHAD

SHAD is a program with a national presence and established links to both the education and private sectors. For 36 years, it has defined its mission as “empowering exceptional students to make the world a better place.” Every July, it operates month-long residential programs at a dozen university campuses across the country. The programs enroll 700 high-potential youth, most of whom will enter Grade 12 after their residency. Youth meet with like-minded peers, often in a previously unfamiliar city, and have the opportunity to solve real-world problems – and fail, in a safe environment. For many, it is the first time they have felt they belonged in a group.

SHAD is a highly intensive education program. Students are surrounded by other motivated peers in a schedule of seminars, lectures, workshops, projects, social events and trips. The program intertwines STEM (science, technology, engineering and mathematics) disciplines with business and entrepreneurship, culminating in the SHAD Entrepreneurship Challenge.

Each year, the program has a specific theme, built around a current economic and social problem. Through the challenge, SHAD youth collaborate to develop an innovation that addresses the issue. As part of this engineering and design challenge, teams complete business and marketing plans, and design and build working prototypes. Winning projects advance to national judging and results are celebrated each fall.

Some SHAD participants also volunteer for internships in August for real-world work experience, building their skills, their resumes and their networks. When the summer program is over, SHAD’s 15,500 alumni can stay in touch and support each other through a peer network.

SHAD aims to reach students during high school years – a pivotal point in their education. Participants in SHAD, 60 per cent of whom are female, are high-achievers, typically already on the path to post-secondary education. The program encourages these students to aspire to greater things.

Participants have developed some impressive innovations. Recent SHAD Entrepreneurship Challenge winners, for example, have addressed Canadians’ outsized environmental footprint with automated power-consumption inhibiting devices and smart greenhouse shelving systems, and have built jackets with LED turn signals to make cyclists safer. Some of the students keep working on their ideas after the program ends.

The philosophy behind the program posits that if students are challenged, exposed to material from across the spectrum of science, business and arts, and given the tools to succeed, they might make different decisions. The erstwhile engineer might decide, years later, to start a company around her big breakthrough; the C-suite executive might be more welcoming when an employee walks into her office

with a radical new idea. SHAD hopes that its alumni will look for the university programs that will give them more tools to make a difference in the world.

Selecting participants

Every year, more than 1,500 students apply for approximately 700 spots in the program. SHAD's VP in charge of admissions said the organization looks for students who have the most to gain from a SHAD experience. This means looking for students who have the most passion and desire to take advantage of what SHAD offers, not just those with the best resumé. According to one contact who works closely with the admissions system, such passion shines through in the application; those who only applied because their parents or guidance counsellors forced them to can be easily identified and put aside.

interdisciplinary thinking. Entrepreneurship is introduced through the team-based challenge, giving students the opportunity to solve real social problems using the tools of business. They are challenged to work in teams, tackle problems, take and provide constructive criticism and keep trying when they fail.

A focus group of SHAD alumni told the Canada West Foundation that very few students knew about the entrepreneurship aspect of SHAD before enrolling. They were attracted by the STEM material, and were often motivated by conventional interests in medicine and engineering. SHAD's programming, they said, demystified business and entrepreneurship. One said the SHAD experience challenged the demonization of business as a career path, a view held by many socially minded young people.

70%

of SHAD alumni surveyed felt the program was highly influential on their aspirations.

A particular effort is made to find students from rural or marginalized communities who show promise but have not been afforded many other personal development and capacity building opportunities.

SHAD's residential, intensive educational model makes it expensive to deliver – around \$8,000 per student. SHAD has funding to cover about \$3,500 for each participant. To help offset the \$4,500 tuition fee, a \$500,000 bursary program is available to families in need, averaging \$1,500 per student. SHAD's philosophy is that there should be no barriers to excellence, and if a family still cannot afford the cost, the Vice-President Finance and Operations contacts them personally to find a solution.²⁴

Entrepreneurship is not the sole focus of the program. Students engage in activities and challenges across a variety of disciplines, giving them a taste of many topics and an exposure to

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"After SHAD, I felt more comfortable doing new, unusual, interdisciplinary things."

– Focus group participant

"Before, I really thought medicine was all about science, engineering was all about math. But there's a business side to everything, there's entrepreneurship in everything you can do."

– SHAD 2016 participant, University of Calgary

With that positive exposure, students make different choices; one participant described with enthusiasm the mindset change that led him to pursue biomedical entrepreneurship instead of medical school. Surveys of SHAD alumni show that more than 70 per cent feel the program was highly influential on their aspirations, specifically in their choice of undergraduate program and career path.²⁵

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²⁴ Mary Hamoodi, Personal communication, July 2016.

²⁵ 2014 SHAD Survey (Waterloo: SHAD, 2014).

SHAD is the first time most participants were in an environment where their drive, leadership and creativity were truly celebrated and challenged. And it shows: 85 per cent of participants said SHAD was extremely effective in developing their collaboration skills; only 10 per cent of participants say the same of their high school education. SHAD beats high schools by similar margins in creativity and critical thinking – skills increasingly required in the workplace. What students needed but didn't get from formal education, they got from SHAD.

SHAD changemakers

Justin Low, SHAD Carleton 2015

After his SHAD experience in 2015, Vancouver student Justin Low decided he wanted to make a difference for his grandmother. Living with her had made him attuned to the challenges of mobility for the elderly, as she was reliant on a cane to walk around the house. When she needed to use both hands, she had to lean the cane against something, from which it would often fall to the ground. Recurrent hip issues made bending down to pick it up a serious challenge.

Justin set to work. Using the iterative creative process SHAD had taught him, he went through a few ideas to help his grandmother, ranging from a new cane design to a series of ceiling harnesses. Eventually, he settled on something practical and affordable: plastic adhesive cane clips to put up around the house, designed and manufactured via the 3D-printing software he had been introduced to at SHAD. Justin plans to create a prototype and to take an undergraduate degree in Industrial Design at Carleton University.²⁶

Medicine for a better tomorrow

The theme for SHAD's Entrepreneurship Challenge in 2010 was *Designing for Canada's Aging Population*. One of the projects that emerged that year was a new type of vaccine, delivered as a capsule instead of through a needle. After they won the campus competition, several members developed the idea further, filing for patents in several countries in 2013.

Competing in the pharmaceutical industry proved challenging, and the founding members have moved on to other activities while completing the patent and approval process. But the idea born at SHAD is becoming a reality, and recently received approval in China.

Michele Romanow, SHAD Fellow (2003), co-founder of one of Canada's fastest growing companies, *Buytopia* and investor on CBC's *Dragons Den*, says:

"SHAD had a strong personal impact on my life. I found a group of friends that were so like-minded – and frankly, so nerdy – at a time when I needed it most, the transition from teenager to an adult. At that time, it is so important to understand that you are not alone. The traditional system of education drags everyone into the middle, producing the average, but SHAD chooses kids, and challenges them to strive further. It had a profound impact at a very important time. You are given the opportunity to build a business from early prototype stages to final execution. Having such an opportunity early on sparked my ambition to be an entrepreneur and I wouldn't be where I am now if it was not for SHAD. To this day, I still have many connections to SHAD, including lifelong friendships and my board membership. SHAD fostered my early love for creation and entrepreneurship."

85%
of participants
said SHAD was
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in developing their
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10%
of participants say
the same of their high
school education.

²⁶ Justin Low, Personal communication, 2016.

JUNIOR ACHIEVEMENT

Junior Achievement (JA) is one of the world's most well-known youth entrepreneurship education programs, operating in dozens of countries and reaching more than 250,000 elementary through high school students each year in Canada alone. In the Nordic countries, it is integrated into the curriculum and in educational policy.^{27,28}

Junior Achievement in Canada (JA Canada) offers 15 different programs for elementary, middle school, and secondary students, though not all programs are available in all regions. Participation in the program is voluntary; interested students self-select. In the lower grades, there is a greater focus on fundamental financial literacy, exposure to basic business and workplace skills, and an emphasis on life-long learning. At the secondary level, programs are explicitly entrepreneurial, culminating in JA Canada's flagship *Company Program*, a four- or eight-month program that teams up students with local businesspeople to go through the decisions and processes of business creation themselves.

JA programs are usually facilitated by teachers and/or volunteers from the local business community. In the Calgary *Company Program*, participating students (Achievers) meet for three hours one evening per week for 18 weeks. Working with five or six advisers, teams come up with an idea, develop a product, create business plans and strategy, execute marketing tactics, learn about financing, launch the business, and conduct sales. In addition to high school credits and the potential for profit if the company succeeds, teams present at a JA Company Program Tradeshow and compete with others for awards.

The Boston Consulting Group conducted a *pro bono* review of the impact JA Canada has had on its participants.²⁹ The results were profound. Even accounting for self-selection bias in JA's programs, 65 per cent of Achievers believe that JA had a significant impact on their decision to stay in high school and attend post-secondary; 65 per cent believe that JA had a significant impact on their decision to attain some business education; and more than 75 per cent believe that JA had a significant impact on skills ranging from financial literacy to problem solving and collaboration.

The correlation between later success and JA participation is strong: Achievers were 50 per cent more likely to open their own business and had incomes 50 per cent higher than their peers'. Considering only those Achievers who attributed life milestones such as staying in school, completing post-secondary education and starting a business to their JA experience, the report concludes that for every dollar invested in JA programing there is a \$45 annual return to the Canadian economy.

Junior Achievement programs are free to participants. Given its broad reach across Canada and clear impact, is an important pillar of entrepreneurship education for many young Canadians.

SHAD and JA give youth the confidence and opportunity to express their innovative and entrepreneurial traits.

²⁷ Richard Chiu, *Entrepreneurship Education in the Nordic Countries: Strategy Implementation and Good Practices* (Oslo: Nordic Innovation, 2013), 44.

²⁸ Maysoun Sukarieh and Stuart Tannock, "Putting School Commercialism in Context: A Global History of Junior Achievement Worldwide,"

Journal of Education Policy 24, no. 6 (November 2009), 780, doi:10.1080/02680930903294636

²⁹ Boston Consulting Group, *Making an Impact: Assessing Junior Achievement of Canada's Value Creation* (Boston: Boston Consulting Group, 2011).



A photograph of two young women, one with dark hair and one with blonde hair, working together on a drone. They are in a workshop or classroom setting, focused on the task. The drone is a quadcopter with a camera attached. The text is overlaid on the image.

ENTREPRENEURSHIP *is a* 21ST CENTURY COMPETENCY

Work is becoming more contract-and project-based, so it makes sense that entrepreneurial competencies and imagination-enabling learning would be a core part of every student's learning. To get the best results, resources need to be concentrated so that they make a significant difference in students' lives. Not all students need to take a mandatory course in entrepreneurship. We do, however, need to provide programs for students who want it.

This also does not have to be an elitist exercise where participants are chosen by judges. Limited spots in SFU's entrepreneurship programs, for example, are simply first-come, first-served. Program administrators want students who are coachable and willing to learn, not necessarily the most accomplished. Accepting those enthusiastic enough to sign up right away is a remarkably effective means of finding those students, said Sarah Lubik, Director of Entrepreneurship Programs at SFU.

When students do not develop to their potential, society is the poorer for it. It is an especially serious loss when students want to develop new ideas, invent things, help people, spur competition and create jobs, but do not get the support needed to succeed. Entrepreneurship education aims to give students the awareness that they can follow that path, and then to help them gain the skills to get there.

Canada has pursued this approach with significant success in another context. The Own The Podium Olympic program succeeded because it made sure

athletes with the aspirations and ability to succeed got the support they needed. Own The Podium's team revitalized the approach to coaching, and sought people who had success in an area that could be transferred to an Olympic or Paralympic sport, such as football players or track and field athletes with enough sprinting power for bobsleigh success. Highly targeted investments paid off and Canada walked away from the 2010 Olympics with 14 gold medals – twice the 2006 total.

Just like for Olympic sports, motivated and talented Canadian young people could reach higher levels of success in innovation with the right support.

Education of this sort is not only good for developing high-performance athletes and innovators. It can also keep at-risk young people engaged in their education and give them another set of opportunities. Major international organizations, such as the U.S.-based Network for Teaching Entrepreneurship, use entrepreneurship education to keep young people in school and to plan for successful futures.³⁰

In a Canadian context, more entrepreneurship education is being aimed at supporting Indigenous populations. Mostly, this is taking place in post-secondary institutions that serve mainly Indigenous populations. There is significant Indigenous programming for business, for example, in colleges like the Nicola Valley Institute of Technology and universities such as the First Nations University of Canada.³¹ Such programs tailor business approaches to the Indigenous context.

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³⁰ "Mission & history," Network for Teaching Entrepreneurship, accessed August 5, 2016, <https://www.nfte.com/what/mission>.

³¹ Warren I. Weir, "First Nation Small Business and Entrepreneurship in Canada" (National Centre for First Nations Governance, 2007).

Initiatives such as the Aboriginal Youth Entrepreneurship Program, offered by the Martin Aboriginal Education Initiative, have expanded entrepreneurship offerings to high school students. This program is offered in partnership with communities across the country, and students learn business skills, problem-solving skills, and financial literacy. The program's curriculum is adapted to the Indigenous context, including specialized teacher resources and textbooks.³²

Women face particular headwinds in entrepreneurship and innovation. They are 13 per cent less likely than men to aspire to start a business, and their businesses tend to be smaller.³³ Yet, there is no good reason for women to be less interested in or less successful at entrepreneurship than men. Women's underrepresentation in the ranks of founders can have pernicious effects. Silicon Valley, for instance, is criticized for a male-dominated founders' culture that underserves women's needs and that contributes to women's perpetually low share of STEM graduates.³⁴

Research has shown that entrepreneurship education can have a particularly strong effect on young women.³⁵ Women have lower interest and self-confidence levels than men in this area, so the potential gains are larger. The effect of entrepreneurial self-efficacy – belief in one's own ability to be a successful entrepreneur – “(appears) simply more important in considering future career options (for girls) than for boys.”³⁶ Given that

entrepreneurship has long been characterized as a domain of men, and that women usually have lower self-efficacy in fields perceived as non-traditional for women, this can be a significant barrier.

Entrepreneurship education widens the possibilities students see for themselves.

SELF-EMPLOYMENT TRAINING

It is important to distinguish entrepreneurship education from self-employment retraining programs. Such programs might be helpful in making sure that people who can no longer find jobs in their industry continue to earn a living, but the products of such programs do not often contribute to an innovation agenda. The spillover benefits of new businesses come mostly from the top. In Canada, from 1993 to 2003, 45 per cent of net jobs were created by the fastest growing four per cent of companies.³⁷ More recent data demonstrates that this is an international phenomenon. In the U.K., a 15-year study that ended in 2013 found that only 11 per cent of firms survived through the whole period – and that only six per cent of those firms yielded 40 per cent of all the jobs created by surviving businesses.³⁸ U.S. data have shown equivalent results. Retraining people for self-employment is an employment strategy, not an innovation strategy.

³² Martin Aboriginal Education Initiative, “Aboriginal Youth Entrepreneurship Program (AYEP),” accessed August 5, 2016, http://www.maei-iam.ca/Aboriginal_Youth_Entrepreneurship_Program.html.

³³ “Half of Canadian Students Aspire to Start Their Own Business After Graduating: BMO Survey,” Bank of Montreal, 2013, accessed August 5, 2016, <https://newsroom.bmo.com/press-releases/half-of-canadian-students-aspire-to-start-their-own-business-bmo-201309060896440001>; and [https://www.ic.gc.ca/eic/site/061.nsf/vwapj/KSBS-PSRPE_August-Aout2013_eng.pdf/\\$FILE/KSBS-PSRPE_August-Aout2013_eng.pdf](https://www.ic.gc.ca/eic/site/061.nsf/vwapj/KSBS-PSRPE_August-Aout2013_eng.pdf/$FILE/KSBS-PSRPE_August-Aout2013_eng.pdf)

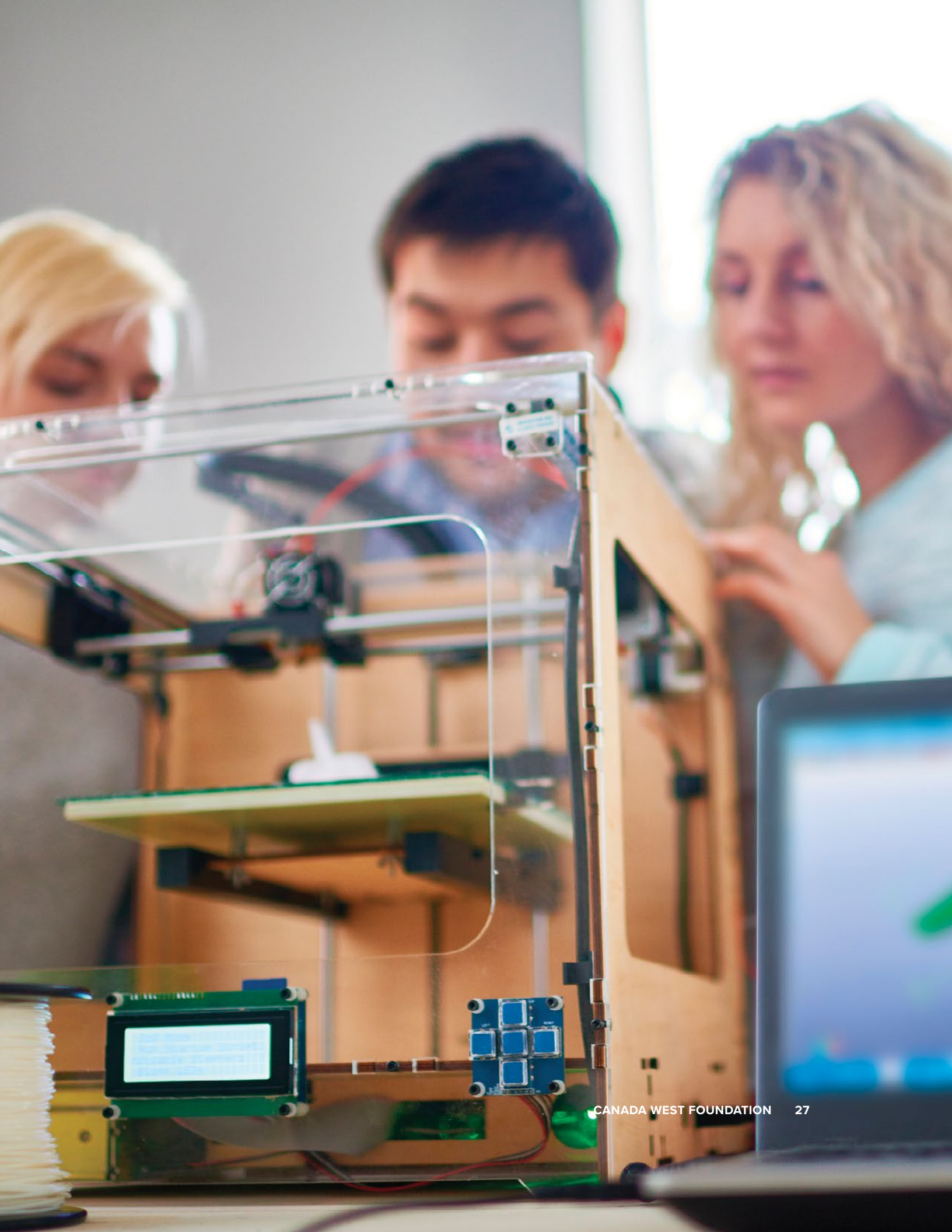
³⁴ For example, see Grace Dobush, “White Men Dominate Silicon Valley Not by Accident, but by Design,” *Quartz*, March 16, 2016, <http://qz.com/641070/white-men-dominate-silicon-valley-not-by-accident-but-by-design/>.

³⁵ Fiona Wilson, Jill Kickul, and Deborah Marlino, “Gender, Entrepreneurial Self-Efficacy, and Entrepreneurial Career Intentions: Implications for Entrepreneurship Education,” *Entrepreneurship Theory and Practice* 31, no. 3 (May 2007), doi:10.1111/j.1540-6520.2007.00179.x.

³⁶ Ibid.

³⁷ Chris Parsley and David Halabisky, *Profile of Growth Firms: A Summary of Industry Canada Research*, (Ottawa: Industry Canada, 2008), 1.

³⁸ Sherry Coutu, *The Scale-up Report on U.K. Economic Growth* (London: Information Economy Council, 2014), 22.



CONCLUSIONS

Entrepreneurship education could play a major role in solving Canada's innovation problem. More and better education and co-curricular opportunities designed to develop the required competencies will ensure that more of our workforce is ready to participate in an innovation-driven economy, and that more Canadians see entrepreneurship as a serious option.

Many youth jobs initiatives include funds set aside for self-employment education and support. Although this is a step in the right direction, policy-makers need to see entrepreneurship education, not just as an add-on to a youth employment strategy, but as a long-term strategy to align the education of young people with the needs of an innovative economy.

Entrepreneurship education is not just about founding companies, either. It is education for the 21st century workforce. Programs such as SHAD and Junior Achievement give participants a more hands-on, collaborative, challenging, engaging and empowering experience than formal education. Greater access to such offerings could help more students lift their aspirations and become more innovative, wherever their career takes them.

Recommendations

Innovation starts with people. To increase innovation activity in Canada we need to incubate more young innovators and entrepreneurs by:

- Giving high school students, through classroom and co-curricular experiences, the opportunity to develop an innovation and entrepreneurial mindset, and
- Making development of innovation and entrepreneurial competencies a priority for post-secondary institutions.

Traditional classroom approaches are not enough. Developing innovation and entrepreneurial competencies requires our education systems at all levels to recognize and enable non-traditional educational methods. It also requires policy and funding changes that will enable opportunities for students, including:

- Exposure to and engagement with entrepreneurs
- Cross-disciplinary learning
- Experiential learning within the complete innovation cycle
- Co-op and internship work experiences.

Further research is needed to prove substantively the long-term efficacy of entrepreneurship education. Entrepreneurship education is a way to give more young people with inclination and talent the experience necessary to contribute to an innovation economy. By making sure there are high-quality opportunities for young people to become young innovators, Canada can keep developing a population that is ready to seize opportunities, wherever they are found.



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