

# RUNNER-UP - Mahzad Sharifahmadian

## Scientist entrepreneurs –



### BIOGRAPHY

Mahzad is manager of life sciences at District 3 Innovation Centre – Concordia University’s centre of innovation and entrepreneurship. She holds a PhD in Biochemistry & Molecular Medicine from Université-de-Montréal, with expertise & publications on design and development of novel drugs for antibiotic resistant infections. While finishing her PhD, she co-founded Rubisco, a biotech company offering point-of care diagnosis of pathogens (dissolved in 2018). Since joining District 3 in 2017, she has advised over 30 startups and 4 university

### INSPIRATION

*“As a scientist with strong publications who could land a job in academia, I was passionate to see my research leading to products with tangible impacts. When I learned about entrepreneurship, I found it a right medium for turning my expertise into applications. Therefore, I created my startup upon finishing my PhD. Beside all learnings and opportunities during my startup journey, entrepreneurship broadened my horizons and made me a better person. I became agile, analytical, sharp, result-oriented and much more sociable! Since my graduation, I have been advocating for entrepreneurship within academic settings – a mission that I continue to accomplish. I believe if a researcher has worked on a technology for 5-6 years, they should have the opportunity to commercialize it.*”

### OPPORTUNITY FOR ACTION

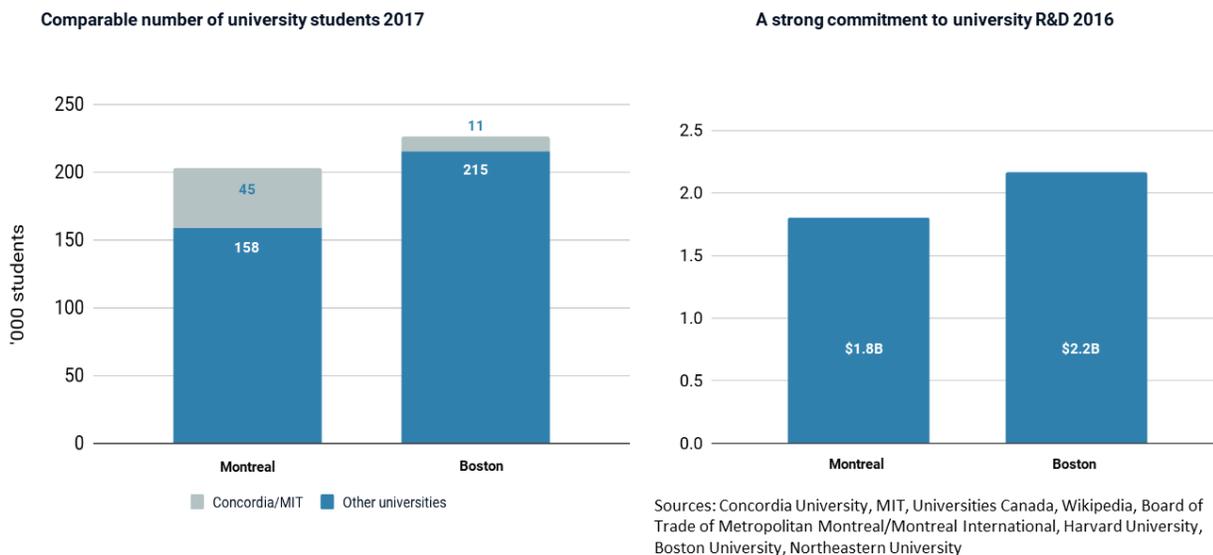
There are over 200,000 PhD students in Canada who are at the highest level of knowledge in their field of expertise and contribute to the advancement of Canada’s scientific discoveries. PhDs can create cutting edge technologies and translate them into applications for the benefit of the general public. It is estimated that over 6,000 PhDs graduate each year. In theory, this high concentration of graduate students enables industries to draw on a significant pool of brain power and workforce.

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## Scientist entrepreneurs – the engines of economic growth

Despite the prestige that often comes with having your PhD, and the esteem associated with the title, it is often difficult for graduates to integrate into the job market. There are a limited number of opportunities in academia, and limited available positions in industry for PhD level expertise, often making them overqualified for available industry positions. Despite major investments by government on education and research at academic institutions, these investments do not translate to forces that would drive the economy. Inevitably, limited career opportunities have led to brain drain of PhD graduates and inefficient economical use of this intellectual force. Considering a large number of PhD students have international status in Canada, it is common to see these students move to other countries after graduation, notably to US for better jobs & salaries. Brain drain is a well-known and unmet problem in Canada [1&2].

Moreover, Canadian industries are facing a problem with a similar root, low pace of adopting innovation. Failure in creating opportunities to attract recent graduates who can contribute to offering disruptive technologies, the shortage in number of scientific talents who match their needs, in particular coping with fast-paced nature of industrial competition, knowledge on innovation methodologies, teamwork and business acumen lead Canadian companies to lose dominance in the market to US rival companies. Canada is a highly innovative nation, but the listed challenges prevent the translation of innovation into wealth creation. As an example Montreal with the highest number of university students per capita among metropolitan areas in North America [3] compares well to Boston, the intellectual capital of the U.S., on core innovation vectors such as number of students and available budget at universities for research and development (Figure 1)[4].



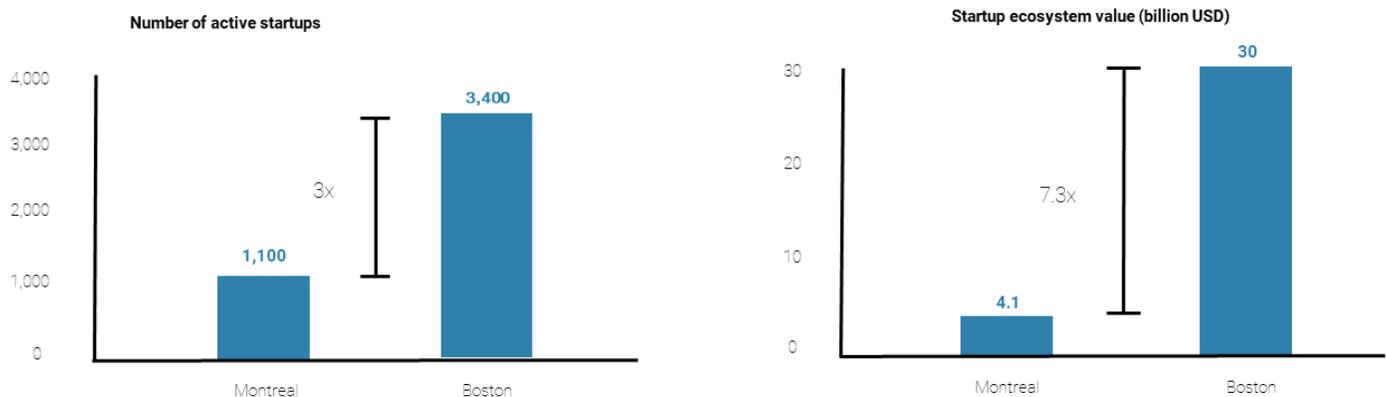
**Figure 1.** Montréal compares well with Boston for key innovation indicators

However, Boston has invested heavily in translating university research into commercialization and training talents on entrepreneurship.

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A comparison on the number of startups and generated value into economy shows that Montreal is far behind Boston: it faces a considerable low number of startups led by university graduates despite the high number of students and R&D projects (Figure 2).



**Figure 2.** Montreal vs Boston: The output gap in terms of startups is massive.

It is clear that Canada's economic growth and stand point in global innovation economy would highly depend on closing the gap between academic research & economy through translation of technological innovation[5].

### PROPOSED ACTION

Here I propose a series of actions addressing the unmet needs for experiential learning, understanding the market fit of academic research and the opportunity to pursue an entrepreneurial path. This proposition with a focus on PhD researchers creates a major opportunity for Canada to support the transformation of researchers into entrepreneurs. This opportunity can stimulate our economy by creating deep tech ventures and jobs for highly skilled and specialized PhD and postdoc graduates. This program expands the skill set of scientists beyond the scope of research and accelerate the translation of research discoveries into commercially viable applications. The following proposed program aims to train the next generation of scientists who can provide value to industries with innovative approaches and ranks them as problem solvers. This proposal entails a national approach applicable to all postgraduate degree programs.

- Training on innovation practices & entrepreneurial skills: a curriculum that will be offered by local university innovation centers or business schools as accredited courses for students in post graduate programs including MSc, PhDs. This curriculum should focus on practices in the specialized industry, commercialization paths for research based technologies, road map to entrepreneurship and fundamental skills for creation of startups. The offering of this curriculum should not be affected by changes in the administration of the universities. A similar training program proposed has been launched in 2019 in Quebec supported by Les Fonds de recherche du Québec (FRQ). Results represented in the first cycle report prove the need of such training among PhD graduates [6].

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- Federally governed network of support: this initiative would align local, provincial and national resources toward accelerating university spin-offs including; fundings, subsidized access to research platforms & access to a network of experts from industrial consortiums of Canada. This network of support de-risks financing & early stage uncertainties and encourages researchers to create start-ups.
- Supporting the culture shift: smart policies that will increase the value of entrepreneurship among academics in a practical way. Defining funds that considers licensing & startup involvement as factors for evaluation of grants. Increase number of grants dedicated to advancing the commercialization of research such as GAPP by Genome Canada. Encouraging & acknowledging collaboration of faculties with entrepreneurship centers as part of their annual performance evaluation.
- Collision of innovative minds; translating technologies into applications that can land in the market requires a teamwork to address needs from different perspectives such as business, design, science, engineering, social sciences. To create a collaborative and multidisciplinary culture that stimulates innovation & teamwork across different faculties (i.e. Industrial mandates for collision of creative minds from design, sciences, engineering & business departments). Indeed teamwork is an instrumental step towards the entrepreneurial journey. Success of centers such as MIT Media Lab is proof that multidisciplinary trainings & joint projects will skill graduate researchers with tools to assess industrial challenges and embark on developing disruptive products [7]. Furthermore, it would accelerate adoption of emerging technologies, for example with Artificial Intelligence and the advancement of scientific discoveries into medical applications.
- A new track in academic system, postdoc entrepreneur. Defining funds accessible to PIs for hiring postdoc entrepreneurs to turn their developed technologies into commercially viable products for their startup.

Success of this program relies on the collaboration of all stakeholders of innovation ecosystem including industries, academia, government and entrepreneurs. Through experiential training, collision of brain powers and alignment of entrepreneurial resources, we will create a nation-wide dynamic living lab that translates into the application of cutting-edge, supporting Canadian industries, and creating career opportunities for university graduates.

This proposition will be a paradigm shift and would change the impact of universities on the economy through five pillars; (i) Facilitating go-to-market strategies for newly developed technologies, (ii) Growing partnership opportunities between research labs and industries, (iii) Creating jobs relevant to the skills and knowledge of PhD graduates, (iv) Driving investments into Canadian companies, (v) Activating an entrepreneurial culture among researchers and graduate students.

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