

## Executive Summary

Global forces are evolving which necessitate the need for innovation in higher education. The global challenges faced by universities identified by the OECD include knowledge diffusion, globalisation and openness, technology convergence and ageing workforces.

The University of Toronto School of Engineering as well as the Canadian education system are top ranked globally and well positioned to adapt to this fast changing globalized and digital economy. Canada is performing ahead of many of its peers, for example the Average Citation score in Canada has ranked 6th place globally and from 2009 to 2014 Canada ranked above average globally across all research fields and among the top 5 globally in five specific fields [1]. Canada stands above peers such as Germany, France, Japan and the US. Furthermore, Canada has the highest share of the population with a post-secondary degree among all industrialized nations [1]. Within the context of the global challenges Canadian Universities are well positioned as Canada ranks 3rd globally for attracting foreign students after only Australia and the US [2].

Despite this the University of Toronto (UofT) and the Canadian education system in general face many challenges and headwinds. Despite the long-standing recognition that lectures, and passive learning are not the best method for delivering all curriculum, UofT engineering still largely leans on these methods. UofT also has deficiencies engaging the industrial sector in the delivery of its engineering programs and curriculum. During COVID the school has struggled to provide programs virtually and requires innovation to maintain student engagement and outcomes. UofT and Canadian schools also struggle to compete with US and European school systems due to a lack of direct federal funding. Canada has historically shown a strong “supply side” bias with research policy and as a result has struggled to translate R&D into industry and economic performance. For example, in 2016 Canada ranked 22<sup>nd</sup> for business investment and in 2018 Canada ranked 16<sup>th</sup> for the state of cluster development, 19<sup>th</sup> for collaboration among business and 19<sup>th</sup> in university-industry collaboration [1].

This report finds that there are many actionable and concrete steps Canadian Universities such as UofT Engineering can take to drive innovation within their curriculums, delivery, funding mechanisms and R&D output. For example, the cone model of learning is effectively used for professional programs but has not been fully implemented within the UofT engineering department. Shifting curriculums to this model and implementing outcomes-based curriculums would modernize the department. With regards to delivery, the engineering school should increase efforts to engage industry in the design of curriculums and participation in teaching. Blurring the lines between industry and the university is an effective cultural shift which will encourage innovation. Because Canadian universities remain underfunded and most of the post-secondary funding originates from government support they would benefit from the American model by implementing additional self-supported ventures such as continuing education programs (these would have the added benefit of further blurring the line between industry). Finally, to increase dissemination of R&D output into the industry and economy, UofT Engineering should initiate a full-scale Science and Industrial Park to facilitate the growth of local start-ups that are closely aligned with the governments Supercluster Initiatives. Combined with a cultural shift to blur the lines between industry and school, this will help close the gap with peers and create long lasting bridges between the school and private sector.