Robot-Proof: What Joseph Aoun's latest book means for higher education in Canada

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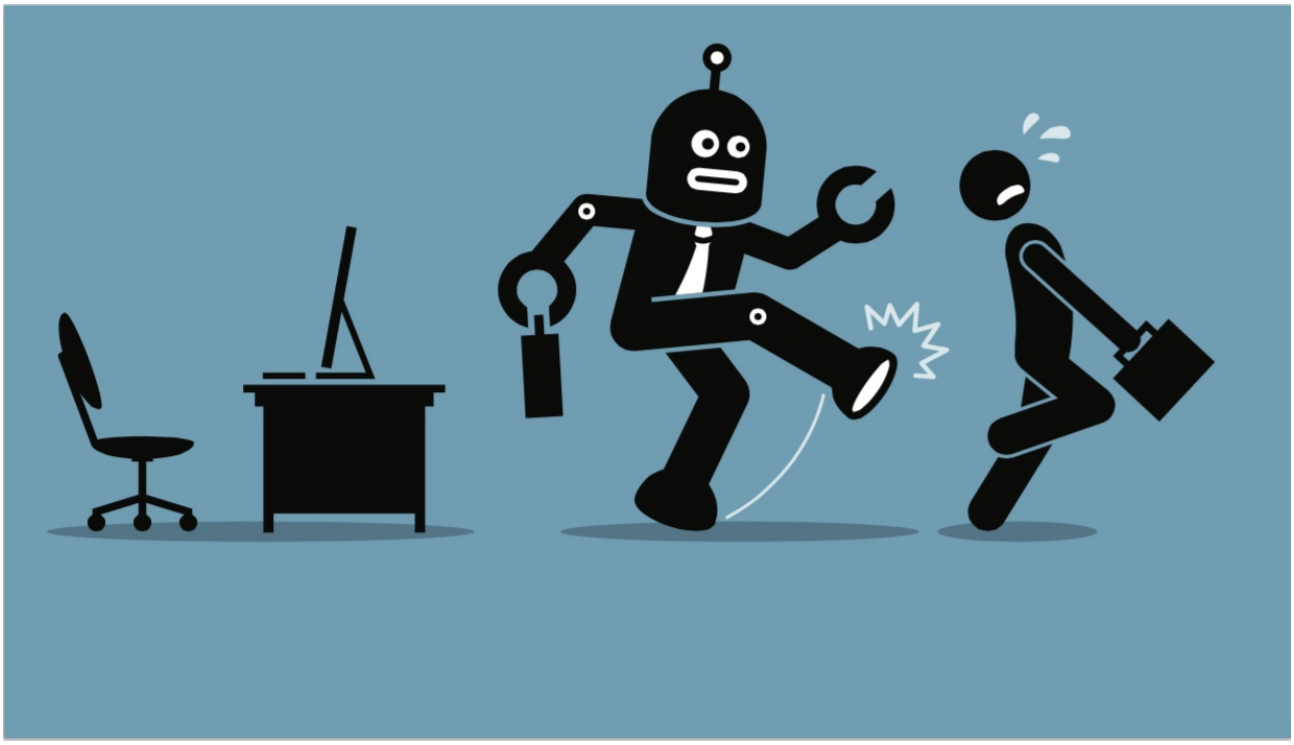
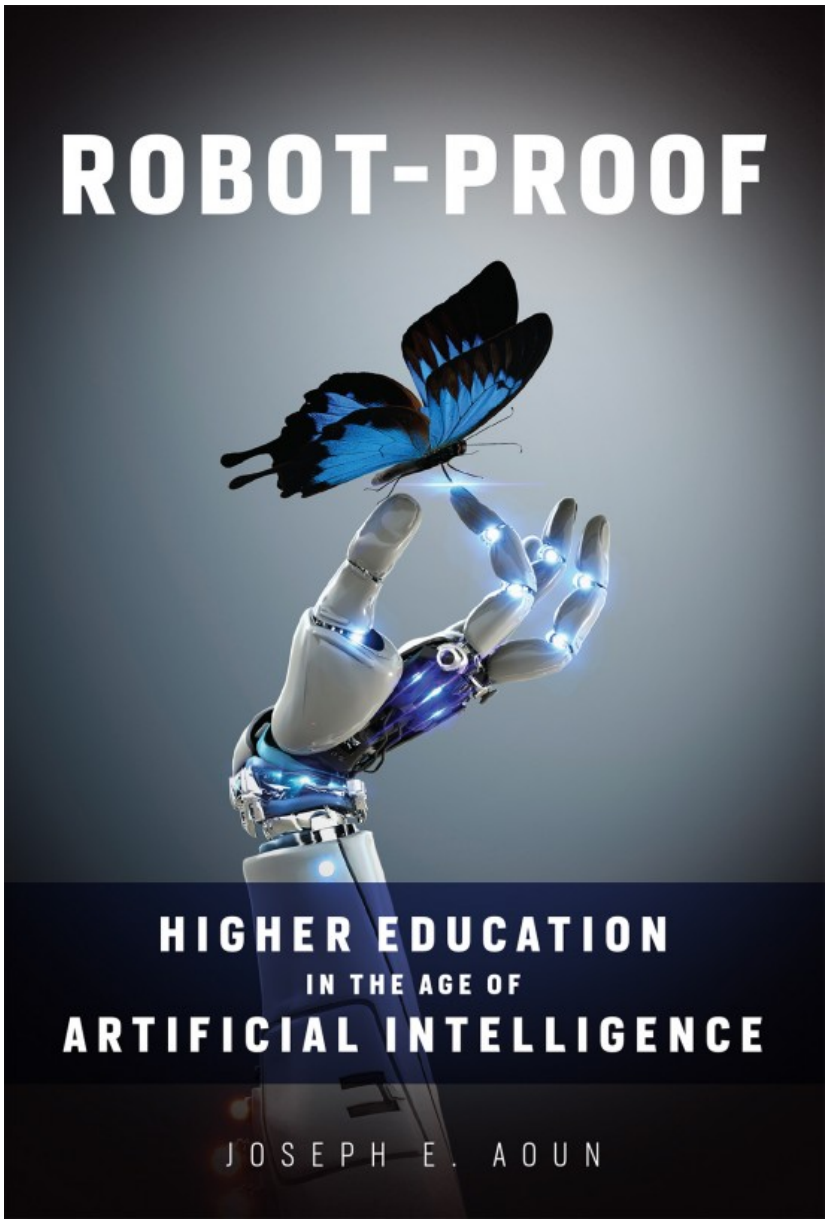
By Daniel Komesch



The changing nature of work is a hot topic these days and policy makers across the globe must grapple with the challenges it presents. In our search for solutions, we need to remember that the future of work is inextricably linked to the future of education.

It is this linkage that makes Joseph Aoun's new book, *Robot-Proof*, a must-read for anyone who is thinking about workforce development or education policy – though, of course, if you're thinking about one, you should be thinking about the other.



Robot-Proof by Joseph Aoun

The full extent of the pressures that technological disruption, largely defined by Artificial Intelligence (AI) and intelligent automation, will exert on individuals, the labour market and society, is up for debate. Aoun largely mutes the fear of labour displacement by offering an antidote to automation anxiety, noting that though jobs will be destroyed, many more will be created. The challenge. therefore, is not in countering the inevitable creative destruction we will incur, but in adapting to it.

For Aoun, the best way to adapt to a future where machines will undoubtedly play a central role in all that we do, is to leverage the very characteristics that set humans apart from machines. He proposes we do this by placing a greater focus in education on what he calls *humanics*, “the abilities that enable humans to not only understand their highly technological world, but to transcend it: creativity and mental flexibility.” To further develop our innate competitive advantages over machines, Aoun also suggests we focus education on three new critical literacies: digital, data and human literacy.

Education as a path to development

To date, our education systems have largely evolved in-step with the economic and social changes of the day. Unlike previous evolutions, we are not making the drastically apparent shift from an agrarian to an industrialized economy, but instead, we are making a more nuanced shift from an industrialized to a digitized economy.

The economy of tomorrow is still being driven by our ability to build new things, but even more so by our ability to connect, optimize, diagnose, monitor and digitize the things that already exist. For example, Aoun points out that GE now makes a significant portion of its revenue not from building the trains or the tracks, but through monitoring the performances of trains and the environmental conditions of their routes, through a "NASA like" control centre, to optimize performance and improve delivery times.

A digital economy, and one where human labour is augmented by machines, requires new skills – skills like creativity, collaboration, teamwork, leadership, critical thinking and communication. Technical skills are no longer the whole of the equation in a world that demands cross-functionality, systems thinking and the cooperation of multidisciplinary teams.

Aoun isn't alone in this thinking. A May 2018 report from McKinsey, *Skill Shift*, notes that, "In aggregate, between 2016 and 2030, demand for social and emotional skills will grow across all industries by 26 percent in the United States," and, "demand for higher cognitive skills, such as creativity, critical thinking, decision making, and complex information processing, will grow through 2030, by 19 percent in the United States."

In today's labour market, the production software and the possession of soft skills are both receiving a premium over hardware and hard skills, and this necessitates a reorienting of education systems to account for society's evolving demands.

One way Aoun suggests our education systems can better teach soft skills is through experiential learning, where the barriers between the classroom and workplace are removed, giving students the ability to learn in their future earning environments. While he is quite correct that experiential learning is a proven way to nurture the development of these critical soft skills, he is short sighted in how experiential learning is defined and delivered – for Aoun, experiential learning amounts to co-ops and nothing else.

In Canada, where we have a three-engine post-secondary education system, comprised of community colleges, universities and polytechnics, experiential learning is delivered effectively in a variety of mechanisms beyond simply co-ops, including through internships, field experience, work placements and practicums. Each of these models of experiential learning has its advantages in terms of professional and soft skill development and shouldn't be overlooked or subsumed in the word "co-op."

In fact, if just-in-time delivery is as critical as Aoun thinks, then experiential learning opportunities that take place within a student's academic semester, rather than outside – like co-ops – may be even more advantageous, as students enter the labour market earlier. Co-op

programs, beneficial as they are, generally add to program length; other forms of experiential learning do not.

Just as what is being delivered in education needs to shift in order to account for new realities, how it's being delivered also needs to shift. Gone are the days of formalized higher education commencing in your early twenties. Now, post-secondary education will need to serve individuals at all stages of their career. If technological change is to be continuous, retooling and refreshing will need to be continuous as well, and higher education has both "an opportunity and an obligation to respond."

To better serve the lifelong learner population, what's needed is shorter, more flexible and stackable credentials, as well as greater participation from employers in curriculum design. Short, agile credentials allow learners to spend less time in the classroom and allow previous knowledge to be "stacked" onto new knowledge.

In a world where change is the constant, the opportunity cost of a four-year degree for those at mid-career is largely too high – it's these smaller, modular, "bursts of focused content," as Aoun calls them, that will allow mid-career workers to build their resilience to disruption by quickly and efficiently modernizing their skill sets.

Finally, the future of both education and work will necessitate closer collaboration between academic institutions and employers in order to develop curricula that better reflect the realities of the labour market and the skills needed to succeed in it. Active employer participation and partnership also facilitates other virtuous interactions, such as the creation of experiential learning opportunities, or best yet, job opportunities for students.

What does Aoun's model mean in Canada?

While written in the context of the United States, much of Aoun's thinking is applicable in Canada. There's no doubt that our post-secondary institutions should heed Aoun's advice and emphasize the so called humanics in learning, nurture an environment that better facilitates experiential learning, and innovate the ways in which we deliver education to make it more accessible and useful to the lifelong learner.

In fact, there are a number of institutions across the country that are already doing just this – what we need to do now is recognize our successes and scale-up the models we know are working.

Though not as renowned as the Swiss VET system or Germany's apprenticeship model, Canada's experiential learning models are today making significant strides. The University of Waterloo (UW) is well known around the globe for its co-op model, connecting students to top-tier employers the world over. However, many other institutions across the country are offering differentiated experiential learning opportunities.

Take UW's neighbor, Conestoga, a leading Ontario polytechnic, for example. At Cambridge Accelerator Grand Innovations, Conestoga students work directly with industry, doing applied research and solving innovation and technology challenges in green recycling for electronics, smart manufacturing and cybersecurity. These collaborative spaces, where students and industry come together to do R&D, are practical opportunities to build real-world experience, enhance innovation readiness and develop critical thinking, communication and the other human skills that will be so critical in our future economy.

An effort has also been launched that attempts to bring together Canada's largest companies and leading post-secondary institutions in order to better facilitate experiential learning opportunities. The Business Higher Education Roundtable (BHER) is presently working towards the audacious, but very worthwhile goal, of providing 100 per cent of all post-secondary students in Canada with an experiential learning opportunity. In addition to work-integrated learning, BHER is also strengthening the R&D and innovation linkages between Canadian firms and post-secondary education institutions and supporting policies and programs that enhance resilience to technological change.

Lifelong learning has also taken a front seat in many postsecondary institutions across the country, in particular, at Canada's colleges and polytechnics. These institutions are motivated by employment outcomes for their graduates (as opposed to universities whose primary mission is knowledge creation). So colleges and polytechnics are natural partners for employers looking to cultivate their workforce for the future or to upskill their existing employees to smooth the effects of technological disruption.

Take for example, the recent workforce development partnership Humber College forged with automation giant Festo Didactic to close the advanced manufacturing skills gap in the Greater Toronto Area. Humber will deliver advanced educational programming to students and employees in the classroom and in the Cyber-Physical Factory – a modular smart factory for teaching and research. For its part, Festo will provide hands-on and experiential learning opportunities, including at its headquarters in Germany.

There are many other such examples like this happening across the country today, and with a sustained push, we can create even more.

The federal government has also recognized the critical importance of upskilling our existing workforce, and intends to launch a Future Skills Centre, tasked with exploring innovative approaches to skills development, identifying skills in demand, and disseminating skills related information and research findings. Leading Canadian post-secondary institutions that are ready to push the boundaries of Canada's higher education system will undoubtedly be key partners in the delivery of this effort.

Joseph Aoun clearly has his finger centred on the pulse of both the needs of our future workforce and how our post-secondary institutions need to respond in order to sustain productivity, growth and human development. In Canada, there are post-secondary education

institutions that are ready to respond to the oncoming workforce development challenge, but in order to remain economically resilient, we need to expand and support these models.

We also need to ensure industry buys into the logic that the future of work cannot be separated from the future of education and that employers stand ready to participate in experiential learning and partner with post-secondary institutions to train-up their existing workforce.

We have the map, and now it's up to our educators, employers and policy makers to respond, in order to ensure that our most precious asset – human capital – remains "robot proof," through all the coming disruption we are sure to incur.

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