

Industry 4.0 requires accelerating evolution in employee capability and institutional agility

By Dr. Salvador Ferreras and Dr. Thomas Carey

The phrase “Industry 4.0” seems to keep popping up in trade publications, higher education news sources and in wider media circles. Conceptually this term denotes an increasingly connected and integrated world, harnessing big data, analytics, the internet of things, automation and new work patterns that seek to integrate human and automated processes in more flexible ways.



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The pace of industrial evolution is accelerating and the scope of change is expanding. While [not necessarily a revolution](#), industry and government leaders are paying serious attention to an accelerated evolution. This changing pace of change will require our educational institutions – primary to post-secondary – to revisit how we can best foster innovation, agility and adaptability to a new industrial and economic reality.

How are other countries responding?

Industry 4.0 isn't just about smarter machines; it's also about a workforce with new technical smarts and with a broader understanding of the big picture of workplace innovation. KPU we've been researching how other countries are positioning their institutions by offering “Higher [i.e. post-secondary] Vocational Education” to proactively address the potential impacts from Industry 4.0 on educational development and delivery.

Consider Advanced Manufacturing as one example. As a [leading company in Germany](#) describes it, “Our people have played the decisive role in Industry 4.0. Connected manufacturing is [transforming the requirements placed on employees](#). A lot of investment is going into new occupational training and [qualifications designed to equip employees for Industry 4.0](#).”

The Austrian Academy of Sciences recently commissioned a research study on the [Effects of Industry 4.0 on Vocational Education and Training](#). It identified specific challenges our institutions will need to address. Among them:

- An accelerated pace of change in technical curricula, as the tasks and tools in the workplace “change much faster than has been the case in the past”;
- That in Industry 4.0 relevant methods of teaching and learning are paramount.
- Right from the start it will be necessary to develop individuals who:
 - can think on their feet and act independently [in more complex tasks]
 - have more IT know-how and are ready for rapidly changing IT knowledge
 - are able to collaborate across different areas of expertise, and with other departments, companies, and customers
 - can acquire a capacity for systemic thinking.
- “The real challenge... lies in the ability to relate and integrate the human and automated processes, in their design as well as in day-to-day operation.”

Crafting a Canadian Strategy to Prepare Graduates for Industry 4.0: A Collaborative Challenge

Our institutions have a long history of collaborating closely with our industry partners on new programming, new pedagogies and new program structures to make sure our graduates will be ready for the roles required of them in the workplace. We know there are current skills gaps, mostly in mid-level skilled positions, where we need to provide more job-ready graduates—both from traditional entry-level programs and from ongoing re-skilling of experienced workers.

In addition, to prepare our graduates for upcoming changes in jobs from Industry 4.0 we need to explore beyond a ‘digital transformation’ to achieve a ‘workforce transformation’ for all sectors of our economy. The focus will be on building innovative co-operative relationships with workplace partners for new pathways in job training and retraining as well as creating new pathways to an adaptable and nimble workforce for jobs yet to emerge. This transformation has broad implications for government policy, education and the nurturing of thriving communities.

Here are four examples of potential initiatives we could undertake in collaboration—and only in collaboration—with industry and government:

- Enhance our cooperation with workplace and government partners to address the broader capabilities needed for an adaptive and agile workforce in this new context. Industry 4.0 and Canada’s innovation agenda offer vast opportunities to catalyze a Made-in-Canada strategy to advance a Make-it-in-Canada thriving economy.
- Accelerate adoption and adaptation of open and online resources for specific technical content in order to allocate more of our instructors’ time to resource development and experimentation with the new pedagogical challenges.

- Track closely the research directions that are changing the technology space in which are graduates will work.
- Commission Canadian research studies on the new integration of automated and human processes, and its expected transformation of the employment arena.

About Kwantlen Polytechnic University

Kwantlen Polytechnic University has served the Metro Vancouver region since 1981, and has opened doors to success for more than 200,000 learners. Four campuses—Richmond, Surrey, Cloverdale and Langley—offer a comprehensive range of sought-after programs in business, liberal arts, design, health, science and horticulture, trades and technology, and academic and career advancement. Over 19,000 students annually have a choice from over 120 programs, including bachelor's degrees, associate degrees, diplomas, certificates, citations and apprenticeships. Learn more at kpu.ca.

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