The RISE of the GENERALISTS

Why Canada's most innovative universities are resisting calls for more job-specific training and embracing fresh approaches to interdisciplinary learning

By ERIN MILLAR

It was one of those beautiful moments of intellectual revelation that undergraduate education is all about. Evan Pivnick was reading Climate Wars by Gwynne Dyer when he realized that climate change wasn't just a problem of science but also of politics. "I used to think about it in an analog way," recalls the University of Victoria political science graduate of his formerly single-channel thinking. All of a sudden, communication theory, psychology, economics and law seemed hugely relevant. "I didn't want to take a narrow look at climate change. I wanted to study the whole spectrum." So Pivnick signed up for Victoria's new minor in human dimensions of climate change. "I wouldn't have encountered the hard science of climate change otherwise," he says. "It also opened me up to economics. I realized I had certain biases so I took classes to understand and be conversational with economists." After graduating this spring, he scored a job working for Andrew Weaver, a Victoria climate scientist who was recently elected the first Green Party MLA in British Columbia.

Pivnick says the interdisciplinary nature of his education strengthened his ability to consider problems from different perspectives and communicate with experts from disparate fields — a type of thinking universities are increasingly attempting to foster in their students. While interdisciplinary education is not necessarily new, unique approaches are popping up across the country that recognize that modern problems such as climate change — messy, complex beasts that won't be solved by a single field — require thinkers with a broad wisdom not limited to a single field.
At McMaster University in Hamilton, for instance, the honours integrated science, arts and science, and bachelor of health sciences programs are inherently interdisciplinary. Since Dalhousie University in Halifax created the College of Sustainability in 2009, more than 1,000 students from almost every faculty have enrolled in a double major that involves working on sustainability challenges in the community with professors in the arts, business, science, engineering, health and design faculties.

Most of the 60 universities researched for the Canadian University Report offer relatively new interdisciplinary undergraduate programs in subjects as varied as cognitive science (Carleton University in Ottawa), peace and justice (University of Toronto), food systems (Trent University in Peterborough, Ont.) and community engagement (Emily Carr University of Art and Design in Vancouver). These programs go by many names — applied or integrated, multi- or trans-disciplinary, inquiry or problem-based — but they all have a fundamental assumption in common: Innovation, whether an idea for a new product or an approach to treating illness, often occurs at the intersection of disciplines.

“One of the dangers of disciplinary thinking is that you can get narrowed into a certain jargon that is familiar to your group of experts but virtually meaningless to other people,” says David Leach, director of the technology and society program at the University of Victoria. “Because we’re not within any faculty, our students have to find a way of communicating and collaborating with one another.”

Communication and collaboration, along with analysis, critical thinking, technological literacy and problem solving, make up a suite of intangibles sometimes called “21st-century skills,” that educators such as Leach argue students gain from a broad education.

This view of what skills are needed to thrive in the 21st century is but one side of a debate that has dominated discussion about the goals of postsecondary education in the past year. In reaction to the tough job market many new university graduates face, a growing chorus of politicians and pundits call for universities to narrow their focus and produce “job ready” graduates with the latest technical expertise; in this view, studying humanities or social sciences is seen as a waste of taxpayers’ money and students’ time because asking unanswerable questions does nothing to prepare one’s mind for the real world.

Writing in Maclean’s magazine, columnist Colby Cosh eloquently argued that broadly educating students amounts to delaying them from entering the work force merely because of a romantic (read: foolish) attachment to the broad education at the heart of the liberal Enlightenment ideal: “What you get when you turn this ideal into a system, however, is a lot like what you get when you transform articles of Christian faith into the Catholic Church: a powerful, unaccountable apparatus that abuses large numbers of young people.”

Prime Minister Stephen Harper has also called for post-secondary institutions to focus on specific skills, particularly in trades, science and engineering. In a meeting with a U.S.-Canada business group in Ottawa last November, he said, “For whatever reason, we know that people’s choices, in terms of the education system, tend to lead us to what appears to be a chronic shortage of certain skills.” The contention that Canada’s skills shortage is a barrier to economic recovery is the justification for the Canada Job Grant, a centrepiece of the government’s 2013 economic plan, which pledged to provide 130,000 workers a year with skills training.
But, according to many educators, the set of skills students need to thrive in the modern economy is about much more than technical expertise. In a speech to the Empire Club of Canada last March, David Naylor, outgoing president of the University of Toronto, called the argument for more job-specific education a so-called zombie idea, "one of those persistent and infectious pieces of misinformation, a meme that shouldn't be alive but just won't die." He argued that, instead of focusing on specific technical skills, all people, regardless of their field, need to be able to think quantitatively, communicate effectively, analyze critically and reason through ethical and social challenges. Even in applied disciplines such as health sciences, teachers are replacing narrow skills with what one might call "renewable competencies," Naylor said. "After all, our students will confront challenges — everything from climate change to cyber-security — that are more intertwined, complex, and social than ever before."

**SO WHAT SHOULD WE MAKE OF THIS DEBATE? IS THIS SHIFT TOWARD INTERDISCIPLINARY TEACHING THAT PRIORITIZES RENEWABLE COMPETENCIES OVER NARROW EXPERTISE PREPARING STUDENTS TO ADAPT TO FAST-CHANGING CAREERS AND ECONOMIES? OR ARE UNIVERSITIES PRODUCING UNEMPLOYABLE MASTERS OF NONE?**

The tiny, private Quest University in Squamish B.C., which exemplifies the trend, may provide the answers to these questions.

Mid-day on a Wednesday in early May, snowshoe-clad students sit on a snowy shore of frozen Garibaldi Lake, a glacial lake in the mountains midway between Vancouver and Whistler, B.C., eating hummus wraps and trail mix. These undergraduates are camping here for five days. They've brought gear such as ice augers and instruments to measure water flow. The goal? To quantify the amount of water in the watershed.

In the next three weeks, they'll spend time on a river and the ocean, studying different aspects of water cycles with professors with expertise in fields from geology to physics to epidemiology. But right now, on this lunch break, they're thinking about the assignment at hand. Student Julia Simmerling is frustrated because her group spent all morning measuring snow density but the instrument kept mauling and seemed to be calibrated incorrectly. All her numbers are meaningless, she complains to physics professor Court Ashbaugh. "There's a way around this," he tells her. After some discussion with Ashbaugh, Simmerling and her group take a new approach to the problem of quantifying the amount of snow in the water shed: by measuring water from snow off a roof. They later realize they were using the snow density instrument incorrectly, but they learned that there are a lot of different ways to tackle a problem in the field.

The lesson may seem inconsequential — Simmerling may never again need to reason out how to measure the amount of water in snow — but this kind of problem-solving is what this class, and Quest itself, is all about. With no majors or departments, the unusual university in Squamish is arguably Canada's most extreme example of broad, interdisciplinary undergrad education. "If you have a conventional education, you're trained in how we view the world in 2013," explains mathematics professor Glen Van Brummelen. "You might be able to exist in the current system for a few years, but what will get you far is flexibility in thinking." In other words, technology and economies are changing at such a pace that industry-specific skills learned through higher education are often obsolete soon after graduation, therefore students are better served by developing the ability to adapt and continue learning outside formal settings.

Quest buys into an idea that is gaining momentum at universities around the world: that instead of being steeped in disciplinary content, students ought to develop adaptable habits of mind. Traditionally, being educated is most often a process of narrowing; one would study increasingly specific knowledge to the point of knowing enough to be considered an expert. But in this new view, what matters isn't specific content but the broad strokes of how the world works. Quest is throwing out the conventions of disciplines in order to get at intangibles. For example, during the field class at Garibaldi Lake, students argued with each other about precision and uncertainty while taking measurements — concepts central to doing science that are difficult to get at in the predictable confines of a classroom.

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1. **Sir Frederick Grant Banting**, who discovered insulin, took divinity studies at the University of Toronto before switching into medicine, and taught anthropology at the University of Western Ontario in London, Ont.

2. **Alexander Graham Bell** studied anatomy and physiology at the University of London in England before moving to Canada and, eventually, inventing the telephone.

3. **Tommy Douglas**, the former Saskatchewan premier who is credited with being Canada's founder of universal health care, studied Greek philosophy and divinity at Brandon University in Brandon, Man.

4. **Marshall McLuhan**, communication theorist, originally studied engineering at the University of Manitoba.

*With files from Tari Ayadi*
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Robert Gifford, University of Victoria

But striking the right balance between teaching habits of mind and disciplinary content is tricky. While Ashbaugh is a great supporter of learning science by doing, he worries his students may end up not knowing much about anything. "Experts think the way they do because they know a lot about something. That keeps me up at night," he says, but acknowledges that a liberal arts education like that offered at Quest isn’t intended to produce experts. Van Brummelen is less troubled: "The big question in this discussion that never gets addressed is: How much technical knowledge do conventionally trained students actually have?"

Yet, that question is being asked. Mere moments after the Harper government announced a cabinet shuffle last July, MP Jason Kenney, who had just been named Minister of Employment and Social Development, tweeted, "I will work hard to end the paradox of too many people without jobs in an economy that has too many jobs without people." His comment hints at the view held by the Office of the Prime Minister, that a lack of jobs isn’t the sole reason for persistently above-average unemployment. Harper also sees this as an education issue, which cuts to the heart of the debate about the purpose of universities. Jobs go unfilled because employers can’t find employees with the right skills, this line of reasoning goes; if only universities were better at equipping students with relevant skills demanded by employers, graduates would find jobs. (It’s worth noting that Don Drummond, former chief economist at Toronto-Dominion Bank, now at Queen’s University, told the Toronto Star that he was unable to verify the unfilled jobs stats used in the 2013 budget.)

Everyone interviewed for this article agrees that employers are frustrated with university graduates’ mix of skills, but most say employers aren’t seeking technical knowledge but instead abstract 21st-century skills or “renewable competencies.” Ginny Dybenko, former chief executive officer of Bell Advanced Communications, says, "Whether I asked Procter & Gamble or the banks on Bay Street or the big consulting firms, without exception, all the senior people told me they needed the soft skills. It’s an ability to communicate with humans. That requires an understanding of how humans think and how they want to understand the world. It sounds so straightforward that I am almost reluctant to say it, but it is something that is hard to deliver on.”

AFTER 40 YEARS AT BELL, A STINT AT A STARTUP, AND FIVE years as dean of business at Wilfrid Laurier University, Dybenko joined the University of Waterloo in Ontario in 2011 as executive director of the Stratford Campus, a new digital media campus. The idea was to create an interdisciplinary graduate program in which students work with companies to tackle digital media problems. The course work would touch on business and technology, but its heart was in the arts — history, fine arts, psychology. "What a remarkable thing — to bring together the geeks and the artists in one site," recalls Dybenko, "give them interesting tasks to work on together, provide them with a creative frame, lots of opportunity to play in that sandbox, and see what happens.”

Dybenko’s colleagues hoped 50 students would sign up in the first year, and were delighted when 100 started the program. The next year 150 qualified students enrolled. An undergraduate program launched last fall was similarly popular. The response from business was also enthusiastic. Google and Canadian Imperial Bank of Commerce were among companies that submitted projects to the program for students to work on, and all graduates who entered the job market (some became entrepreneurs) are employed.
What is unusual about the Stratford Campus is its firm foundation in the arts. (Its academic director Christine McWebb has a doctorate in French literature.) “In the old days, what students would be told if they were really passionate about the arts or the humanities was to become an accountant, and then they could play with that other stuff in their spare time,” Dybenko says. “If they’re passionate about the arts, and that can be music or sociology or political science or geography or history, then we encourage them and give them enough technology so that they can apply that in the digital age and enough business skills so that they are actually useful in the workplace.”

Stratford Campus was established as arts programs were being cut back at many universities. (In August, the University of Alberta in Edmonton suspended enrolment in 20 arts programs, from music to languages.) The value of an arts education is at the heart of the debate about what skills students should gain from a university education, and it’s an extremely old argument – whether education ought to be about fostering critical, independent thought has been up for debate at least since Plato laid out the bones of a Socratic education in his Republic. But new interdisciplinary programs at universities across the country are lending the arts new relevance, rooted in a recognition that in our race to invent widgets, cure diseases and program apps, we may have neglected the human element.

Robert Gifford, head of the University of Victoria’s human dimensions of climate change program, says the program grew out of an understanding that there is a sociological and psychological side to climate change. He argues that graduates will be valuable to governments and industry dealing with environmental problems. “Stephen Harper’s people are thinking industrial, productive, resource-extraction type of jobs – plumbers, electricians, which we need, but we’re producing people who are job-ready, not for resource extraction, but to be managers of a very complex problem.”

For Dana Petersen, one of the first Stratford Campus graduates, the utility of her broad education is obvious. With her ability to speak the language of designers and engineers alike, she scored a job as a user experience researcher at Samsung, exploring how people interact with technology. “For a long time at universities, there were the sociology and psychology departments, and they were about people. Way across campus, there were the engineers who built things. We’re just starting to build bridges.”

The programs

The idea of interdisciplinary learning is not new, but the ways in which that idea is being applied in Canada are constantly changing. Here are five programs that are at the forefront:

**Contemporary studies** at the University of King’s College in Halifax.

**Integrated science program** at McMaster University in Hamilton, Ont.

**One program** at the University of Toronto.

**Renaissance College** at the University of New Brunswick in Fredericton.

**International studies** at Simon Fraser University in Burnaby, B.C.

**With files from Tari Ajadi**