Tony Bates

Introduction

Canada is the second largest country in the world by total area, yet its population is only 35 million. Even though nearly 80% of the Canadian population live near the southern border with the USA, and in its larger cities, Canada is still in general a sparsely populated country, with long distances between urban centres, and between urban centres and their vast hinterland. There are therefore strong geographical reasons for distance education.

At the same time, Canada's closeness to and strong connections with the USA, its economically advanced cities, and a well-educated work force, have resulted in ideal conditions for the development of advanced digital applications such as online learning. Indeed, we shall see that Canada has been at the leading edge of online and distance education developments.

The Canadian Higher Education System

Education is constitutionally the responsibility of the ten provinces and the three territories. Thus there is no *national* higher education system in Canada. There is no Federal Ministry or Department with responsibility for post-secondary education, although the federal government does provide student aid and tax breaks for students and their parents, and funding for research and innovation. The federal government is largely responsible for funding higher education opportunities for aboriginal learn-

T. Bates (✉)
Ryerson University, Toronto, Canada
e-mail: tony.bates@ubc.ca

ers, although aboriginals who go on to post-secondary education usually attend a provincially funded institution.

There are four types of public post-secondary institution in Canada:

- universities,
- polytechnics/institutes of technology,
- one- and two-year professional and vocational colleges,
- CEGEPs (general and vocational colleges) in Québec.

Almost all universities are provincially funded and there are almost no private, for-profit online universities in Canada. New Brunswick is the exception, with two private, for-profit universities (University of Fredericton and Yorkville University) with provincial legal status, but they are not recognised by Universities Canada, the national organization of universities, and their programs are small. There are numerous private, for-profit vocational colleges, but still a majority of two-year college students attend provincially funded institutions.

Students pay tuition fees that vary considerably from province to province, ranging from \$2660 a year in Newfoundland to \$7868 in Ontario. The average nationally is C\$6191. The fees for provincial two-year colleges are usually much lower. International students however pay full tuition fees that can range between \$15,000 and \$20,000 a year for undergraduates. Most Canadian students receive financial support of some kind, ranging from endowment-funded scholarships to low interest student loans to tax breaks. In most provinces, grants and tax-breaks combined usually cover at least the tuition costs.

Distance Students

Because there is no federal agency responsible for higher education, there are no official national statistics on the number of students taking online or distance courses. However, a more recent survey (2017) found that online course enrolments for credits constitute about 16% of all university course enrolments, and 12% of all college course enrolments. Online enrolments had increased by 10% per annum in universities and by 15% per annum in colleges outside Québec over the period 2011-2015.

Almost 40% of the Canadian population live in Ontario. A census in 2010 of all its universities conducted by the Ontario Ministry of Training, Colleges and Universities (Ontario 2011) found there were 500,000 online course registrations equal to 25,000 full-time equivalent students (11% of all post-secondary registrations). This survey included colleges as well as universities.

Many universities report that the number of online courses, and student enrolments in fully online courses and programs, has been slowly but steadily increasing for the last 15–20 years, and at a faster rate than on-campus enrolments.

Some provincial governments, such as British Columbia, Alberta and Ontario, have encouraged the growth of online learning by special funding for the development

of new online courses in addition to the annual government operating grants for universities and colleges.

Distance Teaching Universities

There are two public universities in Canada that offer programs only at a distance:

- **Athabasca University**, established in 1970, and funded by the Alberta government, is an open, fully distance university that draws up to 40% of its 40,000 students from outside the province of Alberta. It offers both undergraduate and graduate degrees fully at a distance. Its Master in Distance Education started in 1994 and is still running today. It also offers a Doctor of Education in Distance Education, the first of its kind in North America.
- **TÉLUQ** (formerly TeleUniversité) in Québec is a francophone, fully distance university offering full degree programs to just under 20,000 students a year. It is part of the province's multi-campus Université du Québec, which awards the degrees and diplomas.

However, both these institutions are facing existential challenges as more and more conventional universities offer fully online courses and programs.

Thompson Rivers University, a campus-based, provincially funded institution in British Columbia, also offers distance courses and programs through its Open Learning Division (TRU-OL). TRU-OL partners with three other BC universities to ladder their distance education courses towards a TRU degree.

Royal Roads University (RRU), on Vancouver Island in British Columbia, offers a mix of online and on-campus programs, focusing on graduate level career development. RRU offers three formats:

- on-site with 100% face to face learning;
- blended, with part of the program taught in a face to face residency and the balance on line; and
- fully on-line.

RRU's residency based programs are usually short, ranging from one to three weeks, usually in the summer. The majority of its programs are fully online.

Dual-Mode Institutions

Many of the campus-based universities and two-year colleges in Canada also offer distance education courses, usually fully online. Some of the universities have a long history of distance education provision. Queen's University (Ontario) offered its first correspondence courses in 1889 and overcame geographical challenges in

regions without access to the postal service by employing the North West Mounted Police (now the Royal Canadian Mounted Police) to deliver material for these courses (CADE 1999).

Since the advent of online learning in the 1990s, many campus-based Canadian universities and some two-year colleges and CEGEPs now offer a wide range of online distance education programs. There are basically four types of distance education courses commonly offered:

- individual fully online courses, serving several purposes:
 - enabling students who have dropped courses, or need only one or two more courses, to complete their undergraduate degrees without having to come back full-time for another year;
 - providing more flexibility in scheduling for students throughout their academic studies;
 - offering increased access for working adults/students with young families;
- courses towards a full undergraduate degree available entirely online;
- post-graduate masters programs, mainly aimed at working professionals;
- non-credit courses or programs leading to certificates or diplomas.

Many of these dual mode universities offer parallel on-campus and distance courses and do not indicate the mode of delivery on degree transcripts. Indeed in most cases on-campus and distance students take the same examination, usually under supervision at a proctored exam site or more recently through online proctoring.

Although the majority of students in Canada are taking just one or two online courses as part of their on-campus program, over the last two years some conventional universities have also started offering complete undergraduate degree programs fully online. For instance, students can start a B.Tech program in computing at Mohawk College then transfer to McMaster University to complete the last two years fully online. Similarly, Queen's University is offering a fully online B.Tech in mining engineering aimed at working miners across Ontario. Fully distance undergraduate programs though are still quite rare in Canada, the main providers still being Athabasca University, TRU-OL and TÉLUQ.

In every province there is at least one campus-based university also offering online and distance education:

- in **British Columbia**, Simon Fraser University has almost 20,000 distance course enrolments per annum, 8% of all enrolments (SFU 2015). The University of British Columbia has just under 90 distance courses for credit and about 9000 distance education course enrolments;
- Athabasca University is the main provider of online and distance education programs in **Alberta** at a university level, but several of the colleges have extensive online courses and programs. Southern Alberta Institute of Technology has a unique program for women in Afghanistan, who take a diploma in business management online from SAIT through the Afghan-Canadian school in Kandahar City. More than 2000 women in Afghanistan have graduated from this program;

- both the University of **Saskatchewan** and the University of **Manitoba** have substantial distance programs;
- in **Ontario**, at least 15 of the 24 universities offer distance education programs. Laurentian University offers over 350 online and distance courses in both the English and French languages. Laurentian is the largest bilingual provider of distance education in Canada. The University of Ottawa also offers online and distance courses and programs both in English and French;
- in **Québec**, Laval University has a very large francophone distance education program. Laval also has a partnership with the African Virtual University, which uses some of Laval's courses in francophone African countries;
- all universities and colleges in **New Brunswick** are currently offering distance education courses using various methods;
- In **Nova Scotia**, which has a large number of small universities, several also offer distance education courses and programs;
- in **Newfoundland**, Memorial University has a large online program. In the fall of 2013, 1441 students were distance education only (8%) and 4161 students (22%) took at least one distance education course. There were over 17,000 online course enrolments in total. Their online enrolments have increased by 50% over 10 years (Memorial University of Newfoundland [2014](#)).

Meta-Organizations

Several provinces have established meta-level organizations to help co-ordinate or encourage online learning, although these organizations do not offer online courses or programs themselves.

BCcampus evaluates emerging educational technologies and has also in the past managed a fund from the provincial government to support the development of new online courses and open educational resources, and more recently (2012–2016) has managed funds for developing open textbooks. It has also established an open educational resources repository available worldwide.

Contact North/Contact Nord in Ontario, established in 1986, offers five core services in English and French. The five services include:

- 112 local online learning centres serving 600 small, remote, rural, aboriginal, and francophone communities;
- a portal of online courses and programs from Ontario institutions for students and prospective students;
- a portal for faculty and instructors, focusing on online learning;
- a portal for students needing literacy and basic skills training;
- a Student Information Hotline providing support to students and prospective students.

eCampus Alberta, eCampus Manitoba, eCampus Ontario and **Contact North/Contact Nord** provide online portals for students where all the courses offered by most of the universities and colleges within the province are listed.

The **Council of Ontario Universities** manages a fund from the Ontario Ministry of Training, Colleges and Universities for developing online courses and creating shared open educational resources, through a competitive bidding process.

These organizations also often support faculty development initiatives for online learning, through webinars and local conferences and workshops. They also facilitate professional communities of practice. In British Columbia, for instance, the **Educational Technology Users Group (ETUG)** is supported by BCcampus.

The **Canadian Virtual University (CVU)** is a partnership of 11 Canadian universities collaborating in the development and marketing of distance and online education. The CVU does not offer courses or degrees itself but serves as a portal service for its members. CVU is governed by a board of directors, consisting of presidents and directors of distance education at participating universities. Collectively, the CVU offer over 2500 distance and online courses, and over 350 complete degrees, diplomas, and certificates. One quarter of CVU's programs and courses are offered in French. In Canada, there can be barriers in transferring credit or qualifications between institutions. Difficulties with inter-institutional credit transfer are a limiting factor for institutions wishing to develop national online or distance programs. However, CVU universities accept each other's courses for transfer credit, thus providing students with greater course selection than is available at any single university.

Several Canadian institutions (Athabasca, TRU-OL, Kwantlen Polytechnic, Portage College, BCcampus, eCampus Alberta and Contact North) are members of **OERuniversitas (OERu)**, which offers free online courses so that learners can gain formal credentials from the partner institutions. OERu is a consortium of 36 organizations across five continents, and is dedicated to widening access and reducing the cost of post-secondary education by providing open pathways to formal, quality credentials.

The **Commonwealth of Learning**, charged with promoting open distance education throughout the 53 countries of the Commonwealth, is located in Vancouver, British Columbia.

There are several Canada-wide organizations that support online and distance educators, including:

- the Canadian Network for Innovation in Education (**CNIE**), created in 2007 through the amalgamation of the Canadian Association of Distance Education (CADE) and the Association for Media and Technology in Education in Canada (AMTEC);
- the Canadian Association for University Continuing Education (**CAUCE**);
- Canada's Collaboration for Online Higher Education Research (**COHERE**);
- **REFAD** (Network for Francophone Distance Education in Canada) supports francophone distance educators.

Quality Assurance and Quality Control

Most provinces have degree quality assurance boards for provincially funded universities and colleges, and an accreditation board for private colleges. However, well-established provincial universities in particular have a great deal of autonomy, using standard procedures to approve courses and programs through academic departments and Senate. This applies equally to online and distance courses, which in general follow the same procedures, but often with more internal scrutiny.

Funding models and practices vary considerably for distance education programs in Canada. Most institutions require a faculty member to be responsible for online courses leading to credit, although that faculty member may not teach all sections of the course. Thus there are likely to be some part-time sessional or adjunct instructors involved in the delivery, especially where the class size is large. Through the use of sessional instructors as well as full-time faculty, instructor: student ratios are at a level where there is regular and ongoing interaction between students and an instructor.

One of the main factors ensuring quality control in Canadian online learning is the use of a team approach for course development, usually involving a full-time faculty member working with an instructional designer, who in turn can call on specialist media designers. Also instructional designers ensure that courses are using Universal Design principles to create inclusive learning environments, and that the most appropriate pedagogy for distance learning is used. Some, such as the University of British Columbia, use a formal quality assurance tool for its online courses.

Most online courses for credit in Canadian universities have been built around learning management systems, which provide a platform for content, a structure for student work, tools for asynchronous online, text-based discussion, and ways for students to submit assignments for assessment. More recently there has been growing use of web conferencing and/or recorded video (moving back to a more lecturing approach), or alternatively a greater use of social media such as blogs and wikis, and e-portfolios for assessment that encourage student content creation and communication (moving to a more learner-controlled or learner-centred approach). Thus the relative homogeneity of course design that typified Canadian online learning since 1995 is now beginning to splinter, although the LMS-based course is still dominant.

Although there are no national figures, most Canadian universities and colleges report online completion rates within 5–10% of students taking the same course via campus classes. For instance the Ontario 2010 survey found that completion rates for individual online courses were an average of 89% for universities and 79% for colleges.

However, as for face-to-face teaching, quality can vary from institution to institution and from course to course. In general though, quality in online teaching is not seen as a major issue in most provincially funded institutions in Canada.

Innovation and Research

Canada has a long and substantial record of innovation and research in open and online education.

Innovation in Open Education

Athabasca University was founded in 1970 by the Alberta government. Its design model, based on open access, print-based courses, continuous enrolment, individual tutors and self-paced independent learning was markedly different from the U.K. Open University's, which also started at roughly the same time. Athabasca also began offering the first fully online degree programs in 1994, including the first fully online MBA in the world.

British Columbia became the first jurisdiction in North America to implement open textbooks. At the end of 2015 there were 136 open textbooks in the BCcampus project, adapted or created by BC faculty, for all 'core' subjects at university and college level. All these books are available for free downloading under a Creative Commons license, and are offered in various e-book formats free of charge, or as print on demand books available at the cost of printing. As of 25 February, 2016, the project has resulted in estimated savings for students of between \$1.2 and \$1.4 million. BC also recently partnered with Alberta, Saskatchewan and Campus Manitoba to assist them in their own roll out of open textbooks. Algonquin College in Ontario has also launched an e-textbook initiative, working with the publishing industry to provide e-books for all courses.

The province of Alberta has implemented a \$2 million initiative to promote and support the use of Open Educational Resources in higher education institutions in Alberta. The province is collaborating with British Columbia and Saskatchewan on a common OER repository.

Innovation in Online Learning

Canada has been a pioneer in online learning. CoSy was an early computer conferencing system developed by the University of Guelph in Ontario in 1983, and was later used by the U.K. Open University for its first courses using online teaching in 1988.

The first fully online course for university credit was offered in 1986 at the Ontario Institute of Studies in Education, a graduate school of the University of Toronto. This was a course for 20 for-credit and 20 non-credit students designed and delivered by Professor Linda Harasim and her colleague, Dorothy Smith. The course was on 'Women and Computers', using 150 or 300 baud modems via the

public telephone network. TÉLUQ (then called Télé-université) also used CoSy for computer conferencing as early as 1989.

TeleEducation New Brunswick developed a DOS-based learning management system in eastern Canada in 1994 and also the TeleCampus, incorporating a distance education website and a metadata depository of online courses.

The first web-based learning management system, WebCT, was developed at the University of British Columbia in 1996 by Murray Goldberg, and acquired in 2006 by Blackboard, Inc. WebCT was being used by 10 million students in 80 countries at that time. In 2000, the University of Guelph partnered with Desire2Learn, a Canadian company based in Kitchener, Ontario, to develop another major learning management system, now called Brightspace.

The University of British Columbia began offering fully online courses for credit in 1995, and also offered its first fully online programs in 2003, a Master in Educational Technology, developed in collaboration with Tec de Monterrey in Mexico (offered both in English and Spanish), and a Master in Adult Education and Global Learning, in cooperation with three international partner universities. UBC is also one of five partner universities in an Asia-Pacific collaboration to create an online certificate program in sustainable forestry management. All these programs are still running 13 years later.

Another important development is the move to full cost-recovery graduate online programs aimed at career development. These use a business model that covers all costs, including university overheads, from 'standard' tuition fees. These business models may need up to seven years before costs are fully recovered, but the business model allows new research faculty to be hired from the increased revenues, as these are new students, often from out of province. Online MBAs, offered by a number of Canadian universities, is another example, but other examples can be found in health, education, creative writing, and engineering.

Dave Cormier, an instructor at the University of Prince Edward Island, was the first to coin the term MOOC (Massive Open Online Course). The first MOOC, *Connectivism and Connective Knowledge (CK08)*, was offered in 1998 by the Extension Division of the University of Manitoba. This course, designed by George Siemens, Stephen Downes and Dave Cormier, enrolled 27 on-campus students who paid a tuition fee, but it was also offered online for free and attracted a further 2200 students. Downes classified this course and others like it that followed as connectivist or cMOOCs, because of their design, which focused mainly on learners sharing experiences and inter-changing ideas through a range of social media linked by hashtags. However, a majority of MOOCs follow a different design, using mainly video-recorded lectures, based on a model developed in 2011 at Stanford University and MIT in the USA. At the time of writing, eight Canadian universities are offering about 20 MOOCs using a variety of platforms.

Canadian institutions have also been heavily involved in developing resources, courses and programs using mobile learning, virtual worlds, and simulations. For instance,

- the Justice Institute of British Columbia, which trains public safety workers (police, fire services, etc.) offers all of its online learning on mobile platforms (phones, tablets), and uses an in-house designed simulation for training emergency responders;
- Loyalist College in Ontario uses a specially designed virtual border post and a virtual car in teaching Canadian Border Service Agents;
- Ryerson University uses ‘virtual’ law firms for its online Law Practice Program;
- UBC has developed open access virtual soil science learning resources (Soil-web.ca).

Research in Online and Distance Education

Canada is home to two of the major peer-reviewed academic journals in distance education:

- the *International Journal of E-learning and Distance Education* (formerly the *Journal of Distance Education*, established in 1986).
- the *International Review of Research in Open and Distance Learning* (IRRODL), established in 2000.

Both these are open access and published at Athabasca University by AU Press, Canada’s first open access publisher.

The Canadian Initiative for Distance Education Research (CIDER) is a research initiative of IRRODL and Athabasca University’s Centre for Distance Education. CIDER sponsors a variety of professional development activities designed to increase the quantity and quality of distance education research, and owes its existence to the drive and leadership of Professor Terry Anderson. Anderson and Randy Garrison of the University of Calgary have been responsible for much of the research and literature on communities of inquiry (Garrison et al. 2000).

There have been two large, research projects in Canada related to online learning, both funded by the federal government. The first was the TeleLearning-NCE project, which was funded to the tune of \$13 million for seven years from 1995 to 2002. In some ways this funding was too early as online learning was just developing in this period, and although the project led to the publication of a large number of academic research papers, its impact on practice overall was negligible.

More recent is the Learning and Performance Support Systems (LPSS) program, a \$19 million initiative from Canada’s National Research Council (2013–2017). The objective of the LPSS is “to build a system where individuals can access, and get credit for, learning from any education provider at all, whether from home, the workplace, or at a school.” The lead investigator is Stephen Downes.

In the early 2000s, several universities collaborated in the eduSource project, a collaborative venture among Canadian public and private sector partners to create the prototype for a working network of interoperable learning object repositories using Canada’s broadband Internet network CA*Net 4.

However, to date most research into online or distance education in Canada has been conducted either by graduate students as part of dissertations or theses or by individual faculty and/or instructional designers working in relative isolation.

Main Challenges and Future Opportunities

In general online and distance education is increasingly accepted and continues to expand in most Canadian post-secondary institutions, but nevertheless there are a number of challenges that need to be addressed.

The Institutional Organization of Online and Distance Education

Traditionally, dual-mode institutions have located the responsibility for the design and delivery of distance education courses within the university or college's extension or continuing education department. The distance education unit will often manage funds to pay for not only release time for academic staff to design and develop distance courses, but also for the cost of additional sessionals or adjunct faculty to teach the courses. The distance education courses, while as often for credit as non-credit, have traditionally been therefore an 'extra', outside the main work of an academic department, and to a large extent funded from the tuition revenues from the distance education students, with perhaps some revenue sharing with the academic departments.

However, in the last few years there has also been a big shift to hybrid learning, a mix of face-to-face and online learning, on campus. This is a fast evolving area, with a number of different design models. Some universities, such as the University of British Columbia and the University of Ottawa, have formal strategic plans to increase the number of hybrid or flexible learning courses. Both Queen's and Guelph have or are developing university-wide visions and strategies for online and distance education.

As more and more on-campus faculty start to use online components in their classroom teaching, so the demand grows for more technical support, such as instructional and web designers. However, such expertise has traditionally been located outside the main faculty departments, in Continuing Education or Extension.

As a result, a few universities have set up a separate unit, or specialist staff have been hired, to support on-campus e-learning, leaving Continuing Education to manage the fully distance online courses. However, some deans and academic heads of department have begun to see online learning as a source of new students, and new academic programs, especially at graduate level, and have wanted access to

the resources located in Continuing Education, especially if most of the distance education students are taking credit courses as part of their degree.

As a result, some Canadian universities have changed both the organizational and funding model, integrating for-credit online courses and programs within the main academic departments, making faculties responsible for the design, development and delivery of online courses, even if supported by and sometimes dependent on specialist staff. Indeed a number have gone so far as to integrate faculty development, support for the use of on-campus learning technologies, and distance education all into one Centre for Teaching, Learning and Technology. Sometimes large faculties with significant online learning activities may also have their own learning technology support departments.

With educational technology support reporting to the Provost's Office (sometimes through a Vice Provost for Teaching and Learning) or to the Dean of a Faculty, academic departments are then more able to decide for themselves on the best mix of courses and programs. However, such organizational changes can be very disruptive and time consuming.

Better Faculty Development

Rapid developments in learning technologies, the need for teaching methods that help students develop the knowledge and skills needed in a digital society, the increased diversity of the student body, and the increasing integration of online and face-to-face teaching require faculty to have a much higher level of teaching skills, and in particular an understanding of pedagogy and alternative course design models.

Most faculty and instructors in Canada are totally unprepared for such developments. Their training is primarily in research and as subject experts. To date, faculty and instructors have been dependent on substantial help from instructional designers in particular, but adding more support staff as the use of online learning grows takes funding away from academic departments and impacts therefore on instructor: student ratios.

The current system of faculty development in Canada is primarily voluntary. More systematic pre-service as well as in-service programs for faculty development are essential, if the quality of online and distance education is to be maintained as it expands into the mainstream.

New Learner-Centred Pedagogical Models

Perhaps the most interesting development though in Canadian online learning and distance education is in the design of courses that require students to develop the skills of knowledge management (Bates 2015). Instead of an instructor choosing, organizing and delivering academic content, courses are designed so that students

collaboratively use the Internet to find, analyse, evaluate and apply knowledge to solve real world problems. E-portfolios are used to demonstrate the knowledge they have acquired. Thus instructors become facilitators and guides rather than deliverers of information. This approach better prepares students for the volatile, uncertain, complex, ambiguous and constantly changing world that they will face on graduating.

Conclusion

Online and distance education continues to grow, and more importantly, online learning has reached a level of acceptance in Canada where it is now being mainstreamed into campus teaching as well as distance education. This is breaking down the previously sharp distinction between face-to-face teaching and distance education.

Many of the conventional universities have moved rapidly into online learning, both for fully distance courses or programs and as part of blended or hybrid learning. This is opening new opportunities, such as fully online professional masters programs that not only bring in new students, often across provincial borders or even internationally, but also brings in new sources of funding, enabling more research faculty to be hired. Above all, online and distance learning offers students in Canada an increasingly wide variety of ways to access post-secondary education.

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