Appendix B CVU Summary

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Purpose and Scope

Why an Examination of Online University Education—and Why Now?
Canada’s national, provincial, and territorial governments’ support of Canada’s human resource development includes a range of activities that encompasses education, research, analysis, planning, and programs, touching on all aspects of the development of our greatest national asset – our people. Human resource development goals are set and implemented across all levels of government and with the private sector. That has been the case for many years. However, the speed of change has brought about a fundamental shift in this complex set of relationships that stands to either make – or undermine – a critical development opportunity for our most important resource.

While our national human resources landscape has always been impacted by the mobility of students and working Canadians, until recently the ease of delivering skill development itself seamlessly across provinces has been limited. We have always had distance education, but the impact has been relatively small, allowing provinces to focus on serving their own populations and those who come to their communities to study. With advances in technology have come the freedom to move not just people to ideas, but increasingly ideas to people; and with that freedom comes greater potential to increase the knowledge base of every Canadian and to significantly complicate the national skill development and education scene. How will jurisdictions of very different sizes and compositions develop and deliver needed programs to potentially large numbers of people across the country, and how will federal, provincial, and territorial governments ensure that skill, training, and accessibility objectives are met? The time has come for a national‐wide examination of some of the issues and what is at stake.

Purpose
This report seeks to provide a better understanding of the impact and potential of online Canadian university education and learning in an increasingly digital world. Specifically, it examines impacts, innovations, effectiveness, adoption, cost‐benefits, business models, and barriers to the expansion of online university education. Open Educational Resources (OER) were also included because of the part they may play in many of those areas. Canadian Virtual University (CVU), a national partnership of English and French universities focusing on online education, was asked to prepare this report because of their decade–long efforts in national collaboration, which may well be essential to moving forward.

Scope
This report presents a snapshot of Canadian online university realities in light of global trends, framed in the context of an ever changing digital world and the potential impact on the Canadian public and private sectors. While references are made to academic research, this is not an academic paper. Rather, this report is intended to foster discussion and assist leaders in developing a better understanding of the associated impacts, realities, and barriers.

One of online university education’s primary challenges is the complexity of its many central issues. The purpose of this report is not to plumb the depth of those challenges but rather to provide a catalyst for a
much-needed dialogue about the status quo and ways forward. It provides a broad overview that may act as a starting point for more detailed discussion of its many complex and important elements. The tone is intentionally conversational, the content sometimes necessarily dense, and the issues multi-faceted – all with a view to providing a relatively comprehensive starting point for discussion and planning.

The sources reviewed include reports, papers, articles, speeches, presentations, and blogs, together with a survey of CVU institutions—always with an eye for the most recent information. Only those directly referenced are included in the Endnotes.

**Terminology**

While the word “university” in Canada is regulated, “online” is a broader term and requires some explanation. Some universities describe their courses as “distance,” “web-based,” “standard web,” “dynamic web,” “technology enhanced,” or “online” depending on the extent of technology used to deliver the course. We will use the term “online” because it is more commonly understood to refer to learning that requires no face-to-face component. The fact that there is considerable variance in the use of these words means that some material will not be referenced (e.g., because it deals primarily with blended learning, which is use of technology to add online components to classroom instruction). Some documents (such as the recent Ontario Ministry’s e-learning Survey gives data for both types of delivery but defines online as up to 20% on-campus delivery) will be used where no other information is available. It also should be noted that online courses may be placed on a continuum between paper based/technological combinations and fully integrated digital courses. Because it is often not possible to distinguish where a given course or program fits along this continuum, for the purposes of this report we have not distinguished between them. The terms used to reference education delivered on a traditional university campus will include “blended”, “on-campus”, “campus-based”, and “face-to-face” instruction.

As well, “education” and “learning” are used interchangeably. Clearly they are not the same, but because this is a discussion paper, the term “online” can be followed by either (or neither), depending on the context. In the interest of brevity, “university” and “for-credit” will only be used occasionally; they (instead of K-12, college, technical school, continuing education, or informal learning) should be assumed throughout, including when an institution is named (e.g. “Waterloo”). Finally, this report does not include college and institutes of technology, though they face many of the same issues as university providers of online education.
Executive Summary

*To achieve the status of being a true digital economy, education... needs increased focus to produce graduates for a digital economy... We need to create groundswell.* -SkillsInfo

This report examines emergent issues impacting online university education in Canada through three broad-based themes: change, innovation, and knowledge. It provides a high-level primer to a complex and constantly changing educational landscape and is framed in a manner we hope will facilitate a vigorous and open discussion of the issues and potential solutions.

Unfortunately, online education, particularly in Canada, has often been perceived as a poor fit with education and training needs (which is ironic, given online education’s inherently flexible nature). Demonstrating how online education fits into and supports the fabric of our economy and society – while looking at the barriers to achieving that success – opens the door for better informed decision making. Advances in Internet technology and emerging understandings of its applications in teaching and learning provide many opportunities for Canada to create the groundswell of graduates required for a digital economy. However, lack of Canadian data and strategy, lack of collaboration, and lack of resources targeted to online university education remain barriers.

**Primary Conclusions**
The report presents the following primary conclusions:

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<table>
<thead>
<tr>
<th>Canadian university online education is constrained by lack of</th>
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<td>national data and strategic planning, cross-jurisdictional collaboration, business models, economies of scale, resources</td>
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<th>This limits universities' ability to capitalize on the potential of digital technologies to improve</th>
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<td>uptake, quality, accessibility, return on investment, tactical innovation, and knowledge transfer</td>
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<th>The ongoing strategic vacuum creates an environment that fosters weakness and duplication and is causing Canada to fall behind other nations in online education</th>
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<tr>
<td>A national e-learning strategy based on collaboration could address these weaknesses and maximize the potential of online education to prepare Canadians for the digital economy,</td>
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... unlike nearly every other country in the OECD, Canada does not have a national strategy to support e-learning or the use of technology in teaching. As a result Canada has lost its lead in e-learning and is slipping behind countries such as Australia and the UK.

-Dr Tony Bates to the Senate Standing Committee on Social Affairs, Science and Technology

The Themes: Primary Foci and Findings

Theme 1: Change

This section examines how online learning is changing— and whether Canada is keeping up. In many ways, this theme is central to the report because as the rate of change in society increases, fields such as online education must keep up. Without constant change, universities will not be able to provide the relevant education needed to support the digital economy, help businesses achieve increased efficiencies, and ensure that Canadians enjoy the benefits of lifelong learning. Effective online learning providers need to look at up-front investments and business models, and respond to the market with new forms of accessible university education. Evidence on uptake in Canada, retention, cost-effectiveness, and business models is examined. Highlighted findings include the following:

- **Enrolments are growing, although likely more slowly and at lower levels than our competitors**
- Underrepresented online students require unique supports and choices to enable success
- Innovative national strategies employed in other countries to increase cost-effectiveness are not being applied here
- **Quality online education needs to achieve significant economies of scale if it is to be sustainable and affordable**
- Inter-jurisdictional collaborations are forming around the world to realize those economies of scale
- Despite Canada’s small population, online education resource sharing is provincially focused due to the provincial jurisdiction of higher education
- **Online university education in Canada is a national activity, while our strategies remain provincial**

Theme 2: Innovation

Innovation relies on new initiatives, research, and creative, student-centered learning. Online education has the capacity to play a key role in fostering educational, economic, and social innovation. Means to achieve this are discussed, together with online education’s track record and capacity to improve learning outcomes through specialized course design, technology utilization, research, and learning analytics. Tomorrow’s economy requires innovative online education today. This report presents the following main observations:

- **Canada has weak national innovation indicators**
- Online education’s ability to foster workplace innovation and STEM growth is not being maximized
- Online learning is best supported through specially constructed scaffolding and student supports, which are often not well understood by providers
- **Quality online university learning outcomes are equivalent to on-campus learning outcomes**
- Online learning is constantly changing, due to new innovations and technologies
Canadian online innovations (virtual environments, integrated learning systems) are *ad hoc*

**Theme 3: Knowledge**

Knowledge is based on information, both in terms of a knowledgeable workforce and population, together with strong representation in STEM disciplines and shared educational e-resources. Alternatives for online university delivery partnerships with the private and public sector stakeholders are provided. Observations include:

- Canada’s **low online university, digital literacy, and workplace and adult learning participation rates** are linked – both to each other and to our growing **digital divide**
- A number of other nations are **forming government, university, and private-sector partnerships** to bridge learning gaps, increase digital skills and knowledge transfer, and facilitate economic growth
- E-resources (digital learning materials) foster knowledge transfer and typically operate under commercial, jurisdictional, or Open Educational Resource (OER) **business models**
- The United States is demonstrating leadership in **online education innovation** thanks to broad-based national and philanthropic support
- Canadian shared e-resource development projects tend to be **provincial (limited) in scope**
- **Open Education Resources** offer the potential for **cost and utility benefits**, but face challenges related to support, resourcing, and systems (e.g., interoperability, tagging, language, quality assurance and maintenance).
Online University Providers

Prior to examining the state of online learning in Canada, it is important to briefly review the types of providers available to Canadians. This report focuses on Canadian public universities, with some references to the various networks they are involved in. It does not focus on providers from outside Canada, because they operate largely outside the purview of provincial, territorial, and federal governments, and because from what we can see they have a modest impact on the Canadian online environment.

1) Public Canadian Universities

- Most Canadian universities offer at least some online courses and some online student supports. A smaller number of universities offer complete online degree programs and a full slate of online services (library, advising) to support students who never travel to its campus.
- Canada has two universities entirely dedicated to online education: Athabasca (Alberta) and TÉLUQ (French, Quebec; currently attached to l'Université du Québec à Montréal). In addition, the majority of Royal Roads (BC) programs are online but do require short periods of residency.
- Universities with the largest numbers of online programs and established systems for serving online students include Memorial (Newfoundland), Thompson Rivers (BC), Manitoba, Waterloo (Ontario), Laurentian (bilingual; Ontario), and Concordia (English, Quebec).

2) Public Canadian Institution Networks

- A number of online education networks have been established to facilitate accessibility and, in some cases, share services.
- Most networks of online education providers are provincial in nature, and include the college sector as well as universities. They often operate with the cooperation and (at least minimal) funding from their provincial advanced education ministry.
- Examples include BCcampus, Campus Manitoba, eCampus Alberta, and Contact North (Ontario); Newfoundland has moved one step further with a cross-sector partnership that includes the K-12 sector as well.
- At the national level, CVU is a collaboration of English and French universities that came together in 2000 to share resources and facilitate transfer credit across provincial boundaries. CVU maintains a website of over 2,500 online courses and 350 programs to provide a single place to search for online offerings across the country. CVU’s work in areas like collaborative program development and resource sharing is limited by the provincial nature of its members’ funding and mandates.
- The Canadian online university landscape could change due to the proposed Ontario Online Institute (OOI). The final shape and size are not yet clear, but as a stated priority of our largest provincial government, it has the potential to change the online educational environment. Depending on how it is set up, a successfully implemented OOI might foster increased university accessibility and quality for Ontario and Canada, or it might exacerbate the challenges currently facing the Canadian online university environment, particularly that of duplication.
• This potential change provides a strong impetus for well-informed decision making over the short and medium term.

3) International Universities
• International for-profit universities have not yet had much success in Canada. Between 2004 and 2008, University of Phoenix, the largest for-profit university in the US, opened offices in three provinces from which it promoted “Canadian” online education. However, uptake appears to have been insufficient for profitability, as all offices have since closed. CVU reported hearing from Phoenix students who lost employer funding for them to continue their Phoenix degree because Phoenix was no longer a “Canadian” provider and to have difficulty finding a Canadian university to recognize their Phoenix credits if they wanted to switch to a Canadian program.
• The low level of international for-profit activity in Canada so far has allowed us to avoid major problems currently facing the US: higher student costs, higher government student loans, and higher default rates. Their small presence also makes it easier to maintain domestic and government control over education and workforce training. (For more on the obstacles faced by US governments dealing with for-profit institutions’ high cost to tax payers and inappropriate business practices, see the Kentucky Attorney General’s comments.) Extensive negative press about for-profit practices has caused unnecessary wariness by students of Canada’s public providers of online education, thus possibly limiting uptake. Canada would benefit from greater promotion of the fact that **Canadian university online education offers the same transferability, transparency, and quality assurance as on-campus education.**
• Australia, UK, and the US are the largest promoters of online education outside their borders. Canadian students are not currently enrolling with these universities in noticeable numbers. Similarly, international students remain a small percentage of enrolments in Canadian university online programs. Between 2005 and 2010, CVU universities reported that about one to three percent of their online students were international. The low uptake is likely due to student loan regulations, accreditation, language, quality assurance, professional sector differentiation, legal and financial systems, preference for local services and entities, and some countries’ policies regarding recognition of non-domestic online credentials (particularly if taken at home). However, given the borderless nature of online education, globalization, and the increasing need for universities to attract more international students, it is only a matter of time before competition for international online students becomes just as heated as competition for on-campus international students. Canada, therefore, needs to be prepared to compete in the global online education market.
Online Delivery Options for Canadians

The following summarizes various factors involved in development and delivery of online education, and the range of options.

Quality/Ease-of-Use Factors in Online Education

Universities are at different points along a continuum regarding the extent to which they are able to provide maximum quality and ease of use in eight areas or factors of online education: Course Development, Content, Instruction, Analytics, Platform, Delivery, Technology, and Supports. The graphic below demonstrates this: The light box connected to each factor describes basic level of provision and the darker box represents fuller or more robust provision in the area. Imagine a number of points between each top and bottom box along which universities are situated depending where along the basic-to-robust continuum they are currently operating. Online courses at a particular university may be in the light box in one area, and near the dark box in another area. Courses closer to the full-service or robust end of the spectrum in all areas provide the most optimal learning experience.

Note that while considerable attention is paid to factors such as the learning and digital-skill potential of gaming, virtual reality, and location-based and emergent collaboration tools, new developments in these areas are often central to just one factor in the online education spectrum (Technology). The other factors are clearly impacted by shifts in technology, but may be functioning adequately with established systems. Choices may therefore be driven largely by leadership decisions (e.g., resources) other than the availability of technology innovations that would optimize Instruction or Supports.
Choice/Accessibility Factors in Online Education

Universities that provide online courses and programs are also at different points along a continuum when it comes to the degree of choice and accessibility they can offer students. Policies and practices in six areas determine how much choice and access to online education students really have. These six areas or factors are Admission, Study Period, Course Work, Interactivity, Cultural Components, and Disability Supports. The dark top box in each pairing describes the traditional and most common scenario at Canadian universities. The lighter bottom box describes more flexible, learner-centric features currently less available, but is where we should be aiming in order to provide maximum choice and the broadest accessibility to all Canadians.

Most universities do not offer alternatives for admission, timing, independence, interactivity, customization, and support at the flexible end of the spectrum. This is largely because of the F2F nature of traditional institutions and the on-campus students they serve. Increasingly, higher education must serve nontraditional students who prefer or require more flexibility, individualization, and choice. Advances in technology make these learner-centric features increasingly more possible to manage, but are very costly to implement. A few universities have been able to make progress on the continuum toward more choice and accessibility, usually as a result of provincial funding for online initiatives (for example, at TELUQ, Athabasca, Thompson Rivers, and Memorial). However, a generally weak understanding by decision makers of the factors determining online education quality and accessibility is a significant barrier to innovation in this important area.
Theme 1: Change

*In a time of knowledge stability, teach; in a time of rapid change in knowledge, learn.*
- Trent Batson, *Campus Technology Magazine*

The Accelerating Rate of Change: Can Canada Adapt?

Canada’s Digital Economy Strategy Consultation included data and observations on the need for improved national responses to the shifting world around us in areas such as readiness to adapt to new technologies (15th), technology availability (14th), tertiary enrolment (27th), and government prioritization of ICT (31st). (See the World Economic Forum summary in Appendix A). As was well documented in that process, we are quite simply not keeping up. While a number of factors were linked to the problem, digital learning emerged as an area of particular weakness, as consultant and writer Tony Bates blogged in reference to his June 9, 2010 Consultation presentation. As is the case for all digital fields, online learning is premised on change, so in some senses change underlies the whole report. The following discussion, however, particularly focuses on how online university education can, does – and at times doesn’t – prepare all adult Canadians to adapt to our changing world with its ever-growing demand for more productivity, innovation, and skilled labour.

Ever-Increasing Efficiencies: New Business Models for Online Education

No one who is even tangentially aware of current economic drivers can be unaware of the seemingly endless push to increase efficiencies: what was good practice one year needs to change for the next. Business leaders are always seeking more efficient, well informed workers and ways of getting their products to market. This has two major implications for universities, which form the basis of this section:

1. **Graduates must be ready to work and live in an ever changing world**, with the soft and hard skills that go along with that. Universities need to ensure their students are ready for the technologies, approaches, and society they will engage with over the course of their lives. Graduates need to be able to maximize existing technologies and adapt to new technologies, social connectivity systems, and worlds – and be ready to engage in formal and informal personal and workplace learning wherever they find themselves, for the rest of their lives. Online learning (employing digital skills to learn anytime, anywhere) is well suited to support that endeavor, and – thanks to best practices, growing quality assurance networks, and research data – the evidence now exists to demonstrate that it can meet the need, if best practices are implemented and resourced.

2. **Online university education needs new, collaborative business models to reduce duplication, increase return on investment, and contribute to student success in order to be sustainable and contribute to national competitiveness.** The current models risk diminishing results (e.g., lower quality, lower learning outcomes, lower retention; and increased student costs), and invite for-profit and foreign providers (associated with large-scale problems as discussed above) to fill the resulting gaps. Evolving
technology is both an enabler and a challenge, continuously increasing the need for economy of scale-based mechanisms – and will require new levels of collaboration among universities and federal, provincial, and territorial governments. To fail to respond is to further increase the uneven playing field led by our competitors with inter-jurisdictional initiatives like the Asia e-University, Western Governors University, Open University UK, and Open Universities Australia.

Are We Keeping Up? Enrolment

Planning and Reporting
Canada’s lack of an online learning strategy is impacting our ability to see where we stand compared with other OECD countries in this key area. Unlike many of our competitors, we have no national education ministry or funding body. This creates challenges for planning and implementing an inter-provincial, economy of scale-based activity such as online university education. We have no single source specifically for online university statistics, nor do the provinces typically publish easily comparable information. While there are growing numbers of websites, reports, and planning documents that give prominence to e-learning, many highlight blended delivery (or plans to move into online delivery in the future). Currently, most national and provincial government, institutional, student group, and university-focused main websites make limited reference to online education. Other than some targeted universities (many clustered in CVU and, increasingly, in BC and Ontario), the most notable exceptions include networks like CVU, BCcampus, eCampus Alberta, Contact North, Newfoundland’s education collaboration, and New Brunswick initiatives; as well as recent discussions related to the proposed OOI.

Canadian Enrolment and Offerings – “Ballparking” an Evolving Patchwork

As stated above, there are no clear, comprehensive, or even apples-to-apples comparators showing participation rates in Canadian online university education. Eleven per cent of students in one national survey did report taking an online course in the preceding year, which is of interest, but doesn’t indicate the percentage of courses taken online. As a result, the figures in the table below are rounded, ballpark estimates of for-credit online university registrations gathered from a range of reports and institutional sources. This estimate is provided for purposes of discussion and as a starting point for further refinement. Numbers are expressed in registrations rather than full-time equivalents because that information was more available (and is applicable for this discussion).

<table>
<thead>
<tr>
<th>Where Student Resides</th>
<th>Estimated Number of Registrations in Online Courses</th>
<th>Estimated Number of Online Courses</th>
<th>Estimated Number of Online Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newfoundland</td>
<td>19,000</td>
<td>435</td>
<td>12</td>
</tr>
<tr>
<td>Maritimes</td>
<td>7,000</td>
<td>250</td>
<td>10</td>
</tr>
<tr>
<td>Quebec (both languages)</td>
<td>97,000</td>
<td>1,000</td>
<td>145</td>
</tr>
<tr>
<td>Ontario (both languages)</td>
<td>146,000</td>
<td>2,000</td>
<td>60</td>
</tr>
<tr>
<td>Prairies and Territories</td>
<td>52,000</td>
<td>1,260</td>
<td>135</td>
</tr>
<tr>
<td>British Columbia</td>
<td>63,000</td>
<td>1,000</td>
<td>138</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>384,000</strong></td>
<td><strong>5,945</strong></td>
<td><strong>500</strong></td>
</tr>
</tbody>
</table>
In 2009, there were 870,000 full-time students at Canadian universities. If each student registered in a minimum of three courses per term (the minimum for full-time status), total registrations would be about five million. Thus, **online university registrations in Canada could be about four per cent.**

However, for a subset universities that have self-identified as strategically focused on online education through their membership in CVU, percentages of total students taking online courses are higher: for example, 19% at University of Manitoba and 22% at Carleton (see Percentage of Students Studying Online, Appendix B). Athabasca and TELUQ are at 100% and together had over 100,000 registrations in online courses in 2009-10. CVU universities have been sharing data on their online registrations for a decade, and all have reported growth: for example, 126% at Manitoba from 2002-2010 (see Increase in Students Taking Online Courses, Appendix B for more data from CVU universities.) These figures are not representative of the situation at most Canadian universities, since core business for the majority remains on-campus education. However, the increases are indicative of the significant uptake by students in online education when it is a strategic priority of an institution.

**International Context**

While Canada may be unique in not having a national education ministry to make online learning information readily available, it is certainly not alone in its lack of clear, comprehensive data. Available statistics often include blended learning, focus on offerings rather than students, list information in terms of overall percentages, or other statistical subsets and generalizations. The International Council for Open and Distance Education (ICDE) is gathering data, but reports that the task is challenging. Several Asian and European countries (Taiwan, Singapore, Korea, Finland, Spain) have had e-learning industry and education sector support programs in place for a number of years aimed at scaling up blended and online learning, including in the professional sectors. Brazil, India, and China (which alone has 68 online undergraduate colleges) are also increasing their focus and are expected to continue to **experience fast growth and surpass** the US with an annual growth rate of 17%.

Most readily available data (in English or French) comes from the United States. Even there, differences in terminology, definitions that often include some campus-delivered components, and meshing of data with non-degree granting institutions make it difficult to find clear data on the number of university students taking online courses. As well, some of the better-known US information is reported voluntarily, creating accuracy issues. Educause published well-supported data listing 1.9 million online students in 2008 (11% of US enrolments), **with a fall 2011 projection of 2.9 million in the US (14% of all enrolments).** As with other US sources, Educause consistently shows larger overall uptake in the US than in Canada and some other OECD countries. The **high US rates present a dual challenge** for other nations, both to (1) increase online enrolments to increase accessibility and online skills, and (2) set up systems that avoid for-profit tuition
levels, loan levels and default rates, misleading admission claims, quality concerns, and degree mills.
Unfortunately, a great deal more ink has been spilled on the second challenge than on the first. Only time
will tell whether other countries will learn from the former challenge to grow their online availability and
uptake, while containing the potential for damage caused by the latter.

A search of online student enrolments as a percentage of total university enrolments revealed the following
from 2007-2009: **US 11%, Australia 12%,** Korea **18%,** India **20%,** and Sweden **25%**. If Canada’s
overall totals are around 4%, we are significantly behind where others were several years ago. Clearly,
considerable work needs to be done if it is important to meet or exceed the levels of competitor nations.

Finally, one central issue that has been well documented (including in submissions to the *Digital Economy
Strategy*) is that Canada is not keeping up in workplace and professional areas of lifelong learning. Our
collective weakness in that area is another indicator of the need for online education data because of the
strong link between online education and adult learning: a high percentage of students taking full programs
online are in their mid-30’s (as distinct from younger full-time students who take individual courses
online to complement on-campus studies). Many reports have highlighted Canada’s low workplace and
lifelong learning / professional development enrolments, which are tied to our lack of a national vision in
what is a primarily national arena. The situation is summarized in a 2008 Canadian Council of Learning
report: “Other countries, including the United Kingdom, Finland, the Netherlands, Sweden, Japan, and
Australia, have recognized and seized upon the importance of lifelong learning in improving skills and
innovation and are devising ambitious strategies to help their citizens become lifelong learners. Canada
does not have a lifelong learning system in place, nor a plan to transform the rhetoric of lifelong learning
into a coherent vision and a plan for action.” A lack of understanding of how online education can foster
workplace and lifelong learning limits opportunities for Canadians to continuously improve their skills.

**Are We Keeping Up? Accessibility**

**The Data**
One of online education’s strengths is accessibility because it allows students and faculty to do much of
their work anytime, anywhere (note that barriers vary from institution to institution as described in *Online
Delivery Options for Canadians* above). However, the lack of online university data in Canada prevents
meaningful comparators with other countries; indeed, we found so little data that we cannot comment on
whether—or how—Canada is keeping up in increasing access to underrepresented populations. Athabasca
University reports approximately 20% higher levels of ‘first-in-family’ degree completion than average, but
apart from some limited student loan-based data, national and multi-institutional data and indicators
for underrepresented students seem to be largely absent. This puts Canadian universities in the
challenging position of having to decide whether and how to increase accessibility for underrepresented
groups through online delivery without the data to inform them and their governments of its impact.
While it would be beneficial to do more collection and analysis individually, it would not provide the full,
cross-institutional and national comparators data sets needed for clear decision making.
Accessibility Drivers
Underrepresented populations targeted by Canadian online initiatives include Aboriginal, rural, remote, low-income, underprepared, underemployed, and persons with disabilities, together with working parents. Others who want access to educational opportunities but lack the ability to access traditional delivery, as well as on-campus students who lack one or more courses to complete their degrees, are also key targets. The primary delivery alternatives that support accessibility were identified in Online Delivery Options for Canadians above; additional considerations (below) are raised in recent academic studies that highlight specific populations that often lack the support needed to succeed in online education:

- Some students with disabilities require universal course design, which is often missing
- Students in rural and remote areas often lack ICT infrastructure with adequate speed
- Some adult, rural, and new Canadians lack technological readiness for online education
- Many Aboriginal communities lack adequate technology, connections, and digital skill supports
- New university students often require skill and discipline preparatory (remedial) programs
- Some low-income and first-in-family students require additional institutional supports and services in areas such as library use, social networking to provide connection, and motivational and learning tools such as course and program scaffolding and specifically designed pedagogical techniques (i.e. courses that are completely designed for self-driven online learning from beginning to end)

These barriers are particularly critical because the students affected often have the most to gain from online education (digital economy skills, confidence, increased levels of accreditation, etc.). Evidence indicates that programs that do not address these barriers will primarily cater to students who seek the flexibility online education has to offer, while presenting traditional and digital university-level skills and equipment. Again, while we know that some Canadian online providers offer some of the above accessibility tools, these data are not collected on a national scale. Neither is this information clearly presented to prospective students to assist them in choosing appropriate online courses. This can lead to drop-out and dissatisfaction with the online learning experience. Hence, we observe several barriers to accessibility to underrepresented and underprepared populations: specifically designed courses and student supports, lack of national data, and lack of clear information to students.

Student Cost Data and Drivers
This report does not include comparative data for this important accessibility issue because, while 2009-2010 information was gathered from across the country, tuition and fee reporting methods vary far more for online than for face-to-face offerings, making parallel comparative data difficult to provide. Universities provide online cost information in a variety of ways: by credit, course, or program; with or without learning resources; by faculty and/or level; or by student place of residence. Some do not provide separate online cost figures at all, making it difficult to determine whether regular student facility-based fees are included, or replaced by a technology fee. As a result, we instead reviewed the data for rough comparison purposes.

Overall, Canadian public online university tuition and fees seem to be fairly close to on-campus fees, although it is difficult to be definitive. However, cost barriers should not be omitted from any conversation about accessibility. Some of the financial advantages enjoyed by online students (travel and relocation
savings and ability to maintain employment) may be reduced because of the disadvantages encountered accessing financial supports such as loans, grants, and bursaries designed to serve the traditional full-time on-campus student. Finally, online education presents a barrier to prospective low-income students that is rarely considered accessibility discussions, that of technology cost. If people interested in online education do not have ready access to up-to-date technology and affordable ICT infrastructure, they may not consider online education as an option for higher education.23

Are We Keeping Up? Retention

Recently, several items and statistics have been posted about Canadian online university retention rates, an otherwise difficult topic to address because most global online institutions do not release that data. The Ontario Ministry of Training, Colleges, and Universities Fact Sheet24 says Ontario online university retention rates (at 85%) are higher than college (77%), a finding similar to several US studies.25 Athabasca and Manitoba have reported similar data (85% of undergraduates who started online courses successfully completed).26 Tony Bates noted that this kind of data can put to bed “the lie about online courses always having high drop-out rates.”27

However, as noted by Shanna Smith Jaggers and others,28 comparisons between online university and college retention, and online and campus, must be made with care. In the same way that college students are less likely to be prepared than university students (because they are more likely to be from underrepresented populations), online students are more likely to have characteristics that challenge completion. Students whose needs, motivations, and aspirations are outside the “norm” will respond accordingly,29 and they are more likely to experience personal and professional obligations that impact retention, and experience computer issues and other problems that extend beyond the reach of the provider to address.30 Regardless, the above studies demonstrate that when targeting underrepresented populations, online retention is more negatively impacted by a dearth of supports like early interventions, social connectivity, high quality course design, and other tools discussed under Accessibility above.

Are We Keeping Up? Serving Aboriginal Communities

If only 1,500 more students eventually graduate each year from high school, the public sector savings just from that cohort would be about $375 million over their lifetime. Since this would apply to each cohort graduating, this is equivalent to an annualized savings of $375 million each year, more than paying for the public sector costs.

-Ashley Sisco, Optimizing the Effectiveness of E-learning for First Nations

As noted in the above quote, one of the greatest potential areas for incurring both long-term economic and social benefits is by investing in online education created and provided in cooperation with Aboriginal communities (which falls under federal jurisdiction). The “benefits of such proactive planning and investment are endless, and include reduced social risk, enhanced career planning and long term economic development.”31 The Assembly of First Nations discussed the same concept, which has considerable systemic cost implications if not addressed: “If the current population boom of Aboriginal
youth is not mobilized out of poverty by educating them and ensuring they are workforce ready, Aboriginal people will remain in poverty for generations to come.  

Aboriginal communities are challenged in terms of breadth and depth of academics that can be provided locally, and universities are challenged to address the academic and support needs of those communities. Online education has the potential to address some of these challenges. Examples of specifically targeted online initiatives for this population are Thompson Rivers’ Certificate in Tax Administration for Aboriginals; Manitoba’s provision of Netbooks instead of textbooks to remote Aboriginal students; Athabasca’s Learning Communities study circles; and Laurentian’s courses in Cree and Nishnaabemwin and a degree in Native Human Services. However, formidable barriers to increased Aboriginal participation remain, including academic readiness, lack of culturally appropriate course materials and delivery mechanisms, high speed internet accessibility, adequate digital skills, appropriate technology, sustained community supports, local mentorship, and job transitions. A national strategy to address these barriers—specifically in the context of online education—could increase access to higher education within Aboriginal communities.

Are We Keeping Up? Cost-Effectiveness

Online education has a unique business model. It presents a number of distinct cost effectiveness considerations which can lead to cost savings. Several US States facing drastic higher education funding cuts have concluded that the best – if not the only – way to provide quality education with reduced budgets is to take advantage of cost effectiveness made possible by online education. The benefits below are listed by the California Legislative Analyst’s Office, one of the states moving in that direction. They are moving to partner with an inter-jurisdictional university to achieve savings without large investments:

- Speeding graduation rates by allowing students to take courses from multiple institutions
- Increasing the number of people with university credits who can use them to complete degrees
- Facilitating collaborations to create a cost-shared joint virtual campus with virtual departments
- Facilitating jurisdiction-wide shared online curricula projects
- Scaling e-resources across a large system (California’s population is slightly larger than Canada’s)
- Partnering with an out-of-state online university to enable system-side cost savings through the provision of courses through existing systems, supports, and courses.

The first two efficiencies have some existing traction in Canada, particularly the first. However, the remaining efficiencies are either happening on a limited scale in some provinces, or not at all. Together, the lack of movement in the remaining areas presents one of the biggest barriers to achieving online cost efficiencies in Canada, as most elements are only developed and delivered on a small scale, if at all.

Are We Keeping Up? Business Models

In order (to) improve the outputs of online courses, it is necessary to improve the inputs into the system, which may threaten current cost models for online education. Thus, any substantial improvements to the effectiveness of online learning may require new cost models.

- Shanna Smith Jaggers, Online Learning: Does It Help Low-Income, Underprepared Students
**Economies of Scale**

The concept of economies of scale as applied to online education is not well understood among many in the public and higher education sectors. As is the case with many virtual enterprises, online education has bigger up-front costs than face to face – thus requiring a larger initial investment— and then becomes gradually more cost effective and elastic until it reaches a tipping point (which in the case of online education is generally thought to be about 50,000 students) at which point it becomes less expensive than the campus-based alternatives. As a result, **unlike with traditional institutions, the more students enrolled at an online university, the cheaper the cost to government** and the broader the program base.

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**Economies of Scale: The Tipping Point in Online Delivery**

The following graph illustrates that online learning becomes less resource-intensive on a per student basis once the economy-of-scale tipping point has been reached, allowing government to increase total learning objectives without increasing total costs. As it shows, **total per student costs are lower** at the right end of the scale than on the left.

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Recent shifts in technology and blended learning may shift the way in which some of the elements in the above principles are played out, but the overarching tipping-point principles remain true for online providers around the world. Every aspect of education provision is impacted: from the larger time and resource investment needed to develop a high quality learning outcomes focused course and larger up front ICT capital requirements, to the more scalable tutor/instructor model, lower marginal costs, and much lower physical capital costs. Course development costs (when designed top to bottom specifically for online learning, including all of the real staff costs associated with dual-mode provision) are perhaps the biggest obstacle, as noted by the Council of Ontario Universities in April: “The development of innovative and effective technology-enhanced courses and programs is costly... Compared to more traditional approaches, a much higher investment of time and expertise is required.” Consequently, the primary
challenge to governments’ ability to achieve maximum efficiencies is finding pathways to offer programs to as large a number of students as possible – particularly for a provincially administered country like Canada, most of whose competitors have international online learning strategies and initiatives.

**Canadian University Responses**

Due to the economies of scale operating across provincial boundaries, online education is by nature competitive. This presents an unusual obstacle to finding common ground relative to the national on-campus public university sector, which is relatively collaborative in nature (for academic and student-centered activities in particular). By contrast, online providers can work to attract students without asking them to move out of province or even across town. The political challenge is complicated by the fact that many universities have moved into online provision by using existing provincial grants and campus-based tuition to divert resources to develop online offerings. The resulting **cost models, funding requests, and tuition levels are at best difficult to navigate**. In addition, when up-front costs are not properly supported, online course and service quality can end up being more uneven than is typically the case in Canada’s on-campus offerings. As Shanna Smith Jaggers noted, “Mixed-offering institutions (those that provide both on-campus and online courses) often have a support infrastructure that is centered on the campus environment. Online students may have difficulties accessing library support, financial aid services, the technical help desk, advising and counseling, or tutoring.”

The most common Canadian business model is that of campus-based universities offering online courses with, in some cases, a small number of certificates or degrees, usually to serve their existing on-campus students. Our 2010 search of all Canadian university websites found that **many institutional reports and business models focus primarily on blended learning**, resulting in a smaller number of targeted, purely online courses and services. Administrative structures employed vary from small units embedded in faculties, to areas within the continuing education department and central hubs tied to the Vice-President Academic’s office or a host faculty like Education or Business. Those that are more focused on online learning, such as the CVU members, Simon Fraser, Waterloo, Concordia, Ryerson, and others, typically have a central online learning office that coordinates course development, the website, services, faculty supports, etc. Some, like Memorial, have additional foci in remote areas in their region and the funding to accompany it; indeed, Newfoundland’s financial, collaborative, and cultural support for online education supports the success of programs at every level, presenting a possible national model. TELUQ (which is attached to UQAM), Thompson Rivers (which also has face-to-face programs), and Royal Roads (blended learning) have central structures that facilitate online development and delivery in all areas. And, finally, all Athabasca’s operations, capital, funding, and business models are completely online-driven.

**Canadian Business Models: Are We Achieving Economies of Scale?**

A unique element of Canada’s online university system is the fact that – unlike the US, UK, Australia, France, Taiwan, Singapore, Japan, Korea, India, China – it has no national support for online curriculum development, networks, or institutions. So, **larger provinces** like BC, Quebec, Alberta, and Ontario (as well as smaller ones like Newfoundland, New Brunswick, and Manitoba), are setting up their own networks and building on existing institutions, each trying to attract enough students from across the country to achieve economies of scale. Students are unlikely to take courses from other nations, but the same does not hold
true for other jurisdictions within their own country, particularly at the more career-mobile and higher visibility university-level (for example, thousands of students from CVU universities have readily crossed provincial boundaries to take online courses that better meet their needs or are not offered by their home university.) Provincial networks help a province and its institutions to realize increased efficiencies across the post-secondary ICT and delivery network and increase the visibility of its online offerings in support of institutions, learners, and the workplace. While investments by provinces like BC, Alberta, Quebec, Newfoundland and Labrador, and increasingly Ontario are helpful in the short term, the resulting resources and outputs are targeted and paid for only by the population of that particular province.

The result is that provinces and universities invest separately in up-front course development, content, supports, ICT, and other costs. The degree of duplication of investment is unknown, as is the impact of direct competition from duplicated course and program development. Many of these costs are just beginning to make themselves known as universities and their governments move beyond large-enrolment online classes, add online services, and move beyond campus-modeled materials to fully online resources. CVU’s collaborative marketing, course-sharing, and special projects (such as learning objects, virtual scholarships) have made modest cost-sharing inroads, but neither Canadian universities nor the provincial networks will be able to achieve economies of scale without cutting into each others’ student base, if existing models continue.

As a result, with the recent growth of entities like BCcampus and eCampus Alberta and the possible creation of the Ontario Online Institute, the national online university business model is in the process of becoming much more complex. In light of the fact that the Council of Ministers of Education in Canada has not focused on online post-secondary provision in previous years, Canada currently has no national strategy or forum to engage in joint, collaboratively-focused discussions. This barrier prevents leaders from being able to identify and implement interprovincial solutions to achieve efficiencies, leverage existing resources, pool course development allocations, settle funding for virtual out-of-province enrolments, improve learning outcomes and graduation rates, and — critically — avoid duplicating taxpayer investment in a time of public sector retraction. This situation impacts Canada’s students, employers, and governments. As our competitor countries’ online learning strategies and intra-national initiatives grow allowing them to be more competitive, it is unclear whether a continued delay can be overcome.

International Business Models and Economies of Scale

There are many different models of online education internationally. They range from relatively low-level national curriculum projects and inter-state online partnerships in the US to mega-universities in countries such as Spain, Turkey, India, and the UK where resources are more focused on one or two institutions, and others offer courses or programs where they discover a demand or niche. From various corners of the globe there are examples of joint online investment networks and provision crisscrossing jurisdictions within countries and at times regions, as universities share libraries, accessibility supports, ICT networks, course content, and delivery mechanisms for online provision. For example, the Asia e-University is an online and blended institution headquartered in Malaysia that facilitates sharing across 26 countries. It is of interest to note that when the UK government dissolved most of its central activities (including post-secondary education) to Wales, England, Northern Ireland, and Scotland, online university education
(together with the BBC) was one of only a few domestic services that the new parliaments decided they should not try to offer on their own, but rather work collaboratively to support online university education.

Perhaps one of the best places to gain perspective on the current trajectory of online university business models is from the Collaborate to Compete: Seizing the Opportunity of Online Learning for UK Higher Education Report, which as the title suggests concluded that inter-university collaboration is the only way forward. The paper was authored by a Higher Education Funding Council for England (HEFCE) task force of UK university leaders, academics, and business leaders with expertise in online education issues to provide leadership as that nation wrestles with how best to proceed. The following summarizes it well:

\[
\text{The building of quality in online learning is not a cheap option. Through collaboration, institutions can achieve significant economies of scale and more rapid development and adoption of technologies, for example in the development of learning resources or in sharing the risk of developing new forms of provision. This approach enables institutions and organizations (that are perhaps already collaborating in other areas) to exploit their joint brands and extend them into new markets, offering innovative, quality provision. (Higher Education Funding Council for England, pg 6)}
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Similar levels of otherwise rare (in the university sector, where academic partnerships are usually much more limited in scope) cooperation are emerging around the world. The US presents a myriad of examples, some of which are undergoing considerable pressure as legislative and funding difficulties associated with for-profit providers continue. Some states are reaching beyond institutional and state borders to achieve economies of scale through virtual departments that join forces to offer programs in targeted areas, large-scale agreements with out-of-state online universities to provide introductory courses to thousands of students, and other programs.

Governments are getting involved as well, moving beyond conventional funding in areas like curriculum and student supports to ICT infrastructure and content digitization in response to the fact that local / jurisdictional, institutional, and traditional “education” programs are no longer enough. The main difference between Canadian and the various OECD university business models is that our competitors have mechanisms in place to incorporate the economy of scale into their development and/or delivery systems, thereby taking the up-front investment and sharing it across the country. Canada is markedly behind in this regard, betraying a growing crack in what is otherwise an excellent university system.
Barriers: Canadian Online Efficiencies and Successes in a Time of Change

The following barriers provide a summary of the major obstacles to ongoing success for Canadian online university education related to the first theme, Change.

1. Canada’s lack of a national forum to strategize regarding nation-wide online university education issues and implement solutions makes initiatives such as shared online provision (that would benefit from intra-provincial and territorial collaboration) difficult, and results in provinces and territories operating out of silos.

2. A lack of data on online delivery, offerings, enrolments, accessibility, retention, and business models / funding challenges Canadian decision makers’ ability to make informed decisions and address needs.

3. A lack of understanding of online education’s potential role in meeting workplace and lifelong learning goals, together with quality online university offerings’ low visibility, challenges our ability to increase uptake.

4. A lack of delivery alternatives for online education minimizes student accessibility and choice (in terms of admission, timing, independence, supports, language options)

5. A lack of accessibility and other support services (and transparency about their availability and role) makes it difficult for underrepresented and other students make informed choices and to succeed.

6. A lack of student funding for part-time online learners (including addressing technology needs) challenges low-income working Canadians ability to access available offerings.

7. A lack of customized, targeted online offerings and delivery created with and provided in Aboriginal communities makes it difficult to achieve social and economic goals.

8. A lack of a forum to identify and pursue online cost efficiencies impedes our ability to realize savings.

9. A lack of understanding of the economy of scale and its application to online education, with its unique need for larger up-front investments that are then amortized over years and large population bases challenges existing funding models that have been developed for traditional university education

10. A lack of strategy while our competitors collaborate, engage in cross-jurisdictional cost sharing initiatives to achieve efficiencies—and find scalability across systems—impedes our ability to compete.

11. A lack of a critical mass student body impedes institutions’ opportunity to achieve economies of scale and cost efficiencies from their investments in online education up-front costs.

12. A lack of strategic investment in the basic tools that underlie online education – both education-focused (course development and updating, student supports) and digital-focused (ICT infrastructure and content digitization) challenge Canadian universities’ ability to offer current, quality programs.
Theme 2: Innovation

*Traditional education’s focus on facts, memorization, basic skills, and test taking has not been good for the development of creativity and innovation. This is changing in the 21st century, and education systems from Finland to Singapore are beginning to put creativity and innovation as a high priority in their desired outcomes for student learning.* -Sir Ken Robinson, British author

Is Canada Innovating?

Indicators of Canada’s innovation gap can be found in the World Economic Forum data in Appendix A: number of patent applications per capita (23\textsuperscript{rd}), companies obtaining technology from other countries (19\textsuperscript{th}), high tech exports (28\textsuperscript{th}), government procurements fostering innovation (25\textsuperscript{th}), corporate spending on R&D (20\textsuperscript{th}), venture capital availability (19\textsuperscript{th}), per minute cell phone costs (66\textsuperscript{th}), and broadband cell subscriptions (68\textsuperscript{th}). *Canada’s Digital Economy Strategy Consultation* demonstrated that we are behind in STEM PhDs, patents, home-grown products, and many other innovation indicators. The recent stock price adjustments of Canada’s innovation-based company Research in Motion serve as another unwelcome reminder of the problem that was reinforced in a number of articles about the RIM innovation gap. Strong language was used across the business and technology sectors: “*We believe that RIM desperately needs innovative products to help revive its business.*” We have a well educated population and a successful economy –yet even one of our best is struggling with innovation.

Online Education’s Potential to Help Grow a National Creative Class

As will be detailed through the rest of this theme, online university education’s ability to reach large numbers of people throughout their lifetime, incorporate learning technology and design innovations, continuously improve through the application of knowledge analytics, and—perhaps most importantly—provide a customized learning experience for each student, combines to create a very powerful tool in support of innovation. This tool is put to best use when it operates in parallel with the likewise critical blended learning opportunities increasingly offered by Canadian universities. In both cases, improved, personalized learning environments increase learning outcomes and foster the heart of innovation: creativity. Some tools in use in Canada and around the world are often in nascent stages and need more academic research and private sector R&D to achieve their potential.

Online R&D and Workplace Partnerships: Are We Innovating?

Canada’s R&D and university-business activities are currently largely focused on traditional, campus-based programs, students, and faculty. Many of those partnerships have been very fruitful and served as the basis of important innovations. Nevertheless, there is mounting pressure to bring both the classroom (learning) and the lab (research) to the “real world”, to the companies that will serve as the future employers and R&D hosts for the students and innovations growing in the “university greenhouse”. At the same time, we have thousands of part-time online students in programs directly related to their day jobs, and online graduate students engaging in research programs that could be enriched by a connection to their employers R&D needs. Without support to encourage professional students to maximize their online
learning and research, and companies to encourage their staff in self-directed online learning, the potential for on-the-ground workplace innovation and R&D partnerships centered on online students is being largely ignored in Canada. Most of Canada’s public and the private programs are not designed with working online students in mind, creating a missed opportunity to foster innovation in companies in rural, urban, and northern areas from coast to coast.

STEM: Are We Innovating?
Many countries are creating new pathways in Science, Technology, Engineering, and Mathematics (STEM) disciplines to support innovation. Canada’s Budget 2011 announced major funding to promote enrolment in key disciplines related to the digital economy such as science, technology, engineering, and mathematics. In the US, NASA has partnered with space and post-secondary providers to offer an online program designed to attract more students to these disciplines by making courses more engaging and accessible.40 The University of Cincinnati offers an online Masters of Education degree to qualify teachers to teach STEM subjects without having to take a leave of absence. More qualified teachers will increase the number of young people able and motivated to continue with higher education in these disciplines.

Online STEM programs require higher up-front investment to ensure quality and to maintain currency. STEM programs are less commonly available online than those in other disciplines and usually lack the extras that programs of that nature have to offer. While there are online degree programs in related areas such as Nursing, Health, and Technology (Manitoba, Memorial, Laurentian, Thompson Rivers, UBC, Simon Fraser, Athabasca), STEM programs tend to be general in nature (Waterloo being the primary exception, with quite a few BSc majors). Purely online science degree offerings are rare and restricted to relatively limited forays by TELUQ, Dalhousie, Thompson Rivers, and Athabasca.

STEM disciplines would benefit from any number of targeted online innovations such as:

- Well-resourced virtual and remote labs
- Technologically integrated learning tools
- Preparedness pathways and supports in calculus and other gateway courses
- Recruitment-focused programs for K-12 and first year undergraduates
- Professional programs to update existing workplace and R&D skills
- Management programs for STEM environments (such as ICT)
- Developing specialized instructional design expertise required for high quality STEM courses

The barrier to achieving these innovations is the lack of a vision and support for a national inter-jurisdictional government-university-private sector solution to the STEM HQP problem, and pathways to address needed cost effectiveness through cross-Canada partnerships.

Online Learning Outcomes: Are We Harnessing Innovation to Improve?
Despite considerable evidence to the contrary, one of online education’s largest challenges remains the perception of its being inferior to traditional campus-based offerings – in terms of learning outcomes,
accreditation, and student experience. The experience issue will be addressed throughout the rest of this theme, particularly in the two Pathways sections below. In terms of accreditation, Canadian students and employers are at a unique advantage thanks to our university system where the use of the word “university” by prospective providers is controlled by provincial legislatures. As is the case with on-campus offerings, anyone who is concerned with accreditation of Canadian online university programs can readily identify appropriate providers. This leaves learning outcomes – the quality and quantity of learning – to be addressed.

Again, Canadian students and employers find themselves in a strong position thanks to both university senate approvals and the Quality Assurance (QA) bodies established by the respective provinces and territories. As is the case with on-campus and blended programs, online programs undergo thorough peer-reviewed scrutiny, in some cases supplemented by specific online QA regulations. Because QA analyses don’t tend to focus on comparing learning outcomes between campus-based and online learning, we looked at recent relevant research studies to answer the primary questions. Unfortunately, most learning outcome comparator studies are not Canadian, but several have Canadian academic involvement and / or are meta-analyses that include offerings from quality-assured universities in Canada, the US, the UK, and further afield.

Learning Outcomes – Do They Measure Up?
Numerous studies have been conducted on the differences between traditional, blended, and online delivery by academics such as Carol Twigg (President of the National Center for Academic Transformation), Robert Bernard (Concordia University), and others. Because of the rapidly changing nature of the field, however, we thought it best to focus on publications from the last two years. The highest profile paper over that period is the US Department of Education’s meta-analysis of online learning studies which contained a number of pertinent conclusions based on the findings of 51 studies. The authors called for a re-evaluation of online learning in light of the following developments in web resources:

- “Students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction.” (pg xiv)
- “Online learning can be enhanced by giving learners control of their interactions with media and prompting learner reflection. Studies indicate that manipulations that trigger learner activity or learner reflection and self-monitoring of understanding are effective when students pursue online learning as individuals.” (pg xvi)
- “Online and classroom conditions differed in terms of time spent, curriculum and pedagogy. It was the combination of elements in the treatment conditions that produced the observed learning advantages. At the same time, one should note that online learning is much more conducive to the expansion of learning time than is face-to-face instruction.” (pg xvii)
- “The meta-analysis findings do not support simply putting an existing course online, but they do support redesigning instruction to incorporate additional learning opportunities online.” (pg 51)

In short, the results supported online learning, in particular the tools it could harness to encourage student interaction and reflection.
Several review papers have been published, highlighting the fact that some studies in the US meta-analysis included K-12, trades, or short-term courses. After reducing the pool, they came to a slightly different conclusion: “the online courses showed no strong advantage or disadvantage in terms of learning outcomes.” Similarly, the California Legislative Analyst’s Office found that “the evidence to date suggests that fully online classes are on average equal to – but no better than – face-to-face instruction.” These findings have received attention in the academic and popular press in the US but not, as far as we could tell, in Canada. Until this kind of data is more widely known, the quality of online education is still being questioned, which is a barrier to increasing enrolments in online education.

Pathways to Strengthen Learning Outcomes

One of the strongest reasons for using information technology in teaching and learning is that it can radically increase the array of learning possibilities presented to each individual student. Thus, the “right way” to design a high-quality course depends entirely on the type of students involved. By customizing the learning environment for each student, institutions are likely to achieve greater learning successes.

- Carol Twigg, researcher, in Improving Learning and Reducing Costs

Current evidence suggests that learning outcomes in online education are similar to those in face-to-face education. However, because of its ability to tap into constantly emerging technologies, online education (together with blended learning) has the potential to improve learning outcomes. The use of technology to improve learning is gaining traction in surprising places. At the 2011 G8, there was a heated discussion about ways of exciting young minds through interactive software to provide guided instruction, instant feedback, providing as many exercises as students need to master each concept, limitless audio and video learning objects, etc. They discussed increasing personalized learning to bring out the best in every student “to make mathematics sticky, to micro-target eighth-grade girls who might want to be physicists, and personalize the reading of each student,” use of iPods to monitor performance, use of e-textbooks, and use of social software to free people from the “tyranny of time and distance.” Online education is able to meet these challenges extended by global, education, and workforce leaders and in so doing can increase interest in learning, improve learning outcomes, and help students graduate more quickly and then update their skills and knowledge throughout their lives. Online education allows:

- Constant interaction between the student and instructor, and where appropriate among students
- Accessibility supports
- Academic integrity (e.g., via plagiarism detection software enabled by high instructor contact and emergent exam security software)
- A bridge to help close the gap between formal and informal learning
- Engaging learning opportunities that are adapted to each student
- Ever-greening course content
- Ever-greening instructional, support, and technological innovations

Applications of computer technology such as these have been demonstrated to increase learning – particularly when designed to support cognition (as opposed to simply present content). Online learning
encourages more time spent on the course, more curiosity-driven activities, and exploration. Paired with technological innovations and personal interaction, it increases comprehension, including in STEM disciplines an ideal combination to maximize innovation and foster innovative potential for the future.

However, online learning cannot reach its maximum potential without a significant investment in specifically designed scaffolding (pedagogy) for the personal, online learning environment. Without it, courses are unable to reach their full potential by maximizing the affordances of the internet. When those innovations are in place, they will create new ways of learning that can be applied to all aspects of life both at present and into the future, including in the workplace. Simply converting face-to-face instruction to online does not achieve that level of change. Instead, courses need to be specifically planned and implemented for a digital experience. Unfortunately, despite having been repeatedly and conclusively demonstrated, this concept is not well known or understood in many education circles and is difficult to resource. Where it is not applied, students may experience inferior courses and outcomes, diminishing the reputation of online learning.

Online Learning Design: Are We Innovating?
We all know that technology can open doors and help increase our knowledge, learning, and understanding. However, in order to obtain and demonstrate specific learning outcomes (as discussed above), the provision of that learning needs to be designed. In today’s workplace, many of us are increasingly self-directed, harnessing ICTs to do our work and to collaborate with others to meet goals. The best preparation for technology-mediated work is technology-mediated education, which can be accomplished through blended or online learning – or a combination of the two. Blended learning is designed by a face-to-face instructor in real time, while online learning is prepared in advance by a team, thereby enabling students to engage with their learning anytime, anywhere. So, how are we currently innovating to take advantage of emergent learning tools and opportunities to improve teaching and learning online?

Online Learning Innovations
Distance learning design has been around for decades and is a major function of the work of today’s online university programming. Many of today’s innovations are centered on the shift from lower to higher levels of technological facilitation as our constantly evolving world empowers higher levels of automation (avoiding redundant tasks and allowing students to control when they learn), provides new ways of presenting content, increases comprehension, enables improved assessment, and – last but certainly not least – meets student expectations for their learning environment. Indeed, online design requires a totally different pedagogy — one that is individualized, adapted to student needs, more actively engaging, linked to regular life, supported by e-portfolios and other digital tools, and networked to learning communities through social software applications such as blogs, wikis, and the like. Generally, professionally designed online university courses in Canada fall along a technology-plus-pedagogy continuum that may be described as starting with Technology Enabled and moving toward Technology Intensive:

1. **Technology Enabled**, where content, communication, management, and assessment are organized through a Learning Management System (LMS); materials and assessments are provided by print or other media.
2. **Technology Enhanced**, where all course content and assessment is delivered online (except perhaps textbooks); students engage with fellow learners through a mediated forum and have full accessibility to digital reading rooms, online libraries, etc for all of their learning and research.

3. **Technology Intensive**, where throughout the course the learner engages with their instructor, content, learning aids, scaffolding, and fellow students through interactive technological tools.

Examples of learning innovations that are being piloted and used in Canada and around the world include:

- **Learning analytics**, which mine data and analytic techniques to study student learning pathways, engagement, and outcomes to allow both improved instruction for future students and adaptation of the current student’s experience to help learn better and faster (still largely at research stage)
- **Games** and other problem-based activities in math and other disciplines
- 150 universities have presences in **virtual worlds** with classroom space, demonstration activities
- **Virtual science** and remote labs
- **Social learning** tools such as wikis, blogs, and social websites
- Synchronous (audio, video, and/or text) chatting and **workgroups**
- **E-textbooks** and **shared educational resources** (which will be discussed in the next theme)
- Increasingly sophisticated LMS with **mobile**, virtual world, and other applications
- **Automated credit** and transfer systems (together with prior learning assessment) to determine course and unit deficiencies (thus avoiding duplication and increasing credential completion rates)
- **Massive Open Online Courses** have been tried at several Canadian universities, allowing many hundreds of online students to take a course at no cost, or to pay tuition if they chose to seek credit

### Canadian Online Learning Innovations

Without a national source of information on Canadian online university education, innovations in online education are difficult to find. One source of information is from CVU universities which were polled for examples of their recent innovative initiatives in online education. Highlights of their activities are listed in Appendix B. A quick overview follows:

<table>
<thead>
<tr>
<th>University</th>
<th>Innovations</th>
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<tbody>
<tr>
<td>Athabasca</td>
<td>Virtual media lab, LMS analytics, showcase interactive course tools, streaming media system, online orientation / course, digital reading rooms, online library federated search</td>
</tr>
<tr>
<td>Memorial</td>
<td>K-12-transitioned e-portfolios, heritage site mobile learning, Virtual Shipyard, virtual projects in Africa and the Caribbean, HTML accessibility coding</td>
</tr>
<tr>
<td>Thompson Rivers</td>
<td>Mandatory online instructional skills course, facilitated online faculty discussion group, partnering with other institutions in BCcampus to develop joint courses and materials</td>
</tr>
<tr>
<td>Carleton</td>
<td>Lecture capture, French language clip library, large-scale PD program</td>
</tr>
<tr>
<td>Laurentian</td>
<td>Tech innovation fund, BEd online (French), courses in Cree and Ojibwe, medical procedure podcasts</td>
</tr>
<tr>
<td>Royal Roads</td>
<td>Online instructional skills workshop offered to other universities, as OER, Online Venture Challenge</td>
</tr>
<tr>
<td>Manitoba</td>
<td>Massive Open Online Courses, DVD and MP3 content for military students, Netbooks instead of textbooks for remote Aboriginal students</td>
</tr>
<tr>
<td>Mount Royal</td>
<td>LMS-based instructor resource centre, screen reader testing, online-blended programs</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>Synchronous web conferencing, single sign-on system, instructor LMS-publishing system</td>
</tr>
</tbody>
</table>
The purpose of the use of technology in online education is first to improve quality and ideally to realize cost benefits. Most innovations are fairly recent, and analyses of the cost benefits are unavailable. One example that was provided was from Athabasca which reported that investments in its online registrar’s office have resulted in a $700,000 net reduction in the impacted service areas. Further data collection on the cost and other benefits of technology innovations would provide valuable learning for institutions, governments, and the public.

Pathways to Continuing to Innovate
The more online research and online learning R&D (for new technologies and software / applications for learning) takes place, the more Canadian universities can leverage existing expertise, content, and delivery systems. The kinds of activities taking place at CVU members like Memorial, TELUQ, and Athabasca and other universities and research networks across the country include:

- The almost endless potential of learning analytics, building on the early stage activities in use by universities and software developers and partnering with adaptation and artificial intelligence researchers to provide a customized Personal Learning Environment for every student
- Augmented reality, created by layering GPS-based information over the real world to enable intuitive location-specific learning
- Automatically generated remote user collaborations built on location-based dynamic group algorithms that bring instructors and students together in new interactive ways
- Complex, motivationally-based games for formal and informal learning
- Widespread application of mobile learning-based activities for phones, iPads and other tablets

The Canadian public and private sector research community has considerable capacity to take these and many other innovations to the next level to enable application across the country, but faces ongoing challenges in its ability to secure needed resources. The potential for public/private sector partnerships will be discussed in the next theme, but whether they act on their own or collaboratively the problem remains: while Canadian research funding has some space for an inherently inter-disciplinary activity like technology in education, most of the funding programs for both academic and development-based research are targeted at either technology (NSERC, NRC, various provincial envelopes) or education (SSHRC and others). Online education falls somewhere in between and is forced to try to reshape itself for funding programs for which it is not a natural fit, thereby both shifting the work and significantly reducing the chances of success.
### Barriers: Canadian Online Education and Innovation

The following is a summary of the major obstacles to ongoing success for Canadian online university education related to the second theme, *Innovation*:

| 13. | Lack of support for online students to **engage in workplace innovation** and applied learning, limiting their potential to foster business innovation |
| 14. | Lack of national **solutions to address the STEM HQP problem**, and a clear place for online education in that conversation |
| 15. | Quality **reputation problems** stemming largely from accreditation, outcomes, and other issues that do not apply to the Canadian online university environment but which negatively impact enrolments |
| 16. | **Low awareness of online research results** that demonstrate equivalent learning outcomes also limits student uptake |
| 17. | Lack of **understanding of the need for scaffolded** online-designed courses to achieve equivalent quality leads to some offerings lacking the tools to maximize student learning and experiences |
| 18. | Academic and R&D **online learning research struggles with limited resources and support** because it does not readily fit well with many existing research and technology transfer programs |

### Barriers to Ongoing Innovation

The following barriers were identified by CVU members in the survey conducted in preparation for this report:

| 19. | Inability to **resource or plan** for the up-front investments needed to add courses and programs |
| 20. | Finding affordable ICT and **ICT infrastructure** for the university, faculty, and rural, and low-income students |
| 21. | Students’ ability to access and pay for **mobile broadband** to enable ubiquitous, location-specific, Cloud-based mobile learning |
| 22. | **Keeping up with needed changes** to software, hardware, expectations, and content |
| 23. | Challenges **achieving ubiquity** (for mobile devices, different platforms, 24/7 web support, etc) |
| 24. | Inability to meet needs of underrepresented or underprepared **students** (also referenced in theme 1, *Change*) |
| 25. | Lack of **ability and time on the part of faculty** to learn and adopt new technologies and methodologies |
| 26. | **Security**, copyright, and like issues |
| 27. | Lack of **instructional designers** and programmers with expertise in creating high quality online courses |
| 28. | Insufficient **French language** resources and program availability |
| 29. | Lost opportunities resulting from **not leveraging public sector investments** |
| 30. | **Disconnection** between e-learning researchers and most faculty and senior administrators |
Theme 3: Knowledge

“Technological developments in the 20th century have transformed the majority of wealth-creating work from physically-based to "knowledge-based." The only comparative advantage a company will enjoy will be its process of innovation -- combining market and technology know-how with the creative talents of knowledge workers to solve a constant stream of competitive problems - - and its ability to derive value from information.”

-Thomas Riley, Executive Director, Commonwealth Centre for Electronic Governance

Has Canada Moved to a Knowledge-Based Economy?
The daily lives of most Canadians and Canadian businesses have shifted as fundamentally as they did in response to the industrial revolution centuries ago. But is our economy keeping up? As the Work Foundation UK stated in the 2009 Knowledge Economy Research Programme paper, half the jobs in industrialized societies are now in the knowledge sector, companies spend more on “intangible” assets (people, software, design) than on “tangible” resources (buildings, equipment), and the majority of the workforce (90%) now presents formal job qualifications, up from 40% in 1970. Once again, the World Economic Forum Report data summarized in Appendix A indicates how Canada is performing with respect to indicators such as digital content (15th), business investment in training (12th), and the rate of new technology absorption by businesses (22nd). Canada has built a successful economy on physical resources; if future economic growth will be centered on what we know instead of what we have, how will we fare?

Knowledge: the Foundation of Productivity and Innovation

.... half of the productivity gap between Canada and the United States can be attributed to Canada’s lower digital literacy. - Dr Leonard Waverman, Dean, Business, University of Calgary

The Digital Economy Strategy Consultation and other recent reports provide information about Canada’s productivity levels, which are lower than many competitor countries. Dr Waverman connects that directly to our e-competitiveness in his annual Connectivity Scorecard where this year we placed 8th. Thanks to Dr Rick Miner and others, governments in Canada are well aware of the growing connection between economics, unemployment, and knowledge, and the move from the traditional definition of literacy to a new and even more critical skill set – that of digital literacy. And as is becoming increasingly clear, the digital divide has moved from one of simple ICT accessibility to the ability to access information, think critically about consumer and other content, interact creatively, and innovate. To achieve success, we now need increasing levels of knowledge, and that learning needs to continue throughout our lives. However, Statistics Canada reports (such as Adult Learning in Canada) point to Canada’s ongoing low adult learning participation rates compared with the US, Norway, and Switzerland.

As reviewed in the first theme it should come as no surprise that we have both adult learning and digital literacy gaps. However, it is unclear whether national, provincial, and territorial governments will be able
to work together to address the shared challenge of online university business models, thereby allowing enrolment levels to increase and fill the gaps (as discussed in the first two themes). The same holds true for Canadian governments, universities, and the business community— as this theme will illustrate.

Building Online Learning Partnerships with the Private Sector

*(Canada has seen a)* 40% *reduction in spending on formal learning* by Canadian organizations over the last 15 years. In 2008, Canadian organizations spent an average of 1.5% of payroll or $787 per employee, well below the expenditures of our U.S. neighbours.

- Allison Cowan and Ruth Wright, Conference Board of Canada

Improving education by filling the gaps in workplace learning, adult learning, and digital literacy will broaden Canada’s knowledge base. The above statistics suggest that, in addition to reviewing what we are doing in Canada to improve workplace learning through education - private sector connections, we also look beyond our borders for best practices. A few such samples are included in the chart below. It is interesting how many countries have integrated online learning, workplace learning, and the development of an online/ e-learning sector as the joint foundation for their strategy to achieve digital literacy and move into the knowledge economy.

<table>
<thead>
<tr>
<th>Country</th>
<th>Description</th>
</tr>
</thead>
</table>
| Taiwan      | • 13 ministries partner to support online/e-learning competitiveness, businesses, technologies, systems, tools, networking, public awareness, and impact on the national and international market through system-wide programs and policies  
• Large growth and significant corporate efficiencies across many sectors  
• Focused on developing value-added applications throughout the supply chain  
• Integration with researchers, science, technology, and education |
| United Kingdom | • Universities have partnered with national and international companies to co-produce professional development and industry training courses, some building on university content and some consisting of (often online) university offerings  
• The University of Durham is co-producing a program with KPMG to guarantee employment outcomes (thereby presenting an interesting model with some concerns) |
| Finland     | • Created an ICT cluster to lead them into the knowledge economy  
• Invested heavily in online / e-learning to foster creativity and innovation |
| United States | • $500 million in the “Investing in Innovation” fund for education technology investment to build state and local capacity to increase the transfer of knowledge  
• $2 billion for (open and other) educational resource development |
| India       | • Online institutions partner with e-learning sector to serve large student numbers  
• Serves as a business sector launching point; the offshore industry alone will reach **$603 million** by the end of 2012, already up from $360 million in 2008 |
| Singapore  | • Incubation strategy focused on supporting new e-learning companies  
• Well-developed legal and regulatory environment in support of ICT ventures |
• NTUC Learning Hub Private Limited has trained 800,000 professionals and working adults, and partnered with more than 10,000 companies to identify and provide training needs, helping undergird national economic growth
• Developed an industry-post-secondary partnership (UniSIM)

Whether it is through just-in-time workplace learning programs like those offered by Taiwanese companies seeking to increase profit margins, or the university-corporate programs being developed in the UK, the world of knowledge transfer and adult learning is growing and changing rapidly – outside Canada.

University-Private Sector Partnerships and Online Knowledge Transfer

People generate the ideas and knowledge that power innovation, and they apply this knowledge and the resulting technologies, products, and services in the workplace and as consumers.

- OECD Innovation Strategy

While the innovations in the previous table have been implemented to increase workplace and adult learning around the globe, many are founded on elements that are different from – or stronger than – those in place in Canada. These include regulatory environments, widespread understanding of the need to increase digital literacy and ICT business adoption (especially among SMEs), corporate sector buy-in to the cost benefits of professional and workplace education, nation-wide postsecondary collaborations, and strong university-business academic partnerships. Together, they challenge Canada’s ability to compete in knowledge transfer for both the workplace and the adult population as a whole. If those barriers can be overcome, Canada’s knowledge transfer rate – and with it our ability to innovate and keep up with competitor nations – can be improved, enabling us to harness online education to take our place in the knowledge economy of tomorrow. Canada stands to benefit in several areas:

• Businesses could use online education to move information into the workplace and prepare unemployed and underemployed adults for emerging positions by partnering with universities for content, delivery, and accreditation purposes.
• The ICT and education sectors could both benefit by partnering to create a strong and cohesive online / e-learning business sector for hardware and software to meet tomorrow’s learning needs (for example, by developing and selling e-textbooks, learning resources, content, Learning Management Systems, and assessment tools.)
• Universities, schools, companies, and the public sector alike could draw from educational resources that provide the information they need for learning and living online in the Canadian context.

Developing Learning Resources for Online Education

Perhaps the greatest potential – and challenge – for increasing academic, economic, and social knowledge transfer rates is in developing high quality learning resources for use across the formal and informal online and blended education spectrum. Many are under development right now, as reviewed below, some for sale and others for sharing within a given distribution or freely available around the world. Depending on the distribution model, there can be complications and competing objectives among universities, other
education providers, government, corporate PD, online and e-learning companies, international
governments, international public and private institutions, and the general public. However, because the
hoped-for wins of large scale learning resource creation and sharing promise transformative impacts on
both online and blended learning for students and institutions alike, stakeholders are moving ahead. After
reviewing business model options, this final section of the report will look at recent developments
internationally and in Canada, and obstacles associated with next steps.
E-resource Business Models

As discussed in the Cost Effectiveness section, states such as California are planning to create efficiencies by developing and sharing educational resources within and outside the state. However, there are a number of ways of approaching the creation and use of e-resources. The following models can be mixed and matched through, for example, a private provider partnering with a state or province to create an e-resource that is free to students registered within their jurisdiction and sold externally – or a company partnering with a university to create something that is free throughout the world but students pay to print and instructors for assessment tools – or a state/province developing e-resources that are customized for its own use and then made freely available. For example, Flatworld Knowledge is a publishing company that offers free online textbooks. Its “freemium” business model sells optional services such as print or audio versions, assessment tools, and customizations. In 2010 over 1,300 educators in 800 colleges and universities used these open textbooks. 53

1. Commercial

Companies create an e-resource for the purposes of selling it. They might develop it for a particular market (curriculum found in introductory biology courses in Ontario), but hope to sell it globally. They might pay or exchange services with a university or with faculty members directly. Pearson is moving in this direction.

The benefits are full service provision including content development, writing, editing, reviewing (for quality assurance), vetting, sales, instructional aids, secure assessment tools, inter-operability (allowing it to be used by multiple devices and applications) and updating (content and media greening).

The costs are primarily borne by institutions and/or students, and have been rising above the rate of inflation.

2. Jurisdictional

Provinces (such as BC) or states (Washington, Ohio) or credentialing bodies establish curriculum committees from local institutions to set curriculum requirements, select authors and approaches, review, and distribute e-resources to some or all students in the target course registered within their jurisdiction.

The benefits are that the targeted institutions and their students have vetted, custom-developed materials distributed directly to them.

Development costs are typically covered by the providers, so increase the budget for development and greening tasks.

3. Open Educational Resources (OER)

Stakeholders – faculty, universities, networks, foundations, provincial/state, or federal governments – develop e-resources and license them under Creative Commons, which is less restrictive than traditional copyright. Creators of content retain copyright but allow free copying and distribution, with or without any conditions.
The costs associated with developing, collating, editing, posting, and – ideally– reviewing, vetting, curriculum matching, promoting, assessment tools, inter-operability provision, and greening are carried by some combination of stakeholders acting on behalf of their users and users worldwide.

**International Learning e-Resource Innovations**

There are, as one might expect, countless learning e-resource providers ranging from individual faculty and students posting something they created to multinational publishing venues. What follows are examples of some of the more innovative approaches outside Canada and primarily open (freely available). Some e-resource websites are provided; reference information about the remaining initiatives can be easily searched. Many of these examples are from the United States, which is a leader in English-language open and other e-resource development (some at the college level are included because the materials could also be used at the university level). The potential for exploration for best practice models and innovations for Canada are considerable.

**Nationally-led Collaborative Initiatives**

- The US Congress and Senate have several bills under consideration dealing with the promotion, creation, and use of open e-resources to increase the accessibility of higher education throughout the country ( H.R. 1464, H.R. 4575, S. 1714)
- The US Department of Education is investing **$500 million over four years** to build curriculum for “teaching, learning, and openness” to help people get the education they need to get back to work
- The UK’s JISC and Higher Education Academy support OER creation, research, and use

**Jurisdictionally-led Collaborative Initiatives**

- Florida’s Orange Grove collaboration has an open digital repository supported by state legislation
- Washington state has several strong programs that have garnered support from the Gates and Ford Foundations to create, distribute, and maintain open e-texts, e-journals, and learning objects
- Oregon has state bill supporting the increased use of OER to reduce student costs
- Ohio has provided grants to create e-textbooks for use by students registered within the state
- Texas has a number of projects, including some with “virtual departments”, and is supported in those endeavors by the state legislature

**Philanthropically-led Collaborative Initiatives**

- The OpenCourseWareConsortium is a worldwide community of 200 universities that since 2001 have made **15,000 courses freely available online**. The quality and completeness of the courses varies greatly. Three Canadian universities are members: Royal Roads, Athabasca, and Capilano.
- Carnegie Mellon University is noted for the creation of complete high quality courses “backed by learning research” which are freely available.
- Connexions is a free “digital educational ecosystem” consisting of 17,000 modules of content and tools for remixing modules into courses or textbooks.
- College Open Textbooks is a partnership of nonprofit and for-profit educational organizations promoting open textbooks as an economical education alternative.
• Khan Academy offers thousands of free videos primarily in math and sciences that provide just-in-time lessons whenever students need them. It is piloting motivational game strategies where students earn points and badges for learning.

• Next Generation Learning Challenge is a collaboration of US philanthropic organizations that is providing millions of dollars to help education explore innovations in technology (such as OER, learning analytics, and social media, for example) that will improve student success in times of declining budgets.

Canadian e-Resource Innovations
Canadian online university providers and users have tapped into the above initiatives and others like them involving curriculum mapping, development guides, and other tools, such as those available through MITE, MERLOT and the OER Matrix. Many Canadian universities use and contribute to commercial, jurisdictional, and Open Educational Resources, such as:

• BCcampus (a provincially funded collaboration of 25 BC postsecondary institutions that develop materials primarily for free use within the province) has just partnered with US organizations to develop a remote science lab that will increase success in online chemistry, physics and biology (three courses funded by BCcampus). The $750,000 US-funded project requires that the final product be freely available.

• Memorial has benefited from provincial grants and support for online and blended learning for curriculum development and distribution, and is about to launch a 3,000-item repository for open use through their provincial library system.

• Athabasca, home of the first UNESCO Chair in OER and Canada’s first open press is working with colleagues in Alberta to increase OER use.

• TELUQ has produced sorely needed French-language OER (including open software tools).

• These build on earlier Canadian projects like the LORNET research network (TELUQ, Saskatchewan, Ottawa, Simon Fraser, Waterloo, and École Polytechnique de Montréal) that paved the way for future innovations.

OER Development and Use
While all three e-resource business models described above present a number of benefits in their capacity to be freely accessed and used by learners and educators everywhere, Open Educational Resources present unique benefits compared with the other models. Underrepresented and low income students, adults needing to upgrade their employability skills, professors and universities seeking accessible customized resources, SMEs with limited workplace learning funds, e-learning companies looking for source content, governments facing ongoing budgetary constraints, small jurisdictions with high per student resource costs, developing world countries with shared computer accessibility but no printing or distribution budgets – all stand to benefit.

Stakeholders and stakeholder networks collaborate to share costs across multiple institutions and jurisdictions, but securing resources for initial development, achieving technological and accessibility, interoperability, and ongoing greening can be difficult. Nevertheless, massive numbers of OER have been
developed worldwide (though less in Canada) which demonstrates a significant shift for jurisdictions and universities that have traditionally safeguarded their knowledge. The focus is starting to shift beyond development of new OER toward greater use of existing OER, with a focus on quality. CVU universities almost universally indicated very low levels of both OER creation and use, identifying the following barriers:

- Lack of institutional policy
- Lack of quality
- Incentives, systems, and networks for faculty to contribute and edit resources
- Faculty accessibility to printed copies, instructional aids, and assessment tools
- User technological skills (especially on the part of faculty) and designer expertise
- Identifying evaluation criteria for different user groups
- Time and energy to identify, sort, and customize them (too much choice can be paralyzing)
- Strong fits with existing proprietary materials
- Finding ways to share the workload and responsibility
- Copyright issues
- Potential loss of university bookstore revenue, and concerns from commercial publishers
- Lack of fit with existing financial support systems for both universities and students
- Need for customization to specific cultures and languages
- Ensuring and planning for greening

A report from the European Union’s Open Educational Quality Initiative which aims to improve higher education through use of OER, suggests that these common barriers can be addressed through:

1. Public policy
2. Institutional policy
3. Collaboration
4. Quality assurance processes

Barriers to Online Education’s Ability to Increase Knowledge Transfer

The following barriers provide a summary of the major obstacles to ongoing success for Canadian online university education related to the third theme, Knowledge (continued from the previous listing):

31. Canadian business, university, and government partnerships tend to focus on research activities
32. Businesses in Canada (particularly SMEs) have lower levels of participation in workplace education, and are less likely to see lifelong learning as central to their ability to innovate and achieve efficiencies
33. Canada lacks a nation-wide, well supported digital literacy strategy with large-scale cross-sector programs targeted to increase adult learning levels, digital literary skills, and knowledge transfer
34. Canada lacks a cohesive online/e-learning economic strategy to foster university innovation
35. Commercial knowledge transfer (i.e. textbooks) costs are rising, but peer-reviewed, curriculum-mapped, grouped, accessible, inter-operative, and updated large-scale e-resources available to students across the country are not yet ready to replace them
36. Many existing freely accessible e-resources are scattered across specific university websites or targeted to students in one province, lacking the national collaborations necessary to make resources scalable.

37. Existing copyright, intellectual property, collective agreement, and other issues combine with a lack of awareness and buy-in across universities and governments to minimize the impact of many e-resources.

38. Most students, universities, and other users have not had access to quality e-resources that can be readily annotated and manipulated, including for use across linguistic and cultural contexts.

39. Canada lacks the e-resource development and digitization programs available in countries like the US.

40. New business models are lacking in the Canadian public and private sectors for the development, sharing, vetting, and greening of emergent learning resources.

Summary Comments

This report presented a broad overview of the Canadian online university education landscape, with the primary purpose of initiating discussion among organizations and bodies that typically have little opportunity to do so beyond the borders of their immediate jurisdictions. The obstacles to inter-jurisdictional collaboration are many, but so too are the potential pathways forward.

In summary, we observed that Canadian university online education is constrained by jurisdictional issues, with a resulting lack of national data, strategic planning, collaboration, and economies of scale.

We also observed that such issues limit Canadian universities’ opportunities to fully capitalize on the potential of digital technologies to improve access, quality, innovation, ROI, and knowledge transfer.

A national e-learning strategy based upon university collaboration could address many current weaknesses and gaps, and maximize the potential of online education to prepare and sustain Canada in the digital economy.

We encourage readers to focus on the following large questions and contribute suggestions aimed at helping Canada maximize the potential of online education:

1. What does Canada need to do to achieve its economic and social innovation objectives?
2. How is online education well suited to help achieve national goals?
3. What does online university education have to provide to help meet national goals?
4. How can decision makers and universities make this happen?
5. Can universities, governments, and other sectors work together to maximize the potential of online education to meet national goals?
### Appendix A: World Economic Forum Data

**World Economic Forum, Global Information Technology Report 2010-2011**


<table>
<thead>
<tr>
<th>Report Summary Indexes, with Select Indicators (summarized where needed)</th>
<th>Cdn. Rank</th>
<th>Behind</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Network Readiness</td>
<td>8</td>
<td>Taiwan, Denmark</td>
</tr>
<tr>
<td>2 Environment Subindex</td>
<td>5</td>
<td>Switzerland, Finland</td>
</tr>
<tr>
<td>3 Readiness Subindex</td>
<td>15</td>
<td>Qatar, Iceland</td>
</tr>
<tr>
<td>4 Usage Subindex</td>
<td>14</td>
<td>Germany, Hong Kong</td>
</tr>
<tr>
<td>1.01 Ease for entrepreneurs to find venture capital for risky projects</td>
<td>19</td>
<td>Bahrain, UAE</td>
</tr>
<tr>
<td>1.03 To what extent are the latest technologies available?</td>
<td>14</td>
<td>UAE, Austria</td>
</tr>
<tr>
<td>1.05 Difficulty to comply with government administrative requirements</td>
<td>40</td>
<td>Namibia, Malawi</td>
</tr>
<tr>
<td>3.06 Gross tertiary education enrolment rate</td>
<td>27</td>
<td>Estonia, Uruguay</td>
</tr>
<tr>
<td>3.10 How accessible is digital content?</td>
<td>15</td>
<td>Korea, Israel</td>
</tr>
<tr>
<td>4.07 Average per-minute cost of various mobile cellular calls</td>
<td>66</td>
<td>Peru, Cambodia</td>
</tr>
<tr>
<td>5.01 Extent companies invest in training &amp; employee development?</td>
<td>12</td>
<td>Finland, Germany</td>
</tr>
<tr>
<td>5.03 How much do companies in Canada spend on R &amp; D?</td>
<td>20</td>
<td>Malaysia, Korea</td>
</tr>
<tr>
<td>5.08 ICT services as a percent of commercial services imports</td>
<td>52</td>
<td>Bulgaria, Oman</td>
</tr>
<tr>
<td>6.01 How much does your government prioritize ICT?</td>
<td>31</td>
<td>Cape Verde, Oman</td>
</tr>
<tr>
<td>6.02 Do government procurements foster technology innovation?</td>
<td>25</td>
<td>Iceland, The Gambia</td>
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<td>6.03 Importance of ICT to the government vision of the future?</td>
<td>28</td>
<td>Cape Verde, Vietnam</td>
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<tr>
<td>7.01 Mobile telephone subscriptions per capita</td>
<td>95</td>
<td>Bolivia, Guyana</td>
</tr>
<tr>
<td>7.02 Percentage of cell subscriptions with data access at broadband speed</td>
<td>68</td>
<td>Sri Lanka, Latvia</td>
</tr>
<tr>
<td>7.08 Is ICT improving accessibility to basic services?</td>
<td>23</td>
<td>Estonia, Oman</td>
</tr>
<tr>
<td>8.01 Extent businesses absorb new technology?</td>
<td>22</td>
<td>Singapore, Germany</td>
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<tr>
<td>8.02 Method companies obtain technology: locally? from other countries?</td>
<td>19</td>
<td>Korea, Taiwan</td>
</tr>
<tr>
<td>8.04 Number of patent applications filed per capita</td>
<td>23</td>
<td>Israel, Iceland</td>
</tr>
<tr>
<td>8.06 High-technology products as a percent of goods exports</td>
<td>28</td>
<td>Cyprus, Mexico</td>
</tr>
<tr>
<td>9.01 How successfully has government promoted ICT?</td>
<td>29</td>
<td>Brunei, Egypt</td>
</tr>
<tr>
<td>9.02 Extent ICT has improved government service efficiency?</td>
<td>20</td>
<td>Oman, Bahrain</td>
</tr>
</tbody>
</table>
Appendix B: CVU Summary

Canadian Virtual University (CVU) is a consortium of English and French universities specializing in online education and collaborating to share resources, avoid duplication, and facilitate transfer credit across provincial boundaries. To support this report, CVU universities provided data and information that help give a sense of the state of online university education among these universities that have a strategic focus on online education. Highlights of their responses are summarized below.

Increase in Students Taking Online Courses
CVU universities reported almost 200,000 student registrations in online courses in 2009-10. The percentage of increase since 2001-02 is indicated where data is available.

<table>
<thead>
<tr>
<th>CVU members</th>
<th># of online courses registrations, 2009-10</th>
<th>Increase since 2001-02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athabasca University</td>
<td>72,448</td>
<td>67%</td>
</tr>
<tr>
<td>Télé-Université du Québec (TELUQ)</td>
<td>35,030</td>
<td>40%</td>
</tr>
<tr>
<td>Thompson Rivers University</td>
<td>19,955</td>
<td>16%</td>
</tr>
<tr>
<td>Memorial University</td>
<td>18,803</td>
<td>64%</td>
</tr>
<tr>
<td>University of Manitoba</td>
<td>15,555</td>
<td>126%</td>
</tr>
<tr>
<td>Carleton University</td>
<td>10,133</td>
<td></td>
</tr>
<tr>
<td>Laurentian University</td>
<td>10,779</td>
<td>36%</td>
</tr>
<tr>
<td>Royal Roads University*</td>
<td>6,027</td>
<td>44%</td>
</tr>
<tr>
<td>University of New Brunswick</td>
<td>2,626</td>
<td>194%</td>
</tr>
<tr>
<td>Royal Military College</td>
<td>~4,000</td>
<td></td>
</tr>
<tr>
<td>Nipissing University</td>
<td>1,629</td>
<td></td>
</tr>
<tr>
<td>Mount Royal University</td>
<td>1,039</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>198,024</td>
<td></td>
</tr>
</tbody>
</table>

*Most Royal Roads programs require short periods of attendance on campus.

Percentage of students studying online
The following universities reported the percentage of its undergraduate students taking online courses in 2009-10:

<table>
<thead>
<tr>
<th>University</th>
<th>% of all undergraduate students taking online courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Manitoba</td>
<td>19%</td>
</tr>
<tr>
<td>Carleton University</td>
<td>22%</td>
</tr>
<tr>
<td>Thompson Rivers University</td>
<td>26%</td>
</tr>
<tr>
<td>Memorial University of Newfoundland</td>
<td>31%</td>
</tr>
<tr>
<td>Télé-Université du Québec</td>
<td>100%</td>
</tr>
<tr>
<td>Athabasca University</td>
<td>100%</td>
</tr>
</tbody>
</table>
Number of online courses
CVU offers a collective catalogue of 2,500 courses. Students from these universities can mix and match courses from any institution, thus giving them greater course selection than any one university can offer and reducing the need for universities to develop courses already offered by another university.

<table>
<thead>
<tr>
<th>University</th>
<th># courses online</th>
<th>% of the institution’s courses available online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athabasca</td>
<td>800</td>
<td>100%</td>
</tr>
<tr>
<td>Télé-Université du Québec</td>
<td>375</td>
<td>100%</td>
</tr>
<tr>
<td>Royal Roads*</td>
<td>300</td>
<td>70%</td>
</tr>
<tr>
<td>Thompson Rivers</td>
<td>260</td>
<td>20%</td>
</tr>
<tr>
<td>Memorial</td>
<td>435</td>
<td>11% of undergraduate courses and 26% of graduate courses</td>
</tr>
<tr>
<td>Laurentian (English and French)</td>
<td>160</td>
<td>8%</td>
</tr>
<tr>
<td>Manitoba</td>
<td>210</td>
<td>8%</td>
</tr>
<tr>
<td>Mount Royal</td>
<td>120</td>
<td>6%</td>
</tr>
<tr>
<td>Carleton</td>
<td>90</td>
<td>2%</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>175</td>
<td></td>
</tr>
<tr>
<td>Royal Military (English and French)</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Nipissing</td>
<td>60</td>
<td></td>
</tr>
</tbody>
</table>

*Royal Roads courses are primarily online but most require short periods of attendance on campus.

Number of Complete Programs
The offering of complete online degrees, diplomas, or certificates not only individual courses is an important distinction. Offering even a small number of full programs online requires greater institutional investment than offering a large number of stand-alone courses. To offer a complete program, a university must assume the student will never attend campus, and so must provide all services, from registration to graduation, in alternative ways, increasingly through investment in ICT. CVU universities collectively offer 370 complete programs online.

<table>
<thead>
<tr>
<th>University</th>
<th># online programs</th>
<th>% of institution’s total programs online</th>
</tr>
</thead>
<tbody>
<tr>
<td>Athabasca</td>
<td>102</td>
<td>100</td>
</tr>
<tr>
<td>Télé-Université du Québec (TELUQ)</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Thompson Rivers</td>
<td>53</td>
<td>30</td>
</tr>
<tr>
<td>Royal Roads</td>
<td>43</td>
<td>95</td>
</tr>
<tr>
<td>Memorial</td>
<td>27</td>
<td>12</td>
</tr>
<tr>
<td>Laurentian (English and French)</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>Royal Military (English and French)</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>Manitoba</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Mount Royal</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Nipissing</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Examples of Innovative Course Development and Delivery

- **Audio clues in a music course, immediate pop-up feedback in quizzes, and interactive visuals that illustrate complex relationships** are examples of how technology is being used to increase interactivity and learning outcomes in high enrolment courses at Athabasca. These digital enhancements were part of a $6.4 million investment to convert 450 distances courses to digital format. Most of these enhancements will be freely available online.

- **Virtual Shipyard**—Engineering students at Memorial design and construct their own shipyard in the virtual world called Second Life. This technology provides students with the opportunity for experiential learning and greater engagement with the content. Overall class performance increased by 10 percent in a variety of courses using Second Life.

- **Pocket Snips**—Laurentian, with partners in Ontario, developed two-minute podcasts demonstrating simple medical procedures such as applying a cast or inserting an IV so health care providers can quickly review procedures on their cell phones before performing them. This has potential for wider applications in any online course where visual demonstration is more effective than text description.  

- **Video on Demand** —Carleton produces high quality television-type recordings of live classes which are then available as video streams or podcasts in online courses. This has reduced costs because the content is copyright free and has already been created by the university for on-campus students. Students reported increased understanding through use of video.  

- **Online Venture Challenge**—Team competitions are common in many business programs, providing important experiential learning. Royal Roads provides this experience to its online students by using wikis, You Tube, and Twitter. Theses social media tools enable virtual team collaboration for students to develop business concepts which they pitch to potential investors, all online.

- **Languages Online**—Increasingly, ICT is being used to improve second-language instruction for students who cannot physically attend classes. For example, Carleton’s VidéoTech tool allows instructors to easily create interactive online exercises based on rights-free videos of French-speaking Canadians in real situations. Spanish, German, French, English, and less common languages such as Russian, Cree, and Nishnaabemwin are offered online, making them available to students anywhere in Canada.

- **Remote Science Labs**—Athabasca students conducting chemistry experiments from home can use remote-access technology to operate high-tech analytical equipment at a remote lab location, providing access to sophisticated technologies and improved learning.

- **CVU universities commit to accept each other’s courses for transfer credit** where courses meet program requirements. In addition, they seek opportunities to share courses to reduce the need to develop an online course that is already available from another university. For example:
  - Royal Roads Environment certificate offers students a choice of electives from 25 other institutions
  - Thompson Rivers Commerce degree directs students to Nipissing for several core courses
Examples of Innovation in Research Related to Online Education

Two CVU universities have invested in research centres dedicated to topics related to online education:

- **LICEF at TELUQ** is unique in Canada for development of models, methods and systems of e-learning in the French language. One outcome has been the creation of an online course design and delivery system that meets the unique language and cultural needs of French institutions. TELUQ also focuses research on the knowledge economy.

- **Technology Enhanced Knowledge Research Institute at Athabasca** promotes research and development of technologies that enhance transfer of human knowledge. Areas of research include Learning Analytics, Open Social Mobile Systems, Adaptivity and Personalization in Informatics, 3D Virtual Classrooms, and Social Networking.

Most universities also conduct research on topics related to improving online teaching and learning, for example:

- **Impacts of Social Media on Learning** examines the impact of technology on access, learning outcomes and cost.

- **Effectiveness of New Learning Technologies** examines the impact of technology on access, learning outcomes and cost.

- **How University Students in Quebec Use Social Media** will inform how to best include these Web 2.0 tools in French online courses.

- Retention and completion studies inform strategies to improve student success, allocate resources, market effectively, and ultimately contribute to a university's competitiveness. For example, Manitoba has ten years of online course retention data and student demographics for the past two decades that help inform strategies to improve quality.

Examples of Innovative Online Programs

Online education allows universities to offer niche programs that typically would have small uptake at any one university, and attract students across Canada. Examples of unique programs:

- **Royal Military College’s Master of Arts in Defence Management and Policy** is a unique program open to military and civilians interested in the security environment, and available online in both French and English.

- **Laurentian’s B.Ed alternatif** is Canada’s only Bachelor of Education degree online (available only in French). A Bachelor of Education online is the one degree most commonly requested via student enquiries on the CVU website.

- **Memorial’s Masters of Physical Education online** is a Canadian first, and possibly the only such degree in North America.

- **Royal Roads’ Doctor of Social Sciences** is Canada’s first applied research doctorate designed exclusively for working professionals. Two other doctoral programs (business administration and distance education) at Athabasca are also firsts and provide increased access to doctoral level studies.

- **Athabasca’s Post-Baccalaureate Diploma in Architecture** is Canada’s first university-level architectural program online (in partnership with Architecture Canada/The Royal Architectural Institute of Canada).
Examples of Online Programs for First Nations Students

• Laurentian’s Bachelor of Social Work Native Human Services is the only culturally-specific social work degree in Canada offered online. 74
• Athabasca’s Bachelor Management Indigenous Organizations blends cultural relevance into management curriculum to help overcome social barriers that discourage full participation of Indigenous students in higher education. 75
• Thompson Rivers’ First Nations Applied Economics 76 supports development of commercial enterprises on First Nation lands and First Nations Tax Administration 77 develops expertise to support competitive market development on First Nation lands.

Examples of Quality Recognition in Canadian Online Education

• Thompson Rivers scored the highest of all BC institutions offering diplomas, associate degrees, and certificates in a 2010 survey of student satisfaction. 78
• Athabasca consistently receives above average scores 79 in Alberta graduate outcome surveys
• 95% of students would recommend TELUQ to peers and 90% of graduates say employers recognize their online credential. 80
• Royal Roads ranked #1 in Active and Collaborative Learning in a 2010 Maclean’s survey of student engagement, showcasing importance of building interaction into online learning. 81
• Memorial is the first distance education unit in Canada to achieve ISO certification for quality of service to students, thus raising awareness of the importance of standardization and continuous evaluation of services to online students. 82

Examples of Innovation in Student Services to Online Students

CVU universities offer innovative student services to meet unique needs of nontraditional learners, for example:

• Adult learners can complete e-portfolios 83 which allows them to document workplace and life-long learning. This can then be assessed for university credit thus reducing the number of courses needed to complete a degree. The digital format allows them to demonstrate digital competency in the areas of self-presentation and critical self-reflection.

• Students with disabilities taking online courses present special needs which universities are now more able to meet through advanced ICT.

• The number of Aboriginal students in online education is increasing, partly as a result of targeted supports. For example, Manitoba provides students with Netbooks instead of textbooks to help develop digital learning skills, Athabasca arranges study circles in remote locations, and Thompson Rivers partners with Aboriginal organizations that sponsor students (over 200 students in 2010-11).

• Military students are particularly well served by online education that is enhanced by support services designed to meet their unique needs. For example, Manitoba provides content on DVD and MP3 if students do not have internet access; it will open a section of an online course so an individual can complete graduation requirements; it relaxes deadlines, refund policies, and residency requirements to accommodate frequent re-location and sudden deployment. This has helped over 1,850 Canadian Forces personnel graduate. TELUQ provides similar flexible support services for military students taking French programs online.
Support for Faculty and Instructional Designers

All CVU universities report lack of enough specialists needed to create high quality online learning. In response, they are creating in-house solutions to help faculty and professionals learn and use new technologies and pedagogies specific to online learning:

- Thompson Rivers has a mandatory online course for faculty who are not “online qualified” and is developing a similar course specifically for administrators working in online education.
- Manitoba, Royal Roads, Thompson Rivers, TÉLUQ, and Athabasca have created degree-credit and professional development programs specifically to address the shortage of expertise necessary to create high quality online courses.
- Mount Royal has a Virtual Programs Administrator assigned to investigate new learning technologies and assist faculty in implementing them.
- Athabasca is piloting a Virtual Media Lab that will test new online tools for potential adoption.
- Carleton supports faculty experimentation through technology innovation fund.
- Nipissing has a dedicated Centre for Flexible Teaching and Learning to oversee online development.
- Laurentian offers awards specifically to recognize part-time faculty who teach online.

Institutional Innovations

New technologies are continuously being applied to improve services to online students and save costs, for example:

- Online drop boxes at TELUQ and Athabasca provide more efficient and secure handling of assignments than emailing assignments back forth between student and instructors.
- E-Letters at Athabasca save $100,000 a year.
- Virtual office hours using SKYPE or web conferencing software at Laurentian allow students to speak to an advisor without travelling to campus.
- Digital libraries at TELUQ, Athabasca, and Royal Roads.
- Increasingly, technology allows for increased self-service online registrar’s offices, which reduce the need for students to contact staff by phone or email, thus reducing costs and providing speedier service.

Barriers to Greater Innovation in Online University Education

CVU universities commonly reported four main themes related to barriers to innovation:

1. Faculty resistance
   - Lack of understanding of the potential of online learning
   - Perception that online learning is inferior
   - Fear that it will cannibalize traditional education
   - Online learning perceived as revenue generating, which goes against academic culture
   - Attachment to traditional textbooks
   - Online is perceived as more work to develop and deliver

2. Shortage of expertise
   - Shortage of instructional designers with expertise and experience specific to online learning
   - Lack of digital technology specialists
   - Competition among universities for specialists in online instructional design and programming
3. Organizational and systemic barriers
   - Traditional infrastructure and policies serve face-to-face students not online students
   - Lack of institutional vision or leadership
   - Promotion and tenure system does not recognize faculty efforts related to online education
   - Lack of national co-ordination results in duplication of efforts
   - Outdated collective agreements

4. Lack of Resources
   - Copyright costs
   - Ongoing costs to update digital infrastructure
   - Training students, staff, and instructors in use of new technologies
   - Time, expertise, and technology required to create high quality online courses
Endnotes


2 Currently, 12 universities from seven provinces support this collaboration: Athabasca, Carleton, Laurentian, Manitoba, Memorial, New Brunswick, Nipissing, Royal Military College, Royal Roads, Mount Royal, TELUQ, and Thompson Rivers.


Some examples include Sisco, Ashley; Optimizing the Effectiveness of E-learning for Aboriginal; Conference Board of Canada; pg 12 and throughout; May, 2010; and Smith Jaggers, Shanna; Online Learning: Does It Help Low-Income and Underprepared Students; Columbia University; pg 12, 18 and throughout; January 2011.


See Smith Jaggers above as well as others such as Nash, Robert D. Course Completion Rates among Distance Learners. Online Journal of Distance Learning Administration; Volume VIII; Numb IV; Winter 2005.


Smith Jaggers, S.


Council of Ontario Universities.


Murdoch, R. http://www.youtube.com/watch?v=RGcPzyioi14&feature=player_embedded


49 http://www.connectivityscorecard.org/


52 The sources for the information in this table are not provided because they are very numerous, and many are not available in English or French (some that are include http://techpresident.com/blog-entry/obama-puts-dollars-behind-open-sourcing-education, http://danielschristian.com/learning-ecosystems/2010/02/23/a-new-foundation-for-21st-century-learning-2011-budget, and http://www.guardian.co.uk/higher-education-network/2011/apr/08/co-produced-courses-future-higher-education). A scan of international online and e-learning public-private and business sector data will reveal many similar examples.


54 http://www.bccampus.ca/nglc-grant-awarded-to-online-science-consortium/

55 http://www.aupress.ca/


57 http://www.distance.mun.ca/portal/index.php?Cat=%22Teaching_and_Technology%22

58 http://www.nosm.ca/pocketsnips/aboutus/default.aspx


61 http://www.licef.teluq.uqam.ca/

62 https://tekri.athabascau.ca/

63 http://newsroom.blog.mytru.ca/2011/02/17/the_impacts_of_social_media_on_learning/

64 http://www.mun.ca/killick/projects/effectivenewtech.php

65 http://www.teluq.uquebec.ca/siteweb/docs/resultats_web2.pdf


67 http://laurentian.ca/Laurentian/Home/Departments/School+of+Education+French/bedalternatif/acceuil.htm?Laurentian_Lang=fr-CA


69 http://www.royalroads.ca/program/social-sciences-doc

70 http://www.mba.athabascau.ca/Titan/aucimwebsite.nsf/AllDoc/7A83B7140388E99587256E13005DD5C6?OpenDocument

71 http://calendar.athabascau.ca/grad/distance_06.php


73 http://www.laurentian.ca/Laurentian/Home/Departments/Centre+for+Continuing+Education/Programs/Programs+List/Social+Work+in+Native+Human+Services.htm?Laurentian_Lang=en-CA


77 http://oncampus.macleans.ca/education/2010/05/13/program-helped-develop-skills-to-learn-on-your-own-3/


79 https://ddr.teluq.uquebec.ca/concours1011/


81 http://today.mun.ca/news.php?news_id=3915