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A 2016 LOOK AT THE FUTURE OF ONLINE LEARNING

Part 1 – ADVANCING TECHNOLOGY AND ONLINE LEARNING – AN IDEAL MATCH FOR THE FUTURE

Part 2 – TRANSFORMATIONS IN STUDENTS, PROGRAMS, TEACHING AND LEARNING, AND POLICY AND GOVERNMENT

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A 2016 LOOK AT THE FUTURE OF ONLINE LEARNING: ADVANCING TECHNOLOGY AND ONLINE LEARNING – AN IDEAL MATCH FOR THE FUTURE

Technology Developments in Support of Learning

Predicting the future of technology is always difficult and most predictions are problematic. This does not prevent a great many people from making them. There is a long catalogue of such predictions, some of which were insightful and many were farcical[1]. But there are patterns of development which we can see, which are likely to continue. Rather than making predictions, here we will look at seven key patterns, which will shape the emerging technologies for learning.

Seven Key Technology Patterns

1. **Machine learning and artificial intelligence will increasingly be used to enable adaptive learning.** Advances in artificial intelligence and machine learning are occurring rapidly, as can be seen in the growth of predictive systems, robotics and new analytical products. As these developments continue, smart devices (we already have smart thermostats, fridges, and televisions) will become ubiquitous. Such smart systems will be embedded in the devices we use for learning and will begin to identify patterns of behaviour and activity, which indicate either remediation or accelerated learning. Such adaptive systems will become more and more personalized over time, as individual patterns of activity and behaviour shape the use of content, assessment and interactions. Learning Management Systems designed simply as delivery mechanisms for content will be replaced by adaptive system in which interaction drives content.
2. **Hand-held, mobile and integrated devices will continue to develop and become the de facto tools for learning, communication and peer networking.** Hand-held and mobile devices are already in the possession of close to four billion people. New, faster devices, which are also lighter and cheaper, will increase adoption, which will also offer more functionality and intelligent apps to support learning. The recently launched Osmo add-on for iPad enables the iPad to support a range of games for learning in three dimensions[2]. We can expect more third party add-ons and apps, which will extend the utility of such devices. We can also expect these devices to strengthen their ability to connect to social networks.
3. **Predictive analytics will grow in significance in terms of student retention and learner support.** Big data analytics are already in use in student recruitment centres, aiming to identify likely candidates

1 For a fun collection, see http://www.buzzfeed.com/lukelewis/26-shockingly-bad-predictions#. yjE0zOMxZ

2 For more information, see http://blogs.wsj.com/personal-technology/2014/05/22/osmo-digital-toy-aims-to-bring-ipad-addicted-kids-back-to-real-life

from pools of enquirers. Such data sets are also being used to predict, from assessment data, students who are most likely to drop-out or temporarily withdraw, based on their patterns of attendance, assignment submission and assignment performance. These data are used to spur active intervention with a view to increasing retention and completion. But this is the tip of the iceberg. We are likely to see much more use of data and analytics aimed at ensuring mastery of knowledge and skills and effective learning. Such predictive analytics will significantly improve the more they are used, since the aggregated data on which they depend will be continuously enriched.

4. **Interconnectivity of devices and systems will be a significant feature of the "Internet of things" and activities**. Homeowners can manage their furnaces from the other side of the world, monitor arrivals at their homes while in flight and deposit cheques in their banks from anywhere. Connectivity and integration are the buzzwords driving the Internet of things. Look at developments in health care. Blood pressure can be monitored continuously by means of the Apple Watch and other devices; exercise trackers are embedded into smart phones; diabetes monitoring is now possible with third party add-ons to a smart phone and soon, we are advised, simple blood tests for a range of conditions will be possible through add-on devices for tablets and smart phones. Imagine these developments for learning – instant flagging of new developments in fields of study, on the fly testing for competencies and skills, instant connections to global expert presentations on topics studied in a course, and real-time viewing of skills in action for apprentices are among the possibilities.

5. **Gamification and virtual reality will enable significant advances in teaching a range of subjects, especially laboratory-based subjects.** Simulations already exist in chemistry, physics, biology, engineering and other sciences. Significant advances in gamification and simulations, as well as the development of easier to use, faster and more innovative "creation engines" are likely or are already taking place. We can expect some of the resultant simulations and games to be available as open education resources (OER), but many will also be proprietary. It is also likely that many of these games and simulations will be designed to test skills and competencies, so that apprentice electricians, for example, can be tested on their abilities largely through simulations. Some of these developments will make use of virtual reality environments, also now quickly emerging.

6. **Translation engines will continuously improve and become embedded in a great many applications.** Buckminster Fuller created the "Knowledge Doubling Curve"; he noticed that until 1900 human knowledge doubled approximately every century. According to IBM, the build out of the "Internet of things" will lead to the doubling of knowledge every 12 hours. To make sense of this knowledge, translation is becoming essential. The faster we are able to translate from one language to another – say, from English to Mandarin and vice versa – then the more we can make use of this knowledge for learning, development and change. Translation engines have been with us since the early 1980s, but are becoming progressively better

and more useful. We are a long way from Douglas Adam's idea of the instant translator[3] which was accurate, fast and seamless, but significant improvements have been made each year for the last decade. Given the extent of learner mobility and the growth of the international student body, these developments may make learning easier for many students.

7. **Collaborative technologies and knowledge sharing will emerge as key resources for all forms of learning.** During the last five years, mainly as a result of the growth of social networking, products dedicated to collaboration and supporting the growth of communities of interest and practice have appeared. Some of these are focused on project management and business, but many are being used for educational networking, resource sharing, collaboration and learning. All of the major learning management systems have collaboration tools either designed in or available as add-ons. Some specialist software – e.g. NING, Core Community, Basecamp – have emerged as leaders in this space. Such systems provide for rapid and easy sharing of documents, videos, games, simulations, and ideas, as well as supporting collaborative groups and focused conversations. Given the power of peer to peer learning and learning networks, these developments are likely to accelerate.

These seven patterns speak to trends and developments in technology which have a direct connection to the design, development, support, and delivery of online learning.

Five Key Features of Online Learning Which Technology Patterns Will Enable

What these seven patterns suggest is that technology will increasingly support five key features of the future for online learning. These are:

1. **Learning is Mobile – Anywhere and Anytime**

   Given the devices which students use for learning – tablets, smart phones, laptops, and occasional access to desktop technologies – a student taking a program or program can be anywhere and can study at anytime. They may have to connect at specific times to interact with a specific person – an instructor, fellow student, knowledge expert, skills advisor, and mentor – but they can be anywhere when they do this. MOOCs demonstrated this, attracting thousands of students from around the world to work together in peer-to-peer networks to develop their knowledge and understanding. While coming together from time to time may be important, it is less important than access, affordability and flexibility to many learners.

2. **Learning is Interactive and Engaging**

   Technological developments will continue to make connectivity, interaction, collaboration, networking and engagement easier and more commonplace. It is not unusual for a student to be connected

3 Douglas Adams. (1979). *The Hitchhiker's Guide to the Galaxy*. London, Pan Books.

to a hundred to two hundred others around the world and, when coupled with translation engines, able to connect with a great many more on an as needed basis. Whether peer-to-peer, student to instructor, or student to network of excellence, connections are all easier now than they were a decade ago. They will get easier, as well as faster, cheaper and smarter. Given that collaboration is the key, not just to knowledge development and learning, but also to finding work, students will use the emerging technologies to collaborate and connect. This also leads them to expect their learning to be more engaging, collaborative and interactive. "Passive" is not part of the lexicon in the emerging learning space.

3. **Learning is Personal and Instruction is Differentiated**

   The value of machine intelligence, analytics and big data use is that it permits "the system" (meaning the technology) to better understand and predict learner needs. Adaptive learning systems – e.g. Knewton, ALEXS, Capterra, DreamBox, Cognitive Tutor, Knowillage LeaP, Planet Sherston and Grockit – enable a high degree of personalization of content and learning activities, based on active student behaviour and assessments. The students feel that their learning is focused on them rather than their having to be part of a class or group, and hence they feel their learning system is more personal. This, in turn, enables instructors to differentiate among students in terms of learning needs and the support provided. As these systems mature and become more refined, ubiquitous and easier to use, we will see much more personalized learning and more routes to achieving learning outcomes.

4. **Learning is Intelligent**

   Just as learning processes can be informed by intelligent systems, so too can the process of knowledge gathering and sharing. Smart content engines, linked to collaborative software and adaptive learning engines, could make learning more relevant, focused and up-to-date, especially at the graduate and advanced levels. Doctoral students can be connected not just to their own instructors, but to the communities of interest and practice associated with their field and up-to-the-minute developments. They can be much more engaged researchers, especially if the volume of new material is filtered through intelligent filters. Imagine courses which automatically update themselves, based on new research and newly available, quality assured open educational resources.

5. **Learning is Global**

   In the 1970s, a student in Sudbury, Ontario could be connected to a small group of other students in their class in Sudbury and, through their instructors and attendance at conferences, a small group of others outside their local circle. A typical LinkedIn member now has some 500+ contacts with whom they can interact daily, weekly, monthly or occasionally. Using Twitter and Facebook, a big idea can find an audience of thousands in seconds. In closed or open collaborative sharing networks, some of which can be dedicated

to specific topics[4], significant global expertise can be available anywhere, anytime. The resources available for course design and development, especially given the growth of open educational resources, can also be globally sourced. There is no reason for a student to be disconnected from peers, experts or sources of knowledge and understanding from anywhere in the world, especially given the growing efficacy of translation engines. Knowledge and learning are truly global endeavours.

If these five features of online learning can be fully realized through current and emerging technologies, then online learning (whether blended or fully online) will continue to grow and develop.

Institutional Context for The Development of Online Learning

Technology enables online learning, but does not drive it or determine its growth. Institutional strategies, student demands, individual faculty decisions and the availability of resources act as the determinants of the development of online learning. But these too are changing. In particular, we should pay attention to these six features of our developing post-secondary education system:

1. **Institutions are Complex and Competitive**

   A variety of factors are making higher education more complex. There are more collaborative programs, regulatory conditions, ethical and ethnic sensitivities, research networks, joint ventures, infrastructure challenges, technology security issues, human resource challenges, financial challenges, links to business, outreach work, international students, and multi-campus locations – all of these add to the competition for students, faculty and resources. There are also many more social pressures, fuelled by social media. Changing what and how a college or university teaches is no longer an internal matter; it quickly becomes a focus for public debate.

2. **Resources are Constrained**

   Public per capita funding for post-secondary institutions in some parts of the developed world is falling at a time when demand for student places (at least in most jurisdictions) is rising. Students are paying more of their own costs for their learning and the speed and scale at which these fees can rise is constrained by both public policy and market conditions. Together, these key revenue factors determine what institutions can do and how quickly they can do it. Faculty can be an asset and a constraint: they are the dominant component of the cost structure of colleges and universities, unionized in many places with the resultant contractual obligations based on a model of teaching, learning, research and service, which may no longer fully reflect the conditions faced by institutions. Much of the post-secondary infrastructure in the developed world is ageing and needs investment, as does much of the technology infrastructure. Yet it is the faculty and the infrastructure that have enabled innovation and

4 For example, see https://blab.im/

development to date. While limitations on revenue and growing costs provide constraints, the available funding also provides significant assets which can be leveraged.

3. Demographic Shifts Impact Activity

College or university student populations do not look the same in 2015 as they did in 1995. There are more international students; more students for whom English is an additional language; more mature and part-time students; and more students using transfer agreements, prior learning assessment and other arrangements to fast track their degrees, diplomas and certificates. Students seek more flexibility in how programs are delivered and how they secure their qualifications. While technology is enabling this flexibility, it would be a mistake to think that learners are simply demanding more online learning. What they are seeking is greater flexibility and a more personalized learning journey. Just as the student body is changing, so too are the demographics of the faculty, with more staff who are older, adjunct and part-time staff, raising new issues in managing people within the institution. Demographics are major drivers of change in post-secondary education.

4. Quality Is an Imperative

Almost every analysis of post-secondary education gives emphasis to the need for quality programs and learning experiences for students. In a highly competitive environment, quality is a key factor in student and faculty choice and in the decisions made by governments to invest or divest. Universities and colleges seek recognition for their quality and efficacy, seeking accreditation for professional programs, student services and other activities, to be able to demonstrate quality. As quality requirements change – with the evolving inclusion of student engagement, online learning design and the learning outcomes based achievements measures – so colleges and universities adapt. While the evidence is strong that online learning is not significantly different from other forms of learning design in terms of learning outcomes[5], demonstrating this consistently across a range of programs is now essential.

5. Change Is Inevitable, but Difficult for Colleges and Universities

Factors listed in this document and elsewhere are leading to substantive and significant changes in the design, development and deployment of programs and courses within universities and colleges world-wide. They are also leading to downsizing, mergers,

closures and acquisitions, most especially in the private college and university sector. Change is difficult (Koelbl, 2015[6]). Some systems are adjusting. For example, all public universities in Malaysia are now accessing MOOCs for first and second year students, following a decision by the government. They use proctored examinations

5 See the accumulated evidence at No Significant Difference - http://www.nosignificantdifference. org/

6 Koelbl, J.J. (2015) The Brink of Closure – What Motivates Higher Education to Change? *Educause Review*, September 1, 2015.

for credit completion, with the resultant credits being transferable to any university in the Malaysian public system. Another example is the Kentucky Community Technical College System which offers enrollment in its micro-courses (all of which carry credit) 365 days a year. Others are changing more modestly and incrementally so as to secure the buy-in of faculty, students and the public. But change is occurring now more rapidly than in the past. This does not make it easier nor are all of the changes successful.

6. Relevance and Value Shape Strategy

There are increasing demands for programs and courses to be relevant and create value. Governments are asking colleges and universities to bridge the skills gap between the needs and demands of employers and the available skills in the workforce[7]. Governments are also asking for a return on their investment in higher education. Outcome-based performance metrics are to be used to demonstrate where the value of a credential is linked to employment, earnings, health, social contributions and other factors. At the same time as governments change or reduce their per-capita funding to institutions, they are demanding more reports and accountability statements showing productivity, performance against outcome targets and efficiency. The challenge here is that the skills needed for the economic development of a jurisdiction change quickly – who can predict what skills will be needed to support a knowledge-based economy as it evolves?

What is clear from these six observations, and the points raised by many others[8], is that our higher education systems are in transition from an established and clear model to new and uncertain models in response to a different future. These changes are being driven by a variety of factors, but the key to success is the development of a coherent, focused and systematic strategy for development, which takes full account of the realities of the challenges which institutions face in terms of learners, programs, teaching, and policy. The second section addresses those changes and their inter-related impacts on all aspects of institutions and of learning,

7 An example of the skills gap in Canada can be found in the Conference Board of Canada (2013) *The Need to Make Skills Work: The Costs of Ontario Skills Gap*. Ottawa: Conference Board of Canada.

8 See, for example, The Future of Higher Education – an online conversation at https://theconversation.com/au/topics/future-of-higher-education (Retrieved November 18, 2015).

A 2016 LOOK AT THE FUTURE OF ONLINE LEARNING: TRANSFORMATIONS IN STUDENTS, PROGRAMS, TEACHING AND LEARNING, AND POLICY AND GOVERNMENT

In this two-part consideration of the future of online learning, we look at the patterns and trends which will shape online learning in the future and how the various components of the post-secondary education system, such as student population, course design and delivery, assessment, resource bases, teaching and learning models, and partnerships will be different from what we have now. The first section, **A 2016 Look at the Future of Online Learning: Advancing Technology and Online Learning – An Ideal Match for the Future,** looks at developments in technology and what potential they offer for better learning, teaching, collaboration, mobility and other key aspects of online learning.

The second section, **A 2016 Look at the Future of Online Learning: Transformations in Learners, Programs, Teaching and Learning, and Policy and Government,** is a more in-depth consideration of the inter- related changes we see taking place across online learning and the implications of this for post-secondary education.

What does the future hold?

Given these observations, what will online learning look like in the future? What does strategic foresight suggest? How will online learning support and be affected by the changes and shifts imagined here?

Overall, it is the system of post-secondary that will be different. What we have outlined here are the inter-related changes most likely to occur within the key components of the system – students, programs, teaching and learning, and policy and government.

Student Demand WILL CONTINUE TO GROW AND CHANGE

Demand for higher education from Canadian institutions will continue to grow, but who will be making these demands and what they expect are likely to change significantly. In particular:

1. More mature students looking for flexible learning options will seek access to and success in programs. This in turn requires programs to provide varied routes to completion, some of which will be online.
2. More international students seeking credential recognition and completion, having started or completed programs elsewhere in the world are not willing to start an entire program again. This gives emphasis to transfer credits, international credit recognition and more focus on the assessment of knowledge, skills and competencies as a basis for prior learning assessments.
3. More international students seeking credentials from Canadian colleges and universities, but doing so on the basis of a competitive value proposition when compared to USA, UK, Australia or other

opportunities. Canada competes with the US, UK, Australia, and other countries for these students who make their decision on the basis of quality, price and relevance. So as to attract more students, Canadian institutions need a strengthened value proposition. Flexibility may be an attractive proposition for many of these students.

4. More students seeking knowledge combined with employable skills programs. This speaks to the need for more collaborative programs between colleges and universities and more joint credentials. More students will be making decisions on the basis of a cost-benefit analysis, linked to the long-term value of their learning investment, with more lenders undertaking these calculations for their student customers.
5. More students seeking shorter programs, which are skill-based and work-ready, means that the demand for micro-credit, nano-degrees and badges will grow. This is already occurring, with colleges and private providers partnering with firms, professions and industry associations to develop competency assessments which can be used irrespective of whether or not the person being assessed has studied formal programs or courses: it will be skills that matter.

We can summarize these developments by saying that there will significant niche markets for learning, each of which has different needs and requirements: one size will not fit all. We can further observe that learners will increasingly be looking for the institution to fit in with their learning rather than the learner having to fit in with the institution. This in turn speaks to the requirement for much more flexible programs, more personalization and more use of a range of means of assessment.

Programs Will Look Very Different

One implication of the changes presented above focused on student characteristics and demand is that program design will be very different. The new focus on outcomes and what learners know, can do and how they can apply their learning, means very different program designs, whether the program is online, blended or more traditional. Here are some of the changes we can expect to see:

1. **More flexible program designs.** More programs will be offered with a small core of courses focused on basic knowledge and skills (4-6 courses), which then permit the learners to construct the balance of their program from a very wide range of options. A design such as Athabasca University's Masters of Arts in Integrated Studies[9] or other mix and match programs, will be more common than the rigid requirements of many current diploma and degree programs. In addition, using e-portfolios, transfer credit and prior learning assessment and recognition (PLAR), as well as adaptive learning systems, learners will take varied routes to the end point that matters to them. Rather than residency requirements and quality being linked

9 Details at http://mais.athabascau.ca/

to time in class, the focus will be on outcomes.

2. **More use of open educational resources.** The open learning and open source movement has created close to one billion open educational resources (OER) ranging from complete courses, to modules that can be used within courses, to simulations, games and learning activities that can form part of the learning agenda. These are freely available on iTunes University, OERu, OER Commons, Merlot and many other platforms. Many MOOCs are accessible year round as learning materials, with mentors and coaching available. Faculty can build OERs into courses or learners can find their own route through these materials, especially if they also access machine intelligent assessments to track their progress.

3. **More creative assessment processes.** Now that many aspects of cybersecurity and verification can be managed with biodata, the integrity of online assessment in terms of who is taking the test can be assured. Assessment has two purposes:

   - assessment *for* learning – aimed at helping the learners progress through their learning journeys by highlighting areas they are strong in and those needing more effort; and
   - assessment of learning – which is a learning outcomes assessment at the end of a course, stage of a program or the program itself.

   New methods of assessment, which leverage cognitive neuroscience, machine and artificial intelligence, simulations and games, and real world challenges are now appearing which speak to a renaissance in assessment (Hill and Barber, 2014)[10].

4. **More micro-credit and** nano-degrees. The growth of short programs, badges and other forms of recognition for learning will continue. Some of these will be employer designed; others will be undertaken collaboratively between industries and post-secondary institutions or between institutions. The narrow range of routes to recognition will dramatically expand.

5. **More co-op and experiential components within programs.** There are growing demands within Canada for students to have international experience and for learning to be undertaken in real world environments and through project-based or lab-based work. Currently, some 55 universities, 26 colleges and three institutes offer some 1,100 co-op programs[11]. This will continue to expand, as will other forms of experiential learning and work-based learning. While students are off-campus, their learning will be supported by online communities of practice, technologies, and learning resources.

6. **More international collaborative programs.** Colleges and universities in Canada are already very active as partners with

10 Hill, P. and Barber, M. (2014) *Preparing for a Renaissance in Assessment*. Available as an e-book at http://pageturn.co.uk/pearson/preparing_for_a_renaissance_in_assessment/ (Retrieved November 11, 2015)

11 Source: University Affairs at http://www.universityaffairs.ca/news/news-article/co-op-programs-are-popular-and-growing-at-canadian-universities/

colleges and universities around the world. Joint programs, collaborative programs and faculty exchanges are common. What we can expect to see in the future is a significant and substantial expansion of these developments, with more institutions partnering to offer more options within programs.

7. **More transfer and qualification recognition agreements for programs between nations.** The EU and the Commonwealth both have substantial trans-national qualification agreements and these are now being negotiated into trade agreements, such as the Canada and European Union: Comprehensive Economic and Trade Agreement or the Trans Pacific Partnership Agreement. We can expect more reciprocity, especially for professional qualifications, and more transfer agreements for partially completed qualifications. Learner mobility will be a dominant theme of public policy world-wide.
8. **Blurring of lines between college and university.** With the growing number of joint programs between colleges and universities, a student can graduate with both a degree and a diploma, demonstrating expert knowledge and practical skills. We can expect the number, scope and level of these to increase and for laddering (apprentice to diploma, diploma to degree, diploma with a degree, degree to diploma) to continue to be the cornerstone of program development.

   Not all of these developments rely on online learning, but all of them are aided by the opportunities such learning affords. Most of these developments require regulatory change, change of quality assurance regulations and a relentless focus on outcomes, rather than process.

Teaching and Learning Will Change

Just as the pattern of demand and the nature of programs will change, so too will the way in which students learn and faculty support this learning. Seven key developments we see in this future are:

1. **Learning will no longer be defined by time, place or institutional offerings.**

   Learners will expect and secure access to learning anytime, anywhere on their schedule. This will include a growing number of short courses (2-3 weeks in duration) which carry credit, weekend and intensive learning sessions, as well as longer compressed learning periods (6-8 weeks). Admission to programs and courses will allow for multiple start dates, the cycle being driven by demand, not availability of academic or instructional staff. New forms of support for learning - instant mentoring, online peer networks, and coaching from global support structures – will meet this demand. Learners will drive provision – they will no longer have to fit in with the schedules designed by others.
2. **Learners will create their own learning agendas, which reflect their own career, personal and lifelong learning goals.**

   The shift from institutionally determined programs to skills and

competency-based programs determined by labour market needs or individual learner preferences will reduce the reliance on formalized program structures and increase the ability of learners to mix and match their learning activities against their learning agenda. Some of these agendas will be set by the professional bodies and accrediting organizations, while others will be set by individual learning interests, passions and commitments.

3. **Learners will secure their learning outcomes through a combination of formal, informal, self-directed, instructor delivered, in class and online learning.**

   One key difference between now and future learning relates to how learners acquire knowledge and skills. In the future, routes to knowledge and skill acquisition will become much more varied. Students might take courses from post-secondary institutions (as a great many will continue to do) or obtain their knowledge and skills through self-directed learning, informal learning networks, intense workshops, online learning from public or private sources, open educational resources, mentors, coaches or other means. As we move from time in class to knowledge, skill- and competency-based assessment as the basis for credit recognition, employment and professional development, how a person gained knowledge and skill will be less important than the fact of mastery.

4. **Learners will expect personalized learning services and supports for their learning agenda**.

   As personal investments of time, money and energy in education increase, expectations of service and quality will rise as well.

   Learners will expect fast, reliable and quality services, not just in terms of courseware and coursework, but also in terms of all of the related services – mentoring, coaching, guiding, advising, knowledge management, financial services, and information and registration services.

   This in turn will require a refocusing of our understanding of quality to one based on learner engagement and satisfaction with the learning experience. Assessing the quality of peer-to-peer and instructor-to- peer interaction, assignment feedback, learner engagement and other essential components of learning will all form part of this different approach to quality assurance.

5. **New mechanisms for meeting personal learning agendas will appear in the market as the "unbundling" of learning continues.**

   "Unbundling" refers to the separation of the components of the learning and credentialing process, potentially separating course design, development, delivery, support, assessment, and credentialing. Learners will be able to select the providers of content, the mentoring and coaching for mastery and then undertake assessment in dedicated assessment centres so as to secure recognition by professional bodies, credit coordinating agencies, and/or universities and colleges. Given that quality no longer relates to residency at any one institution but to competencies and

mastery, unbundling is the key to personalized learning routes and differentiation of providers.

6. **Courses will be less important than mentoring, coaching, counselling, advising and assessment.**

   The implications of unbundling are that the real focus for the future is on providing opportunities for the assessment of learning and guiding learners towards their assessments. This is aided by significant developments in our ability to assess competencies and skills, supported by immersive technologies, simulations, machine intelligence and adaptive assessment. Hill and Barber capture this in their 2014 paper Preparing for a Renaissance in Assessment and we can see employers and professional bodies moving quickly to create rich assessments offered frequently so that learners can be assessed "just in time" and on the learners' timetables.

   To support this focus on assessment, learners will turn increasingly to coaches and guides to help them navigate their learning journey.

   While some instruction may be necessary for some components of learning, it will be the case that many of the learning needs associated with needed competencies can be acquired through a range of different routes: navigating these requires expertise.

7. **Diverse and new forms of credentials will appear, which reflect the varied needs of learners, employers, social agencies, innovation organizations and entrepreneurs.**

   As has been suggested, many significant employers now look less at what the credential is and look more carefully at what an individual can actually do. To help them assess this, more and more employers are looking to proofs of work-based learning, badges, evidence from learner portfolios of projects completed and other forms of evidence of knowledge, skills and competency.

   In the UK, answering this question has led to a new kind of document known as a Higher Education Achievement Report[12], which documents more of what the learner can actually do than a traditional transcript.

   Similar developments are occurring in the US with the development of a Postsecondary Achievement Report. Both of these developments are in their infancy.

   Digital badging – recognizing competencies and skills based on agreed rubrics – is also emerging as a way of recording learners' mastery. A number of MOOC providers are also offering credentials. Udacity, for example, has over 10,000 individuals enrolled in nano- degrees, designed in partnership with major employers. Coursera is offering verified certificates (verified by partner academic institutions).

   Alternative credentials are unlikely to replace the traditional degree or diploma any time soon, but they offer another option for professionals

12 For more information, see http://www.hear.ac.uk/

and learners alike, and may eventually become more integrated within formal programs. For a time, these various credentials will present a confusing landscape for employers and learners, but some of these will emerge as leading the pack of credentials as essential for employability.

Policy and Government

We have explored significant developments in technology and online learning and their implications for teaching and learning. Now we look at what we can expect to change in terms of public policy. Before we do so, it is important to see three contextual factors shaping this work. These are:

- continued pressure on public finance as a result of demographic shifts, shifts in the energy economy and the new financial implications of international trade and related agreements;
- the increasing complexity and competiveness of higher education systems placing new demands on governments to rethink their roles as stewards and regulators – the demand being to reduce controls so as to enable institutions to make effective responses to market conditions, while at the same time protecting the public interest and the efficacy of their investments; and
- growing investment in education within the private sector[13] and a growing number of public - private partnerships to deliver to educational outcomes.

The context of public policy is changing. Five key developments can be anticipated:

1. **Significant Changes in the Way in Which Higher Education Is Funded**

   While per capita funding will continue to reflect overall economic conditions, the funding mechanisms used for higher education will change. This is already clear in Canada with Ontario, Alberta and the Maritime Provinces in the midst of funding model changes. The shift will be to funding social, economic and learning outcomes and away from funding processes and enrolment. Governments will recognize that changing the funding model also means changing the extent of regulation and control. A comprehensive rethink of the role of governments is what will unfold, but it will not take place quickly.

2. **Strong Focus on Quality Assurance, with a New Understanding of Quality**

   In a growingly complex market, becoming more international and competitive, quality assurance will play an increasingly important role. Student will have more input into quality assurance standards and measures. The new focus will be on the experience of learning rather

13 2015 was in fact the most significant year for such investments – see http://hackeducation. com/2015/12/23/trends-business for an analysis of these investments

than the design of programs and courses. Quality assurance will look for:

- Programs which have meaning and value and engage them in authentic learning.
- Faculty members defined by how engaged they are in supporting the learning needs of students and how creative they are in designing engaged and authentic learning.
- Flexibility in how, when and where students are able to learn.
- The affordability of learning and the relevance and benefits of achieving learning outcomes.
- Recognition of learning (past and present) by post-secondary institutions and employers and the authenticity of assessment.

3. A Commitment to Learner Mobility

The European Union is committed to learner mobility as a principle, and this drives a great deal of public policy amongst member states with respect to higher education. Ensuring transnational qualifications alignment (e.g. Bologna process) and credit transfer arrangements within and between nations enables learners a great deal of flexibility. Canada currently is lagging behind many other jurisdictions with respect to learner mobility. We also lag behind other jurisdictions in terms of the international experience of higher education students. Both of these features will change as governments require better transfer credit arrangements.

4. More Public - Private Partnerships

Many colleges and universities in Canada are partnering with private education and educational technology companies, seeing them not just as vendors but as true partners in providing learning pathways. We can see strong partnerships between employers and higher education institutions in delivery and the recognition of learning. Badges and micro- and nano-credentials are often negotiated in partnership with major employers. We can also see a slow but gradual expansion of the recognition of work-based learning activities for credit within college and university programs.

In the field of apprenticeship, which has always been a partnership between employers, unions and colleges, we can expect an acceleration of e-apprenticeship and the development of outcomes based and skill centred assessment centres.

5. A Strong Focus on Outcome Based Accountability and Public Assurance

As governments focus more on outcomes and impacts, they will strengthen the evaluation and measurement regimes which provide the evidence base for public policy and public assurance. More attention will be paid to measures of student engagement, learning outcomes, value added to the economy, and impact of the work of colleges and universities on communities, industrial sectors, innovation and health. The higher education equivalent of the secondary school based Programme for International Student

Assessment (PISA), developed by the OECD and widely used for policy development within jurisdictions, will emerge, despite failed recent attempts to introduce such a measure[14].

There will be other developments, but these five are certainly evident in current public policy discourse and are likely to grow in significance.

What Do Colleges and Universities Need to Do?

When we examine these suggested patterns, trends and likely developments, the obvious question is: "What should college and university leaders do?"

There are several responses to this question, but we outline five here as a basis for stimulating an inspired conversation.

1. **Start engaging in strategic foresight as the basis of strategic planning.**

   A great many strategic planning processes begin with the present and project development to the future. A different approach, widely adopted in a number of sectors, is to start with the future and come back to the present. Planning for a different future begins by committing to that different future and then working to make it happen.

2. **See students as partners, not customers.**

   The period 1990-2000 saw the language of customer service and service quality begin to shape some institutional practices in colleges and universities. The argument was that as students were paying more for their learning, they should be seen as customers, not just as learners Students should be increasingly seen as engaged and active partners in the design and development of institutions, as well as actively involved in all aspects of program and course design and deployment.

3. **Rethink the Role of Faculty.**

   A key to the future is an understanding that the focus for and the nature of learning is changing. As program design, learning activities and learner engagement change, so too will the role of faculty. Faculty roles will shift from instruction to coaching, guiding and mentoring, while learners make more extensive use of online learning and open educational resources. Blended learning developments and moving from a limited to much larger number of course start dates, for example, will change faculty roles. While constraints are significant, experimentation and creative use of the collective agreements are required to increase the productivity and nimbleness of institutions.

14 OECD introduced an outcome based assessment for higher education known as Assessment of Higher Education Learning Outcomes (AHELO) in 2011-12, but this work has not yet been widely supported. Several regional evaluation and analysis models are in development and use and Ministers return to this theme frequently as meetings of OECD and the Commonwealth.

4. **Rethink outcomes and impacts and re-imagine assessments and accountability.**

   Anticipating both a different focus for learning and for public assurance and accountability, institutional leaders should shape the agenda for institutional outcome and performance assessment, while at the same time accelerating significant developments in terms of assessments of learning and assessments for learning.

   The next decade will see significant focus on learner and institutional assessment and outcome evaluation. Smart institutions will want to shape how this work unfolds.

5. **Build collaborations (local, provincial, national and international) and partnerships.**

   Collaborations and authentic, value driven partnerships will shape a great deal of the future of higher education. Institutional leaders, having identified key elements of their strategic intentions and shaped their future, need to find the natural allies and collaborators to accelerate their journey to that future. Few institutions will be able to make this journey alone.

   The key message here: think back from the future, leverage collaboration, and rethink key roles and accountability as part of an accelerated route to a different future. As learning and the public policy context shifts, colleges and universities need to be seen as driving this agenda rather than playing catch up.

Disruptive Challenges Ahead

Working from a substantial and ongoing environmental scan, we have focused here on online learning and developments in higher education. Many will disagree with the observations and implications outlined here – the future is always a contested space. What is clear is that the future is not a straight line from the past – there are challenges, disruptions and far-reaching opportunities ahead.

We hope to inspire a conversation about what work colleges and universities might be engaged in the next few years and to create a sense of urgency about a change and development agenda for higher education in Canada. The future really isn't what it used to be.