Contact North | Contact Nord
Ontario's Distance Education & Training Network

ACCESS • INNOVATION • COLLABORATION

HOW TO KEEP ONLINE LEARNING AT THE LEADING EDGE

Under the patronage of His Highness Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum, Crown Prince of Dubai and President of Hamdan Bin Mohammed Smart University

Innovation Arabia 9
7 – 9 March 2016
Dubai

March 2016
contactnorth.ca

HOW TO KEEP ONLINE LEARNING AT THE LEADING EDGE

Online learning is an established, integrated part of the higher education learning landscape in the Arab and other parts of the world.

In the United States, for example, 2.85 million students are studying their college or university program entirely online and an additional 5.8 million take one or more fully online course as part of their program of studies. Blended learning is increasingly the standard for how teaching in higher education is undertaken. Technology-enabled education is a world-wide feature of higher education.

But there are challenges. Not all faculty, even in colleges or universities very involved in online learning, support online learning – some 35-45% do not consider online learning of sufficient quality or efficacy. Not all courses have high levels of student engagement; some provide few opportunities for students to construct their learning. Not all online programs and courses are well designed – indeed, one Massive Open Online Course (MOOC), offered by Coursera, was withdrawn after one week because it was so poorly designed. Ironically, the course was Fundamentals of Online Education: Planning and Application.

If online learning is to continue to develop, expand and become even more central to all of our higher education systems, then we need to push some key boundaries, test new approaches and find new limits, particularly in these five areas:

a. Teaching and Learning
b. Access and Flexibility
c. Assessment
d. Programs and Course Delivery
e. Learning Environments

This is our focus: how do we expand the boundaries and test the limits of online learning so more students are more successful and their learning has a greater impact on society, economies and culture?

Expanding the Boundaries... Testing the Limits of TEACHING AND LEARNING

Pedagogy is a design science. We know a lot about how different kinds of students learn and about the ways in which learning can be enriched through simulations, games, challenging problems, experiential learning and field work. Developments in learning analytics and adaptive assessment now enable us to differentiate instruction and engage in much more personalized learning. Our increasing understanding of neuro-linguistic pathways for learning – cognitive science – also helps us significantly improve learning design. But most in higher education are not doing this.

Most of our colleges and universities are designed physically to support a model of batch learning, face-to-face instruction and conventional learning. Rather than designing new campus buildings for personalized, engaged and project-based learning, we continue to design our instruction and facilities for a model of learning designed in a different place for a different time.

There are three things we need to do to expand the boundaries for teaching and learning:

1. Stop thinking there is a particular, deliberate and defined route to learning outcomes and let students choose their route to completion.

The University of Wisconsin started to offer a competency route to a degree based on competency assessment. Known as the "flex option", courses are not required, but rubrics for competency are very clear and explicit, making learning focused and direct. The University suggests appropriate learning resources for leaners to use to support program completion, but courses are not needed. Students can use the mentoring and coaching services of the University when they feel the need of assistance. When ready, the student calls for a mastery assessment. Such a program is similar to the Western Governors University offering. They are not alone in doing so. In the US, Southern New Hampshire University, Capella University, Kaplan University and Walden are all offering this same route to a degree.

In his call for free college education in the United States, President Barack Obama recognized these developments as "game changers" for skills[1]. This model is growing quickly in the United States and around the world. It marks the end of the Carnegie unit – time served in class coupled with course-based assessment – as the basis for program completion and the beginning of a movement to "unbundle" education.

2. Worry less about content and more about engagement. This is essentially about design. The suggestion is to take a more constructivist approach to teaching and learning, with students encouraged to use learning materials (textbooks, open educational resources, resource libraries) and projects to master knowledge, competencies and skills through projects, activities, and challenges. Passive mastery of a body of learning is less effective that active engagement in the work of learning.

3. Re-think the Role of Faculty. Thinking differently about design, deployment and delivery requires us to think differently about who the faculty are and what it is that they should do. They need to have an in-depth knowledge of a specific subject, but they also need to become learning designers. "Sage on the stage" needs to be replaced by "mentor, coach and guide" for the learning

[1] Speech in Buffalo, New York, August 22, 2013.

journey. Rather than knowledge expert, faculty need to focus on designing learning activities, challenges and experiences which inspire, engage and enable students to understand the subject matter and skills involved at a deep level. Rather than being temporary, deep learning needs to be memorable and mindful.

All of this can be aided by developments we are seeing in technology and by the shifting demographics of higher education.

Expanding the Boundaries... Testing the Limits of ACCESS AND FLEXIBILITY

It is estimated 262 million will be enrolled in higher education around the world by 2025 – an increase from 165 million in 2009. This growth will be absorbed by new approaches to learning, more open and online institutions, more internationalized learning and greater student mobility. New colleges and universities– both public and private – will emerge, but so too will new approaches to the scalability of higher education.

In this context, scale means a program or course attracts a significant number of students who are both highly satisfied and engaged in their learning and secure high levels of completion in what is accepted as a quality program. For example, Athabasca University's MBA began with just 60 students and now has over 1,000 each year – getting to scale secured the revenue Athabasca needed to also launch a doctoral program and specialized versions of the MBA, as well as non-credit post-graduate programs and courses. The Indira Ghandi National Open University in India was created to give access to quality distance education programs for India's growing population. Each year, it offers programs and courses to over 3.5 million students.

Scale is about more than revenue and program growth. Many colleges and universities offered MOOCs so as to make their presence felt globally, especially in fields in which they wanted to develop a global reputation for excellence and research. MOOCs were as much about building brand presence as they were about increasing access to learning.

Getting From Small Scale to Large Scale

There are several studies of the challenges of getting to scale. They all focus on a set of key issues:

1. Understanding and analyzing the potential of a development and the limits to scale.

2. Effective design of the student experience from first hearing of the opportunity through to graduation – a very complex set of challenges where scale makes a difference to the ability to deliver.

3. Changing the roles of key players in the student experience – faculty, advisors, financial support providers, registrars and others.

4. Managing the risks of moving from small scale to large scale.

Colleges and universities are, in general, poor at market analysis and research in part because this is a difficult task for any organization and also because they are unable to spend the kind of resources on securing appropriate professional help.

A comprehensive global market scan can cost a great deal and even regional scans (North America, Europe, the Trans Pacific Partnership zone) can be very expensive. In the end, a reason innovations remain small is there is no confidence in estimates of the size of the opportunity and a general avoidance of risk, especially in public higher education institutions.

A second reason relates to the complexity of any scalable innovation. Look at the "map" below of the range of services and supports associated with a program of studies at a college or university. Each of these activities has to be re-engineered to go from a program with 100 students to a program with 1,000, 10,000 or 300,000 students if, that is, the college or university wants to have a strong reputation for quality and excellence and wants to strengthen its presence in its chosen markets rather than weaken its position.

There are a total of 31 separate functions on the diagram which need to be thought of in terms of scalability. Some may not be needed. For example, the extensive use of open educational resources may eliminate the need for a bookstore and the course can be designed to eliminate the need for ethical and legal services. Still, a lot of re-engineering of services is also something colleges and universities try to avoid – "we have ways of working which work for our normal operations, but will not work well for this scale..." is what is often said.

[2] Fogg, B.J. (2009) A Behavioral Model for Persuasive Design. Available at http://bjfogg.com/fbm_files/page4_1.pdf

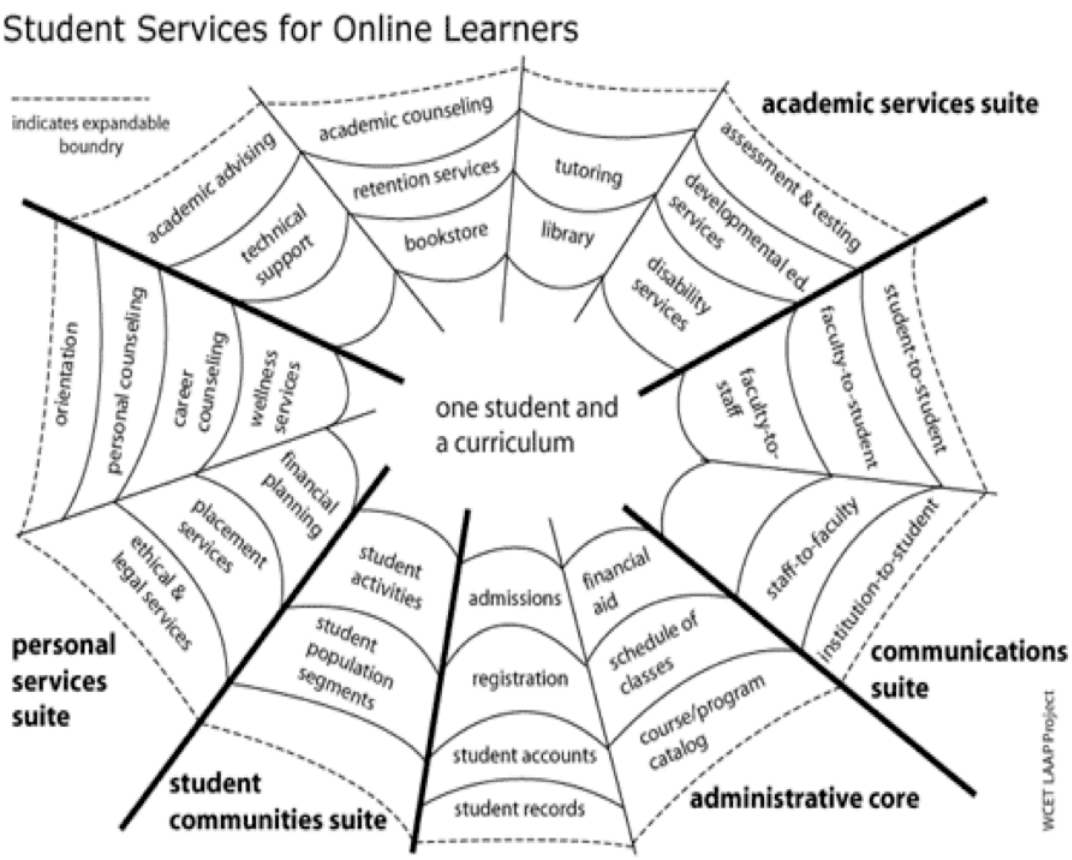

Figure 1: Student Support Functions for an Online Course

Major transformations at scale are occurring and are possible. For example, at the University of Technology Sydney (UTS), a significant and highly prized change has occurred across the University, which currently has some 39,000 students. In a major rebuild of its campus (a $1 billion development), it did not create many traditional teaching spaces (there are some lecture rooms) or replicate old ways of teaching and learning, but instead built “an engagement campus” around the idea of the flipped classroom. UTS’ strategy transforms students learning through aligning: curriculum renewal and innovation; curriculum-led learning technologies; and new learning spaces. It impacts every student, instructor and program, and has had a major positive impact on learning outcomes and student performance. This campus of the future has changed the practice of teaching and learning for all at UTS.

Here is another example. Medical education is changing. As Canada moves towards competency-based medical education, individuals seeking certification can use a new and widely recognized evidence-based learning engine called Osmosis. It is a web and mobile learning platform that allows students to create, engage, and share within a global learning community. Focused entirely on medical education at this time, students can create and gain access to tens of thousands of questions, flashcards, and videos, but the idea is much bigger than simply an online library of resources.

Similar to evidence-based medicine, Osmosis is committed to evidence-based education. The Osmosis team includes PhDs in neuroscience and education, practicing clinicians, and medical students, who built proven cognitive techniques into the platform so as to maximize learning and retention. The platform includes: test-enhanced learning, spaced repetition, memory anchors, collaborative learning, learning built on the Fogg behaviour model[2], and gamification, among others. This platform is infinitely scalable, both for medicine and other disciplines. It currently has 29,000 users from over 300 medical schools. It was developed by a creative team and won the 2015 Reimagine Education Prize for innovation – a kind of Oscars for learning innovations.

These two examples and many more suggest getting to scale is possible if we focus on the end goal and re-engineer all aspects of design, development, deployment and delivery. For example, using machine intelligent assessment engines would enable competency-based assessments for a specific set of skills on 250 days a year rather than just a few; thinking differently about student support for learning could open up courses to 365 start dates each year. Getting to scale requires us to focus on what matters and imagine how we could do the work differently to attract a larger volume of qualified and able students.

If we are serious about increasing access and success, achieving significant gains in learning outcomes and doing so in a way that brings in new revenues, then we need to think about scale to get there. Thinking big requires us to understand all of the small processes, cost drivers and roles that need to change when we scale up. Doing what we have always done and expecting different results is unlikely to be the route to success.

Expanding the Boundaries… Testing the Limits of ASSESSMENT

Technological developments are enabling a re-thinking of how, how often and where students are assessed.

There is a distinction drawn between assessment and review intended to facilitate the next stage of a student's learning (assessment for learning) and the summative assessment of a student's knowledge, skill and competencies (assessment of learning). These developments in particular appear important:

- More advanced automated assessment – item generation, assessment design and marking.

We already have highly efficient and effective basic test item generation and marking systems for multiple choice and short form essay items, such as those just described. We are getting closer to long form essay marking systems.

• Providing meaningful tutoring at anytime.

Artificial Intelligence (AI) systems can appear very human and very well informed, which is why AI counselling systems online are seen to be effective. AI tutoring systems are already emerging – mainly in the areas of mathematics, writing and basic science. The range and quality of these services will quickly expand, especially since tutoring is a fast growing business.

• Predicting student behaviour and outcomes.

Can we predict when a student will drop out, fail or find a particular section of a course difficult? Using behavioural analytics, analysis of every past student's behaviour in an online course and their behaviour on other courses, systems exist, which can provide predictive analysis and encourage active intervention to prevent dropout, failure and enable a higher level of student success.

• Adaptive learning systems.

If you login to an Amazon account, their AI engines suggest books or items you may be interested in based on past patterns of searching and buying. Google adjusts search results by location and past search behaviour. As these systems become more sophisticated, they are integrated into adaptive learning engines, which change the content of a course based on student behaviour and performance.

As the student completes self-assessments, the system changes the next set of materials they see so they reinforce areas of strength, but significantly enhances activities and resources linked to areas of weakness. More recently, such systems also adapt to the learning styles of the user, based on observed patterns of behaviour.

• Enabling trial and error / prototype learning.

Trades education involves trying to do something (a weld, a dovetail joint, an electrical installation, plumbing in a bathroom) under supervision and then improving performance the next time the task is completed.

Using both simulations and immersive environments (virtually reality), students can practice these skills with an AI tutor who can provide feedback in a neutral environment. Students could repeat these activities at any time and not feel they are taking too much time or that their performance is having an impact on how their real-life tutor views them. Such systems exist and are being enhanced all of the time.

Several of the developments outlined here provide the focus for a great deal of private capital investment in education and represent a significant focus for the major technology players – Google, Apple, Facebook, Pearson, McGraw Hill. Some universities are partnering with these organizations and others are leveraging their own resources to move in the directions outlined here. The costs of adoption are coming down and the opportunity to improve student retention, completion and depth of learning outcomes appears real.

If we wish to expand the boundaries for online learning, re-thinking assessment is a key component in this work. We need a new renaissance in assessment (Hill and Barber, 2014)[3].

Expanding the Boundaries... Testing the Limits of PROGRAMS AND COURSE DELIVERY

Governments and many others are concerned about the preparedness of graduates for the workplace and for a fast changing socio-economic conditions and the need to create employment, build jurisdictional advantage and create sustainable growth. They suggest there is a skills gap between what graduates can do and what employers and society needs.

This has led some jurisdictions to give emphasis to science, technology, engineering and math (STEM) programs and others to close programs in social sciences, arts and humanities so as to focus scarce resources on programs more aligned to the needs of the workplace[4].

“Relevancy” and “value” as program requirements presuppose we know much more about the future than we actually do. We do know the future is not be a straight line from the past and there are a great many disruptive technologies on the horizon – new kinds of food, new kinds of industries, new kinds of work requiring new kinds of skills. In 2016, 65% of the jobs, which will be taken by those entering primary education this year for the first time, do not yet exist.

We need to look at the “soft” skills which programs and courses develop just as much as the knowledge, competencies and skills, which the learning objectives for the courses within a program are focused on. In particular, the following are the adaptive and resiliency skills we need to see in all who graduate with any kind of post-secondary education:

- Complex problem anticipation and solving
- Critical thinking – understanding challenges from several dimensions

[3] Hill, P. and Barber, M. (2014) Preparing for a Renaissance in Assessment. Available at http://gr8dbl.doverbay.ca/wp-content/uploads/2015/04/Preparing_for_a_Renaissance_in_assessment.pdf

[4] For example, the closure of various arts, social science and humanities faculties in Japan – See http://monitor.icef.com/2015/09/japanese-government-asks-universities-to-close-social-sciences-and-humanities-faculties/

- Creativity – imagining new and different things, as well as seeing opportunities for breakout, breakthrough and disruptive ways of working
- Strong people management and team skills
- Effective social and personal networking – using networks to make a difference and have impact
- Resilience and emotional intelligence coupled with a strong array of coping skills
- Sound judgement and decision making skills
- A strong service orientation
- Effective negotiation skills
- Cognitive flexibility – being able to use cross-boundary learning to look at challenges, problems and opportunities with new eyes

We also need to see boundary-crossing programs which integrate seemingly disparate subjects – computer engineering and food science, artificial intelligence and transportation logistics, agriculture and human health – so as to facilitate the next generation of breakthroughs and innovation.

We may want to look at delivering these cross-boundary courses across other borders - e.g. facilitating more and more international learning through study abroad programs, more co-operative programs or programs involving internship, more work-based learning accreditation to blur the boundaries between higher education and the world of work.

Expanding the Boundaries... Testing the Limits of LEARNING ENVIRONMENTS

In 1786, the definition of an "academic" was "one who dwells in the groves of academe", suggesting the academy was a separate, distinct, tranquil and contemplative place. A place where scholars explored ideas which were of interest to them, whether or not they were deemed of social or economic value or, indeed, scientifically valid. By 1986, colleges and universities were very different places and now, in 2016, they are different again. They continue to change.

Just as the workplace is changing from highly autocratic, hierarchical and regulated places into much more flexible, dynamic and fluid places, so higher education institutions are changing. The growth of mobile learning, for example, is changing where and how learning is taking place. Indeed, there are some remarkable examples of the effective use of mobile devices for learning.

One of the largest deployments was led by MoLeNet in the UK for trades and vocational students between 2007 and 2010. This team supported initiatives across 104 projects involving approximately 40,000 students and over 7,000 post-secondary vocational teaching staff.

[5] The Impact of Mobile Learning – Examining What It Means for Teaching and Learning. Available at http://media.cornwall.ac.uk/ostube/media/document/83.pdf

Evaluation studies show this work increased retention, learning outcomes and employability of students , though the studies also point out these impacts varied by project and by type of student: one size of design does not fit all.

MOOCs are also changing how we think about what and where learning takes place and how peer networks can support learning. Last year, more people took a MOOC than in the three previous years combined – 35 million persons pursuing one or more of 4,200 courses (1,800 were added in 2015).

Almost all universities in the United Kingdom offer credit for training or professional development completed at work or through professional bodies, industry associations or learning networks. These range from a small amount of credit to between 50-75% of a Masters or Doctoral degree. The growth of professional Masters programs and applied doctoral degrees are enabling us to think differently about where learning occurs and what "counts" as learning, as far as the recognition of knowledge, understanding, skills and competencies goes.

What is happening here is the college or university is now a hub for learning – a place for the student to explore ideas, knowledge and skills and to have their learning recognized whether the student is a casual learner or a full-time student.

The real competitive advantage of a higher education institution is to be able to accredit learning. While teaching will remain a key activity, focus is shifting to students and learning. The new reality is there are no boundaries to where learning can take place or no limits to the extent to which learning can be found in a variety of different settings. While there are some constraints – notably our quality assurance systems – we need to think beyond the current limitations and start to remove boundaries to learning and ensure the commitment every nation has made to the life-long learning sustainable development goal translates into action.

The profound implication of this is that openness, flexibility and boundary-breaking learning will be the hallmarks of the college or university in the 21st century. Rather than become preoccupied with how learning is "delivered", we should become preoccupied with what the student is doing to develop their understanding, mastery and knowledge and the meaning of their learning for their own future. A focus on outcomes, not modes of delivery and an emphasis on engagement as a driver for quality represent the new environment for learning.

Think about this: rather than being "on campus", the campus is in your hand, in your car traveling to work or at work. The college or university is wherever you are as a student: it comes to you and helps you define your learning playlist and your pathway for learning that matters to you.

Rather than you as a student having to fit in with the college or university, the institution has to adapt to each of its students.

The radical idea of focusing on the student, not the course or time or faculty member is with us now: available technologies make truly personalized learning possible, 365 days a year. The new learning environment is wherever the student happens to be right now.

LET'S IMAGINE A DIFFERENT FUTURE SOME 25 YEARS FROM NOW.

This is a broad-brush overview. There are some specifics – and much more concrete suggestions are to be found at **www.teachonline.ca** – but the key here is to imagine a different future some 25 years from now and then use this future thinking to help us plan now.

Rather than ask "what do we do next", let's ask "given what learning will be like in 10 years, in 20 years, what do we need to do now to be the leading player for that future?".