

LEARNING, TECHNOLOGY AND INNOVATION

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**Briefing Documentation
High Level Round Table for Vice Chancellors
& Heads of ODL Institutions
Commonwealth of Learning (COL) and
Asia e-University (AeU)**

Kuala Lumpur, Malaysia
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Setting the Scene

These materials are intended to inform and stimulate an engaging group discussion. All participants at this round table will have their own context, challenges and opportunities to consider as they review these materials and these contextual factors are key components in making sense of what follows. Rather than try to enumerate all of these contextual issues, we look at ten key developments based on a global review of developments in online flexible and open learning.

The question being asked is this:

What is taking place that may cause institutional leaders to pause and reflect and, perhaps, adjust their strategies for the future of their universities?

We end with five reflective questions which can be used as the basis for group discussions and individual reflection.

Ten Key Developments

In documenting ten key developments, we are not suggesting that these are the only developments occurring or that the order in which these are presented represents any kind of ranking or prioritization or that each one applies in all contexts. Rather, these are developments which we see as having the potential to impact in different ways the strategic plans and actions of universities around the world.

Here are the ten key developments:

1. Student Expectations and Requirements are Changing.
2. Flexibility is Shaping New Ways of Delivering Programs and Courses.
3. Competency-Based and Outcome-Based Learning are Growing Quickly.
4. Technology is Enabling New Approaches to Pedagogy.
5. MOOCs are Offering Expanded Routes to the Delivery and Recognition of Learning.
6. Assessment for Learning and Assessment of Learning Are Changing.
7. Governments are Rethinking Quality and Accountability.
8. Equity Remains a Challenge, Despite Massification.
9. e-Portfolios Are Emerging as Critical Resources for Students.
10. The Roles of Faculty are Changing.

Let us now look briefly at each in turn.

1. Student Expectations and Requirements are Changing.

Demand for higher education from recognized, quality institutions will continue to grow, but who will be making this demand and what they expect are likely to change significantly. In particular:

- More mature students who are seeking flexible learning options will seek access to and success in programs. This in turn requires programs to provide varied routes to completion.
- More seniors seeking opportunities to learn, but not necessarily for credit or credentials.

- More expectations for the use of technology-rich environments for learning, for access to resources, and for communication and collaboration with instructors and other students.
- More local and international students seeking both credential completion, having started programs elsewhere, but not willing to start again. This demands effective prior learning assessment and recognition (PLAR), work-based learning agreements, and recognition of foreign credentials through national and transnational qualification agreements, as well as partnerships and alliances and joint programs.
- More local and international students seeking credentials from universities, but doing so on the basis of a competitive value proposition when compared to other competing universities in the region.
- More students seeking programs that offer knowledge and applied workplace skills, as well as high-level skills in group work, communication, project leadership, etc.
- More students seeking shorter programs, which are skill-based and work-ready – the demand for micro-credits will grow.

The changes in the composition of the student body at universities will vary according to the institution and the region of the world, but student technological sophistication and the demands of the workplace will combine to require new thinking and new strategies.

2. Flexibility is Shaping New Ways of Delivering Programs and Courses.

The University of Wisconsin has also started to offer a competency route to a degree based on competency assessment. 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 learners to use to support program completion, in this “flex option” program. Students can use the mentoring and coaching services of the University when they feel the need of assistance, but pay a fee for these services. When ready, the student calls for a mastery assessment. Such a program is similar to the [Western Governors University](#) (WGU) offering of competency-based degrees.

Wisconsin and WGU are not alone in developing these flexible routes to degrees. 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 Obama recognized these developments as “game changers” for learning and skills¹.

Flexibility of routes to a degree is an emerging mantra for Vice Chancellors in North America and Europe. Given the focus on student achievement of learning outcomes, how they achieve these outcomes can vary. Technology enables us the tracking of learners’ abilities as demonstrated through assessment and should make flexible learning a cornerstone of university education in the near future.

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

3. **Competency-Based and Outcome-Based Learning Are Growing Quickly.**

Many school systems are moving from a broad knowledge-based curriculum to a skills- and competency-based model for learning. A review of developments in Australasia, Asia, Europe and North America in particular suggests that outcome-based and competency-based learning are dominant forces in curriculum redesign in many national school systems. This work is leading colleges and universities down the same path.

In part, this is driven by the new emphasis from governments on skills and bridging the gap between what employers are seeking and the skills of graduates of post-secondary education systems. In part, this is linked to globalization and the global war for talent. But critically, it is linked to the reality that universities need to be seen as critical producers of highly qualified people that can drive socio-economic development.

The move to competency-based learning is also evident amongst professions which demand graduates of universities to complete competency- and skills-based professional assessments as a pre-requisite for entry into a profession.

4. **Technology is Enabling New Approaches to Pedagogy.**

The technological landscape is in a constant state of evolution; some would say revolution. Handheld devices now surpass desktop computers in terms of ownership and use. Growing access to broadband (still not universal) has changed access to knowledge, information, services and support. The emergence of online learning has transformed access to learning for a great many students and has changed the dynamics of higher education.

These five developments, driven by technology, seem the most likely to have an impact on teaching and learning:

- Artificial intelligence and machine intelligence will generate new ways of assessing and supporting students, using adaptive learning systems and automated assessment. Such developments may also lead to a growing use of robotic technologies to support learning and student services.
- Enhanced simulations and games using augmented reality will permit life-like laboratories in science, engineering, music, art and other disciplines, but also make remediation for struggling learners more effective when combined with adaptive learning technologies.
- More visual and aural learning will be available. With the growth of voice and gesture recognition and an increase in computing power, learners may make more use of audio, video, graphics, gesture and 3D imaging in their study and in their assignments.
- More personalized and differentiated approaches to teaching and learning will use adaptive learning and analytics. As the technology becomes more ubiquitous, then learning can shift from batch-processing (classes with an instructor) to a more individualized and self-paced experience.
- Far more extensive use will be made of open educational resources by both learners and their instructors, because of ease of access, low cost and quality assurance being attached to such resources.

While in the past the barrier to accelerated adoption of such technologies has been the willingness of faculty members to utilize them, student behaviour and the growth of private providers for higher education in some jurisdictions will lead to more universities adopting these technologies not simply for competitive advantage, but also for better teaching and learning.

5. MOOCs Are Providing Expanded Routes to the Delivery and Recognition of Learning.

More people signed up for MOOCs in 2015 than in the previous 3 years combined. In total, some 35 million registered for a MOOC, with *Coursera* securing 7 million new registrations in 2015, with this company now occupying some 50% of the MOOC market. The Open University affiliated *FutureLearn* is now the third largest MOOC provider - they secured a 275% growth in 2015. Around 1,800 new courses were announced in 2015, taking the total number of courses announced since the inception of MOOCs to 4,200². Over 500 universities and colleges around the world, not to mention other organizations, are now offering MOOCs - they are here to stay.

A new set of credentials to recognize knowledge, competency and skills secured through the completion of MOOCs is developing quickly. Learners have more options and choices about how they demonstrate mastery, including badges, specializations, nanodegrees, XSeriesMOOCs and HBXCORE.

Let us look at these new kinds of credential opportunities:

- **Badges:** Launched in 2011 using an open architecture and standards, badges have been slowly gaining acceptance ever since. Once a person masters a competency and has been assessed and successful, a badge showing mastery is placed in a portable e-portfolio. Learners can make their portfolio available for review by prospective or current employers or educational providers. While some are trying to commercialize this development³, most are seeking to leverage these developments to advance competency-based learning and credentials. More than 14,000 independent organizations are already issuing badges to document formal and informal learning and workplace training, providing more ways for learners and workers to get verifiable recognition that can lead to increased access to opportunities for further education and career success. The McArthur Foundation is supporting a network of such organizations – the Badge Alliance⁴ – to leverage and accelerate these developments. Badges are now being offered through MOOCs by George Washington University and many others.
- **Specializations:** Coursera began specializations in 2014 and now has some 83 specializations, consisting of a group of related courses designed to help learners deepen expertise in a subject. According to Coursera, 1.5 million Coursera learners have signed up for courses that are part of a specialization. To earn a Specialization designation, learners need to achieve a verified certificate in every course that

² Based on data available at [By the Numbers: MOOCs in 2015](#).

³ Pearson has launched an e-portfolio called Acclaim from which it is not possible to export badges once deposited. A critical review is available here: <http://dougbelshaw.com/blog/2016/02/11/pearson-open-badges/>

⁴ See <http://www.badgealliance.org/>

is part of a specialization. The final step is a capstone project – a project that demonstrates the knowledge acquired during the specialization. The cost of a specialization lies in the range of \$150 – \$500US. An example would be the Methods and Statistics in Social Sciences specialization developed by the University of Amsterdam, which comprises of 4 courses and a capstone project.

- **Nanodegrees:** Udacity began offering nanodegrees in partnership with companies and major employers in June 2014. Partnering with companies such as Google, AT&T, Tata and others, they create custom MOOCs which meet the competency and skill needs of these employers. All of the nanodegrees are in ICT at this time, but they readily are created for and offered in a range of other subjects. Some of these nanodegrees come with job guarantees.
- **XSeries MOOCs:** Launched by MIT through edX in 2013, each XSeries will cover content equivalent to two to four traditional residential courses and take between six months and two years to complete. In a break from previous offerings, the XSeries sequences are composed of shorter, more targeted modules without one-to-one residential course equivalents. These programs will offer certificates of achievement, but not academic credit. Many have been developed for specific industrial needs (e.g. supply chain management), but are not linked to particular companies.
- **HBX CORE:** This is the Harvard Business School offering a “credential of readiness” in the fundamentals of business thinking (CORE). Irrespective of their academic backgrounds, learners take three modules: Business Analytics, Economics for Managers, and Financial Accounting over ten weeks of study. The aim is to enable basic competency across these three components of business practice. HBX CORE costs \$1,800 (\$3,600 if credit is required).

We can expect to see more credentials and platforms linking badges, nanodegrees and other forms of recognition of learning through e-portfolios. As competency-based learning gathers pace, and as more employers demand proof of competencies, these forms of recognition for learning will grow in scope, quality and relevance.

What has not yet happened, but will, is the needed renaissance in assessment (Hill and Barber, 2014)⁵. Rich assessments, based on demonstrating understanding, showing skills in action through simulation or immersive challenges, will be needed to further refine the move towards a more holistic form of skills assessment.

6. Assessment for Learning and Assessment of Learning Are Changing

Technological developments are enabling a rethinking 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:

5 Hill, P. and Barber, M. (2014) Preparing for A New Renaissance in Assessment. See <https://research.pearson.com/articles/preparing-for-a-renaissanceinassessment.html>

- **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 past student behaviour in an online course and in 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 have been 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 will see to reinforce areas of strength and significantly enhance 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 simulations and immersive environments (virtually reality), students can practice these skills with an AI tutor who can provide feedback in a neutral environment. Students can repeat these activities at any time and not feel that they are taking too much lab or class time or that their performance is having an impact on how their real-life tutor views them. Such systems exist in other fields as well, such as counseling, nursing, and environmental sciences, 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, and McGraw Hill. Some universities are partnering with these organizations and others are leveraging their own resources to move in these directions. The costs of adoption are coming down and the opportunity to improve student retention, completion and depth of learning outcomes appears real.

7. Governments are Rethinking Quality and Accountability.

A recent publication from CHEA – *CIQG International Quality Principles – Towards a Shared Understanding of Quality*⁶ - documents developments in our understanding of quality. In particular, important chapters on the shifting understanding of quality by governments and the growing emphasis on the student experience show clearly that our notions of quality are changing.

People go to universities for different reasons. Some want to fast track through and get their credential. Others want to think, engage and learn through discourse, dialogue and challenge. Technology can help with all kinds of aspects of learning, but in the end, the key is relationships:

- Relationship between the student and the knowledge base
- Relationship between the student and his or her faculty member
- Relationships between the student and other students
- Relationship between the student and others in the same area of study beyond the class or institution
- Relationship between the knowledge and skills being developed by the student and the real world uses or applications of that knowledge
- Relationship between the faculty member and the knowledge base
- Relationship between the faculty members and his or her peers in that discipline
- Relationship between today's knowledge and the creation of tomorrow's wisdom
- Relationship between the faculty member and those who can support the work of teaching and learning for that discipline

A quality assurance system for post-secondary education could focus on documenting and analyzing these relationships and their value as predictors of learning outcomes and student performance. Technology developments would enable this to occur.

8. Equity Remains a Challenge, Despite Massification.

Drew Faust, President of Harvard, has suggested at the [World Economic Forum in Davos](#) that education is the route by which inequality around the world will be ended. She points to recent developments in technology enhanced learning as the core of her case:

“The relatively recent proliferation of online learning opportunities has enabled universities to reach people around the world in ways that would have been unimaginable just a few years ago. Some 6 million students have enrolled in more than 650 courses provided by edX, a platform co-founded by Harvard and MIT, and they represent just a fraction of individuals who have discovered communities of like-minded learners online. These efforts do more than share knowledge far beyond our campuses. They encourage and test new approaches and methods, and they create unprecedented amounts of data that are shedding light on the most effective methods of teaching and learning.”

She may be right, but unless things change significantly, she is overly-optimistic.

She is looking at the power and potential of MOOCs as the basis for her optimism. Yet a recent study of those taking MOOCs by researchers from Harvard and MIT, reported in [Science](#)⁷, suggests that the profile of successful MOOC graduates closely resembles that of many current participants in higher education and is not leading to greater equity in terms of educational outcomes. While there are extraordinarily talented students from all backgrounds who succeed in MOOCs, those from more affluent and better-educated neighbourhoods are more likely to enroll and succeed in these courses. Moreover, the relationship between socioeconomic resources and course success is strongest among teens and college-aged students, exactly the ages where we might hope that MOOCs could provide a new entry point into higher education⁸.

This is not surprising. David Berliner has been observing, based on systematic data analysis⁹, that educational outcomes, such as outcomes measured by standardized tests or formal assessments of learning, are much more about social class as they are about teaching and learning. MOOCs are only one aspect of the search for greater equity in access to and success in higher education, but the composition of their student base reflects many of the same characteristics as that of traditional higher education.

9. e-Portfolios Are Emerging as Critical Resources for Students.

Learner mobility is a major tenet of public policy and is fast emerging as a key issue for the future of higher education. With a growing number of transnational qualification agreements (e.g. EQF, South African Development Community Qualifications Framework, Transnational Qualifications Framework of the Small States of the Commonwealth, Caribbean Qualifications Framework, Association of South Asian Nations Framework Agreement)¹⁰, many of which are now reciprocal, learners have greater mobility now than they have ever had before. Further, national and regional systems of credit transfer, work-based learning accreditation and prior learning assessment and recognition (PLAR) are all making the life of registrars more difficult. Securing transcripts, interpreting transcripts, assessing equivalencies, and valuing credit and credentials now comprise a complex task.

The idea of the e-portfolio is not new; the first examples began to emerge in the mid 1990s. What is new is their more extensive use. In November 2015, for example, Cal State rolled out a major initiative to make e-portfolios available to more than 3 million students and alumni. Also last month in the US, 80 of the country's most selective institutions — including the Ivy League schools, Stanford, University of Chicago, Amherst, Swarthmore and Williams — announced a plan to offer free e-portfolios to high school students so that they can begin tracking their skills, achievements and work and engage in reflective learning. It is estimated that, worldwide, over 30 million students now maintain e-portfolios.

7 See <http://science.sciencemag.org/content/350/6265/1245>

8 <http://ww2.kqed.org/mindshift/2015/12/14/what-achieving-digital-equity-using-online-courses-could-look-like/>

9 See <http://www.tcrecord.org/Content.asp?ContentId=16889>

10 For a review and analysis, see [http://www.etf.europa.eu/webatt.nsf/0/720E67F5F1CC3E1DC125791A0038E688/\\$file/Transnational%20qualifications%20frameworks.pdf](http://www.etf.europa.eu/webatt.nsf/0/720E67F5F1CC3E1DC125791A0038E688/$file/Transnational%20qualifications%20frameworks.pdf)

e-Portfolio accounts are available for individuals anywhere, with providers hosting the functionality and data on their servers. Many e-portfolio providers also offer simple ways of using a smart phone or tablet to capture evidence and to upload the evidence. Being able to collect and reflect on their own work, whether in class assignments, community-based projects, or individual initiatives, allows students to see changes over time, in itself an important learning experience.

Employers can look beyond the certificate, diploma or degree to spot patterns across student work, assess its relevance to workplace demands and use predictive algorithms to parse competencies and match candidates to job descriptions. Data from e-portfolios also allows employers to identify future talent, develop a candidate pipeline and begin meaningful engagement through internships to evaluate student work firsthand.

We are starting to see e-portfolio and MOOC integration in some of the more recent MOOC offerings¹¹ (there is even a MOOC on how to develop and use e-portfolios¹²). Learners themselves are making this happen, using simple and effective low-cost tools¹³, something institutional leaders need to notice.

10. The Roles of Faculty Are Changing

When we put these developments together, the nature of the offer universities make to their students and the value proposition they make to governments are slowly changing. This inevitable involves changes to the roles of faculty.

But the Rogers adoption curve is still in play. Shown below, this curve is used to explore the speed at which technologically driven change is adopted by members of an organization. Rates of adoption vary, but in North America the evidence suggests¹⁴ that there is still a long way to go to persuade faculty that blended, online and flexible approaches to learning represent quality, meaningful and valuable approaches for learners in their subject.

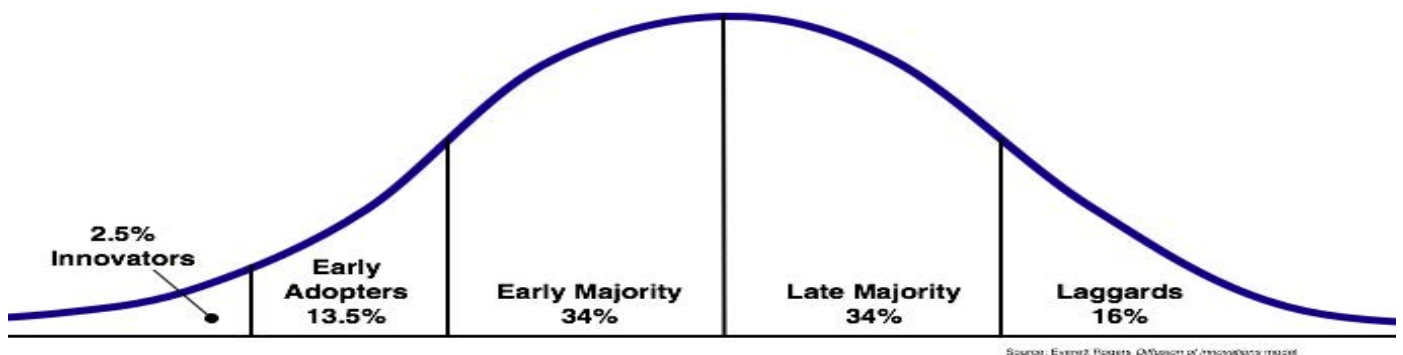


Figure 1: Rogers Adoption Curve

11 Bonk, C.J. et al (2015) MOOCs and Open Education Around the World. London: Routledge/ Taylor & Francis.

12 See <http://www.openeducationeuropa.eu/en/news/europortfolio-and-uoc-announce-launch-eportfolio-self-development-study-mooc-emma-platform>

13 A catalogue of these tools is available at <http://epac.pbworks.com/w/page/12559686/Evolving%20List%20of%20ePortfolio-related%20Tools>

14 See <http://www.thechangingfaculty.org/>

Given all of the developments outlined here – and there are many more – what is it that faculty now need to do?

The knowledge, skills, understanding and social networks, which faculty have, can be more fully leveraged in the interest of learners and learning. This work includes, but is not limited to:

- In partnership with employers and other faculty members, determine what the needed knowledge, skills and competencies are for a particular set of learning outcomes.
- Design and develop a range of rigorous, multifaceted assessments for the knowledge, skills and competencies making best use of all available technologies for assessment.
- Design, in partnership with other faculty members, instructional designers and librarians, the learning pathway and resource recommendations for learners making best use of open educational resources, third party multimedia and more traditional resources, and community resources.
- Create, either on their own or with others, new open educational resources, which fill gaps they have observed in the available resource base.
- Design, in partnership with instructional designers and others, alternative routes for learners who are most able and those who are least able, given the learning outcomes and competencies they are expected to master.
- Be available to mentor, coach and guide learners on an as-needed basis, following the college or universities design for this support.
- Participate in professional development activities aimed at improving assessment, outcome-based learning, the development of OER material and learning pathways.
- Use social networks to connect to others engaged in teaching, research and development in their field and find new ways of connecting their learners to these networks.
- Translate research findings in their disciplines into action and development.

This work fully leverages both the content and professional instructional expertise of faculty, but also places them in a different relationship to learners than is currently the case. They are co-creating and navigating a learning journey rather than instructing. All of this work can be aided by technology, especially collaborative technologies.

Re-think what we are doing and how we doing it.

This has been a rapid exploration of the future of technology enabled learning. The future is, as we can see, different and challenging. But this review also provides an opportunity to rethink what we are doing, how we do what needs to be done and who we are able to serve. It is an exciting time. Given the range of things happening, some of which are captured here, courageous leadership is needed to take our universities to the next level.

FIVE QUESTIONS FOR VICE CHANCELLORS

1. When you look at these ten key developments, what do you think your university needs to STOP doing?
2. When you look at these ten key developments, what do you think your university needs to START doing – something you are not doing now at all?
3. When you look at the Rogers adoption curve (above), where are your faculty in relation to the effective use of technology for pedagogy and what needs to happen to enable them to be more open to the kind of changes and developments outlined here?
4. Of the ten key developments listed here, which one or two do you think is most important for your university to pursue?
5. What are the barriers to adopting any of these developments that you think would be beneficial for your institution?