How technology developments are driving change in Higher Education

University of the Fraser Valley

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Introduction

Never before in history has higher education been so vital to the economic and social development of countries. And never before have opportunities to reach so many learners – millions globally – been so abundant, or the chance to accelerate learning been so possible.

This makes the role of higher education institutions … like this one … more important than ever. As the Asian Development Bank puts it: higher education institutions "operate as incubators of the innovation and creative thinking needed for an economically competitive society."[1]

UNESCO (United Nations Education, Scientific and Cultural Organisation) has identified higher education as being critical to addressing the sustainable development goals that the organisation is setting for post-2015.[2] Those global goals, which are to be formally adopted in the UN General Assembly during the 70th sitting a year from now, emphasise the significance of higher education: in reducing poverty, improving health, empowering women and protecting the environment.

UNESCO's Director-General Irina Bokova sums it up this way: "The evidence is unequivocal: education saves and transforms lives."[3]

It may seem obvious on one level how education in general, and higher education in particular, benefits people: It equips individuals with competencies and skills that are needed in the labour market.

But consider this, from the World Bank, in its Education Strategy 2020: Not only do "investments in quality education lead to more rapid and sustainable economic growth and development" … but "Educated individuals are more employable, able to earn higher wages, cope better with economic shocks, and raise healthier children." [4]

There is also much data these days to show that providing higher education to women is one way of enhancing gender equality and empowerment. In Sub-Saharan Africa, for example:

- women with no education in the region average 6.7 births ;
- those with primary education average 5.8 births, and
- those with secondary and higher education average 3.9 births.[5]

And higher education not only influences women's choice of family size: it gives them better job options, increased confidence, greater health, safety and empowerment.

All of this makes the provision of higher education – and the job of higher education institutions – both exciting and a little daunting.

In this presentation, I will focus on some of the challenges in the higher education environment today and what the implications of these are. I will address three key developments that are changing the face of higher education:

1. shifting economic and social demands
2. rising costs of tuition and of learning resources … and, related to those costs, changes in how people value that investment in terms of securing a livelihood, and
3. constant and rapidly changing technology.

Finally, I will talk briefly about how these changes are likely to impact the fundamental value of higher education in all countries, and what all of this means for institutions like the University of the Fraser Valley.

So, what are the global developments that are influencing higher education?

Let me start with those three key developments I mentioned that are dramatically altering the nature of higher education.

Changing Economic and Social Demands

First are shifting economic and social demands. In all countries, **labour market needs** are rapidly evolving. Automation and digitisation of industry, agriculture and the knowledge economy are changing what is taught, how it is taught and when and where learners are likely to want to be taught.

According to a study from Oxford University, "47% of occupations are at risk of being automated in the next few decades."[6] This means that as many jobs change and others become obsolete, it will be essential for higher education to also change to meet new knowledge and skill demands.

At the same time, of course, graduates consistently need to upgrade their skills and companies need to top up their human capital.

A 2013 Organisation for Economic Cooperation and Development (OECD) report[7] points to the importance of higher education, especially in light of the 2008 economic crisis that hurt many countries. The data illustrates a not-so-surprising fact: that a great deal of the economic and social hardship caused by the crisis fell chiefly on less-educated individuals. The unemployment gap between well-educated young people and those who left school early widened during the crisis. At that time, across the OECD countries, on average only 5% of the population with a tertiary education level were unemployed, while 13% of those without an upper secondary education faced unemployment.

These kinds of statistics were, and remain, much worse in many the developing countries in Asia and Africa, given the already high levels of unemployment.

The implication here is clear: a person's education and field of study, especially at the post-secondary education level, will determine the level of risk she or he faces during times of economic and social crisis.

Coming back to the World Bank and its Education Strategy 2020[8], I quote:

"The stunning rise of the middle-income countries, led by China, India and Brazil, has intensified the desire of many nations to increase their competitiveness by building more highly skilled workforces.

 "Persistently high levels of unemployment, especially among youth, have highlighted the failure of education systems to prepare young people with the right skills for the job market ….

"Expanding and improving education is key to adapting to change and confronting these challenges.

The rising cost of education

Let us look now at the second key development changing the nature of higher education today: **the rising costs of tuition and of learning resources** – costs that are being increasingly felt by students and society.

As an article in *The Economist* this past June noted[9], higher education suffers from the Baumol Effect (a.k.a. Baumol's "cost disease") – that is, "the tendency of costs to soar in labour-intensive sectors with stagnant productivity."

This phenomenon (described by William J. Baumol and William G. Bowen in the 1960s) is often used to describe what happens when the quaternary sector of the economy, and public services such as public hospitals and colleges,[10] shows no real productive gains although wages in jobs still rise.

Recall that the quaternary sector is the knowledge-based part of the economy. It is driven by the services industry – so, those businesses and services involved in information generation and

sharing, information technology, consultation, research and development, financial planning … and education.

Besides the basic nature of the higher education sector that can drive up costs is the fact that *the demand* for higher education is exploding.

From 150.5 million students worldwide seeking tertiary education in 2007, demand grew to 165 million in 2012. It is expected to reach 263 million by 2025 – just 10 years away.

Given recent high levels of unemployment in OECD countries – for example, about 20% of 25- to 29-year-olds being "NEET" (neither employed nor in education or training) – demand has grown for education.[11]

The average age of the learners is also rising as a substantial proportion of them now come from the workforce looking to re-learn .The rapidly changing workplace has made lifelong learning more important than ever. Higher education therefore needs to enable individual learning pathways that can help prepare individuals to lead productive lives and equip them with 21st-century skills.

Technology Changes

The third key development changing the nature of higher education today is also the most disruptive one: **technology changes**.

Rapid advances in information and communications technology (ICT) and other related developments are now constantly changing job profiles and skills demanded by labour markets. Yet, these advances also offer possibilities for accelerated learning and improved management of education systems.

From Massive Open Online Courses (or "MOOCs") and Open Educational Resources (OER), to mobile technologies, learning management systems and the proliferation of educational apps, these developments have radically changed how we understand both teaching and learning.

MOOCs have been big in BC. In January 2013, the University of British Columbia offered its first MOOC – a free online science course run jointly by UBC and Stanford University. It attracted more than 130,000 registrants, with learners from every Canadian province and almost every country in the world. [12]

The first MOOCs emerged from the Open Educational Resources movement. The term "Massive Open Online Course" was coined in 2008 by Dave Cormier of the University of Prince Edward Island and Senior Research Fellow Bryan Alexander of Britain's National Institute for Technology in Liberal Education. This was in response to a course called Connectivism and Connective Knowledge which was led by George Siemens of Athabasca University and Stephen Downes of the National Research Council.[13]

MOOCs offer the opportunity to increase access to high-quality education and access to global leaders in fields of study, all with minimal to no costs. Nevertheless, we have yet to see successful business models emerging to take on more MOOC developments.

But there are some down-sides of MOOCs too. As UNESCO has summed it up, they can be: (1) costly and time-consuming to produce, (2) most participants are already well-educated, and (3) only about 5% of registrants actually complete their courses.[14]

For motivated learners who have appropriate technology and Internet bandwidth, MOOCs provide an opportunity to participate in global learning and possibly earn credits from globally renowned institutions.

Yet, what about those learners who lack the technological and bandwith requirements? Several MOOC providers are looking at ways to address these barriers.

COL, for example, has run MOOCs with various partners in the developing world with a view to research and understand the opportunity this kind of learning platform offers. In a recent COL publication, authors Sandi Boga and Rory McGreal[15] note that: "MOOCs as a type of globally-networked learning environment could become a very useful delivery model in the developing world – but not necessarily when tied to a specific platform."

The authors point to the risk of developing countries locking themselves to platforms that do not encourage true collaboration. Instead, learning platforms need to be flexible to take into account the context of the learners and their access to technology. This is critical if MOOCs are to be successfully used for higher education globally. In the context of Africa, for example, Boga and McGreal identified mobile phones as important to the way the MOOCs are constructed. Countries like India and Malaysia have already taken a policy position that encourages the use of MOOC models to enable widespread education of their citizens.

The variety of MOOCs is increasing, and in the future they are likely to be more targeted at specific audiences. You can well imagine how difficult it is for any single learning experience to meet the needs of thousands of participants who have varying starting levels of relevant knowledge and experience. Yet MOOCs seem to attract many types of learners who have varying reasons to be on the course.

MOOCs are also likely to increasingly offer credentials of economic value, such as college credits, badges or certificates of competency. Then, if employers begin to consider such credentials for hiring and promotion decisions, we anticipate that participants will be more willing to pay fees to cover the costs of MOOCs production, which will help ensure the sustainability of MOOCs into the future.

Open Educational Resources

An important component of effective MOOCs and underpinning the model is the availability of the course materials and learning resources as Open Educational Resources – or OER for short.

COL recognises and promotes OER as central to its agenda of learning for development. COL has adopted the widest definition of OER, describing them as: "materials offered freely and openly to use and adapt for teaching, learning, development and research."

While OER are mainly shareable in digital formats (both online and via offline formats such as DVD or CD-ROM), COL does not see them as just being synonymous with online resources, online learning or e-learning. Rather, in COL's view, OER can also be in printable formats.[16]

The term OER was first used at a UNESCO meeting in 2002. An early manifestation of OER was the Massachusetts Institute of Technology's Open Courseware initiative, in which teachers placed their lecture notes online for free use. The UK Open University's Open Learn followed by placing existing self-instructional materials, in online format. Another step forward was the Virtual University for Small States of the Commonwealth, or VUSSC, where the capacity is built to develop courses collaboratively using free authoring tools.[17]

In 2007, leaders of the OER movement met in Cape Town, South Africa, to endorse what has become known as the Cape Town Declaration. They called on all educators to participate actively in this movement based on the belief that all taxpayer-funded resources should be OER. COL and UNESCO have been working for several years now to promote the development and use of OER and jointly convened the World OER Congress in 2012.

This advancement of OER is taking root in British Columbia with the Ministry of Education and the Ministry of Advanced Education. Open School BC is offering a range of resources for free use and reuse. BC is also set to become the first province in Canada to offer students free online, open textbooks for the 40 most popular post-secondary courses. It is anticipated that up to 200,000 BC students each year could benefit from this BCcampus work, saving every student hundreds of dollars a year in education-related expenses.[18]

Open textbooks are published using an open licence and can be downloaded at no cost. The textbook can also be modified and adapted by teachers, lecturers and tutors to enable greater contextualisation. The BC government is working with local higher-education institutions to implement this policy as well as working with other provinces in Canada and states in the US and to share such resources.

Other Influences of Higher Education

There are other changes influencing higher education, too. Of these, developments in mobile learning (mLearning) are especially potent.

In the developing world, the gap between supply and demand for education is wide. However, while Internet services may be very low in many countries, use of mobile devices is very high – and growing. This trend has opened up immense possibilities for creating access to education irrespective of location, concentration and number of learners – and all at affordable costs, thus addressing the supply and demand issue.

In 2010, the top four country adopters of mobile learning were the US, Japan, South Korea and Taiwan. They together accounted for about 70% of the mLearning market. By 2015, these countries will account for only 40% of that market, with China, India, Indonesia and Brazil coming on with the new highest growth rates in mLearning adoption.

An interesting statistic in this regard is the growth of mLearning among US corporations – 39% of the corporations are using this form of education and training. Often such learning uses the smartphone and accesses various kinds of courses and other forms of learning via the Internet. This is further reflected in the projection that by 2015, 80% of people accessing the Internet will do so from a mobile device, especially a smart phone[19].

There is also a shift in the way learners, empowered by the new "massifying" technologies, are taking control of their own learning – being proactive managers and indeed producers of their own learning solutions, portfolios and materials. The term *learner* is used here to denote all *users* and includes everyone from young degree aspirants to workplace-based adult learners.

Another important segment of learners too are the higher education faculty who want to stay continually effective in their changing work environments and society as a whole.

As well, changes in higher education are apparent in the way education is being organised. Private higher education is emerging as the fastest growing segment in higher education, accounting for 30% of global higher education enrolment[20]

Helping to drive such growth at both the national and international levels is private equity – that is, privatisation. This trend is now evident even in public universities that are faced with ever-decreasing funds and are expected to identify other sources of funding and to compete for funding from both the state and the private sector.

This trend is also forcing many higher education institutions to become more efficient in the courses they offer. Courses must, more than ever, be relevant to the needs of the economy and be of top quality.

Conclusion

Globally, as labour markets respond to rapidly changing economies and just as rapidly changing needs and expectations of society, so the pressure is mounting on higher education to keep up.

At the same time, we can't ignore that other big pressure: the escalating costs of higher education. Apart from the rare announcements of free higher education, like the recent one from Germany, education-related costs are on the rise. Such costs are passed on to students in most instances or are carried by government through taxes.

Technology is at once opening doors to much more extensive opportunities – for many more people – seeking knowledge and skills development, AND driving significant changes in both the teaching and the learning processes.

We also see technology reshaping the form of higher education institutions. Developments such as MOOCs, OER and mobile phones offer major avenues for addressing the needs of citizens in every nation to obtain high-quality learning opportunities that are either free or at very reduced costs. The outcome is a greater global equity in access to learning.

All of these factors have implications for higher-education institutions in both developing and developed countries. Across Canada, institutions like the University of the Fraser Valley, I'm sure have been analysing the changing education environment and developing strategies to respond to it.

I would like to conclude with a few positive notes on why the changes I have outlined should be positively embraced:

- The changes are inevitable and therefore it is important to understand how to turn the challenges into opportunities. This requires gathering data, doing careful analysis and developing strategies.
- Higher-education institutions have unique opportunities to engage in partnerships with industry, government, NGOs and other bodies to better understand the needs of learners within the economy and society.
- Technology offers many ways to improve teaching, increase independent learning by students, and widen access to global resources (via MOOCs, OER, etc.). Perhaps, most important of all, though, it offers a means for a greater number of people wherever they are in the world to gain the skills and knowledge they need to live productive, satisfying and meaningful lives.

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