

PREPARING FOR A DIFFERENT FUTURE – LEARNING IN AN AGE OF DISRUPTION

“Education is not about filling a pail but about lighting a fire.”
– Plutarch

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A number of change forces are reshaping communities, organizations, work and identity. These global forces require educational organizations to rethink their purpose, ways of working and their collaborations to better serve the needs of society. They are leading to new kinds of educational organizations, new forms of learning and new kinds of credentials as well as a relentless focus on skills development.

These global change forces are:

- **Demographic shifts.** In many countries around the world – Canada, US, Japan, Russia and parts of Europe – an ageing population is reshaping the workforce, communities and the economy. Several countries have dependency ratios (the number of people not in work compared to the number of people in work) that are falling rapidly, with Japan already at 1:1 and Canada will shift from 4:1 to 2:1 by 2035-40¹.
- **Shifts in regional economic geography.** By 2050, the shape of the global economy will shift from the “old” Europe and North America to Asia, especially China, India and Indonesia. 424 cities will generate 75% of the world’s GDP and 325 of these will be in Asia². It is already the case that 50% of the world’s largest companies are headquartered in Asia.
- **Climate change, population growth and sustainable development.** By 2050, there will be between 9.7 and 10 billion people living on earth and climate change will spur significant changes to where and how people live³. Water and extreme weather events in particular will shape politics and the global economy.
- **Technological disruption.** Emerging technologies, especially artificial intelligence (AI), 3D printing, robotics, genomics and new material technologies, will reshape many industries from financial services, retail and transportation to construction and education. Some estimates suggest that some 30-40% of all current work activity will require change, given the power of these technologies⁴.
- **New models of organizations.** Coupled with all of the developments is the rapid emergence of new forms of organization: flatter, nimble organizations that leverage a global workforce. Uber is one example, but there are many more, which use the same principle of technology-enabled workforce management to deliver goods and services. These organizations rely on intangible assets to generate wealth.

1 Bricker, Darrell, and John Ibbitson, *Empty Planet: The Shock of Global Population Decline*, (Signal, 2019).

2 United Nations DESA, *2018 Revision of World Urbanization Prospects*, (New York: United Nations, 2018).

3 United Nations DESA, *World, Population Prospects – The 2015 Revision*, (New York: United Nations, 2015).

4 Hasan Bakshi et al., *The Future of Skills – Employment in 2030*, (London: NESTA Discussion Paper, 2018).

- **New models of work.** The so-called “gig” economy of freelance work is becoming a dominant model in some economies. Self-employment is the fastest growing form of employment in most economies of the world and in Canada; the gig economy is also growing quickly.
- **New challenges for economic development – Debt, austerity and recession.** Global debt from governments, corporations and individuals is currently (app.) US\$240 trillion - US\$100 trillion higher than the level of debt before the 2007 financial crisis⁵. Unfunded pension liabilities of governments will constitute an additional US\$400 trillion of debt by 2050⁶. As one commentator has said, “we no longer speak of business cycles; we speak of debt cycles”. Within these debts is significant consumer debt, now ten times higher than 45 years ago⁷. All of these debts suggest a coming, major recession.
- **Growing social and economic inequality.** A characteristic of our time is growing social and economic inequality. Globally in 2018, 26 people owned the same amount of wealth as the 3.8 billion people who make up the poorest half of humanity⁸. In some countries, the poorest 10% are paying a higher portion of their income in taxes as the richest 10%. Income inequality began to rise in Canada in the early 1990s and continues to do so.
- **The sense of “self” and identity.** A further characteristic of our time, fueled in part by social media and a culture of “self” before others but also by several of the significant shifts described above, are issues related to meaning, purpose and identity. Social changes in the structure of families, new patterns of work and employment, the growth of social networks as defining features of identity, as well as the challenges of daily living are leading to life-style changes for the iGen and millennials and to increased levels of anxiety, stress and mental disorder.

There are other global forces at work, including accelerated globalization, the growth of nationalism and populism, the emergence of new forms of intangible capital and domestic terrorism, but these developments are subsets of those described here.

5 Andy Blatchford, “Skyrocketing Global Debt a Top Concern, Bank of Canada Official Says” *Global News*, March 15, 2019, <https://globalnews.ca/news/5060412/rising-global-debt-bank-of-canada/> (Accessed April 12, 2019).

6 Mike Mish Shedlock, “Global Pension Gap Expected To Hit \$400 Trillion – US Leads the Way”, *MishTalk Global Economic Trends*, April 26, 2019, https://moneymaven.io/mishtalk/economics/global-pension-gap-expected-to-hit-400-trillion-us-leads-the-way-R1rSLQ12IEePt5W_mIZC5Q/ (Accessed April 12, 2019).

7 Duino Schiappapietra, Debt and Financial Crisis – Are We Near the End of the Long-Term Debt Cycle? *Medium*, July 15 2018, https://medium.com/@duino_s/debt-and-financial-crisis-are-we-near-the-end-of-the-long-term-debt-cycle-615d2ec2976a (Accessed April 12, 2019).

8 Oxfam, *Public Good or Private Wealth*, (Oxford: Oxfam, 2019).

KEY DEVELOPMENTS AT THE FRONTIER OF CHANGE IN HIGHER EDUCATION

The focus in what follows is on higher education and the patterns and changes that reflect potentially significant tipping points for the design, development and deployment of learning opportunities. Informed by the global change forces mentioned above, innovations in education are being sought, which will both increase access and success in learning for a greater range of learners.

More specifically, the policy of many governments is focused on creating learning opportunities for those traditionally denied access to universities, colleges and training. While MOOCs and online learning have been part of this response, it is not yet clear that those accessing these learning opportunities have a significantly different profile from those who have traditionally accessed education beyond school.

A 2018 study suggests that the expansion of higher education, which began in earnest in the 1960s, will continue, with some 600 million students enrolled in universities around the world by 2040, with parallel growth in colleges, apprenticeship and training organizations⁹. This growth will be especially strong in India, Africa, China and the Middle East.

In a substantial overview of developments in higher education in the developing world by the International Bank for Reconstruction and Development / The World Bank, the authors note that there has been such a massive expansion of higher education in developing nations that the system has moved from a system geared to elites to a system focused much more on access for suitably qualified candidates, no matter what their background¹⁰.

Some specific examples of the developments intended to increase access and reduce barriers to success have occurred through:

- **The development of mega universities.** There are institutions in India, Iran, Turkey, Pakistan and Bangladesh, each with over a million enrolled students. The largest is the Indira Gandhi National Open University, based in Delhi, with over 4 million enrolled students. There are at least 65 degree granting entities with over 100,000 students enrolled.
- **The development of open universities.** Where admission is open to all, but completion is based on performance. Well-known examples include The Open University (UK), Athabasca University (Canada) and Sukhothai Thammathirat Open University (Thailand). These universities do not require prior learning achievements (certificates, high school completion, etc.) for admission to their undergraduate or first level programs. There are now 65 open universities around the world, with 2 in South America (Argentina and Venezuela).
- **The growth of differentiation within higher education.** More and more institutions are seeking to differentiate themselves from their sister

⁹ Angel Calderon, *Massification of Higher Education Revisited*, (Melbourne, AUS: RMIT, 2018).

¹⁰ International Bank for Reconstruction and Development / The World Bank, *Higher Education in Developing Countries – Peril and Promise*, (Washington, DC: World Bank, 2000).

institutions within and between jurisdiction, focusing on specific areas of study. For example, the recently created Ocean University of Sri Lanka focuses on maritime and sea transport logistics, while the Institute for International Law in Abu Dhabi does what its name implies. There are a great many technical and polytechnic institutions, as well as schools of design, art and other discipline-focused institutions. There are also institutions exclusively for women, Indigenous peoples and minorities. Specialized institutions are now a key part of the fabric of higher education around the world.

- **The development of private provision.** A fast growing private sector in many (but not all) nations is adding to both the capacity and nimbleness of higher education provision and to its complexity. Not all of these private developments are for profit; there are also significant non-profit and philanthropic institutions, such as Amity University in India. Some 80% of higher education students in the Philippines are enrolled in private institutions and they play a major role in Korea, Japan, Belgium, Indonesia, Columbia, US, India and Brazil.
- **The growth of dual mode universities.** Universities that offer both on-campus and online / distance learning programs are also contributing to increased access. Major dual mode universities include University of Laval (Quebec), Deakin and Murdoch Universities (Australia) and University of Madras (Chennai, India).
- **The emergence of open education resources (OER) for credit.** More recently, students have been able to study through the use of open education resources (free to use learning materials), be assessed and obtain transferable credit, which can then be used in many on-campus or online programs around the world. The OERu seeks to provide exactly this service.

All of these developments aimed to make affordable access to suitably qualified or motivated candidates possible and each of these developments have contributed to massively increased access to higher education.

One group that has especially benefited from these developments has been women. The *World Atlas of Gender Equality in Education*, published by UNESCO, suggests that, in the last four decades, a significant reversion of the historical process of exclusion of women in higher education has occurred and women have gained significantly more access and success at this level of education¹¹. These are, however, two regions where this is not the case: South and West Asia and in sub-Saharan Africa. Women are still underrepresented in some disciplines in some regions and have a long way to go to ensure pay equity following qualification, even in developed nations.

More recent developments are also intended to both increase access to and success in education beyond school and to accelerate the completion of qualifications, which recognize knowledge, skills and capabilities. These developments include:

11. UNESCO *World Atlas of Gender Equality in Education: UNESCO Reference Works Series*, (Paris: UNESCO, 2012).

- **Competency-based qualifications and assessment only qualifications.** Western Governors University was established to coordinate prior learning recognition for learners across the United States and to offer degrees based on the assessment of competencies and capabilities. More recently, the University of Wisconsin and others have offered “flex” degrees, which use anytime assessments to determine whether or not a candidate has the required knowledge and skills to earn a diploma or degree.
- **MOOCs for degrees.** India, Malaysia and other jurisdictions have developed systems by which credit earned by learners enrolled in MOOCs can count towards degrees or other qualifications. Some MOOC providers, such as FutureLearn, offer degrees, diplomas and certificates through their MOOC platform.
- **Micro-credentials.** These are currently offered in a variety of fields in colleges and universities around the world, especially computing, social media marketing, human resource management, digital architecture, supporting individuals with disabilities and in teaching. Many are offered through intensive workshops, online learning or in a blended learning (combining face-to-face and online learning). The range and depth of these credentials is expanding rapidly and more of these credentials are becoming “stackable” so that learners can use them as part of certificates, diplomas and degrees. Some jurisdictions, such as New Zealand, see these developments as critical responses to the skills shortages they are experiencing.
- **Work-based learning accreditation.** In many parts of Europe, qualifications can be earned through work-based learning activities. Learning at work, such as specialized skills development in an auto repair shop, leadership development in a financial services organization, enabling new technology in a manufacturing plant can all be used to build a learning portfolio suitable for a degree or diploma or other formal qualification. Here are some specific examples:
 - o In France, employees can build a portfolio of their work – projects, analytical assessments, reviews and evaluations – and offer an analysis of this work so as to obtain a degree by work-based learning. The process here is like that used to provide graduate degrees for published work, though in this case the e-portfolio provides the basis for this evaluation. Similar programs exist at many Universities throughout Europe.
 - o In Finland, some 5% of competence-based qualifications (a technical and vocational education qualification system for adults) are obtained without the learner undertaking any type of formal instruction; instead, workers obtain these qualifications through validation of learning acquired through work experience and other non-formal means.
 - o McDonald’s University is a modular program offered by the restaurant chain for management development in company owned learning centres around the world. Manchester Metropolitan University (UK),

as well as many other post-secondary institutions around the world, has imported these modules into what is known as a “shell” program (a degree framework based on modular outcomes and competencies) and then given credit to individuals who complete the McDonald’s program and the associated evaluations and projects. Notice that the University does not design this program nor does it teach or assess it – the credit is granted based on an articulation and competency framework agreement between the company and the University. In the US, some 1,600 colleges accepted the McDonald’s program as partial credit towards a degree through similar articulation agreements.

- o At the University of Derby (UK), work-based experiential learning can lead to up to 50% of a master’s degree or the equivalent of the first two (of three) years of undergraduate study and up to one third of the final year of the baccalaureate.

UNDERLYING PATTERNS OF CHANGE IN EDUCATION BEYOND SCHOOL: LEARNING FOR THE EMERGING WORLD

These several developments all speak to increased access, flexibility and innovation in post-school learning. When we explore what lies beneath these developments, we can see these patterns:

1. **Diversifying the time and place for learning.** Learners will have more opportunities to learn at different times in different places. e-Learning tools facilitate opportunities for remote, self-paced learning. MOOCs and work-based learning can be pursued through a variety of settings with varying levels of support. Micro-credentials and assessment-based learning recognition require minimum space and time commitments. The hallmark of this development is flexibility.
2. **Personalizing learning.** Learners will learn with study tools that adapt to their capabilities as a learner. This means above average learners shall be challenged with harder tasks and questions when a certain level is achieved. Learners who experience difficulties with a subject will get the opportunity to practice more until they reach the required level. Learners will be positively reinforced during their individual learning processes. Learners can also construct their own route to success. Our schools, colleges, polytechnics and universities are already using adaptive learning systems to enable this.
3. **Enabling greater choice.** Though every subject that is taught aims for a specific destination (a badge, a certificate, diploma, degree, apprentice qualification), the road leading towards that destination can vary for learners. Similarly, to the personalized learning experience, learners should be able to modify their learning process with tools they feel are necessary for them. They should be able to plot their own route to the destination. Learners will learn with different devices, different programs and techniques based on their own preference.

4. **Developing and expanding project-based learning.** As employees are adapting to the future economy, learners of today will adapt to the new forms of work and organizations through project-based learning and working. This means they have to learn how to apply their skills to real world and wicked problems and to a variety of situations. Learners should be fully acquainted with project-based learning in high school. This is when organizational, collaborative, and time management skills can be taught as basics that every learner can use in their further learning and work careers. However, all levels of education should require project and teamwork, since these are essential skills for the new forms of work.
5. **Facilitating work experience.** Because technology can facilitate more efficiency in certain domains, curricula will make room for skills that require human knowledge and face-to-face interaction. Schools, colleges, polytechnics and universities will provide more opportunities for learners to obtain real-world skills that are representative to their chosen jobs or career paths. This means curricula will create more room for students to engage in internships, mentoring projects and collaboration projects.
6. **Encouraging all learners to develop data interpretation and analysis skills.**
Though mathematics is considered one of three literacies, it is without a doubt that the manual part of this literacy will become less relevant in the near future. Computers will soon take care of every statistical analysis, describe, analyze data and predict future trends. Therefore, the human interpretation of these data will become a much more important part of the future for mathematics, science and other forms of education.
7. **Rethinking assessment.** As courseware platforms will assess learners' capabilities at each step, measuring their competencies through traditional exams and assessment might not suffice. Assessment of competencies and capabilities is at the heart of emerging patterns and needs significant overhaul across our education system.
8. **Promoting learner ownership of their learning journey.** Learners will become more and more involved in forming their learning and program of study. Maintaining a curriculum that is contemporary, up-to-date and useful is only realistic when professionals, employers and learners are involved. Given the speed of change in both work and our understanding of knowledge, learners need to be able to design their own qualifications as well as follow established pathways.
9. **Supporting mentoring.** In the coming years, learners will incorporate so much independence in to their learning process, that mentoring will become fundamental to student learner success. Teachers and instructors will form a central point in the tangle of information that our learners will be working their way through. Guidance and support systems (driven by AI) coupled with mentoring and peer support networks are essential for learning.

All of this can be enabled by emerging technology, both for teaching and for student support services. The underlying key will be the need to reimagine the organizations that deliver such learning. Interesting prototypes of such organizations are emerging, including Woolf University and Tecnológico de Monterrey. This latter Mexican private non-profit university has adopted TEC21 as its framework for learning, which involves:

- Challenge-based learning, where students develop disciplinary competencies while solving real world challenges with companies, government entities and NGOs.
- Flexibility in the how, when and where our students learn, leveraged by technology.
- A memorable higher education experience, which will provide an experience of professional and personal growth.
- Inspiring faculty, where professors are agents of positive change, innovators, and use technology as a teaching aid. Their work remains deeply personal – engaging learners in the risk of learning.

The future is not a straight line from the past. It involves significant and substantial change and needs to do so if we are to respond to the significant shifts occurring in society, the environment and the global economy.

Education, whether in school or beyond, is a vehicle for enabling each individual to develop the knowledge, skills and capabilities they require to lead both a fulfilling life but also to be a difference maker. Learning systems and institutions need to enable the passions and beautiful risk of education for each person and focus on providing a basis for each person to live a life of meaning and purpose.