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MAKING SENSE OF FLEXIBILITY AS A DEFINING ELEMENT OF ONLINE LEARNING

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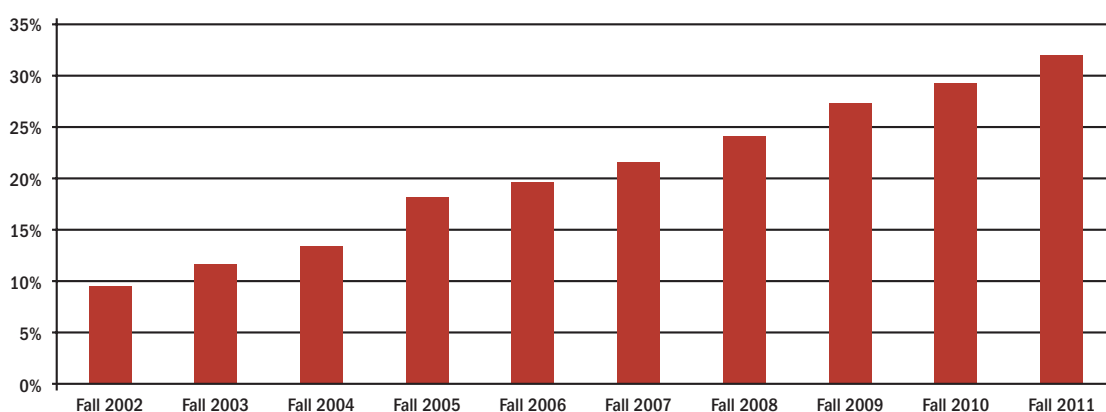
Summary

Contemporary developments in online learning have their origins in the technology of the industrial revolution, when new methods and machines were used to create better products inexpensively at scale. Now technology has also broken the hold of the ‘iron triangle’ that prevented earlier generations from enjoying wide access to education of quality at low cost. First correspondence education and then multimedia open and distance learning (ODL) brought flexible learning to millions. Today online technologies have brought further flexibility to post-secondary education on various dimensions. Institutions should exploit these new flexibilities purposefully, focusing on opportunities to engage students more deeply in learning leading to useful outcomes.

Introduction

‘When more than one-quarter of higher education students are taking a course online, distance education is clearly mainstream’. This is the conclusion of the 13th Babson Report on online learning in the US (Babson, 2016, p. 3).

Online Enrollment as a Percent of Total Enrollment: Fall 2002 - Fall 2011



From Inside Higher Ed - USA

We first recall the historical origins of open, distance and online learning (ODL), noting its origins in the industrial revolution and the emergence of flexibility as its most powerful feature. In section two, we summarize the current trends, attitudes and patterns in online learning described in the Babson report, which focuses on the USA but seems broadly applicable to Canada as well. The third section examines the additional flexibility online learning offers to students, teachers and institutions and the challenges it poses for choosing study options, assessing outcomes and revamping organizations.

Flexibility has many dimensions. For students, it means easier access to learning, greater convenience in choosing where to study, a wider variety of credentials to aim for and more autonomy in scheduling their lives. For instructors, it expands the range of pedagogies available in program/course design, makes available new (often free) teaching resources, implies less ‘stand-up teaching’ and permits greater variety and creativity in assessing students’ work. Evidence indicates that effective use of these options can improve learning outcomes by

stimulating students to engage more fully with their courses (Daniel, 2016a). Institutions can use online learning to expand their geographic reach and, perhaps more importantly, to make their offerings more attractive to campus-based students by deepening their engagement with their courses.

Flexibility sounds like an entirely desirable attribute but it has limits. Buildings and earthquakes are a useful analogy. A building constructed too flexibly and one built too rigidly can both collapse in a major earthquake. Engineers aim for structures that have the toughness and resilience to cope with the range of stresses they are likely to encounter. This is expressed more abstractly in the cybernetic Principle of Requisite variety (Ashby, 1956): 'the larger the variety of actions available to a control system, the larger the variety of perturbations it is able to compensate'.

Some complain that current higher education systems are too rigid, but neither should they be too flexible. Traditional classroom teaching places constraints on students and is difficult to scale up, but it does have the inherent flexibility of any cottage industry. Individual instructors are responsible for most elements of the students' learning experience. With minor variations, each classroom instructor designs the course curriculum, prepares learning materials or assigns textbooks, teaches the course in the classroom, administers and corrects any formative assessments (e.g. quizzes) and often sets and marks the summative assessment (final exam or project). These individual teachers can, in principle, adapt readily to changing circumstances and student needs. To recall the language of cybernetics, they can compensate for perturbations in the system.

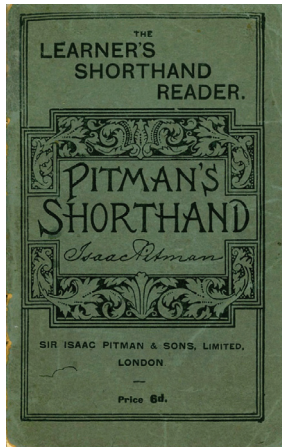
We shall return to the contemporary dynamics of flexibility after recalling their evolution as open, distance and online learning developed from the industrial revolution to the Internet revolution.

The Industrial Revolution: The Roots of Open and Distance Learning

Early attempts to scale up education at low cost with consistent quality were inspired by the industrial revolution. Adam Smith, who is famous for his analysis of the disruptive elements of the new production processes that created the industrial revolution, also believed strongly in extending public education. But he might have been surprised to see how the processes that drove the production of more, better and cheaper goods in the industrial revolution, which he captured so compellingly, would be used to expand education in the following century.

In his famous description of the pin factory, Smith identified the division of labour as the key to greater productivity: 'This great increase of the quantity of work which, in consequence of the division of labour, the same number of people are capable of performing, is owing to three different circumstances; first, to the increase of dexterity in every particular workman; secondly, to the saving of the time which is commonly lost in passing from one species of work to another; and lastly, to the invention of a great number of machines which facilitate and abridge labour, and enable one man to do the work of many...' (Smith, 1776).

Smith's statement also heralds the application of technology to the expansion of more flexible forms of education. The 'dexterity of every



particular workman' translates to the creation of teaching-learning systems that bring together the contributions of a range of specialized functions and individuals. 'The saving of time...lost in passing from one species of work to another' implies that different specialists can make their inputs simultaneously, which both scales up and speeds up the overall impact. Today, rapid developments in information and communications technologies and other media provide us with a 'great number of machines' to facilitate the tasks of teaching and learning.

These principles were the basis for much of the development of ODL in the 19th and 20th centuries. Taking advantage of the postal service made possible by the expanding rail networks in mid-19th century Britain, Isaac Pitman, who had invented his system of Shorthand notation in 1837, offered a correspondence course to teach the new method across the country. It was the first widely adopted practice of distance education and was largely responsible for the successful dissemination of Shorthand (Norman, 2016). The growing numbers of office workers across Britain had the flexibility of learning Shorthand directly from its inventor without leaving their homes.

Correspondence education benefited millions of people worldwide over the next century. Its key features, which brought new flexibility to teaching and learning, were printed learning materials, mass produced as a standard product, and personal interaction with tutors, who corrected and commented on students' assignments using first the postal system and later the telephone. By the 1960s, correspondence education was attracting research. Holmberg (1983) described it as 'guided didactic conversation', while Peters called distance education 'the most industrialised form of education' (Peters & Keegan, 1994).

From Correspondence to Multi-Media

With the creation of the United Kingdom Open University (UKOU) in 1969, ODL made the jump from basic correspondence education to systems of multi-media learning materials backed by sophisticated arrangements for student support. Although the UKOU was lauded as great success and inspired the establishment of specialized distance-teaching universities in other countries, its example did little to encourage campus institutions to engage in ODL.

Two factors contributed to their reluctance to engage with ODL. First, the residual image of correspondence education as an industrialized commercial enterprise still gave distance learning a poor reputation. Second, the large scale operations - and in some cases the very high quality - that the open universities offered discouraged head-to-head competition. Moreover, the formats of ODL at that time (printed materials rich in graphics, broadcast-quality TV and radio programs, etc.) made for relatively high barriers to entry into the market.

These barriers began to fall with the development of the Internet in the late 1990s. Suddenly it seemed possible for campus universities to offer distance learning without making the huge infrastructure investments required for multi-media production and logistics in the open-university model. Furthermore, it was already clear the Internet would provide the opportunity for a quantum leap in the flexibility of study options that post-secondary education institutions could offer. Research on ODL had consistently revealed the importance of rapid feedback in fostering student success. Instant communication through the Internet was a step change from exchanging assignments and comments through the postal system.

But, once again, two developments made institutions cautious. The hype of the dotcom frenzy of the late 1990s collapsed into economic turmoil for some players as the forecast that most human interactions would quickly move online proved exaggerated! A little later, in the mid-2000s, some Internet teaching ventures launched with fanfare by elite British and US universities were ignominiously shuttered after only a few years. Taylor Walsh (2010) described these initiatives with verve in *Unlocking the Gates: How and Why Leading Universities Are Opening Up Access to Their Courses*. An important feature of her book was a foreword by William Bowen, which addressed the cost of ODL, a key element in permitting its flexibility.

Bowen, an economist who later became president of Princeton University, had written a classic paper (Baumol & Bowen, 1965) on the 'cost disease'. It showed the prices of manufactures had gone down in real terms; those of many services, such as hairdressing, had stayed roughly constant; while the prices of personal services by highly trained professionals (e.g. academics, dentists, horn players and stockbrokers) had risen. This reasoning implied there was little possibility of reducing the costs of post-secondary education by using new approaches.

In the foreword to Walsh's book, Bowen reversed his scepticism about the potential of technology to improve productivity in higher education because the costs of the highly trained professionals he cited in the 1965 paper had evolved in different directions. The price of dentistry may rise faster than inflation because it is a personal service with limited scope for automation. The case of orchestral musicians, such as horn players, is different. They are rare professionals, but technology increased their productivity and reach dramatically. Today people can listen to them on smartphones, instead of in concert halls, at much lower cost. The most interesting comparison for post-secondary education is with stockbrokers. Their prices went up more rapidly than those of academics until the 1980s and then fell steadily to a relatively much lower level. This was when brokerage services went online, giving individual investors more control.

For an establishment figure like Bowen to conclude that technology could improve the productivity of higher education was a significant indicator of changing attitudes. Institutions without previous experience of ODL had already begun to offer courses online, though usually as initiatives of particular departments or individuals rather than as part of an institutional strategy. In North America, as a result, online enrolments grew slowly but steadily, and more rapidly than campus enrolments, as the 21st century advanced.

Online Learning: From Margin to Mainstream

Tony Bates tracked the growth of online learning through these years (Bates, 2011; 2012; 2013). In 2011, he noted that learning management systems (LMS) were being used by 95% of all post-secondary institutions in North America (Bates, 2011), suggesting wide experimentation. There was 'a great deal of innovative activity around the fringes of formal courses, and especially in informal learning' with 'the LMS and lecture capture remaining the bedrock of most online learning'. But he concluded his 2011 survey by writing: 'we continue to add bells and whistles to the horse and cart... When are we going to get a railway, never mind a high-speed train?'

Two years later, Bates' review for 2013 noted that 'partly as a result of Massive Open Online Courses (MOOCs), but also because of moves

towards integrating online learning with classroom teaching, a number of institutions... either developed or started to develop a more strategic approach to online learning'. He was personally involved in advising on these developments at numerous institutions.

Between 2011 and 2013, MOOCs had come to the United States (US). Although there had been a MOOC in Canada in 2008, Bates probably did not have the US MOOCs frenzy in mind when he continued: 'the outlook for e-Learning in 2012 is generally highly favourable... the trends towards more openness, more mobility, more innovation in teaching and learning, and more powerful tools for instructors and especially students, are clear and consistent with developments in previous years. Yes, history is on our side' (Bates, 2012).

The media coverage and controversies that MOOCs generated in 2012 did more to make the global higher education community take ODL seriously than any other factor (Daniel, 2012; 2016b). Enrolments in distance education courses began to accelerate everywhere. We shall comment on MOOCs later because they highlight the challenges of flexibility in online learning in an extraordinary manner.

The 2015 Babson report (Babson, 2016, p. 3) declared that 'distance education is clearly mainstream because over a quarter of US students are taking at least one course online'. This was the final review of a series that the Babson Survey Group had published annually since 2003. It noted that enrolment trends, attitudes to online learning and patterns of institutional provision were now fairly stable, rendering further yearly narrative reports unnecessary. Henceforward the National Centre for Education Statistics' Integrated Postsecondary Education Data System (IPEDS) will track the growing numbers of online learners in the US.

Fewer data are available for other jurisdictions and will likely remain scarce as distance education becomes mainstream in them as well. It was easy to count distance learners when most of them were in open universities teaching exclusively at a distance. In 1995, for example, I found that there were 2.8 million distance students in the world's eleven mega-universities (Daniel, 1996, p. 32). Today, however, campuses offer both distance and classroom courses and students often combine them in their timetables. It will become increasingly difficult to disentangle higher education delivery modes in gathering data. A comment from a 2010 study in the United Kingdom (UK) sums up the problem: 'much of this growth has taken place on an ad hoc basis, often at the departmental level, and this has led to a situation where it is difficult to assess the overall level of (open and distance learning) activity across the sector' (Oxford University, 2010).

In Canada, there have been no formal attempts to quantify the scale of online learning since 2010. In that year, an Ontario survey reported that 15% of post-secondary programs were online, accounting for 20,000 courses and 500,000 student registrations. These numbers have since grown significantly. Contact North | Contact Nord, Ontario's distance education and training network, reported a 28% increase in enrolments in 2015 alone. Jean-Louis (Contact North, 2015) estimated there were some 1.3 million online course registrations every semester across Canada in that year. Calculated pro-rata to national populations, this figure suggests online learning is even more popular in Canada than in the US.

Reliable data on the spread of online learning will, however, become increasingly important for government policy makers, institutional planners, researchers and others. The time is ripe to agree internationally on definitions and to gather authoritative data on country-by-country patterns of adoption of online learning using similar survey instruments.

Online Learning: Advances and Attitudes

Although its particular mix of public, private non-profit and private for-profit higher education institutions makes the US unique, the findings of the 2015 Babson report are still a useful reference for other jurisdictions. We highlight the following.

Definitions

Babson has used consistent definitions of online, face-to-face and blended learning courses since the first report was published in 2003. These are (Babson, 2016, p. 7):

- Online: at least 80% of the course content is delivered online.
- Face-to-face: courses in which zero to 29% of the content is delivered online (this category includes both traditional and web-facilitated courses).
- Blended (or hybrid): between 30% and 80% of course content delivered online.

Babson uses the terms blended and hybrid as synonyms. Bates (2015, p. 311), however, made a useful proposal to use ‘blended learning’ for all combinations of online and face-to-face with between 30% to 80% delivered online, but to restrict the term ‘hybrid learning’ to blended courses where, instead of using online technology in opportunistic and serendipitous ways, the whole teaching-learning system is redesigned to create optimum synergy between the face-to-face sessions and learning online (Daniel, 2016a).

Patterns of online enrolments

The numbers of US students learning online rose by 3.9% in 2015, slightly up on the previous year’s increase. Of the 5.8 million people studying online, nearly half were taking all their courses online. Public universities account for nearly three-quarters of student enrolments of all types and also for three-quarters of all undergraduates studying online. This growth in online study has been accompanied by a decline in campus-based enrolments.

The percentage of US higher education institutions (HEIs) offering MOOCs is now just over 11%. Some other HEIs are still considering whether to offer MOOCs but most have now decided against it.

Despite a widespread perception that the private for-profit sector dominates this delivery mode, the large majority of online students are in public institutions. Another myth is that institutions are recruiting students from the entire world through online learning. In practice, the majority of US students working exclusively online reside in the same state as the institution offering the course (84% for public institutions). Only 2% enrol from outside the country in any sector of US higher education. Online learning is not a Trojan horse for academic imperialism!

Although many institutions are dabbling in online learning - some 70% of the 4,806 US HEIs offer some distance education - almost half the students are concentrated in just 5% of these institutions: the 247 HEIs with over 5,000 ODL enrolments. 30% of all distance enrolments are in only 80 institutions (less than 2% of the national total) that each counts over 10,000 such students. How this set of institutions markets and develops its distance programs will determine the learning experiences of the large majority of distance students in the US.

Perceptions

What do US academic leaders think about online learning? The Babson reviews show the attitudes of institutional leaders and chief academic officers to online learning are stabilizing and becoming more differentiated as individual HEIs firm up their policies.

After rising fairly steadily over 12 annual surveys, the proportion of institutions now reporting 'online education is critical to their long-term strategy' has decreased sharply, from 70.8% in 2014 to 63.3% in 2015. This suggests that after weighing up whether to commit to online learning, institutions have been making up their minds one way or the other. This is particularly true of the very smallest institutions. In 2014, 70.2% of small institutions reported online education was critical to their long-term strategy, but by 2015 this had dropped to only 46.0%. Conversely, institutions that made a commitment to online programs continue to see them as strategically important.

The overall expansion of online learning is linked, no doubt, to the steadily evolving perceptions of its quality and effectiveness among senior academic officers. Over 70% of them consider that learning outcomes in online education are the same or superior to those in face-to-face instruction, while fewer than 30% see them as inferior. Unsurprisingly, respondents at institutions with large distance education enrolments are the most positive, with over 40% rating online as "superior" or "somewhat superior" to face-to-face instruction. We presume these views are based on evidence rather than wishful thinking!

A challenge for the future development of ODL, however, is these senior academic officers perceive their faculty members to be much less convinced of its merits. Overall, fewer than 30% of chief academic officers presently believe their faculty members accept the value and legitimacy of online education. Indeed, faculty members were more positive about ODL a decade ago than they are now. Here too, however, there is a sharp difference in perceptions between institutions. At institutions with over 10,000 ODL enrolments, 60% of leaders consider their faculty members are onside, a figure that drops to 10% for institutions with no ODL offerings.

The reluctance of many academics to engage with ODL may reflect their unfamiliarity with the digital world rather than any principled objections. A survey by Straumsheim (2016) found nearly 40% of US faculty members had never heard of OER (Open Educational Resources), while a further 36% knew a little about them but had never reviewed or used them. This may partly explain the slow take-up of ODL by many academics, since exploring and adopting OER is a very flexible approach to using digital content in course materials. Indeed, knowing something about OER could be taken as a surrogate for awareness of the world of digital learning generally. But change is

coming. Straumsheim found half of the faculty members who were not using digital materials expected to be doing so within five years.

Notwithstanding the steady change occurring, there appears to be a disconnect between the conclusions about the speed of technology adoption of researchers like Straumsheim and the Babson team, who review the past and the present, and those who make future forecasts by peering through the lens of developments in technology.

Forecasting the Future

The 2016 Horizon Report (Johnson et al., 2016), which is largely based on anecdotal evidence from institutions, is a good example of the latter approach. It concludes, for example, that: ‘the time to adoption for augmented and virtual reality, along with makerspaces, is estimated within two to three years, while affective computing and robotics are expected to be more prominent in colleges and universities within four to five years’.

In its two-part study *A 2016 Look at the Future of Online Learning*, Contact North | Contact Nord (2016a) takes a less anecdotal approach than the Horizon Report and organizes its forecasts into trends. In Part 1, *Advancing Technology and Online Learning – an Ideal Match for the Future*, it identifies seven key technology patterns and distils them down into five key features of online learning which technology will enable. These are that learning will be:

- Mobile: anywhere and anytime;
- Interactive and engaging;
- Personal (differentiated instruction);
- Intelligent (drawing on artificial intelligence); and
- Global.

Part 2 of the Contact North | Contact Nord (2016a) study, *Transformations in Learners, Programmes, Teaching and Learning, and Policy and Government*, provides a good run-in to our next section. After looking at likely changes in student behaviour, programming, teaching/learning methods and the implications for policy and government, it asks what institutions should do to position themselves in this environment and avoid the potential disruption ahead.

Interpreting Flexibility: The Iron Triangle

Ministers of education seek to provide wide access to good quality post-secondary education at low cost (Daniel et al., 2009). Making a triangle with these three vectors of access, quality and cost is a simple way of representing different models of post-secondary education graphically and illustrates the ministers’ dilemma (Daniel, 2010, p. 51). It shows that although classroom teaching may be flexible, it does not allow us to extend any one of these three vectors in the desired direction without compromising the other two.

Attempting to increase the quality of the classroom experience, say by offering more learning materials or better equipment, will increase cost and likely reduce access. Expanding access by putting more students into each classroom will provoke accusations of lowering quality, and so on. Focusing on cost cutting may reduce both access and quality.

This visual representation of the constraints of traditional classroom teaching methods has come to be known as the ‘iron triangle’. Only



through the use of technology, which has already increased the availability and cost-effectiveness of products and services in most other aspects of life, can quality education be expanded at low cost. Technology renders the iron triangle flexible so that it can be stretched to give greater access and better quality while simultaneously lowering costs. This is a starting point for assessing flexibility in online learning.

How far can we extend flexibility in post-secondary education and where are the limits? We attempt answers to these questions by mapping three challenges of online learning, options, outcomes and organization, onto the three vectors of access, quality and cost that define the Iron Triangle.

Access: New Options

The increasing number of options for learning and teaching is the clearest manifestation of the flexibility online technology has brought to higher education. We each feel the impact directly and personally. For example, my daughter is studying online with a foreign university for a Masters degree that is not offered in Canada and I have combined the study of 12 MOOCs with my work and travels.

The new options online learning offers boost the vector of access. On top of the usual ODL freedoms of where and when to study, contemporary online learning may also offer students open admission, a greater variety of qualifications and credentials, easier routes to the recognition of previous learning, and interactions with a large and diverse body of other learners. Teachers enjoy new options for designing and delivering their courses when they adopt online teaching and training.

Contact North | Contact Nord (2016b), in *Five Ways that Online Learning is Enabling Change in Post-Secondary Education*, makes the simple but important point that whether they are enrolled in an online course or not, 'all learners today are online learners to some degree'. Even those taking entirely face-to-face courses turn to search engines to chase down facts and knowledge, they use social media to stay in touch with fellow students and they exchange e-mails with their teachers. The 'real issue', the article continues, 'is how developments in technology are enabling changes in pedagogy, which in turn may affect the way in which colleges and universities operate'.

This 'real issue' resonates with students, who find that they often engage more fully with online studies than with other methods of teaching (Owston, York & Murtha, 2013; Daniel, 2016a). Online work gives them more opportunity to construct knowledge themselves, which leads to deeper learning and also motivates them to work harder.

But there is a caveat. Whilst there is often synergy between greater flexibility in course formats and greater convenience for students, this is not always true. The capacity of ODL to enable people to study anywhere does combine flexibility and convenience in a positive way. A large project on mobile learning in the UK improved retention and progression rates and was found to be particularly helpful to non-traditional students (Attewel et al., 2009).

But the power of ODL to bridge time needs more careful handling. If students' convenience were the main criterion, then allowing them to enrol in a course at any time and complete it at their own pace would be the answer. Flexibility in start dates is fine, although it does reduce

the possibility of interaction between students who are at the same point in the course, as well as being more challenging for tutors and teachers. But there is abundant evidence that making courses entirely self-paced after enrolment leads to lower retention and completion rates.

This is not surprising. All learners, but particularly older students with jobs and families, have many calls on their time. They need a mechanism that motivates them to give some priority to their studies. This usually takes the form of assignment deadlines and a fixed date for the end of the course while giving them flexibility to schedule their work within this framework. Another approach is to break the course into several shorter courses so the student can complete each one more quickly and, if desired, take a break before tackling the next one.

Pacing study in this way is less important for informal online learning opportunities like MOOCs. As a MOOC learner myself, I sometimes like to get ahead of the course schedule, although I also find it helpful if the course remains accessible online well after its formal end date.

The key criterion for judging the value of flexibility in online learning is whether students become more engaged and perform better. Contact North | Contact Nord's (2016c) posting, *Towards a New Pedagogy of Engaged Learning*, provides much useful guidance to teachers, as does its companion document, *Seven Habits of the Professor of the Future* (Contact North | Contact Nord, 2016d). What do they say?

Having recalled the earlier point that all learners today use online tools, they explore the 'new *pedagogy of engaged learning* from the disruptive point of view that it is time to stop thinking of online learning, blended learning and classroom-based teaching as if these were competing pedagogies. They are not. They are all part of the approaches available to 21st century college or university instructors'.

Engaged learning is an amalgam of the time and effort students put into their studies and how effectively the institution organizes resources, curricula and other learning opportunities to encourage participation in activities that foster learning. The US National Survey of Student Engagement (NSSE) (2013) noted, *inter alia*, the following three points about student engagement.

Most students taking all of their courses online:

- Experienced high levels of challenge, spent slightly more time studying and reading, and were assigned more writing.
- Used learning strategies, such as identifying key information from reading assignments, more often, giving higher self-reported grades.
- Were significantly less engaged in collaborative learning and had fewer interactions with faculty but rated the quality of those interactions more highly than students with no online courses.

The Contact North | Contact Nord (2016c) posting stresses that establishing communities of practice for faculty members is also important: 'they need to be able to see what is possible and to connect to those who "go before them" so they find out what works, what didn't work and what were the lessons learned'. The teachonline.ca portal for faculty and instructors is an attempt to do this (<http://teachonline.ca/home>).

Seven Habits of the Professor of the Future (Contact North | Contact Nord, 2016d) makes some similar points. Useful options for the faculty member are:

- Intelligent magazine-like search engines that collect new information in their current fields of interest (e.g. Flipboard).
- Continuous updating of course resources for students (e.g. through OER finders).
- Tools that facilitate large-scale global collaboration (e.g. on research, program development and accreditation standards).
- Assessment banks that facilitate competency testing.
- Tools for creating multi-media courses (e.g. iBook developer).
- Tools that make meetings more effective and efficient.
- Using face-to-face sessions for apprenticeship-style demonstrations of using skills and applying knowledge.

What these options have in common is they help teachers, who are being pulled in many different directions, to discharge their tasks more efficiently and provide their students with more engaging and meaningful learning opportunities.

Quality: New Outcomes

The outcomes learners achieve through their studies align with the quality vector in the Iron Triangle. Quality assurance (QA) processes in post-secondary education once focused on the quality of the inputs (grades of incoming students, qualifications of the faculty, library holdings, etc.). In its next phase of development, QA paid greater attention to the processes of teaching, learning and assessment. Today, prodded by employers and governments, QA agencies are grappling with the challenge of judging students' learning outcomes.

Outcomes range from formal university degrees and college diplomas through the certification of new skills to informal methods of recognition or simply the basic satisfaction of having mastered new knowledge. Online learning has created much greater flexibility in the definition of learning outcomes, but where are the limits to that flexibility?

Students coming into higher education are seeking - and being offered - a wider range of learning outcomes than in the past. Traditional degrees and diplomas will not become obsolete any time soon, but shorter learning opportunities are blossoming under the stimulus of online learning. MOOCs, which use online technology to offer learning content to very large international audiences, are an extreme example. We use the term 'learning content' to make the point that most MOOCs do not usually offer the formal assessment and certification we normally associate with a 'course', although this is changing (Contact North | Contact Nord, 2016e).

Lack of credible certification does not, however, make MOOCs less helpful to many of the thousands of learners who seek a particular content. The 12 MOOCs I have taken were all interesting and well designed. Using the content of these MOOCs to enrich my everyday life is a more significant benefit for me than any certificate of participation. My latest MOOC, *Strategies for Successful Ageing* (FutureLearn & Trinity College, Dublin) is a perfect example. The encouragement to keep fit, eat healthy food and sustain my social networks is a more useful outcome from my study than having a course participation certificate on the wall!

Starting from the example of MOOCs, where individual learners largely judge the value of the learning outcomes for themselves, there is now a range of approaches to certifying learning outcomes leading right up to the examinations and screening used by the most exacting professions. Online technologies have facilitated this diversification, open badges being a good example.

Open badges are based on software that allows any organization or individual to present a digital badge to a learner who has satisfied the criteria for earning it. Because they are in digital format, badges can include more information about what and how the learners studied, how they were assessed, the time involved, etc., than a normal paper record. However, value of the badge to the holder who presents it to a potential employer as proof of competence depends crucially on the credibility of the organization or individual that issued the badge.

While some established institutions issue badges, such as universities that use them to motivate students to master ‘soft skills’, their principal virtue is to foster greater variety in skills certification. Many organizations are taking advantage of this opportunity, following the example of companies (e.g. Cisco, Microsoft) that have a long tradition of certifying people they judge competent to service their products, certification that commands respect throughout those industries.

Organizations without such a track record have various opportunities to demonstrate their quality and credibility through external review. For example, the US Council for Higher Education Accreditation has an International Quality Group (CHEA/CIQG) that administers a quality assurance process (the Quality Platform) to such ‘post-traditional’ providers. The process focuses almost entirely on reviewing the articulation and attainment of student learning outcomes. Successful organizations gain recognition as CHEA/CIQG Quality Platform providers.

In a previous essay on Making Sense of Blended Learning (Daniel, 2016a), we explored the debates about the skills and knowledge graduates will require for life and work in the 21st century. Two of the main challenges are to give more attention to developing core skills whilst embedding them in the appropriate context and to ensure students grasp the academic knowledge that underpins their areas of study. In *Beyond Course Content: Teaching Core Skills Online*, Contact North | Contact Nord (2016f) illustrates how various institutions are using online methods to embed the teaching of these core skills within and alongside instruction in different disciplines.

One of these core skills is digital literacy. Reinforcing the findings of an earlier study (Jones & Husein, 2010), a recent US survey refutes the assumption that younger people are more at ease with digital technology, noting that ‘millennials find the Internet more scary than older Americans’ (Rasmussen College, 2015). MediaSmarts (2015), which defines digital literacy as the ‘capacity to participate in a society that uses digital communications technology in workplaces, government, education, cultural domains, civic spaces, homes and leisure spheres’, reports on digital literacy policy and practice in Canada.

We conclude from this analysis of flexibility in learning outcomes that students should be aware that new forms of certification take time to establish their credibility, although in this fast-moving field that time need not be very long. Nevertheless, after learners find a course that matches their needs, they should check the credibility, within that particular field, of the body that will certify their achievement.

Cost: New Organization

In order to derive most benefit from online learning, organizations must adapt their structures and policies. We relate this requirement for new forms of organization to the cost vector in the Iron Triangle. Online learning presents both opportunities and challenges to the traditional economic models and cost structures of post-secondary education. MOOCs are a particular instance of the challenges that online learning poses. MOOCs are offered online at scale, yet are mostly offered free of charge. How do institutions integrate courses that do not generate direct revenue into their business model?

As the options for students and teachers evolve and the outcomes of post-secondary education diversify, we should expect changes in the ways institutions organize themselves. There are two trends at work, pulling in opposite directions. We start with the less attractive.

Post-secondary education is being unbundled. This 'refers to the separation of the components of the learning and credentialing process, potentially separating course design, development, delivery, support, assessment, and credentialing. Learners will be able to select the providers of content, the mentoring and coaching for mastery and then undertake assessment in dedicated assessment centres so as to secure recognition by professional bodies, credit coordinating agencies, and/or universities and colleges. Given that quality no longer relates to residency at any one institution but to competencies and mastery, unbundling is the key to personalized learning routes and differentiation of providers' (Contact North | Contact Nord, 2016a).

Does this describe a happy world of extraordinary flexibility and rich choice for learners or something closer to anarchy? These elements of flexibility foreseen by the proponents of unbundling will doubtless become available. But there are several reasons for suspecting that few students will opt for the fully unbundled model.

First, most people do not want and cannot handle too much choice, quite apart from the transaction costs and complexities of dealing with different bodies for each step of the learning and certification process. Students like the security of dealing with an institution they know and trust. We saw earlier that notwithstanding the global reach of ODL programs, most ODL students enrol at institutions physically located in their own jurisdiction.

Second, faculty members like to have some consistency and continuity in their student body and will likely find the free-for-all of the unbundled post-secondary world demotivating.

Third, institutions also like the idea of being able to identify 'their' students. Their reluctance to reduce residency requirements is more than a ploy to protect a market. To proceed through a program with a cohort of fellow students can be just as meaningful for online learners as those taking classes on campus.

On this reasoning, it seems likely HEIs will react to unbundling by organizing themselves to re-bundle the total learning experience for students - and students will accept this gratefully. This leads naturally to the more positive organizational trend.

The Irish scholar Desmond Keegan once pointed out that in classroom education, the teacher teaches, whereas in distance education the

institution teaches (Keegan, 1990). This is because ODL courses exist somewhat independently of the particular academics that first prepared them, so the institution has to take some responsibility for ensuring continuity in offering and supporting these courses. As our ODL course offerings expanded at Laurentian University in the 1980s, for example, we found it necessary to strengthen the central administrative function so faculty members could take vacations or sabbaticals with the assurance the ODL office would organize support for the students in their courses in their absence.

Open universities, which function exclusively through ODL, build these central support systems before they start operations, whereas campus institutions that add ODL offerings must put them in place as the program expands. This is usually controversial because any involvement of the central administration in teaching functions tends to provoke resistance from the schools and faculties as well as from individual academics. The answer, at least in theory, is subsidiarity; an organizing principle that matters ought to be handled by the smallest, lowest or least centralized competent authority. This could mean, for example, central services operate a common learning management system for the whole institution, whereas, say, the school of nursing organizes support and practicums for its own ODL students.

However, as technology evolves and ODL offerings expand, the optimal expression of subsidiarity will change too. Nearly everything in the preceding sections suggests, for instance, that institutions need to take responsibility for helping faculty members re-equip themselves, both materially and intellectually, to handle the options and outcomes we described. Human resources policies must also adapt to changing patterns of academic work. While the negotiations required may be painful, they are probably best conducted at the institutional level rather than unit-by-unit.

An effective approach to subsidiarity in organizing an institution for a more flexible future will also help it to cope with the challenge of unbundling. Some institutions, both out of self-interest but also with the encouragement of students, may set up brokerage-style services to help students re-bundle the elements they want. This will mean hiring increasing number of counsellors and specialists of various kinds to staff these functions.

As they go down this route, HEIs must avoid hollowing out their academic and teaching functions. US post-secondary tuition fees have increased much faster than inflation in recent years because institutions have added many new non-academic staff while reducing the number of appointments to full-time faculty posts. Some institutions may find this financially unsustainable, quite apart from the threat it poses to their intellectual vitality.

Conclusion

Flexibility is a defining element of online learning. We have explored the opportunities and challenges it presents by referring back to the Iron Triangle of access, quality and cost that helped us visualise how technology initiated a revolution in education through open and distance learning (ODL). Although online learning presents a richer and more complex range of possibilities than earlier forms of ODL, the Iron Triangle remains a useful point of reference.

Viewing the new options for learning and teaching online through the lens of accessibility helps us find a balance between flexibility and effectiveness. Similarly, using the yardstick of quality to guide us through the wider range of learning outcomes made possible by online learning permits enables us to advise students constructively. Finally, we related the new organizational approaches that online learning requires to the cost vector. The highly flexible study frameworks generated by online learning pose difficult challenges to institutions. Those offering MOOCs must develop a lucid business model that balances costs against reputational and other benefits. More crucially, institutions need to develop both strategies and tactics that will enable them to maintain their institutional integrity if the trend of unbundling post-secondary education gathers momentum.

The many choices of study options and learning outcomes that are now available pose both opportunities and challenges to all post-secondary stakeholders as they organize themselves for a technology-rich future. Post-secondary education has been accused of being too rigid; does it now face the danger of becoming too flexible?

Both students and faculty members want useful outcomes for their work. Online technologies can help them achieve these because they favour deeper student engagement and commitment as well as bringing greater diversity and intellectual excitement into the teaching-learning process. Post-secondary institutions will have even greater responsibilities to their students in the coming era. They must strive to achieve an ethical balance between helping students sift through the wide array of external course choices and ‘bundling’ opportunities and proposing programs within the institution that will deliver the outcomes their learners want. Institutions will also have to provide fuller support to their faculty members and staff, notably in fostering opportunities for training and networking in communities of practice, as well as back-up for an increasing array of technologies.

Buildings collapse in earthquakes because they are either too flexible or too rigid. Institutions should foster the organizational resilience needed to ensure they can cope with the perturbations that a more flexible era of post-secondary education will bring.

References

- Ashby, W. R. (1956). *An Introduction to Cybernetics*. London: Chapman Hall.
- Attewell, J., Savill-Smith, C. & Douch, R. (2009). *The Impact of Mobile Learning: examining what it means for teaching and learning*. LSN. <http://media.cornwall.ac.uk/ostube/media/document/83.pdf>
Accessed 2016-03-16)
- Babson (2016). *Online Report Card: Tracking Online Education in the United States*, by Allen, I. E. & Seaman, J., Babson Survey Research Group, 58pp. <http://www.onlinelearningsurvey.com/highered.html>
Accessed 2016-02-17)
- Bates, A. W. (2011). *E-Learning in 2011: A Retrospective*. <http://www.tonybates.ca/?s=e-Learning+2011>
Accessed 2016-03-07)
- Bates, A. W. (2012). *E-learning outlook for 2012: will it be a rough ride?* <http://www.tonybates.ca/2012/01/02/e-learning-outlook-for-2012-will-it-be-a-rough-ride/>
Accessed 2016-03-07)
- Bates, A. W. (2013). *Look back in anger? A review of online learning in 2013*. <http://www.tonybates.ca/2013/12/15/look-back-in-anger-a-review-of-online-learning-in-2013/>
Accessed 2016-03-07)
- Bates, A. W. (2015). *Teaching in a Digital Age: Guidelines for Designing Teaching and Learning*, BCcampus. <http://opentextbc.ca/teachinginadigitalage/>
Accessed 2016-02-18)
- Baumol, W. J. & Bowen, W. G. (1965). On the Performing Arts: The Anatomy of their Economic Problems. *The American Economic Review*, Vol. 55, No. 2, pp. 495-502;
- Contact North | Contact Nord (2015) *An Overview of Online Learning in Canada*, by M. Jean-Louis. http://teachonline.ca/sites/default/files/pdfs/an_overview_of_online_learning_in_canada_-_april_2015.pdf
Accessed 2016-03-05)
- Contact North | Contact Nord (2016a). *A 2016 Look at the Future of Online Learning*. http://teachonline.ca/sites/default/files/tools-trends/downloads/2016_look_at_online_learning.pdf
Accessed 2016-03-05)
- Contact North | Contact Nord (2016b). *Five Ways Online Learning is Enabling Change in Post-Secondary Education*. Accessed 2016-03-14) <http://teachonline.ca/tools-trends/how-teach-online-student-success/five-ways-online-learning-enabling-change-post-secondary-education>
- Contact North | Contact Nord (2016c). *Towards a New Pedagogy of Engaged Learning*. <http://teachonline.ca/tools-trends/facilitating-student-engagement/towards-new-pedagogy-engaged-learning>
Accessed 2016-03-14

Contact North | Contact Nord (2016d). *Seven Habits of the Professor of the Future*.

http://teachonline.ca/sites/default/files/tools-trends/downloads/seven_habits_english.pdf

Accessed 2016-03-14

Contact North | Contact Nord (2016e) *Five Ways MOOCs are Influencing New Ways of Teaching and Learning*.

<http://teachonline.ca/about-us/external-presentations/towards-new-pedagogy-five-ways-moocs-are-influencing-teaching-and-learning>

Accessed 2016-03-15

Contact North | Contact Nord (2016f). *Beyond Course Content: Teaching Core Skills Online*.

<http://teachonline.ca/tips-tools/beyond-course-content-teaching-core-skills-online>

Accessed 2016-03-14

Daniel, J. S. (1996). *Mega-Universities and Knowledge Media: Technology Strategies for Higher Education*, Kogan Page, London.

Daniel, J. S. (2010). *Mega-Schools, Technology and Teachers: Achieving Education for All*, Routledge, New York & London

Daniel, J. S. (2012). Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility. *Journal of Interactive Media in Education*.

<http://jime.open.ac.uk/articles/10.5334/2012-18/>

Accessed 2016-03-08

Daniel, J. S. (2016a). *Making Sense of Blended Learning: Treasuring an Older Tradition or Finding a Better Future?* Online Learning News, Contact North - March 2.

http://teachonline.ca/sites/default/files/tools-trends/downloads/making_sense_of_blended_learning-eng.pdf

Accessed 2016-03-06

Daniel, J. S. (2016b). Massive Open Online Courses; what will be their legacy? *FEMS Microbiology Letters* 363, 2016, fnw055.

Daniel, J. S., Kanwar, A. & Uvalić-Trumbić. S. (2009). Breaking Higher Education's Iron Triangle: Access, Cost, and Quality, *Change: The Magazine of Higher Learning*, March-April.

<http://www.changemag.org/Archives/Back%20Issues/March-April%202009/full-iron-triangle.html>

Accessed 2016-02-17

Holmberg, B. (1983). 'Guided didactic conversation in distance education', in Stewart, D., Keegan, D., and Holmberg, B. (eds.) *Distance Education: International Perspectives*. London: Croom Helm

Johnson, L., Adams Becker, S., Cummins, M., Estrada, V., Freeman, A., and Hall, C. (2016). *NMC Horizon Report: 2016 Higher Education Edition*. Austin, Texas: The New Media Consortium.

<http://www.nmc.org/publication/nmc-horizon-report-2016-higher-education-edition/>

Accessed 2016-03-01

Jones, C. and Hosein, A. (2010). Profiling University Students' Use of Technology: Where Is the Net Generation Divide? *The International Journal of Technology Knowledge and Society* Vol. 6 (3) pp. 43-58.

- Keegan, D. (1990). *Foundations of Distance Education*. Routledge.
- MediaSmarts (2015) *Mapping Digital Literacy Policy and Practice in the Canadian Educational Landscape*.
<http://mediasmarts.ca/sites/mediasmarts/files/publication-report/full/mapping-digital-literacy.pdf>
 Accessed 2016-03-15
- National Survey of Student Engagement. (2013). *A Fresh Look at Student Engagement—Annual Results 2013*. Bloomington, IN: Indiana University Center for Postsecondary Research.
http://nsse.indiana.edu/NSSE_2013_Results/pdf/NSSE_2013_Annual_Results.pdf#page=8
 Accessed 2016-03-14
- Norman, J (2016). *Pitman, Shorthand & the first Correspondence Course*.
<http://www.historyofinformation.com/expanded.php?id=2415>
 Accessed 2016-03-06
- Owston, R., York, D. & Murtha, S. (2013). *Student perceptions and achievement in a university blended learning strategic initiative*.
<http://aifprojects.yorku.ca/files/2013/01/blended-learning-article-Smurtha.pdf>
 Accessed 2016-03-14
- Oxford University (2010). *Study of UK Online Learning*.
http://www.hefce.ac.uk/media/hefce/content/pubs/2010/rd1710/rd17_10.pdf
 Accessed 2016-02-17
- Peters, O. & Keegan, D. (1994). *Otto Peters on Distance Education: The Industrialization of Teaching and Learning*, Psychology Press.
- Rasmussen College (2015). *Digital Literacy in America*.
<http://www.rasmussen.edu/resources/digital-literacy-in-america/>
 Accessed 2016-03-14
- Smith, Adam (1776) *The Wealth of Nations, Book 1 Chapter 1 para. I 1.3*. Retrieved from
<http://www.econlib.org/library/Smith/smWN.html>
 Accessed 2016-03-05
- Straumsheim, C. (2016) No Rush to 'Go Digital'. *Inside Higher Ed*, February 22
<https://www.insidehighered.com/news/2016/02/22/study-faculty-members-skeptical-digital-course-materials-unfamiliar-oer>
 Accessed 2016-03-01
- Walsh, T. (2010) *Unlocking the Gates: How and Why Leading Universities Are Opening Up Access to Their Courses*, Princeton University Press

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