

National University Technology Network

Annual Conference 2015
Savannah, Georgia, USA
2015-09-22

***Making Sense of Educational Technology:
from MOOCs to Blended Learning - where next?***

Keynote address
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Introduction

Good morning! It is a great pleasure to be here with you in Savannah. I have only been here once before but it struck me then as one of the pleasantest cities in America.

It is a great privilege to have been selected for the Distinguished Service Award of the National University Technology Network this year. I thank you warmly for conferring this honour upon me. The honour is the greater because I seem to be the first foreigner that you have recognised in this way.

45 years ago I enrolled in a Master's Programme in Educational Technology at Sir George Williams University in Montreal. I had completed my doctorate in Nuclear Metallurgy at the University of Paris and had been appointed Assistant Professor of Metallurgical Engineering at the Ecole Polytechnique, which is the Engineering School of the University of Montreal.

Perhaps perversely for a young engineering faculty member, I thought that having become an academic I ought to learn something about education - the scientific study thereof. I looked around Montreal for a programme that I could study part-time that appeared to have some intellectual bite to it and was not focussed wholly on K-12 education.

The Educational Technology programme at Sir George - the first of its kind in Canada - was the only one that fitted the bill. I had little idea what educational technology was and felt somewhat suspicious, but I took the plunge. It turned out to be a life-changing experience. That was partly due to the courses, because coming from a very specialised European training in the physical sciences, I had never done any college-level social science before then. But what really set my career on a new path was the 3-month internship required by the programme.

This was 1971 and the press was full of stories by an amazing innovation, by the Brits of all people, called the Open University. This was clearly where the frontier of educational technology then was, so I wrote off and asked to do my internship there. The Director of

the Open University's Institute of Educational Technology, David Hawkrige, kindly offered to take me as a visiting lecturer for three months. He would not pay me but would give me interesting work.

That summer of 1972 in Milton Keynes was a conversion experience. I felt that in the Open University I was seeing the future of higher education. Everything impressed me: the scale - 40,000 students in only the second year of operation; the students - mostly mature folk with a level of motivation I had never seen before; the use of multi-media learning materials produced to the highest standards I had ever encountered; and the nation-wide student support system. I had never seen such a student-focussed university. It seemed that from the vice-chancellor down through the full-time and part-time faculty to the packers in the warehouses everyone treated the students as priority number one.

Not surprisingly, after this overwhelming experience, I returned to Montreal in September 1972 'no longer at ease in the old dispensation'. I had seen the future of higher education and I wanted to be part of it.

I got lucky because two weeks later the University of Quebec announced that it was hiring people for the Télé-université that it was setting up. This was clearly an open university for Quebec and French-Canada, so I applied, was appointed Coordinator of Educational Technology and moved to Quebec City for four very exciting years. From there I became Vice-President for Learning Services at Athabasca University, another open-university start-up based in Alberta.

This is where I had better get my confession out of the way. While in Quebec City I had commuted to Montreal twice a week to complete my coursework in the Educational Technology Master's programme. But when I got to Alberta completing the thesis that I had started on the introduction of computers in Quebec schools seemed less relevant, and since Athabasca was keeping me busy I dropped out of the programme.

I hasten to add that I continued to be a student, taking distance learning courses from the Télé-université and Athabasca and later a diploma in Theology.

By the time I finished the theology programme - if I may fast forward - I had become Vice-Chancellor (or President) of the Open University and we were living in Britain. The desire to continue studying was still there and I thought of doing a law degree - at a distance of course.

At that point my long-suffering wife sat me down and we had a robust conversation. She pointed out that I had a 24/7 job as head of the UK's largest university and suggested that a little more family time would be a good idea. She proposed that instead of doing law I should complete the Educational Technology programme from which I had dropped out 15 years earlier.

This seemed like an excellent idea but in the meantime plenty had changed. Sir George Williams University had merged to become Concordia University and, of course, the Ed. Tech. programme had changed out of recognition. I am pleased to say however, that Concordia University, showing admirable flexibility, reviewed my CV, decided that I had made good use of my earlier studies, and re-admitted me to do the thesis.

The Open University generously gave me a month's study leave and I went to Montreal and spent the time in friend's basement writing a thesis that later became my book *Mega-Universities and Knowledge Media: Technology Strategies for Higher Education*.

So 25 years after I had first enrolled, I presented myself at Concordia's commencement ceremony in 1995 and became a Master of Educational Technology. I guess that means I am a slow learner, but also a lifelong learner, so there is bad news and good news!

So, thank you again for making your Distinguished Service Award to someone who has followed a rather unusual trajectory.

But it's time that I got to the point. My title today is *Making Sense of Educational Technology: from MOOCs to Blended Learning - where next?*

In 2012 I got lucky again. The Korea National Open University invited me to spend a month in Seoul as a visiting professor. They asked me to prepare a research paper whilst I was there and a good friend suggested that since everyone was talking about MOOCs I should write about them. It was an excellent idea and the result was my paper *Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility*.

I was fortunate to be one of the first to the Web with a paper that took a critical look at the MOOCs frenzy and made some predictions about where it might take us, so the essay was widely quoted. Re-reading it three years later I find that my forecast of the impact of MOOCs was pretty well on target.

My colleague friend Maxim Jean-Louis, head of the Contact North network in Ontario, must have concluded that I had some talent for making sense of things and suggested that I do a similar number on Blended Learning. I am still working on that but will share some of my conclusions so far.

That's why I've broadened my title to: *Making Sense of Educational Technology: from MOOCs to Blended Learning - where next?*

MOOCs: A quick assessment

I shall begin with a quick assessment of MOOCs in several points.

Let me first recommend a book that deals with this topic more comprehensively than I can here. If you're not aware of Tony Bates magisterial e-book, *Teaching in a Digital Age: Guidelines for Designing Teaching and Learning*, you should download it immediately. Tony used to be a bit of a sceptic about Open Educational Resources but he

has published this with BCcampus as an OER. His book is a real *tour de force*. The good news is that it says almost everything there is to say about teaching in a digital age. The bad news is that he has made it very difficult for folk like me to say anything new. Anyway, here is my perspective.

A first point is that MOOCs were manifest in two very different forms in their first four years and have since diversified so much that we must ask whether the term MOOC is still useful.

The term MOOC was first used for a course offered at the University of Manitoba in 2008. The title, *Connectivism and Connective Knowledge*, gives you the flavour. It followed the philosophy espoused by Ivan Illich in his book *Deschooling Society*, which is summarised in this slide:

The aim is to ‘provide all who want to learn with access to available resources at any time in their lives; empower all who want to share what they know to find those who want to learn it from them; and, finally furnish all who want to present an issue to the public with the opportunity to make their challenge known’

As this implies, the students are the principal actors in these connectivist MOOCs as they share and comment on the resources they can find, in effect constructing the course as they go along.

But as you know, it was the use of the term MOOC by various elite US universities in 2012 that put the term on the map and started the MOOCs frenzy. This early MIT course on *Circuits and Electronics* can stand for that second generation of MOOCs.

With over 150,000 registrations it was certainly **massive**.

It was **open** in the sense of being free to the user, though free in the sense of free beer, not free speech, because the materials were usually copyrighted and not reusable by the learners as open educational resources.

It was **online**, so accessible to anyone with a computer and a connection.

Was it really a **course**? Purists - and I guess I am one - believe that higher education is not just about teaching and learning but also about assessment and the award of credentials. These first US MOOCs did not give credentials and you certainly could not get credit for them from the universities offering them.

But, of course, notwithstanding such quibbles, these pioneers had tossed a very big rock into the quiet pool of higher education.

Seen from overseas, American universities seem to be amazingly deferential to Harvard and its ilk, so if Harvard is going online it must be OK, and if Harvard is offering MOOCs they must be OK.

So a remarkable copycat phenomenon got under way and one university president almost lost her job because she didn't get her institution to jump onto the MOOCs bandwagon quickly enough to suit her board. There was a herd instinct at work and lots of MOOCs were produced.

But the more significant impact was to make institutions rethink their attitude to online learning generally. Previously - I generalise, but only a little - online learning had been bracketed with distance learning as a lower quality form of education. Sure, online enrolments had been growing steadily through the 2000s, but this was driven more by student demand than by institutional commitment.

Tony Bates, whom I mentioned earlier, surveyed the online learning scene in North America every year and he reckoned that it was only in 2013 that online learning came of age here, meaning that most institutions offering it began doing so in a professional manner with institutional backing. He also predicted a shakeout in the MOOCs space in 2014 and I believe we saw that happen.

You are all familiar with the Gartner Hype Cycle. Using this analogy we were at the peak of inflated expectations in 2013. Then we slid down into the trough of disillusionment in 2014. Now, to continue the analogy, we are climbing the slope of enlightenment to the plateau of productivity. In what way have we been enlightened? I suggest that we are seeing beyond MOOCs to the real potential of online learning.

I illustrate this by juxtaposing the Gartner Hype Cycle with Moore's Technology Adoption Cycle, with which you will also be familiar. On this analogy the experience of MOOCs stimulated an early majority of institutions to engage with online learning in their regular courses.

That is because there are two big problems with MOOCs, which are related.

First, there is no sure-fire business model. They cost money to produce - and as more players have jumped in, the competition to use higher production values has increased the cost - yet they are offered free. I realise that some institutions make money around the edges by selling certificates of completion and recruiting students into paying programmes, but by and large MOOCs are at best a loss leader.

The exception, which to my mind proves the rule, is the UK Open University. After careful calculations it has shown that it gets an 8% return on its investment in free media: not just MOOCs but its OpenLearn website and other freebies. But the UKOU has such a massive global footprint, not least with the billions worldwide who see its TV programmes, that it is hard for others to copy its success.

But the solution is obvious.

The second problem is that most MOOCs do not lead to credit, hence their lack of appeal to many students.

I have taken six MOOCs from the FutureLearn consortium, found them excellent and enjoyed them thoroughly, but then I already have all the degrees I need and did my MOOCs for fun. I noticed, however, that when MOOCs were launched by some of the elite universities in China they fell pretty flat because Chinese students are very utilitarian and want a useful qualification or credit to show for their efforts.

Clearly, you can solve the two problems at one go by offering online courses for credit, because you can charge for those. That is what many institutions are doing. Many still call them MOOCs, perhaps because in the public mind MOOC has become a synonym for online learning. But as this famous slide shows, the term MOOC is really past its sell-by date. As the caption here says, the meaning of every letter in the acronym is now negotiable.

That does not mean that MOOCs - in the original meaning of the term - do not have a future but that future will be found more in continuing education and skills development.

For example, one of my former institutions, the Commonwealth of Learning, is involved in creating a series of MOOCs for development. A good example is agricultural training in India, where 20 MOOCs are being created to address the learning needs of hundreds of millions of farm workers.

So, to summarize on MOOCs: by going online for their regular programmes institutions can solve the two main problems of MOOCs. But MOOCs may have a big future outside higher education.

Here is Tony Bates take on MOOCs:

'MOOCs can be seen then as either a major revolution in education or just another example of the overblown hyperbole often surrounding technology. MOOCs are a significant development, but they have severe limitations for developing the knowledge and skills needed for higher education in a digital age... MOOCs are a tool for continuing and informal education, which has high value in its own right.'

So much for MOOCs! Let's go back to the Gartner Hype Cycle, which we left on our way up the slope on enlightenment to the plateau of productivity.

I've suggested that the enlightenment that dawned on higher education was the realisation that there was more to online learning than MOOCs. People like you have known this for a long time, but institutions that had never even dabbled in distance learning thought for a while that going online meant doing MOOCs. Two years ago I visited a large state university in this country, a university that has a long a successful tradition of distance learning, and was startled to find that when it jumped into MOOCs it set up an organisational unit for the purpose that was separate from its established distance learning operation.

Blended Learning: Next destination?

Anyway, having been enlightened, what is the plateau of productivity we are now aiming for? The general view is that it is blended learning, meaning a mix of face-to-face and online learning. I mention in passing that what institutions are really offering is blended teaching, because how students really learn from different media is still pretty mysterious, but I don't want to be pedantic so I shall talk about blended learning.

Let's start with this continuum of blended learning that I've taken from Tony Bates' book. Many of us use the terms blended learning and hybrid learning interchangeably but he makes a useful distinction between these terms. He uses blended learning to mean any combination of technology and face-to-face teaching, combinations often arrived at serendipitously using the technologies to hand and conforming to the timetabling expectations of the institution. But he reserves the term 'hybrid learning' to designate situations where, instead of using technology in a serendipitous and opportunistic way, the whole teaching-learning system is redesigned to create optimum synergy between the in-person sessions and learning online.

My focus here will be on blended or hybrid learning within individual courses, but I note in passing that we can also apply the term to programmes. For example, the Dallas-based company Academic Partnerships is now producing short courses called Specialisations with a number of partner universities.

Specialisations are short (e.g. 4 week) self-contained and fully online courses. These are commissioned from 'provider' universities and offered through 'host' universities, often in other countries. The host university agrees to charge a small additional fee across the board so that all its students can take one or more of these short specialisations. The company manages students' progress through the courses electronically from start to finish (registration, pacing, assignment correction and final assessment). The host university is then notified of successful course completions and includes the specialisation(s) on the students' transcripts, either as an integral part of their study programme at the host institution or as an optional extra.

This example shows a trio of Specialisations from the University of South Carolina inserted into the regular MBA programme of the University of Johannesburg in South Africa.

But let me now return to the more general discussion.

What is optimum synergy between the in-person sessions and learning online? I shall address this in three points. First, what does the research say about the relative strengths of in-person and online? Second, what should we be teaching students to equip them for the 21st century? Third, what then are the principles that guide us towards an optimum blend?

I shall address these points in a summary style - so my apologies to those who would have liked a more nuanced account.

What does the research say?

First then, what does the research say about the relative merits of in-person and online instruction? I note three significant studies.

Almost 50 years ago Dubin & Taveggia (1968) (see also Neuendorf, 2013) set the tone of much that was to follow when they wrote: 'we have reported the results of a reanalysis of the data from 91 comparative studies of college teaching technologies conducted between 1924 and 1965. These data demonstrate clearly and unequivocally that there is no measurable difference among truly distinctive methods of college instruction when evaluated by student performance on final examinations'.

Since then the most significant research has been done by using meta-analyses to bring together the results of many separate investigations. I note two of them.

Bob Bernard and his group (Bernard et al., 2004) compared distance education with classroom instruction for a variety of learners by examining 232 studies published from 1985 to 2001. They found an overall effect size close to zero for student achievement (but) asynchronous distance education had a small but significant positive effect on student achievement.

Ten years later Barbara Means and her colleagues (Means et al., 2013) compared blended learning with face-to-face teaching on the basis of articles published between 1996 and 2008 that focused on web-based courses where more than 25% of the instruction - but not all - was delivered online. They only included research with robust methodology in their meta-analysis, winnowing a pool of over 500 papers down to a final cut of 45.

They found that students in online learning conditions performed modestly better than those receiving face-to-face instruction. The advantage over face-to-face classes was significant in those studies contrasting blended learning with traditional face-to-face instruction but not in those studies contrasting purely online with face-to-face conditions.

In their conclusions these authors warn us not to interpret studies of instruction in different media as demonstrating an effect for the medium itself, because conditions may vary with respect to a whole set of instructor and content variables.

Studies using blended learning tended also to involve more learning time, additional instructional resources, and course elements that encourage interactions among learners. From a practical standpoint, therefore, a major reason for using blended learning approaches is to increase the amount of time that students spend engaging with the instructional materials.

Their findings do not support simply putting an existing course online, but they do support redesigning instruction to incorporate additional learning opportunities online while retaining elements of face-to-face instruction. This is the form of blended learning

that we called hybrid learning earlier. In other words, the task is to 'create optimum synergy between the in-person sessions and learning online'.

Furthermore, since the research shows that face-to-face instruction is, in general, less effective than online learning, we should consider online learning, not face-to-face instruction, as the default option when making choices. This is a break with current habits.

What else do we need to bear in mind?

What environment do students need?

What do students need? This has two related aspects: what instructional environment do they need or want; and what do they need to learn for life and work in the 21st century?

I'm speaking in the USA so, as regards the instructional environment I'll simply note some of the conclusions of a book by Arum and Roksa that made a stir a couple of years ago: '*Academically Adrift: Limited Learning on College Campuses*'.

It found that '36 percent of students did not demonstrate any significant improvement in learning over four years of college'. It continues: 'the main culprit... is a lack of rigor... 32 percent of students each semester do not take any courses with more than 40 pages of reading assigned a week, and half don't take a single course in which they must write more than 20 pages over the course of a semester... Students spend, on average, only about 12-14 hours a week studying, and much of this time is studying in groups'.

It also found that students who study by themselves for more hours each week gain more knowledge -- while those who spend more time studying in peer groups learn less. And, perhaps not surprisingly from what we hear about them overseas, students who spend more time in fraternities and sororities show smaller gains than other students.

This is an important argument for more online learning because:

- Students like online learning;
- They work harder, engage more deeply with the subject and enjoy it;
- They work more independently.

What do students need to learn?

Second, what do students need to learn? This is a whole keynote in itself and I've written about this elsewhere so let me just make a few points.

We need to equip students for life in tomorrow's world with a combination of skills and knowledge. The skills are sometimes called 21st century skills.

You can make your own list but some key ones are: problem solving, team working, critical thinking, creativity, leadership, communication skills (including the use of social media), the ability to learn independently, ethics and responsibility, and knowledge

management. But the key point is that many of these are not abstract generic skills. They mostly need to be embedded within a knowledge domain so developing them is often context specific. The communication skills needed by nurses are different from those needed by lawyers.

Knowledge comes in two types, experiential knowledge and academic knowledge. Knowledge that students learn from experience is important but academic knowledge is more future proof. Academic knowledge is a second-order form of knowledge that seeks abstractions and generalisations based on reasoning and evidence. It's fashionable in some quarters to denigrate anything using the word academic but this is a big mistake.

It is not an accident that the societies that have prospered in both the industrial era and the knowledge age attach importance to rigour, abstraction, evidence-based generalisation, rationalism and academic independence. Depreciating the importance of academic knowledge is tantamount to cutting off the branch on which we are sitting.

The classic example used to make this distinction between experiential and academic knowledge more concrete is Newton's Third Law of Motion, which states that for every action there is an equal and opposite reaction. Two decades ago Howard Gardner showed that even MIT physics students adopt the practices of naive elementary students when studying Newton's Laws of Motion (Gardner, 1991; Brown, 1992).

Ensuring students' grasp of academic knowledge is an area where in-person conversations between students and teachers are often necessary, even though MIT - possibly stung by Gardner's comment - has some excellent OERs on Newton's Laws.

Principles for an optimum blend

I finish by listing three key principles that should guide us in finding the optimum synergy between in-person teaching and online learning that fits our definition of hybrid learning.

First, I've already argued that online learning should be the default position. Everything that can be done online should be done online. Make full use of Open Educational Resources to improve quality, cut costs and enhance productivity.

Second, replace the cottage industry approach to teaching by teamwork and specialisation. The key faculty roles requiring interaction with students are inculcating difficult skills, helping students grasp challenging academic knowledge and commenting carefully on the assignments that students produce through independent work.

Third, focus on learning outcomes. The move to online learning will challenge the viability of our campuses. But we will not solve that problem by forcing students to come to campus for study that they could do just as well online wherever they choose.

Conclusion

My title was a question *Making Sense of Educational Technology: from MOOCs to Blended Learning - where next?*

The answer is that our next destination is hybrid learning that genuinely represents an optimum synergy between in-person sessions and learning online. Achieving that optimum synergy will require changes in the way faculty teach. Instead of individuals lecturing to large groups, teams will focus in-person teaching on reviewing students' independent work and holding apprenticeship-style sessions with small groups to focus on complex skills and challenging academic knowledge.

A future of hybrid learning is an opportunity, not a threat. If implemented sensitively and professionally it will lead to higher student performance and greater staff satisfaction than trying to revamp an older model of higher education that was simply not designed for the masses of diverse students seeking higher learning in today's technology-rich age.

We cannot promise a golden age of learning but the opportunities for empowering humankind are enormous.

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