

A New Pedagogy is Emerging... And Online Learning is a Key Contributing Factor

In all the discussion about learning management systems, open educational resources (OERs), massive open online courses (MOOCs), and the benefits and challenges of online learning, perhaps the most important issues concern how technology is changing the way we teach, and - more importantly - the way students learn. For want of a better term, we call this “pedagogy.”

What is clear is that major changes in the way we teach post-secondary students are being triggered by online learning and the new technologies that increase flexibility in, and access to, post-secondary education.

As a first step in an exploration of what these pedagogical changes are and their implications for students, faculty, staff, and institutions, we begin here by:

- Taking a look at some key developments in online learning and how they impact our understanding of pedagogy;
- Illustrating these developments through highlighting innovations in Ontario colleges and universities from the Pockets of Innovations series on the Ontario Online Learning Portal for Faculty & Instructors and offering links to many more; and
- Raising some questions about changes in pedagogy and in student learning.

But this is only the first step. Our goal is to use these questions on teaching and course design, student learning, and technological choice to spark a dialogue with professors, instructors, and those who work with them to provide online learning, through opportunities for online and face-to-face discussions of the emerging pedagogy.

We will then take this input and fashion a second document that works towards defining the new pedagogy. We will focus on how it is impacting, not only teaching and learning, but also course design, faculty support and development, student assessment, location of teaching and learning, roles of faculty and students, student support services, and institutional planning.

WHAT TRIGGERS THIS NEW PEDAGOGY?

What drives the development of this new pedagogy? Changes in society, student expectations, and technology are motivating innovative university and college professors and instructors to re-think pedagogy and teaching methods.

New Demands of a Knowledge-Based Society

There are several separate factors at work here. The first is the continuing development of new knowledge, making it difficult to compress all that learners need to know within the limited time span of a post-secondary course or program. This means helping learners to

manage knowledge - how to find, analyze, evaluate, and apply knowledge as it constantly shifts and grows.

The second factor is the increased emphasis on skills or applying knowledge to meet the demands of 21st century society, skills such as critical thinking, independent learning, knowing how to use relevant information technology, software, and data within a field of discipline, and entrepreneurialism. The development of such skills requires active learning in rich and complex environments, with plenty of opportunities to develop, apply and practice such skills.

Lastly it means developing students with the skills to manage their own learning throughout life, so they can continue to learn after graduation.

New Student Expectations

Even the most idealistic student expects to find a good job after several years of study, a job where they can apply their learning and which will also provide a reasonable income. This is especially true as tuition increases. Students expect to be actively engaged and see the relevance of their learning to the real world.

Students have grown up in a world where technology is a natural part of their environment. Their expectation is that technology will be used where appropriate to help them learn, develop essential information and technology literacy skills, and master the technology fluency necessary in their specific subject domain.

New Technologies

Recent developments in digital technologies, especially web 2.0 tools such as blogs, wikis and social media, and mobile devices such as phones and tablets, have given the end user, the learner, much more control over access to and the creation and sharing of knowledge. This empowers learners, and innovative instructors are finding ways to leverage this learner control to increase motivation and relevance for learners.

WHAT ARE SOME KEY ELEMENTS CONTRIBUTING TO THE DEVELOPMENT OF THIS NEW PEDAGOGY?

As professors and instructors become more familiar with digital technologies for teaching and learning, pedagogical challenges and strategies are emerging. The developments listed below have had an impact on how teaching is structured and how and where learning happens.

1. Hybrid learning

Until recently, there was a clear dichotomy between classroom-based teaching, often supplemented by technologies, a learning management system, and digital resources, and fully online teaching, in which the entire course is provided online.

Now there is a much closer integration of classroom and online teaching under the generic

term of hybrid learning, where classroom time is reduced but not eliminated, with the rest of the time being used for online learning.

In the 'flipped' classroom, the professor may record a lecture and/or provide access to videos, readings, learning objects, quizzes, and other resources which students work through prior to coming to class. Classroom time is spent on interaction between students and instructor, whether through discussion, problem-solving, practical exercises, or lab work. In some cases, the materials are designed to be used after class for review and assignments.

Successful hybrid teaching and learning require a focus on what may best be done on campus, such as face-to-face interaction between students and instructors, and what may best be done online, such as providing flexibility and wide access to resources and experts. This requires a rethinking of classroom layouts as more interaction takes place, involving the students, instructors, and outside experts who participate in-person or virtually. Teaching models for both classroom and online delivery need to be reconsidered and recalibrated in response to new technological capacities.

2. Collaborative approaches to the construction of knowledge/building communities of practice

From the early days of online learning, there has been an emphasis on enabling learners to construct knowledge through questioning, discussion, the analysis of resources from multiple sources, and instructor feedback. Social media have encouraged the development of communities of practice, where students share experiences, discuss theories and challenges, and learn from each other. The professor is no longer responsible for delivering all of the knowledge or even all of the sources for learning – but maintains a critical role as guide, facilitator, and assessor of the learning.

Some institutions, such as the University of British Columbia, have now created course [blogs](#) and [wikis](#) that encourage contributions and reflections from the wider public, to accompany formal courses that are 'private' to enrolled students, thus opening up courses to external expertise, and providing students with important contacts and networks outside the institution.

Most professors would not have experienced learning, much less teaching, in such collaborative environments, especially when facilitated through technology. It requires a re-consideration of roles, authority, and how learning is achieved and measured.

3. Use of multimedia and open education resources

Digital media, YouTube videos such as TED talks or the Khan Academy, and, increasingly, open educational resources (OERs) in the form of short lectures, animations, simulations, or virtual worlds enable professors and students to access and apply knowledge in a wide variety of ways. There are now many thousands of examples of stand-alone, open educational resources that can be downloaded free for educational use. Examples include MIT's OpenCourseWare, Apple's iTunes University, and the UK Open University's Open Learn.

OERs help students who have never fully mastered mathematical concepts or techniques, or have forgotten them. They provide an alternative route for students who struggle to keep up in classroom lectures. They also appeal to an increasingly large group of learners who are just interested, but don't want to enroll in, a formal course or program. Instructors can incorporate them into their course designs.

Even text books are changing to incorporate video and audio clips, animations and rich graphics and become more interactive, allowing both instructors and students to annotate, add or change material including interactive assessment questions and feedback. These electronic texts will of course be accessible via mobile phones, iPads or e-readers.

Using multimedia for education is not new, but, with the Internet, the selection and integration of appropriate sources – by both professors and students – raises questions of quality, appropriate and timely usage, multiple points of view, and packaging of a wide range of resources within the framework of course-specific learning objectives and assessment practices. Balancing the use of multimedia and open educational resources with professor-delivered content raises issues of course ownership and of measurable learning outcomes.

4. Increased learner control, choice, and independence

Students can now access content, free of charge, from multiple sources via the Internet. They can choose alternative interpretations, areas of interest, and even sources of accreditation. Students have tools, such as mobile phones and video cameras that can collect digital examples and data that can be edited, stored and used in student work. Thus strictly managing a set curriculum in terms of a limited content chosen by the instructor becomes less meaningful. The emphasis shifts to deciding what is important or relevant both within a subject domain, and to the needs of a particular learner.

Learners within any single 'class' are likely to have multiple needs. Within the framework of the learning objectives, more flexible approaches to content choice, delivery, assessment, and other factors are emerging. Equally important is the development of learners taking responsibility for their own learning, and approaching this as a skill to be taught and developed.

This approach challenges the instructor to move away from selecting and transmitting information in large blocks or chunks, such as a one hour lecture, to guiding students to find, analyze, evaluate, and apply information that is relevant to a particular subject domain. This 'relevance' becomes more negotiated between instructor and student. Indeed, the term 'instructor' becomes misleading in this context, as the role moves more to that of facilitator with less control over where and how learning takes place, and often entering into negotiation over exactly what the content is.

5. Anywhere, anytime, any size learning

The development of 'any size' learning can be seen in the creation of smaller modules, such as those offered through the 'Learn on Demand' program at the [Kentucky Community and Technical College System](#), that can be built or aggregated into certificates, diplomas or even full degrees, and which can also be used as stand-alone free open resources. These smaller modules fit the needs of many full-time students who are working part-time, as well as those needing greater flexibility or additional help with their learning. Instructors can incorporate open resources into their courses and students can use them for independent learning and research.

There is growing demand from learners for short, 'just in time, just for me' learning modules that fit an immediate learning need. The creation and aggregation of these modules for credit requires reconsideration of course structure and the crediting of learning that is not equivalent to a full course completion. In the evolving world of open access to learning, students who successfully complete such modules may be awarded 'badges', with the possibility of credit being transferred at a later time into a more formal program.

Mobile learning, with Smart Phones, iPads, tablets and other devices, is the basis of the anywhere, anytime learning provided through online learning. Offering content, quizzes, multimedia resources, and connections among learners using mobile devices requires a new look at course design, content packaging, and a consideration of limitations of data packages. How to best integrate mobile devices into course delivery and assessment is a field of continuing exploration.

6. New forms of assessment

Digital learning can leave a permanent 'trace' in the form of student contributions to online discussion and [e-portfolios](#) of work through the collection, storing and assessment of a student's multimedia online activities. [Peer assessment](#) involves students in the review of each other's work, providing useful feedback that may be used in revision of documents and a better understanding of issues.

[Learning analytics](#) are being developed to make this tracking of student learning as demonstrated through their digital activities easier and more scalable. Such analytical feedback to students can be continuous throughout a course, resulting in early diagnostics that enable learners to focus on areas of weakness before a final assessment.

The accessibility of such demonstrations of learning offers many advantages both to students and professors, compared with traditional forms of assessment. It also brings new challenges concerning what type of learning to assess, student support in using technology for sophisticated demonstrations of learning, and issues of security for exams. Not all students are as fluent and secure in their use of technology for learning and assessment as their continuous texting may indicate.

7. Self-directed and non-formal online learning

While there has always been a minority of learners fully capable of managing their own learning, and a long history of self-directed and non-formal learning in adult education, recent developments such as massive open online courses (MOOCs) provide many more potential learners with support and encouragement for self-directed or non-formal learning. The availability of free open educational resources combined with social networking enables large numbers of learners to access knowledge without the necessity for meeting institutional prior admission requirements, following a set course, or having a personal instructor. Computerized marking and peer discussion and assessment provide learners with support and feedback on their learning.

Such initiatives are still in early stages of development, and more experimentation and evaluation is needed, but such opportunities for self-directed and non-formal online learning are likely to play an increasingly important role in learning.

THREE EMERGING PEDAGOGICAL TRENDS

Underlying these developments are some common factors or trends:

1. A move to opening up learning, making it more accessible and flexible. The classroom is no longer the unique centre of learning, based on information delivery through a lecture.
2. An increased sharing of power between the professor and the learner. This is manifest as a changing professorial role, towards more support and negotiation over content and methods, and a focus on developing and supporting learner autonomy. On the student side, this can mean an emphasis on learners supporting each other through new social media, peer assessment, discussion groups, even online study groups but with guidance, support and feedback from content experts.
3. An increased use of technology not only to deliver teaching, but also to support and assist students and to provide new forms of student assessment.

It is important to emphasize that these are emerging pedagogical trends. More experimentation, evaluation, and research are needed to identify those that will have lasting value and a permanent effect on the system. Our goal here is to start a conversation on these trends, and others experienced by those working in post-secondary education.

HOW THIS NEW PEDAGOGY IS TRANSFORMING TEACHING AND LEARNING

These new developments are not emerging as neatly as the above analysis suggests. Particular

initiatives often combine a range of the methods listed above. Professors and teaching and learning specialists in post-secondary institutions in Ontario have been re-thinking pedagogy and designing new resources, courses, and programs that illustrate new approaches to teaching and learning. Using, for the most part, innovations featured in the Pockets of Innovation series on the [Ontario Online Learning Portal for Faculty & Instructors](#), short case studies exemplifying new trends in pedagogy are outlined below.

thinking pedagogy and designing new resources, courses, and programs that illustrate new approaches to teaching and learning. Using, for the most part, innovations featured in the Pockets of Innovation series on the Ontario Online Learning Portal for Faculty & Instructors, short case studies exemplifying new trends in pedagogy are outlined below.

1. Hybrid learning

Case Study: Blended Learning in Introductory Psychology at McMaster University

Demonstrates:

- hybrid learning
- flipped classrooms

The Department of Psychology, Neuroscience and Behaviour at McMaster University in Hamilton faced a challenge that is shared by many post-secondary institutions – how to provide high-quality learning for the thousands of student enrolled in first-year psychology. A hybrid learning module was introduced in 2007 and has continuously been researched and improved.



The IntroPsych Blended Learning Model (i-BLM) features:

- **Weekly Web Modules** which deliver the primary course content. The content features slides with video, animation and text with narration, with each lecture

divided into units for easier access and targeted learning.

- **Testing:** there are weekly online tests with multiple choice questions that assess conceptual understanding and application of the knowledge. There are 12 weekly tests and the top ten marks count for 40% of the students' final grade; and
- **Weekly Live Lectures:** Professor Joe Kim gives one weekly live lecture for each class. As the lectures no longer have to deliver the entire course content, they can be more dynamic and engaging while complementing and expanding the web modules. The weekly lectures are attended by about 90% of the students and offer an opportunity for direct interaction with the course instructor.
- **Weekly Tutorials:** The weekly tutorials are delivered by teaching assistants (TAs) for groups of 26 students.
- **Feedback:** A range of tools are used to provide regular feedback to students. Of the thousands of student comments received concerning the course, the great majority have been positive.

Additional examples of Hybrid Learning

[eLearn@Mohawk](#) at Mohawk College

[Before, During and After Class](#) at Sir Sanford Fleming College

[Matching Online and Experiential Learning](#) at Durham College

[Engaging First-Year Students](#) at Queen's University

2. Collaborative approaches to the construction of knowledge/building communities of practice

Case Study: [Knowledge Building](#) using online environments at the University of Toronto

Demonstrates:

- collaborative learning
- knowledge construction
- use of multimedia and open educational resources

The Master of Science in Biomedical Communications (BMC) at the University of Toronto, Mississauga is an interdisciplinary program in the design and evaluation of visual media in medicine and science. Online Knowledge Building was integrated into the second-year Medical Legal Visualization course, using the Knowledge Forum® platform, to extend the opportunities for case-based discussion, collaborative critique, and formative evaluation of student images beyond the classroom.

Students upload consecutive iterations of their medical legal visualizations on Knowledge Forum so that classmates, instructors, and external experts can comment and contribute to improvement. With only 16 students in the class, mentorship becomes a collective process; students learn through providing and receiving assessments and building on each other's ideas.

Knowledge Forum is used for formal feedback and communications, but the students have expanded online group interaction and building of ideas to other technologies that they use more readily, such as Twitter, wikis, and Google docs. Structuring group feedback is no longer the sole responsibility of the professor but an intrinsic component of the learning. In a formal evaluation study, all of the students assessed the educational value of the process of online Knowledge Building as excellent or good.

Additional examples of Collaborative Learning and Communities of Practice:

Facilitator Community of Practice at Brock University

3. Use of multimedia and open education resources

Case Study: Border Simulation for student learning in a virtual world at Loyalist College

Demonstrates:

- use of virtual worlds and simulations

In the Justice Studies program at Loyalist College in Belleville, a customs and immigration track is offered. A customs port was built in a virtual world where the students could function as Border Service Officers (BSO). The use of a virtual world for learning was based on research that showed that participants in virtual worlds identify quickly with roles and situations they encounter in virtual situations, they experience the virtual interactions as real events, and those experiences carry over into real life.

The simulation training takes place during class time. Each student takes on the role of a BSO, with his/her avatar interviewing the avatars of the travellers wishing to enter Canada. The avatars present a range of challenges to the BSOs, present travel documents to be verified, and drive a car that can be searched for contraband. At a secondary site, a virtual car can be completely dismantled so students learn all possible places where contraband may be concealed. All communication is done by voice communications, with the people playing the travellers in a separate room from the students.



Students participating in the first year of the border simulation achieved a grade standing that was 28% higher than the previous class who did not utilize a virtual world. The next class using the simulation scored a further 9% higher.

Additional examples of Multimedia and Open Education Resources:

Social Media and Society at Durham College

Simulation-Based Learning Tool at Sheridan Institute

Digital Education Strategies at the G. Raymond Chang School of Continuing Education at Ryerson University

Connected Teaching and Learning at Queen's University

VidéoTech – Online Learning Resources at Carleton University and University of Ottawa

Creating Learning Objects at Fanshawe College

4. Increased learner control, choice, and independence

Case Study – Student-Generated Course Content at George Brown College

Demonstrates:

- student-generated course content
- use of multimedia
- increased learner control, choice and independence
- new forms of assessment

As a teacher making extensive use of technology, James Kinney, a professor of graphic design at George Brown College in Toronto, was finding that maintaining mastery of the software in the field was increasingly difficult. The time lag from the release of a piece of essential software, to its acquisition, installation, and testing by the college, to faculty integrating it into the curriculum, and finally to its introduction for student learning could be 12 to 18 months.

But the rapid rate of software evolution means that introduction in the curriculum often equates with obsolescence – and so the students are exposed to dated product.

A new model of pedagogy was necessary – the model that was introduced moved from a top-down, teacher-delivered curriculum to one of distributed teaching and learning in which everyone in the classroom is both a teacher and a learner.

The new model of pedagogy is called Rapid Integration of Skills and Knowledge – RISK. The students are divided into research teams and assigned three major software titles in each group. The teams work with each software application to understand its structure and functions and prepare documentation for its use based on their experience and web research. Team presentations are made to the full class using visuals, captions, and full text, the documentation is exchanged, revised, and edited, and finally assembled into a manual entitled Legacy of Learning. In the following years, students update and add to the manual.



The professor becomes a co-learner, with a particular role in designing the overall focus and ensuring that the students are learning what they need for their program and their careers. He is no longer the sole voice of authority in the class, as sources from the Internet and the students' own discoveries result in more voices being recognized. The students are co-researchers, co-testers, and co-documentarians.

[Additional examples of Increased Learner Control, Choice, and Independence](#)

[Developing Autonomous Learners](#) at University of Ontario Institute of Technology

[Digital Media Zone](#) at Ryerson University

5. Anywhere, anytime, any size learning

Case Study: [Mobile-Assisted Language Learning](#) at George Brown College

Demonstrates:

- Student generated content
- Mobile learning
- Collaborative approaches/Community of practice

To support English-as-a-Second Language learning, eight mobile language learning tasks were designed and then pilot tested by students. Mobile activities included creating an audio dictionary, which included peer review of entries; producing podcasts; sharing voice-based blogs; and scavenger hunts involving through their mobiles and communication with people on the street. Student response was positive, language capacities improved, and the shared activities developed better interaction and a sense of community.



Based on this experience, guidelines were developed for instructional design for mobile learning that stressed the need for:

- opportunities to create and share learner-generated content;
- a teaching presence and learner support available through mobile technology; and
- tools, resources, and activities clearly structured around learning objectives.

Additional examples of Anywhere, Anytime, Any Size Learning:

[Going Mobile](#) at Nipissing University

[Digital College](#) at Algonquin College

6. New forms of assessment

Case Study: [Peer Evaluation, Assessment](#), and Review at the University of Guelph

Demonstrates:

- new methods of assessment

PEAR, a peer evaluation, assessment, and review tool, developed in the Centre for Open Learning and Educational Support at the University of Guelph, facilitates and automates much

of the administrative work associated with student peer review, making it more practical for learning, even with large classes.

PEAR **BETA**
**Peer Evaluation, Assessment
and Review**



The peer review process can be as open or restricted as the professor wishes; the submissions can go from student to professor, to professor and editor, to classmates, to outside reviewers, or an iterative process through these steps. Reviewers can share comments with each other; the students can respond to comments and explain their choices of revisions; and class groups can be created with assigned articles to review. The project overview keeps track of all exchanges, submissions, reviews, and responses.

Peer review offers students the opportunity for a broader experience of the writing, researching, verifying, and articulation process, as they learn to be more analytical and critical of their own writing through examining the work of others. A higher calibre of writing is encouraged, as are the skills of editing, revision, and assessment. PEAR is now being widely used in distance education courses at the University of Guelph.

Additional examples of New Forms of Assessment

E-Marking at the University of Ottawa

Online Marking at University of Waterloo

7. Self-directed and non-formal online learning

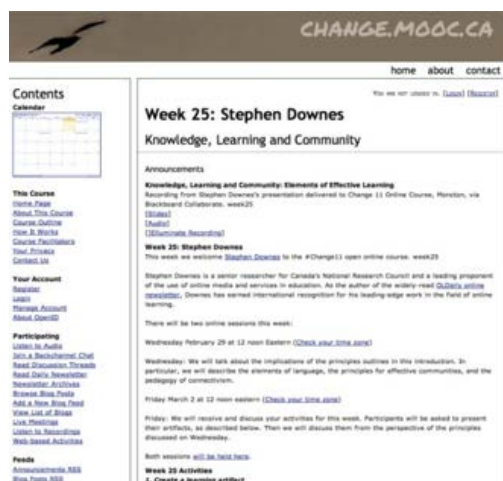
Case Study: Change 11 MOOC,

Demonstrates:

- Massive open online courses
- Multimedia and open educational resources

Massive open online courses, MOOCs, have grabbed media attention mainly because of their sheer size, with sometimes over 100,000 students enrolling for a single online course, and their association with elite private institutions such as Stanford University and MIT. Coursera is a company developed by two former Stanford professors who taught one of the first MOOCs, and claims over 1.5 million MOOC course enrollments to date. The University of Toronto is currently offering two courses through Coursera, with three more to be offered in January 2013.

The Change 11 MOOC was facilitated by [Dave Cormier](#), [George Siemens](#) and [Stephen Downes](#) who had offered the first MOOC from the University of Manitoba. The course introduced participants to the major contributions being made to the field of instructional technology by researchers. Each week, a new professor or researcher introduced his or her central contribution to the field. Participants used a variety of technologies and resources, for example, blogs, virtual online worlds, new updates aggregated from multiple web sites, live streaming video, and web conferencing. Participants were not expected to read and watch everything but to pick and choose content that looked interesting and appropriate to their needs.



MOOCs are very new and still evolving. Even a modest sized MOOC is likely to reach a large number of potential learners. Thus we are likely to see innovative attempts to provide better interaction between massive numbers of participants and relatively few instructors, and more creative ways of assessing very large numbers. Institutions are also looking at the impact of MOOCs and the possibilities of incorporating them or their associate resources into their course offerings. There remain though, serious questions about the quality of the learning, and the integrity of assessment, at least at present. On the other hand, as with open educational resources, MOOCs provide opportunities for open access to learning on a global basis.

IMPLICATIONS AND QUESTIONS

There is a ground swell of change taking place in teaching methods. As the [Ontario Online Learning Portal for Faculty & Instructors](#) indicates, across the province, innovative applications of technology to teaching and learning are being developed, researched, and evaluated. We have presented some of the development and considered their pedagogical impacts and would now like to enter into a broader dialogue about new ways of teaching and learning. What are the implications of these changes?

We are interested in your thoughts, experiences, and responses to the questions below. We would like to work towards a shared understanding of the new pedagogy that incorporates the changes in teaching and learning triggered by online and technology-based learning.

Key Elements

Here, we have outlined, and provided examples of a few of the aspects of online learning that are having an impact on pedagogy.

- What additional elements of online learning are having an impact on how you teach or prepare and evaluate resources for teaching and learning?

Three broad emerging trends, concerning accessibility; changing roles of professors and students; and technology for delivery, support, and assessment, are presented above.

- Do you agree with our choice of these trends and what others would you highlight?

Impact on Teaching and Course Design

A new pedagogy is intrinsically linked to teaching practice and strategies for course design and delivery.

- What new factors do you take into account in your teaching and course design and what elements of classroom practice do you maintain?
- What have you learned about student's needs, preferences, concerns, and success rates with online/hybrid learning?
- What specific strengths and limitations for online delivery are linked to the subject matter which you teach or for which you prepare resources?

Impact on Student Learning

Student learning is the other key component of an emerging pedagogy, with their success as the goal of all our efforts.

- What new demands are student making in terms of how they want to be taught and assessed and what are your responses?
- What new roles are students taking in their online or hybrid learning and how has this changed your teaching practice?
- What new strategies for and areas of student support are being built into course structures to facilitate effective online learning?

Technological Choice

Matching pedagogy, learning objects, subject matter, and student access and success to appropriate technologies, software, and online strategies is the ongoing challenge of online learning.

- Which technologies are you using and what strengths and challenges do they present for online and hybrid course design delivery, assessment, student interaction, and student support?

Further Questions

- What other questions should we be asking to develop a better understanding of the new pedagogy?

Technology allows us to teach differently, to meet new as well as old needs. It is helping drive innovation in teaching and learning. But in the end, decisions need to be made about how best to use technology, and for what purposes. We hope what you've read here will begin a discussion leading to a better understanding of the new pedagogy

FURTHER READING

Bates, T. (2012) What's Right and What's Wrong with Coursera-style MOOCs, [Online Learning and Distance Education Resources](#), August 5

Daniel, J. (2012) [Making sense of MOOCs: Musings in a maze of myth, paradox and possibility](#) Seoul: Korean National Open University

Sharples, M. et al. (2012) [Innovating Pedagogy](#) 2012 Milton Keynes UK: The Open University

Siemens, G. (2005) [Connectivism: A Learning Theory for the Digital Age](#), International Journal of Instructional Technology and Distance Learning, Vol. 2 No. 1